Du Pont Superior Pan possesses those photographic qualities you require to produce a good negative. It has a long scale gradation that registers the detail in shadows without, at the same time, plugging the highlights. Its color sensitivity is balanced correctly for both natural and artificial lights. It gives you the speed and fine grain qualities you need for general production work. In short, you can count on Superior Pan for the kind of negative that makes a beautiful print.

Du Pont Film Manufacturing Corporation
INCORPORATED
9 Rockefeller Plaza
New York, N.Y.
Plant, Parlin, N.J.

Smith & Aller, Ltd.
6656 Santa Monica Blvd.
Hollywood, California

Better things for better living through chemistry
New Photrix SS Exposure Meter with Wider Reach of Sensitivity; Simple Operation

The newly announced Photrix SS exposure meter is claimed to fill the gap between indoor and outdoor light control through providing so much additional sensitivity that its measuring range extends from brightest sunlight far into the field of indoor photography. In addition, the Photrix SS boasts of a simple, self-explanatory reading method, of smooth, compact and attractive appearance and of highest grade accuracy and workmanship. Its movement is made by the Cleveland, Ohio, firm of Hickok for many years a well known name in the field of precision electrical measuring instruments.

The design and reading method of the Photrix SS embodies a number of novel and interesting features. While the exposure meter is in the aiming position, it is not necessary to take any readings of figures at all but only to set the ring so that the red index registers with the needle indication. This automatically lines up all usable combinations of film speed and exposure time on the lower part of the dial. The glass window is provided with a red pointer and turns in the calculator ring, thereby serving the double purpose of protecting all the scales and of setting the exposure meter for the particular film speed so that the user does not need to remember his film speed every time he takes a reading. The Photrix SS is very flat, measuring only 3/4-inch in thickness. The surface of the meter is completely smooth without any protruding parts, levers or screws. All figures are under glass, very legible and well spaced. The scales are clearly marked and easy to identify. The casing consists of a one-piece bakelite molding of high strength and rigidity. The movement is operated by a cobalt steel magnet and a high output photocell of permanent stability. The Photrix SS is distributed by Intercontinental Marketing Corp., of New York City. Retail price is $17.50.

Improved Slide Projector Model DP Argus Announced by International Research

New brilliance in a slide projector is claimed by International Research Corporation for its Argus Model DP, which will sell between $20 and $25 and will employ a standard 110-120 volt, 100-watt projection lamp in conjunction with a newly engineered condensing and objective lens system. The lamp socket will handle a 200-watt lamp, if desired. Lens focal length is five inches.

Streamlined design of the DP projector allows for a generous-sized lamp-house with new ventilation principles that keeps heat to a minimum. It has a die-cast base and all-metal construction, is finished in Argus gray with chromium and Chinese-red trim. Lamp-house is hinged for easy access to lamp, reflector and condensing lenses. An improved type of slide carrier, of heavy-gauge stamped steel with cadmium plated surface, is unusually rigid and holds two two-inch slides securely and without danger of jamming in the slide aperture.

There is a tripod socket in the base of the projector, making it unnecessary to rest it on a table or other surface. A locking tilting-foot for elevating the image on the screen is built into the front of the base. The DP is equipped with a nine-foot extension cord, with moulded rubber plug, and a snapswitch on the cord a few inches from the projector. The cord is Underwriters-approved.

A carrying case accommodating the projector and 150 indexed slides in a hinged lower compartment will list at around $5.00. When projector and case are ordered together, there will be a list price saving of $1.00 or more. Case is of strong plywood construction, leatherette covered and nickel trimmed.

Ampro Brings Out Two Moderately Priced Models of 16 mm Sound-Film Projectors

Ampro Corporation is bringing out two new and improved low-priced 16 mm sound-on-film projectors, which are basically new in design, and priced to fit a moderate budget. A radically new adaptation of Ampro's
standard sound mechanism assures sound reproduction of a quality found in higher priced Ampco models. Brilliant, flickerless picture projection is assured with 750-1000 watt illumination. The new models are compact, quiet, and easy to operate. All in one case they are small and portable, weighing only 49 pounds, including 1600 foot reel, carrying case, accessories and cords. Operation is quiet that a blimp case is unnecessary. All controls are centralized on a single illuminated panel. Reel arm brackets are permanently attached and swiveled into position so that there are no parts to set up and fasten.

Threading is simplified with only two sprockets and film guides to facilitate threading.

Amprosound Model "X," for industrial use, is equipped with 60 cycle AC motor and sells for $275. Amprosound Model "Y," for educational use in classroom and small auditoriums, is equipped with Universal AC-DC motor with silent film speed and sells for $295.

**Versatile Leitz VIII-C 100 watt Still Projector Has Many Novel Features**

Designed for home use, visual education, and for salesmen who desire a still film projector for showing pictures to small groups of people, the new Leitz VIII-C 100 watt projector presents many novel features. It measures 614x461x5 inches, not including lens; is made of plastic and metal, plastic around the front of the projector where heat should not be transmitted and metal around the lamp house where heat should be transmitted.

The VIII-C projector embodies a black top 100-watt, 110-volt projection lamp and may be used for projecting either 2x2 inch glass slides or 35 mm film strips. Slide changing gate is interchangeable with the film carrier and the front of the projector may be rotated so that both horizontal and vertical pictures may be projected from film strips.

A three lens condenser system and a silvered reflector behind the projection lamp makes illuminating system unusually efficient for a 100-watt projector. The condenser system is easily removable so that either 50 mm Leica camera lenses of a special 85 mm projection lens may be used. A heat absorption filter between lamp and condenser system aids in dissipating the heat, while the black top of the bulb permits the tops of the inner and outer lamp housings to be open for maximum ventilation. Current is controlled by a toggle switch built into the rear of the projector.

The projector may be obtained without lens (for use with interchangeable 30 mm camera lenses) or with the Hektor 85 mm f 2.5 projection lens. With slide changer for 2x2 inch slides and condenser system for 50 mm Leica camera lenses, but without lenses, it lists at $47.

**New Edition of Wabash Exposure Guide Available Free to Photographers**

The new edition of the Wabash Exposure Guide for flash and flood photography is now available free to every photographer writing the Wabash Photolamp Corp., at Brooklyn, New York. This pocket guide from the manufacturers of Superflash and Superflood photolamps is one of the most complete ever published, and lists over 1200 different films in 35 mm, cut film, roll and film pack, made by Agfa, Defender, DuPont, Eastman, Gevaert, Hammer, Elford, Perutz, Univex, etc., together with data and exposure tables on their correct use in making flash and flood pictures. Complete data and exposure tables are also included with the various 8 mm and 16 mm films for home movies, as well as tables on Dufaycolor and Kodachrome films.

**Agfa’s New Printing Frame, Safelight Outfit and New Acid Hypo Size**

A new PRINTING FRAME for negatives ranging from 1x1½ inches to 4x5 inches, has just been announced by Agfa Ansco Corporation. The Agfa Masking Print-Frame, as the new model is called, is equipped with adjustable masks, so that negatives of various sizes may be accommodated. This improved masking device also makes possible easy and quick cropping of negatives. In addition, lengths are marked off in inches along each side so that the print may be made accurately to desired dimensions. It retails at $1.50.

A UNIVERSAL SAFELIGHT outfit with interchangeable safelight filters, introduced by Agfa Ansco Corporation, to retail at $1.95. It includes a black enameled Agfa Safelight Lamp, Agfa A-3 Green Safelight Filter, Agfa A-5 Red Safelight Filter and a 10-watt Yellow Bulb. Used in the lamp without a filter, the yellow bulb provides safelight illumination for contact printing papers such as Conveta. With the red filter the safelight may be used for Plenachrome and other orthochromatic films. When developing panchromatic films, except those which require development in total...

Tradewinds
News of New Products—Publications

Close-ups
Shamroy Picked as Award's Bet

News of the Month
Color Progress Dominates 1939 Horizon
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Mickey Rooney—Pictures by Graybill
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Studio Club News
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Why Modern Lights Are Better—Macle
Projection Symposium—Thompson

Classified Directory

Copyright, 1938, by Local 659, International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada.
Entered as Second Class matter, Sept. 30, 1930, at the Post Office at Los Angeles, California, under the Act of March 3, 1879.
International Photographer, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. International Photographer assumes no responsibility for the return of unsolicited manuscripts or material.
Subscription Rates: U.S.A., $2.50; Canada-foreign, $3.00 per year. Single Copy, 25 cents.
Office of Publication: 503 Taft Building, Hollywood, California
Telephone: Hillside 7221
1690 North Vine Street
Publication Date: 5th of Each Month
Two shots of new "Red-Hed" pistol grip for all types of cameras, described on this page, and which is first of a new line of photographic gadgets to be manufactured by two veteran Hollywood cameramen. Left: pistol grip with Speed Graphic Right: with 9x12 cm. still camera.

List prices quoted on the new daylight-type photoflood lamps are: 50 cents for No. 1, $1.00 for No. 2; and, $2.50 for No. 4 Lamp.

New Leica Wrist Strap and Price Slash on Leitz Reelo Developing Tank

A new Wrist-Strap for the Leica, which can also be used with any other camera equipped with a standard, American tripod socket, is announced this month by E. Leitz, Inc.

With the camera secured to the wrist by means of this accessory, the photographer may go about his business without fear of dropping the camera; and it may be used to brace the camera in the hands when making exposures. This latter is a highly desirable advantage when pictures are taken under poor light conditions that require the use of the slower, "instantaneous" shutter speeds. In situations of this kind use of the Wrist-Strap either forestalls or minimizes camera movement, thereby insuring maximum picture sharpness.

The strap itself is of the adjustable hook and eyelet type. Its 18 eyelet holes permit wide latitude in fitting it to wrists of different size. The Wrist-Strap is attached to a large disc-shaped base with a screw that fits into the tripod socket of the camera—the socket of the Leica is located on the right-hand side of the camera base plate. Injury to the part of the camera near the tripod socket is prevented by a felt padding surrounding the base of the screw. The outer edge of the disc-shaped base is knurled to facilitate attaching and disconnection of the Wrist-Strap from the camera.

Reelo 35 mm Developing Tank, distributed by E. Leitz, Inc., has now been reduced in price to $4.50. The Reelo tank is made throughout of chemical resistant bakelite so that it has great strength and will give years of constant service. The important part of the tank, the reel itself, is a single unit and non-adjustable. The value of this, the makers claim, is that the film grooves can never get out of alignment nor can the distance between the grooves vary.

New Filmosound Film Library Book from B&H Lists Over 2,000 Reels

The Filmosound Film Library Book just issued by Bell & Howell fully covers the company's service in providing a single film source adequate to meet the most diversified demands of educational institutions, industry, homes and communities. It is a treasury of sound-on-film features, comedies, cartoons, adventure, nature subjects, music, religion, history, news reels, sports and teacher training.

Its sixty-four 8½x11-inch pages are packed with titles, description, classification and pricing of over 2,000 reels of sound film offered for rental or sale by the Bell & Howell Filmosound Library. There is also much information on the method of booking and servicing film prints, or the varied application of listed films to subject-matter fields, and criteria
or the strict appraisal of all offerings. The book is illustrated with
tones from listed films.

A separate 8-page alphabetical index, treated as an insert, facilitates
finding films known by title and gives outright sale prices. Both Film-
sound Library Book and index are 'handier-punched' for later inclusion of
anticipated additions and for filing.

A majority of film listings in the Film-sound Library Book—over 2,000
cards—are for entertainment, but selected, too, with a view to cultural
use. Feature films drawn from the great producers are grouped by con-
ces: historical, educational, musical, human relations, etc.

A foreword describes the method of using feature films in school audi-

toria for educational purposes, tied in directly with classroom prepara-
ry and review activities. Similar suggestions are included with the head-
ing of other picture groups, such as serials, travel, nature, current
ents, foreign language teaching, vocations, etc.

Each of these groups is further broken down for ready reference. The
ovel films, for example, are grouped by continent, then by country and
subsequently by individual countries. Religious pictures are sub-
vided into Biblical, geographical and ethical discussion groups. Nature
printscs are classified under physical, plant, marine, insect, bird and animal
fields. There are over 500 cards dealing with social science, over 100 on
general science, and over 150 on nature.

A copy of the Bell & Howell Film-sound Library book is sent free to each
owner of a 16mm sound projector registered in the Bell & Howell
It is only required of such owners that they report their make of
machine and purchasing source in sending for their free copies. Addi-
tional copies and copies to non-owners of sound equipment are priced at
5 cents each.

**Scheibe Reminds of Many Uses of Monotone Filter**

George Scheibe reminds amateur and sub-standard photographers that many
of them are overlooking the economic and professional uses of the
Monotone filter or monochrome. The veteran pioneer in the filter
manufacturing field says:

"How many times have you wondered: What kind of a picture will that
shot make? Straight light, cross or back-light has everything to do with the shot.
Color adds to the problem. Wondering about the shot will mean nothing.
Hooting will mean something, either it is a shot worth while or it is a
hustler's shot. Whether you are an amateur or a professional does not
make much difference, you still are unable to tell to a degree what any shot
will look like. You can guess at color and light but that will never do.
Only the well known Monotone Filter will tell you to a degree of fineness
that any shot will look like. There is no guesswork about it.

In motion picture work the Monotone Filter plays an important part in
making pictures. It is used in the focused mounting of the camera. These are
inch round and are in almost every camera in the Hollywood Studios and
never motion pictures are made. They tell just what every shot will look
like before the lens, and it is known about the Monotone Filter for the
faintest tints are shown. Costumes show just the shade they will take
photographically, every combination of color will show how it will be taken.

Color and lighting of a shot will show how it will look photographically
through the Monotone Filter.

"For the Transparency Department they show how the background will
look, whether light or too dark. There is no limit to what use they can
be put. It is a universal filter for it can be used for nearly every kind of
work and for all phases of the work."

The Monotone Filter is used in every kind of a photographic studio,
retail, commercial and other studios. Of course, it is used for viewing
prints.

**NEW PUBLICATIONS**

(Outstanding technical volume published during the past year
unquestionably Photograph Chemicals and Solutions, by J. J. Crab-
te and G. E. Matthews, of the Kodak Research Laboratories. It was
published by American Photographic Publishing Company of Boston, Mass.,
It is priced at $4.00. Every photographer and chemicals worker will find useful
information that will make the volume indispensable."

The chapter dealing with Directions and Precautions in Handling Pho-
tographic Chemicals is worthy of note to anyone working with chemicals,
drops in to inspect the new setup.

as it explains the prevention of chemical poisons that one might receive
while working with solutions, fixing baths and photographic chemicals.
It gives suggestions relative to gases and liquids used in the cleaning
of film and the gases and liquids that are created by the film passing through
various chemical solutions that are harmful to the human system. This
article alone is worth the price of the book.

The chapter on Formulas is complete and especially valuable in that
the formulas are written in a manner that the average layman can under-
stand. It is not necessary that the reader be a graduate chemical engineer
know exactly what he is doing.

In general the writer recommends this book to all persons engaged in
photographic processing. It is a very valuable and up-to-date handbook
for the art that one likes to have always handy for ready reference.

**New Editions of Eastman Handbooks**

Also received last month were the latest revised editions of two valuable
technical handbooks of Eastman Kodak publication. The eighth edition
of "The Fundamentals of Photography," by Dr. C. E. K. Mees is well-known
and the new edition is revised and brought up to date. One of the most
valuable and informative reference works from the Eastman researchers
is the anonymous staff written volume, "The Photography of Colored Ob-
jects," which in its fourteenth edition is brought up to date with latest
developments in color research, theory and practice. The chapters on filters
are particularly worth while.
When the script calls for SPEED...

THAT'S where Agfa's two great speed films come to the rescue of the cameraman.

For Agfa Ultra-Speed Pan and Agfa Supreme have actually achieved the "impossible" in high-speed emulsions! Agfa Ultra-Speed Pan is the fastest 35mm. film manufactured—Agfa Supreme only slightly slower.

Both of these films disprove the old axiom that speed could be gained only at the sacrifice of other qualities. Agfa Supreme—despite its astonishing speed—is actually better in grain size, color balance and gradation than slower films.

With these two great films, the whole scope of cine-photography is being widened. If you haven't tried them—do so at once. You'll find out why they won the 1937 award of the Academy of Motion Picture Arts and Sciences! Made by Agfa Ansco Corporation in Binghamton, N. Y.

AGFA RAW FILM CORPORATION

HOLLYWOOD
6424 Santa Monica Blvd.
Tel: Hollywood 2918

NEW YORK
245 West 55th Street
Tel: Circle 7-4635
We started out last month to line up some information from and about Leon Shamroy, longtime ace cameraman, who was recently appointed by the executive board as chairman of Local 659's committee which will guide the destinies of International Photographer during the coming year. The first pleasant surprise we received was the information that Shamroy stands an excellent chance of capturing the 1938 Academy annual award for outstanding cinematography. Talking to Russell Birdwell, able publicist of the Selznick organization, we learned that Shamroy's camera work on "The Young in Heart," recently released Selznick pictures featuring Janet Gaynor, Douglas Fairbanks, Jr. and Paulette Goddard, is developing strong support as an awards candidate; and this opinion was confirmed by a number of technicians with whom we talked.

Shamroy is a great believer in fitting photography to the mood of a story and of extending the fullest cooperation to the director and writers in fitting the photographic effects and composition into the varying moods of individual scenes. Technicians who have seen the picture state that "Young in Heart" is a remarkably consistent achievement in this direction.

"Photography, like everything else in the complicated industry art of motion pictures, must have its compromises to get out of the realm of the empirical and reach the practical result of bringing successful entertainment to theatre audiences," Shamroy says, in expressing his working philosophy. "The cameramen must strike a compromise between the aims and intents of the producer, the director, the writers, the players, the laboratory that must process the film, general good taste and his own personal pet ideas."

"Just as in the world at large under our complicated industrial civilizations, the big problem today is to work out a system of compromise and cooperation, so in the motion picture industry, which like all great arts, reflects culturally the mood and spirit of the times, cooperation is the prime essential. Jealousies, petty temperament, and "dictatorial" whims must be subordinated to the general good."

"Reflecting the spirit of Local 659, we are trying to do our bit in that direction through International Photographer, which avoids all controversy and bickering in favor of constructive cooperative presentation of the news of technical progress. We want every sincere worker in the industry to feel that International Photographer is interested solely in the advancement of motion picture technical methods in cooperation with the artistic and business elements. And I am sure that every member of Local 659, and of the sister studio locals of the IATSE, are 100 percent behind the executive board, the magazine committee, and the editors of Inter-
NATIONAL PHOTOGRAPHER for the continuation of these policies during 1939.

Like many another successful Hollywood technician, Shamroy started out with engineering as his goal and no thought of the picture business. Influenced by his uncle, Nickolas J. Shamroy, well-known to pioneers of the aviation industry for his contributions to the first air-cooled, motor, developed by Charles H. Lawrence, his studies at New York City College, Columbia University and Cooper Union were bent along the lines of mechanical design; and after leaving school, he took an opportunity to work for the Worthington Pump company, having been selected as one of a small group of students to be trained by the organization.

However, a trip to Hollywood to visit relatives in the film capital diverted him for his original aim and after several years of practical shop experience, he found himself working in the Paramount lab. He later worked at Fox and finally became assistant to a number of the ace photographers from 1921 to 1925 during the "golden age" of silent pictures. From laboratory to assistant, Shamroy acquired a complete practical working knowledge of the many technical details that are so important in photography.

He loaded cameras, worked on their repair, checked lenses, recorded footage, and performed other odd jobs. "It was then possible," Shamroy recalls, "for the cameramen to do more experimenting than today. In fact, constant experiment and study was vital, for there were not available the many lenses, lights and special emulsions of today. Effects had to be obtained by manipulations that now seem archaic. This made lots of work for the assistants, and gave them the finest kind of training. I doubt that training of this kind is possible now, unless the anxious assistant rigs up his own laboratory and invents his own course of study."

In 1925, Shamroy joined Abe Scholtz in the organization of the well-remembered Chester Bennett laboratory, which later was absorbed by Consolidated. Later he became operative cameraman and stillman for Hugo Ballin; was with Dave Abel at Warners for several years; and finally became a first cameraman on Charles Hutchison's serials and stunt picture for Pathé.

Shamroy's emergence from the rank and file of photographic technicians traces to his association with Paul Fejos as co-producer of "The Last Moment," an experimental feature film that had a revolutionary effect on motion picture technique. It was a silent picture without subtitles, featuring montages, unusual camera effects in story telling. It won the Gold Medal of the National Board of Review and ranks as one of the outstanding experimental works of film history.

After "The Last Moment" Shamroy was associated with Robert J. Flaherty in making a documentary film of the Pueblo Indians of the Southwest, and later travelled extensively photographing throughout the ancient world and the Orient for the Huntington Ethnological Expedition.

Upon his return to Hollywood in 1932, he was signed to a long term contract by B. P. Schulberg and since that time has been photographing a succession of outstanding pictures. Among these will be remembered: "Jennie Gerhardt," "Three Cornered Moon," "Private Worlds," "You Only Live Once," "Mary Burns, Fugitive" and "The Young in Heart." He has just completed "Made for Each Other," starring Carole Lombard and James Stewart, also for Selznick. Shamroy now is beginning a new term contract at 20th Century-Fox, where his first assignment will be "Alexander Graham Bell."

In 1932, Shamroy was associate director in the Ben Hecht-Charles McArthur production unit for Paramount release and his recent pictures have been photographed for such top directors as Fritz Lang, William K. Howard, Wesley Ruggles, Gregory La Cava, Richard Wallace and John Cromwell.
Color Progress Dominates 1939 Technical Horizon

Greatest era of feature production in color due; experts step up research programs; strong financial backing available for quality-quantity laboratory release print service; Technicolor, Cinecolor, Telco leaders in print service expansion plans.

By Ed Gibbons.

The most important technical development in the professional motion picture sphere during 1939 appears at this writing to be in the field of color. This is so, not only because a strong trend toward more color is already showing its effect in production schedules, but also because the showmanship importance of color during the coming year, will transcend technical progress in other phases, no matter if they be equally impressive as engineering and research achievements.

The what, where, why, who and when of this progress is a serial story that will require more space than this present article. Somewhat optimistically we last month announced that we would follow our December roundup on television with a January roundup on color. The much wider experimental activity in color, coupled with its possibilities for more immediate practical application present a much greater field of factual and speculative reporting than did television. In delving into the field we came up with a program of news coverage on color that will carry INTERNATIONAL PHOTOGRAPHER through 1939 with a thorough series of articles on all phases of the subject. Cooperation toward this program has been assured by the important workers in the field from the experts of the color companies to the rank and file technicians of Local 659 and our affiliated IATSE motion picture technicians locals in Hollywood.

"Believe it or not," there are approximately 85 different color systems now in process of experiment, test and photography or more or less practical operation. Color is being approached from many slants and technical springboards. Many are similar, or fall into family groupings, headed of course, by the Technicolor, imbibition process, conventional bi-pack (with many different modifications) and the triple-emulsion-monopack systems such as Kodachrome and Agfacolor, which spring from the Fisher patents.

However, and most important, color, when considered from the practical aspects of motion picture production, today is not an inventive promotion, but a laboratory service. The big demand of major motion picture producers, their independent competitors, and the commercial producers of
under way. Color is headed for its biggest year. Radical improvements in actual color photography technique, keenest study by producers, artists and technicians who have not yet used color; important improvements in efficiency and economy of operation in color production; continued excellent cooperation by the lighting manufacturing organizations, and intensive work by the emulation manufacturers to produce stocks of high quality for color (particularly in radical improvement of bi-pack) are among the trends foreseen. Entirely new and different color systems may be unveiled by researchers; and greatly changed modifications of present known systems are expected. Big news is expected soon from Eastman on Kodachrome and Agfa Ansco on Agfacolor.

Behind this thought of "great expectations" lies the solid enthusiasm of an increasingly color conscious public, which is being sold more and more on color—natural color. Fully cognizant of public demand is a ready and willing capital that will pour cash money into color systems or services that can deliver the goods in practical consistent service of quality release prints.

**Telco Bids for Color Recognition**

Radical new system of processing bi-pack for natural color effects with speed and economy put to severe test in first full length Western feature soon to be previewed.

After four years of under-cover experimentation with a radically new approach to 35 mm feature calibre color, using bi-pack negative, Telco Corporation late last month announced plans for an expenditure of approximately $500,000 in the near future on a Hollywood laboratory plant. The announcement came simultaneously with the completion of a full length production, made without publicity fanfare or advance ballyhoo, with the idea of giving Telco's color a thoroughly practical test before the entire motion picture industry. The picture, "The Lure of the Wastelands," is new in the final editing stages and a major release is likely.

The new color process, technical details of which are first published herewith exclusively in International Photograher, was invented and patented by Bob Hoyt, former newsreel cameraman, and Leon Ungar. Principal claims made for it are: economy in production, with an estimated 10 per cent greater than black-and-white; remarkable depth of field; close approximation to natural colors as seen by the human eye; rapid, accurately controlled processing; use of virtually entire standard black-and-white equipment from makeup to lighting; and unusually long life of release prints.

Hoyt and Ungar got into color more than four years ago, working with lens systems, and attracted considerable attention with their special coverage of the Texan Centennial for Universal News in 1936. They soon dropped the complicated and expensive color lens systems favor of their present system, which depends entirely upon the laboratory processing of specially printed positives from any good quality, properly exposed bi-pack.

A year ago, with adequate financial backing, Hoyt and Ungar built and equipped their own plant to complete experiments on their finally arrived at system. Patterning after an experimental model machine, which they had built in Brooklyn, N. Y. (illustrated on Page 11) they installed and experimented with a complete laboratory unit, which now has a daily capacity of 20,000 feet of negative and approximately the same footage of positive prints.

This unit, now perfected from every angle of operation, will be the model of the units to be installed in Telco's contemplated new laboratory. There will be ten units, each with a capacity of 50,000 feet per day and provisions will be made for addition of more units. Illustrations on Page 9 show the compact layout at the experimental plant on La Brea Avenue in Hollywood.

During the experimental period, Hoyt and Ungar surrounded themselves with an organization of two dozen workers, who have been thoroughly familiarized with the Telco system since its inception. Ace of the staff is its chief chemist, Dr. Al Feidler, well-known to veteran industry technicians, who remember the old Empire lab.

Dr. Feidler, graduate of Columbia University and University of Berlin, and a veteran practical chemist, is credited by Hoyt and Ungar with important contributions to the operation of their experimental lab.

Telco's system is a new approach to bi-pack based upon the well-known principle that the panchromatic part of bi-pack is sensitive to the color spectrum only from the central yellow through the reds; while the ortho part is blind to that end, and sensitive from yellow, through blue to the purples at the other end; plus the fact that these separate halves of the bi-pack record are sensitive to the spectrum halves described so that they record such values in black and white on the film.

Any good bi-pack negative—properly exposed with due regard for color—is taken into the Telco plant and first thoroughly
sample tested. Then the negative is developed with the sound track and photographic record in black-and-white. The positives are printed on a "duplitized" stock, of the type available from several emulsion manufacturers. This stock, of course, has an emulsion on one side which takes the panchromatic exposure and an emulsion on the reverse that takes the ortho exposure.

Figure 1 shows the typical "duplitized" positive stock in cross-section after printing. From then on Telco color is produced on the positive photographic record, leaving the black-and-white sound track intact, in one single processing job, which is quite technically complicated, despite its simplicity and speed in actual operation.

The illustrations on Page 9 show the neatness and compactness of the Telco processing unit as developed at the company's Hollywood experimental plant. Positive stock goes in one end of the neatly covered machines and comes out after numerous changes and special operations at the other end, ready for immediate projection.

Telco's processing depends upon a completely controlled swelling of the silver image according to the gradations of exposure and the filling in of the crevices in the swelling with a gelatin filter, plus buffing this filter down to exact alignment with the top of the swollen image; then re-swelling the uncoated top of the image and filling in with a second perfectly buffed filter layer. This operation is performed on both sides of the duplitized stock.

As illustrated in the accompanying diagrams on Page 12, the Telco process, reduced to simple terms, works as follows:

In Figure 2 we see what happens in the first step—swelling the film. The blacks of the positive retain their original height at exposure, while the solid whites are swollen out considerably. Along the left side of the diagram we see a conventionalized depiction of the way the various gradations of the black-and-white image are swollen out in varying degrees between the flat blacks and the greatly raised whites—according to the degree of grey scale record they received in recording the actual image.

The second step, shown in Figure 3, shows the filling in of the crevices with the special gelatin filter; with a red filter for the...
panchromatic or red-sensitive emulsion; and with a blue filter for the ortho or blue-sensitive emulsion. Note that the blacks are covered with the heaviest amount of filter, the whites with none at all.

Third step, shown in Figure 1, finds the high whites swollen again, while the superimposed filter layers are undisturbed. The whites corresponding with the yellow center of the color spectrum, have tinier crevices than those of the grey scale photo...

sible a duplication of the real colors seen by the human eye, when the film is projected.

Most bi-pack processing depends upon dyeing or toning the pan side in some orange-red combinations and the ortho side in some blue-green combination; and in fact, Kodachrome and Agfacolor (see Int. Photog., April, Sept., 1937) with their triple emulsion on a single base, use in their final processing dyes that give yellow, magenta and blue-green. Telco strives for a combination closer to natural red on one side and natural blue on the other side of the spectrum, while the front yellow filter and rear green filter, through a process of reasoning in color physics, achieve a balancing effect from yellow through the other hues.

An important feature is that Telco can be controlled in a manner greatly similar to color control in the printing industry. The producers can have a pastel effect, running less bright and glaring than in nature; or if preferred, may take the other alternative and produce a stronger and more brilliant effect than is seen by the human eye every-day. This latter effect is the general practice in all color systems of any prominence in commercial activity today, and it also holds sway in the printing industry. In fact, optical experts state that to this fancy for high-powered color effects can be attributed the complaints of many persons that color pictures cause eye-strain and headache.

There are complicated scientific explanations as to the effect of the pull of strong primary colors and brilliant hues upon the eye. Physics students are familiar with experiments in this direction, some of them of a surprising nature.

None of the Telco viewed by this writer produced any eye-strain, and in fact, the color is so radically different from what we have seen from all other sources to date, that it takes considerable time to become accustomed to it, for the reason that it is so much closer to the colors actually observed in nature, but not usually on film. Beautiful as many color effects produced with other systems may have been, it is conceded by all that they have not and do not present truly natural color. Whether Telco has achieved the technician's dream of natural color—completely devoid of eye-strain—will be proven by time and experiment. But as it stands today, it gets results that are impressively better than the experimental stage.

The color concern is putting its process to the severest possible test in the forthcoming new production, "The Lure of the Wastelands." This first full-length western...
action picture in color was produced by Al Lane under normal independent state right conditions, which taken all-in-all, cannot even come near the production time and care of the lowest major studio "B" film. No concessions were made to the color in meeting the rapid fire production schedule, which included a location trip to Zion Canyon, Utah. Full union crews were used under regulating conditions as prevail throughout the industry today. The producer and Telco executives estimate an approximate 10 per cent budget up over black-and-white experience for the same type of picture.

The picture was photographed by Francis Corby and James R. Palmer, the latter a member of Local 659, IATSE. Reaction of the photographers, who were highly complimented by Hoyt on the consistent quality of their negative, was that the system has more depth of field than black-and-white, and produces a definite third-dimensional effect. (In scenes viewed by the writer, the depth of field was truly astonishing.) Exposure, they found, called for about 10 per cent more light than black-and-white and some changes from standard practice, particularly in front lighting. Like all color, exposure latitude was considerably restricted, but when properly exposed, results were invariably satisfactory.

With plans for the new Telco plant nearing completion, Hoyt and Ungar are consulting with representatives of the important emulsion manufacturers on technical suggestions they have developed in their experiments with their color system. These suggestions lie in the realm of improvement and in some instances radical changes in bi-pack emulsion making. Further details of this development will be published in next month's International Photographic Review, along with other stories in our program of presenting color progress for 1939.

The Telco system is fully protected by an array of patents, not only affecting the methods and machines described in this article, but also on various off-shoots of the system, some of an interesting and technically radical nature to be discussed in forthcoming issues.

Mickey Rooney in Ten Best

Durward Graybill, Local 659 stillman, captures "Huck Finn" personality of young player who in 1938 jumped to fourth place amongst box-office appeal stars in Hardy series.  By Herbert Aller

For several years two youngsters, Shirley Temple and Jane Withers, have ranked among the ten best money making stars of the screen, according to the annual poll of motion picture exhibitors of America, conducted by the Quigley Publications to judge the box office rankings of some 200 top stars and near stars. For 1938 a third juvenile player enters the charmed circle, in the person of young Mickey Rooney, who after playing in more than 50 pictures since his first screen appearance as a tot in 1926, last year took fourth ranking as a drawing power.

The down-to-earth Judge Hardy series, which MGM is producing, was responsible for Mickey's high jump in box office rating; and Mickey, who plays Andy Hardy, now has been entrusted at MGM with the title role in one of America's most popular boy stories, "Huckleberry Finn," by Mark Twain.

That Mickey Rooney will make an ideal prototype of Twain's youthful hero is evident from the excellent selections on Pages 14-15 from the collection of still photographs for MGM's publicity campaign on the production by Durward "Bud" Graybill, stillman member of Local 659, IATSE. Graybill has captured young Rooney's "Puckish" personality with his camera in a manner that not only conveys the spirit of the Mark Twain story but also reflects the photographer's mastery of his medium.

The first ten box office appeal stars as rated by the Quigley Publications were:

- Shirley Temple, Clark Gable, Sonja Henie, Mickey Rooney, Spencer Tracy, Robert Taylor, Myrna Loy, Jane Withers, Alice Faye and Tyrone Power.

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Hollywood
Eight character studies of Mickey Rooney, young player who sky-rocketed to fourth place as box office draw star last year. (Story on
Page 13, Column 2. Shots are from MGM's "Huckleberry Finn," by Darward "Bud" Graybill, stillman member of Local 659, IATSE.
Wanger Pic Important for Process Work

"Tradewinds" an outstanding film of 1938 as first production with rear projection as an integral part of production program; opens new fields of story material; release timely as Academy Research Council report on rear projection technique and standards due.

One of the most important productions of 1938 was Walter Wanger's "Tradewinds," not so much for its excellent values as screen entertainment as for its technical background. For "Tradewinds," is the outstanding example in the motion picture industry to date of the advance planning of a story for film production to take full advantage of the recent progress made in rear projection technique by the small army of enthusiastic workers in special effects photography.

The history of rear projection has been one of constant pioneering (See Int. Photog., April, 1938, Process) and every day's assignment for the special effects and process technicians brings new opportunities for pioneering.

"Tradewinds" was born when Director Tay Garnett decided to take a world cruise and mix business with pleasure by photographing background action for several stories he had in mind. Garnett photographed some 40,000 feet of usable foreign background scenes, mostly Asiatic locations with romantic and dramatic associations to American audiences, such as Honolulu, Shanghai, Saigon, Bombay, Singapore, etc. James M. Shackleford photographed the scenes on the trip.

In the final production, as previewed to an appreciative audience late last month, there were some 3,000 feet of processed background in the picture. Out of 79 sets used for the production, 31 were designed for process work by the art director, Alexander Toluboff.

For his first story in this experimental program with process effects as a fundamental backbone of the production program, Garnett chose a story with a pattern that the motion picture can do better than any other entertainment medium—the chase.

"Tradewinds" is one long chase from start to finish, complicated with a strong romantic conflict and a minor element of crime solution, which is brought in to climax the yarn. In the story, Joan Bennett, a suspected murderess, is hunted across the Pacific from one romantic spot to another by Fredric March, playing a detective on special assignment from the San Francisco police. In a fast-moving story against a continuous procession of new locales, a romantic involvement is developed between the pair, leading to a dramatic climax back in San Francisco, where March solves the murder, and wins Miss Bennett. Ann Sothern and Ralph Bellamy excellently support the star team.

It is understood that the production cost of the Wanger picture ran close to $750,000, yet the same picture—produced without background projection technique, with the alternative of either sending a company on an extensive location or reproducing the settings in Hollywood—would have cost up to as much as $2,500,000. General opinion following the preview was that

All illustrations accompanying this story bare rear projection backgrounds. Stills by Ned Scott, member of Local 659, IATSE.
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The Wanger-Garnett venture opens the path for much greater attention to background projection.

The "Tradewinds" preview was timely from another technical slant, because it came just as the Academy Research Council was in the final stages of completing its report on rear projection, which is expected to set new and valuable minimum standards in the field upon its release next month. A number of manufacturers are withholding the placing of new and improved equipment on the market pending the release of the report.

Membership of the process and special effects committee, which is the largest group functioning on behalf of the Research Council and contains representation from all of the studios as well as all of the companies manufacturing and developing all types of process projection equipment, consists of:


Up to the present time, the industry's attitude toward rear projection and similar special effects has been secretive and considerably on the far side from cooperation. Not since the Academy's symposium on special effects in 1951, has there been any general cooperative working together of the experts in the field up to the Research Council's current study. The general agreement by studio experts on minimum requirements in rear projection equipment is expected to be an important step forward, since it will not only guide the manufacturers toward close cooperation with studio technicians, but also will open the way for further general discussion and solution of problems in this field. The release of "Tradewinds" adds to the technical note of progress the indispensable overtone of box office value.

Process photography on "Tradewinds" was handled ably by Ray Binger. Accompanying illustrations of various highlight scenes from the picture, in which process was used, are from the still series photographed for the publicity campaign by Ned Scott, still man member of Local 690, IATSE. Scott worked under the handicap of having to snap his stills in synchronization with the shutter timing of the rear projection; and his job was made extremely difficult because frequently figures in the projected background would walk forward and out of focus. One of the most spectacular scenes in the picture, a perfectly matched studio action against the process background of 50,000 people at the Singapore race track, is missing from the still series because of such technical handicaps.
Studio Club News

Plans for 1939 include regular rotating print exhibit; news of elections; photographic outing planned for February; 1939 Fair exhibits.

By George M. Haines.

INTER-STUDIO CAMERA CLUB greets the new year with a program of interesting activities and events that should not only put the joint organization ahead, but also benefit the individual clubs. Of interest to club members will be a new rotating system for exchange of prints, to be developed as regular procedure during 1939. From three to five outstanding prints from each club will be selected to form the exhibit, and there will also be special exhibits in various classifications. Details will be sent to club presidents later this month.

In this connection, it might be noted that clubs having difficulties in classifying prints should contact Douglas Rudd, president of the Paramount club, for an outline of his splendid system, which has worked very successfully for that group.

News of elections received to date (there will be more next month) are as follows:

Paramount: Douglas Rudd, president; Virginia Printzlau, secretary; Lorin Grignon, secretary; United Artists: Harry Sunby, president; John Wentworth, secretary; 26th Century-Fox: George M. Haines, president; Woody Laguna, secretary.

The Paramount studio club will hold its annual salon exhibit on January 12. Try to attend the exhibit of this very progressive club, which always produces much that is worth while.

Columbia's club is making consistent progress and reports that officers were re-elected: Paul Murphy, president; and Howard Edgar, secretary. An exhibit of Columbia club prints is now being shown at Hal Harm's Studio at Photo Supply Company.

Blank forms will soon be sent to all the clubs so they may participate in 1939's big World's Fairs at San Francisco and New York.

Plans are now being made for a photographic outing during February under Inter-Studio Camera Club auspices. Details will be mailed to club presidents so that those interested will have plenty of time to make arrangements.

Kornman to S. A.

Tony Kornman, veteran cameraman, who has been conducting a free-lance equipment brokerage business during the past year, sailed January 14 for Buenos Aires to act as director of photography for Estudios San Miguel. Kornman will also assist in the installation of a considerable amount of modern equipment that the South American organization has purchased from Duplex.
Backlot Handbook

Lighting equipment, power connections and handy accessories.
By George M. Haines, Local 37, IATSE

Our latest batch of technical gadgets in the Studio Mechanic's Handbook, intended for eventual publication as the industry's first practical handbook of the many odd and unusual items used in motion picture production, deals with lights and power. Don't forget that we are counting on readers of INTERNATIONAL PHOTOGRAPHER to supply us with suggestions and comment on this series. In the near future, details of a plan to expand and expedite the coverage of this vast field will be sent to department heads and key technicians.

In the accompanying illustrations on this page we see at the top two very handy items developed at the 20th Century-Fox lot. Left: a neat open arc protective shield; and Right: the streamlined portable work-box.

Next, at the Right, we have the commonly used "A" splicer or connecting box, which is used for bringing in juice from the main line and distributing it to the various lighting units. At Left is the 6-hole plugging box, which is clamped to the "A" box at the other end from that shown in the illustration. Below the 6-Hole box are seen the head extensions which are run out to the individual lamp units.

Finally, we show some of the modern lamps. Above at the Right is a 100-Amp Fresnel type Arc, mounted on rolling tripod. At Lower Left is a 36" Arc, mounted on portable wooden dolly, while at the lower Right, we have a trio of 100-Amp Fresnel Arcs mounted on a portable metal dolly. This later item is quite widely used at the 20th Century-Fox lot; and in an early issue we will present a complete layout of their metal type grip equipment.

Alley Back from Tour

Norman Alley, veteran newsreel cameraman member of Local 659, IATSE, got back in time to cover the Duke-USC New Year's Day Rose Bowl classic after a leave of absence from his post as cameramen-supervisor for Universal News in the Southern California area. Alley lectured in many key cities and at universities and colleges last fall on photography and newsreel experiences. He delivered three lectures at Columbia University, which has extensive courses on motion picture technique. Proving that there really is "always something new" in a newsreel's life, it was the first time in his more than 20 years behind the lens that Alley had photographed a Rose Bowl game.
Why Modern Lamps Are Better

Scrupulous attention to details develops steady, efficient illumination as proven by scientific measurements with G-E photometer.

By Peter Mole, Mole-Richardson Company.

The statement is often made that today’s studio lighting equipment is better—more efficient—that that of the past. In many instances, daily performance on the set gives practical proof of this statement. But the matter has generally been allowed to rest there, with the acceptance of the fact. No scientific measurements have been made to prove the point—to show how much better are today’s lighting units.

Recently, in the course of routine tests of the Duarc, the new all-purpose twin-arc general lighting unit lately introduced by the Mole-Richardson Company, a series of tests were made in which actual performances of the new unit and of two types of older arc “broadside” were compared with scientific precision.

The three units tested included, in addition to the Duarc, an M-R “Type 29” Side Arc and a typical twin-arc “broadside” of the days before the coming of sound. The Side Arc was developed a scant five years ago, to meet requirements of the then new three-color Technicolor process. It is a typical representative of conventional current practice. The “broadside” was made not less than fifteen years ago, and represents typical pre-talkie lamp design and performance.

The tests were made by means of a General Electric photelectric recording photometer. In this device a photelectric cell of familiar type is coupled to a movable stylus which traces upon a moving roll of paper the curve which represents the performance of the lamp.

Figure 1 shows the curve yielded by the pre-talkie “broadside.” It will be noticed that when the arc is first struck, the radiation jumps to a relatively high intensity, resulting in a peak after about 30 seconds’ burning. After this, the intensity descends rapidly, with frequent and noticeable variations until after about 3/4 minute of burning the lamp is radiating but 1/3 as much light as it did at the start. Then the arc...
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considerable periods, it was seldom safe to burn them continuously for more than three minutes, or at most, five minutes.

Figure 2 shows the record of a test of one of the more recent Side Arcs. It is easy to see that the characteristic slow decline in intensity, and the longer-period fluctuations which characterized the older arcs have been largely eliminated. Sufficient minor variations or flickers remain, however, to make it clear that with today's highly sensitive films and more uniform processing, even this lamp cannot be considered truly flickerless.

The companion test of the new Duarc is shown in Figure 3. From this curve it will be seen that while minor fluctuations still exist in the light-radiation of the new lamp, they average less than 1/6 the magnitude of those of its immediate predecessor, the Side Arc, and less than 1/25 the magnitude of those of the pre-Vitaphone "broadside." The various superimposed flicker-pattern of longer period and greater magnitude, evident in the earlier lamps, have

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vanished. For all practical purposes we may count this as an absolutely flickerless arc.

This gratifying confirmation of the general opinion that modern lamps are better than those of the past gives us a measure of how much better they are. At the same time, it raises the question of how and why these improvements were obtained.

In the case of twin-arc general lighting units, the chief cause of the improvement is better knowledge of the behavior of carbon arcs, especially as regards the feeding of the carbons, and the resulting improvements in the arc-feeding mechanisms. Improvements in carbons have also played their part, for which the engineers of the National Carbon Company deserve much credit; but the best carbon will not perform well in a mechanism which feeds the carbons incorrectly.

The early lamps used a simple gravity-magnetic carbon feed, and fed both pairs of carbons simultaneously. This made for mechanical simplicity; but inevitably it would result in feeding one arc of a pair prematurely, while the other's feed might be delayed too long for efficient operation. The feed was of course extremely intermittent, so that the arc-gaps increased sufficiently between feeds to lessen the intensity of the light, whereas, as the curve showed, the result could not be other than a badly flickering lamp.

The Side Arc of five years ago remedied at least on of these basic faults. Instead of feeding both pairs of carbons together, each pair operated independently. In this way each arc was fed at a rate more closely related to its individual needs. As the curve showed, this eliminated the large-pattern flickerings. But since the feed remained intermittent in nature, there remained considerably less flicker.

In controlling a twin arc lamp to meet the present-day requirements of a constant spectrum balance and flickerless operation, it is necessary to adhere strictly to the basic principle that each of the arcs must be fed independently in exact accordance with its carbon consumption, and in a manner to maintain within the closest tolerances equal and constant voltage drops in each arc. In the Duarc this principle is complied with by an ingeniously devised feed motor circuit instantly responsive to voltage changes of less than one volt. The motors feeding each trim rotate at an average speed of five revolutions per minute, a speed so slow that it introduces no problem of mechanical noise. The carbons feed continuously rather than intermittently, each trim feeding in exact accordance with its consumption. The result of these improvements are clearly seen in the flickerless curve traced by the Duarc in the test.

It will be seen that these improvements in performance have come less from sweeping innovations in broad aspects of design than from careful attention to details. Scientific measurements of this nature show what can be done to improve performance, after which simple common sense in design usual-
Power Supplies

Since the introduction of vacuum tube amplifiers into the commercial field some years ago there has been a continued endeavor on the part of engineers to find ways and means for supplying the necessary DC power from AC sources. The most common method of accomplishing this result has been the employment of power supplies consisting essentially of rectifiers and filter circuits. Our further discussion will deal with the rectifiers and the filters separately and will divide power supplies into two general classes, viz., low voltage—high current types ("A" supplies, etc.), and high voltage—low current types ("B" supplies, etc.).

Types of Rectifiers

We will briefly define a rectifier as a combination of elements which will pass current in one direction only. This definition does not strictly hold for all commercial rectifiers as we will see later, but will hold for all rectifiers discussed unless otherwise noted.

(a) For "A" Supplies

The hot cathode, gas-filled rectifier known commercially as a Tungar or Recton, is a special type of two element vacuum tube. The operation of the ordinary two element vacuum tube as a rectifier is shown schematically by Figure 1 in which "V" is the tube with a filament and plate, "T" a transformer to supply filament current for the tube and to act as a power source, and "R" a load to which it is desired to supply DC.

Whenever the polarity of the voltage developed across the secondary winding of the transformer "T" is such as to make the plate or anode of the rectifier positive with respect to the filament or cathode, electrons will be drawn from the filament to the plate and hence through the load "R." During the half cycle, when the polarity has changed from the above, there will be no current flowing through the tube or through the load "R." The result of the above cycle of events is that a pulsating direct current is set up through the load with a pulse of current flowing every half cycle.

The gas-filled rectifier differs in operation from the above in that the gas within the tube is so heavily bombarded by the electrons that it becomes ionized, and the ionized gas then acts as the principal current carrier. The beam derived from the ionization of the gas is that the rectifier will pass very heavy currents, up to about 15 amperes, with a very low voltage drop within the tube (6.8 volts).

A special tube of this type contains a small amount of mercury vapor which allows much higher voltages to be developed across the load, but necessitates a warming-up period before the plate voltage may be applied.

A copper-oxide rectifier is used quite often in this type of power supply. The single elements of this type of rectifier are copper discs covered with a layer of cuprous-oxide. These discs will pass about five thousand times as much current in one direction as in the other and will pass about two amperes per square inch of disc surface. High voltages and high current outputs are handled by using many discs in a series parallel arrangement.

(b) For "B" Supplies

One of the most common rectifiers used for high-voltage—low current power supplies is the two-element hot cathode high vacuum tube, usually known as the krypton or diode previously described. The average characteristic of such a tube is shown by Figure 2, although other tubes are made to rectify voltages as high as 100,000 volts.

The addition of a very small amount of mercury vapor into a krypton reduces the tube drop to about 15 volts, and hence allows heavier currents to be drawn from these tubes. Commercial tubes of this type will develop currents as high as 150 amperes and as high voltages as 15,000 volts.

Another type of rectifier tube which has been used considerably in the past but is not so common now is the cold cathode, or glow tube. When two electrodes are enclosed in a glass envelope filled with a gas-like neon, electrons will be liberated from the cathode when a potential exists between the cathode and the anode. Certain metals such as aluminum liberate electrons much more readily than other metals such as nickel. By constructing a tube with a large aluminum cathode and a small nickel anode (and an AC potential between the two), we find that most of the current will flow when the nickel is positive rather than when the aluminum is positive. This current difference is sufficient to make this type rectifier of commercial importance.

General Types of Rectifier Circuits

In its fundamental form a practical rectifier circuit consists of three parts: (1) the power source (usually a transformer); (2) the rectifier itself, and (3) a filter circuit to smooth out any AC ripple which comes from the rectifier. In our discussion we will group the transformer and rectifier, and discuss filter circuits separately.

The two fundamental forms of most tube rectifier circuits are shown in Figures 5 and 6. As explained before, in the half-wave rectifier current flows through the load only every other half cycle that is, only when the plate or anode is positive with respect to the filament or cathode. In the case of a full wave rectifier, however, current flows through plate No. 1 when it is positive with respect to the filament, which results in current flowing through the load during every half cycle. This is illustrated by Figure 5.

Figure 6 illustrates a simplified schematic of a rectifier circuit which is used to a great extent in the radio field, and is called a voltage doubler. By voltage doubler is meant that the DC output voltage can be as high as twice the peak value of the AC input voltage. The operation is as follows: Assuming that during one half cycle of the input voltage the upper wire is positive with respect to the lower wire, during this half cycle the top rectifier tube will pass current and charge the top condenser as indicated. When the polarity has reversed, the bottom rectifier tube will pass current and charge the bottom condenser in a similar manner. The result is that since the two condensers are in series there will appear across the output terminals a voltage of 2-E. When the current is drawn by the load this voltage will of course be dropped somewhat, depending upon the magnitude of the load current and the size of the condensers. Practice, Radiotrons 25Z5 and 25Z6 are used for this purpose, as illustrated by Figure 7. Other commercial combinations of single and three-phase rectifiers are illustrated by Figure 8, which also shows the DC output voltage for each of these circuits.

The three most generally used types of filters incorporated in power supplies are shown by Figure 9. These are known as the choke-input type, the condenser-input type. The number of sections to be used and the values of the various components depend upon
the individual power supply with which the rectifier is to be used. Figure 10 shows the voltage regulation curves for two of these types of filters using the tube illustrated by Figure 2 both as a half-way and as a full-way rectifier. It should be noted that for a given available AC voltage the condenser-input type of filter results in a higher DC voltage, but that the choke-input type gives better regulation.

Two examples of typical power supply circuits and their associated amplifiers are shown by Figures 11 and 12. It should be noted that the power supply shown in Figure 11 makes use of two rectifier tubes. The RCA 85 supplies "B" voltage, while the RCA 80 supplies "C" bias voltage for the RCA 2A3 tubes. Another interesting circuit is shown in Figure 13 and illustrates a "B" supply which is both line and load regulated; that is, the output voltage is practically constant for any current output from zero to full load, and for any line voltage from 90 to 125 volts.

A good example of an "A" power supply is shown by Figure 14. This power supply makes use of the gas-filled—hot cathode type of rectifier tubes and is intended to supply the heater current for amplifier tubes used in very low level circuits.

**Types of Amplifiers**

In general there are two different functions to be performed by amplifiers as applied in the recording and reproducing field. The first of these functions is a matter of pure amplification; that is, when it is connected to a device in which are generated small electrical voltages it should increase the amplitude of the small voltages it delivers across its output terminals an exact but greatly enlarged duplicate of its input voltage. This type is generally known as a voltage amplifier.

The second function that an amplifier must perform might be termed "power conversion"; that is, it must convert voltages applied across its input terminals into power delivered to its load. This is the so-called power amplifier. It should be noted that these two functions may be accomplished by the same amplifier, and most practical amplifiers are of this type.

Figure 12 is an example of a power amplifier, while Figure 11 illus-
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Writes Takafumi Hishikari, Cameraman for Domei News Agency, Tokio, and Son of General Hishikari who Captured Manchuria in 1931...

It is a pleasure to tell you that, because of its dependability, the Eyemo camera is used almost universally by cameramen covering the Sino-Japanese war. Almost every one of us prefers the Eyemo because it is smaller, and therefore easier to handle than other types, and in our work at the front compactness and lightness of weight are of extreme importance.

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An interesting sidelight is the experience of one of my friends who was using his Eyemo, equipped with an extremely long telephoto lens, to make pictures of a very distant Chinese machine gun. The Chinese observer noticed the long lens (one new type of artillery) and directed his fire toward my friend. Although bullets struck the camera and damaged one of the lenses, neither the camera nor the other lenses were damaged, and the Eyemo continued to function.

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INTERNATIONAL PHOTOGRAPHER

Vol. 10 February, 1939 No. 1

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Editor, Ed Gibbons; Managing Editor, Herbert Aller; Art Editor, John Corydon. Hill: Business Manager, Helen Boyce.
Copyright, 1939, by Local 659, International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada.
Entered as Second Class matter, Sept. 30, 1930, at the Post Office at Los Angeles, California, under the Act of March 3, 1879.

INTERNATIONAL PHOTOGRAPHER, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. INTERNATIONAL PHOTOGRAPHER assumes no responsibility for the return of unsolicited manuscripts or material.


Office of Publication: 503 Taft Building, Hollywood, California
Telephone: Hillside 7221 1630 North Vine Street
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SAFETY ASSOCIATION PROGRAM GETS RESULTS

Motion Picture Studio Safety Association enters second year with excellent record of achievement under chairmanship of Paul M. MacWilliams, WB medical chief; crafts giving enthusiastic support; third rail adopted.

An important cooperative project of the motion picture industry that is producing valuable results after a year of pioneer activity by a small but enthusiastic group is the safety campaign of the Motion Picture Studio Safety Association. Notable progress in elimination of accidents and in expert care of accident victims has been made by the production end of the industry during the past five years. This is just another sign of the industry's growing up from its happy-go-lucky pioneer days to big business status.

Realization by studio executive management that safety conditions for workers has economic as well as morale values has been matched by enthusiastic cooperation from the various industry crafts. The program is being carried on along practical and efficient lines through individual studio safety committees, as well as through the joint organization in which each studio is represented. The Association was organized last April and in less than a year has proved a useful and efficient coordinator of the industry-wide safety drive.

While it was inevitable that the growing industry would eventually adopt sane and practical safety standards and an organization to educate and enforce them, the actual start of the existing program began when an ex-gob, doing stunt-work at the old Sennett lot in pre-war days was the victim of a serious accident.

The ex-gob had the experience of nine years of medical work in the U. S. Navy behind him and then and there he started selling himself (and eventually the industry) on the idea of organized industry medical service and accident prevention. Returning from World War service a few years later, he has since been continuously active in studio medical care. His name is Paul M. MacWilliams, director of medical service and accident prevention at the Warners studio, and chairman of the MPSSA. Last month he was unanimously re-elected chairman, while John Hamilton, of the RKO-Radio insurance department was elected secretary to succeed Louis Purcell, of the 20th-Fox accounting department, who had served in that capacity since the Association’s organization last year.

MacWilliams is known to thousands of studio workers, having served on virtually every lot in the business before joining the Warners organization in his present post. His enthusiasm has won the approval and support of these thousands, from top executives to the rank-and-file of studio workers. Under his leadership, the MPSSA is conducted on strictly non-political and business-like lines. Its present program revolves around a complete study of studio conditions, craft by craft. Monthly meetings of the studio representatives of the Association are held, at which all department heads of one or two selected crafts attend and consciously go over all safety angles connected with their particular departments.

Findings and suggestions from these meetings are conveyed back to each individual studio safety organization. Safety education filters down to the rank-and-file of studio workers from these lot meetings, while at the same time proposals and suggestions are developed for possible industry-wide adoption.

Outside of the general selling of safety messages and accident prevention psychology, which are reflected in improved accident control statistics, the most important accomplishment of the Association has been the agreement throughout the industry to adopt a standard “third rail” for all lighting parallels. This third rail, important to insure against falling of men and materials from the lighting arrays strung above studio sets, is the practical result of much discussion and special cooperation by experts in the grip and electrical departments.

Many minor policies and principles toward safer working conditions have been adopted, and eventually the program will establish similar standards to protect every
worker from the players and technicians on the set to the laboratory employees who work close to film and chemicals.

At the Warners lot, MacWilliams has instituted several workable incentives to exploit safety values. One is a $10 cash award to the author of the best letter containing a safety suggestion that is accepted at the monthly studio meetings. Another is a large and conspicuous record board, wherein each department's monthly safety record is displayed. This is on the wall of a building near the main entrance to the lot. Under a merit system, fairly apportioned by points according to craft size and hazards of work, each department competes against the others for an annual cash prize, which is distributed among the workers of the winning department. This has won the hearty support of the rank-and-file to the extent that voluntary safety "policing" is the order of the day and workers who endanger department records by carelessness find themselves "on the spot" with their associates. Similar plans are in effect at other lots.

Representation on the Association governing body for 1939 includes:


Representatives from the Selznick and General Service lots still are to be appointed. Also serving as regular members are Aubrey Blair, Screen Actors Guild, and Campbell MacCullough of Central Casting on matters affecting extra players; and Douglas Jones, safety engineer of the Lumberman's Mutual Casualty. This firm handles 30 per cent of the workmen's compensation insurance for the Hollywood studios and has been actively cooperating with the Association since its inception.

Additionally, business representatives and officials of the various A. F. of L. crafts unions are invited to attend the regular monthly sessions when meetings of department heads in their particular field are held. Among recent guests, who have engaged in round table discussion of safety matters have been Lew C. G. Blix, business agent of Local 37, IATSE, and Al Speed, business agent of Local 40, IBEW.

MacWilliams states to International Photographer that the Association welcomes and solicits cooperation and suggestions for better safety conditions from every branch of the industry. The Association chairman, himself, is constantly campaigning along these lines. Simple, intelligent suggestions and a sense of humor characterize his propaganda methods. Interesting and instructive is the following sample message, distributed along with a letter urging safety alertness to Warners' workers:

A FEW SIMPLE SAFETY RULES

1. Before operating any machine, see that the safety guards are in place and working properly.

2. Always wear goggles which are provided, while working with, or near emery wheels, for glass eyes are cheap and don't look so good.

3. When running short material through jointers, use your rule or piece of material instead of your hand.

4. Watch the upturned nail. Respect it as you would a rattlesnake.

5. Do not wear tennis shoes.

6. Check every ladder and scaffold before putting your weight on it. If you think it unsafe, call it to the attention of your foreman.

7. When working overhead, do not drop loose material, and do not leave loose material on run-ways.

8. In coming down from up high, do not make short-cuts. Use ladders or steps provided for this purpose.

9. In lifting, don't try to be a Samson. You can have help merely for the asking.

10. Do not jump on and off moving trucks. It is bad medicine and besides, stunt men get paid for that.

11. Do not under any circumstances attempt to remove slivers with the aid of your pocket knife. This is a very dangerous practice, which oft-times results in serious infections, and infections cost you money.

12. When entering dark stages, proceed with caution until your eyes have had a chance to accommodate themselves to the change.

13. When driving on the lot, please observe the eight-miles speed limit, and watch all inter- sections.

14. If you are an electrician, always wear your gloves when making connections or plugging in. Watch out for shorts from your pliers when hooking up hot spiders.

15. Report all injuries to the First Aid station, so that they may be properly cared for. This is not held against you, but is for your benefit and protection.

16. Do not attempt to work, especially high up, if you are ill. It is dangerous not only to yourself, but to your fellow workers. A word to the foreman and he will advise you.

On the Cover

This month's cover shot is unusual, because even we sent it to the engraver we were asked whether it was a composite shot. It shows a Columbia camera crew shooting special inserts of crocuses blooming in the snow for the picture "Let Us Live." The scene is the setting for a symbolic concluding scene of the picture. The snow is artificial product of studio craftsmen and was concocted on the Providentia rental ranch near Los Angeles. In the picture, photographed by Art Marion, veteran stillman member of Local 659, IATSE, are: Lucien Ballard, cameraman; Lloyd Ahern, operator; Marcel Grant, Roy Babbitt, assistants.
GRADUATED FILTERS
By GEORGE SACHSE

GRADUATED FILTERS have been on the market since 1916, and as a matter of fact, the combination color filters were among the first used. In the past 23 years they have proved their worth time and again. While they are widely used by professionals, many of the experts have not noticed the progress and improvement made in this direction by all filter manufacturers. Catering especially to the studio photographers, motion picture and still, I find a keen interest in filters and their use, a photographic enthusiasm that photographers outside Hollywood, both professional and amateur can well emulate to their profit.

Since one picture is worth the proverbial "10,000 words" the accompanying illustration (see Page 8) photographed in mid-afternoon with no special effort or care, shows what can be done in the way of obtaining night effects with the latest type of graduated filter. The shot was made with a 29°F to infra-red filter at 1/2 second exposure at f:22. Ordinarily for moonlight effects in broad daylight, a lower yellow half and red upper-half is used. These are available in a number of combinations and our organization makes them up to any specifications you may desire.

The combination graduated filters are much the best to use for night effects. Single or one-color graduated require no increase in exposure as the top half is only used during exposure. The two or three color filters will require added exposure for the lower half only, depending upon the density for the lower half.

Process Progress

Last month International Photographer announced publication of the full text of the report of the Academy Research Council's committee on process or rear projection photography, containing the first minute standards laid down by studio technicians in industry-wide accord in this field due to delays in securing final approval of the report text from the usually large and representative committee, this will not be available for publication until March. Leat honored and outstandingly important are the studio technicians working in this field. A bush-bush policy is invoked in the belief that publicity for these amazing resourceful experts might expose production secrets has blanketed them under a bushel. So that the entire industry may become better acquainted with these men who are known and highly respected by those with whom they come in contact on their professional journeys, International Photographer will publish in conjunction with the Academy's first process report, a complete illustrative layout featuring the key men of the process field.

Linderman Visits Hollywood

Robert Linderman, Managing Director of Mole-Richardson's British affiliate, Mole-Richardson (Eng.) Ltd., is currently in Hollywood visiting the parent M.R plant. Purpose of his visit is to keep abreast of latest production technique and survey new methods and developments at M.R plant. Before assuming his present post abroad, Linderman was Hollywood representative of General Electric.
Night effect shot photographed in mid-afternoon by George Scheibe with new type 29F to Infra-Red Filters; for details see accompanying story on graduated filters.

With these combinations you can make night effects that really are night effects; they look natural, black sky and dark foreground. They are made to order generally.

Also, natural density filters are made up in graduated filters in any grade of neutral you want. They are made in singles or doubles—two color neutrals are extremely popular for making moonlight effects. Many effects can be obtained with these filters which would be impossible with any other filters or without filters, such as changing a young man to an old man, a white man to colored, and similar stunts.

It should be remembered that these graduated filters positively cannot be used in the round type, since the horizon varies with nearly every picture you take. Square filters are the only practical kind that can be used successfully as they can be raised and lowered to fit the sky-line in your composition. This is particularly important in motion picture work, as constant adjustment is necessary. You can have them in any length desired.

All other filters of the all-over color type can be used as round or square filters as there is nothing to adjust in the picture. The graduated filters can be made up in the single or one color filter with the lower-half clear; the K series, G. 21, 23a, 25a, 29f. The two color filters as follows: K.3 to 21, 16 to 23a, 23a to 25a, 25a to 29f, 29f to infra red. Any color can be made up in graduated filters. The three color filters are made up in the K series to G and into any red you might want. Try some graduated filters in your pictures and surprise yourself with the wonderful effects you really can get. They will help any photographer.
Stillmen Mustn’t Stand Still

Pertinent remarks by industry’s recognized publicity expert on still pictures with suggestions for a program to improve quality of still pictures sent out from Hollywood for selling purposes.

By JOHN LE Roy JOHNSTON
Director of Publicity, Walter Wanger Productions

One of many things Hollywood has not learned during 25 exciting years is the very great difference between ‘criticism’ and ‘ridicule.’ No use explaining further, since those willing to learn will understand and why try to influence those who don’t want to learn? It is an axiom, though not fully absorbed throughout Hollywood, that good pictures—still or motion—are not made by mechanical precision so much as by spirit, alertness and appreciation of values.

At the risk of being called a "smart alec" and "know-it-all with unparalleled nerve," I should like to offer some frank criticisms in the form of observations on the Hollywood still picture situation. My criticisms are not of personalities but of conditions; of what stillmen frequently overlook or have failed to notice. If stillmen had to peddle their own pictures to magazines, newspapers and theatres as unusual press agents—they would realize a lot of things, and quickly. But I am not criticizing stillmen so much as still pictures. Let those really responsible for bad pictures juggle the cause.

Being this thought down to cases, a stillman friend recently sent me a colored post card (see illustration Column 2) from a border-town. Only as a "gag" was the card an attraction, yet, as I looked it over and smiled at its senseless staginess and my friend’s humorous comment, I tried to picture to myself how many stills Hollywood has sent out during the past year that were just as stiff, as imaginative, as bloodless and emotionless. The man who sold the old-fashioned cards, felt gratified in disposing of a dozen in a year; but what about the Hollywood still of similar stamp?

That mediocre Hollywood still was created for one purpose, to intrigue thousands of show shoppers into paying 25 to 75 cents to see a motion picture which cost $250,000 to a million dollars. The post card was a "gag" but the Hollywood still was "bait" for a theatre showcase expected to draw a business of many dollars per day; to enthuse an editor, whose cooperation is needed to build business; to represent adequately, even a little too enthusiastically the appeal of an expensive (and perishable) motion picture show.

There could be no "gag" about the real commercial importance of the Hollywood still. It was to represent—in 10,000 places—the stars of the hour; the glamorous personalities of Hollywood and the genius of motion picture writing, direction and production. It was to be the advance map of fortune in entertainment commodities. With this in mind visualize the typical mediocre Hollywood still.

You’re bored?

So am I! Such a still obviously couldn’t perform its proper function. The still wasn’t half as smart as the prospective theatre patron (particularly if he’s a photography bug) who hungrily looked into the lobby, or into his newspaper’s page for the picture that he expected to be sold an entertainment commodity. I really isn’t funny when you stop to analyze it seriously; it seems rather pathetic and stupid that an industry spending $100,000,000 on making moving pictures to entertain the world, should pay so little attention to the basic element of its business attractors—still pictures.

Why were there so many uninspired, stiff, unattractive stills last year? A thousand and one reasons and ten thousand answers. Under the reducing glass the plain truth is—obviously, lack of consideration. Lack of consideration is chargeable not only to the man who clicked the camera but to the man (or men) who expected the stillman to accomplish in a few moments what the movie cameraman planned carefully, aided by a director, a script, an art director, electricians and the production department. Those most responsible are the men who give the stillman “the fast brush” and treat him like a nuisance—and the stillman who thinks so little of his own importance that he allows himself to be pushed aside by the unscrupulous.

A stillman makes himself important not by ponting, being surly or unduly aggressive, but by selling the value of his work to all who have failed to realize it. The best form of salesmanship is alertness, personality and accurate knowledge of what better stills mean. The stillman cannot get these things from books. He can get them from observing successful men at work; profiting from this learning and from experience rather than only envying (or being jealous) or critical of the honest go-getter.

The art of making modern stills is very important; the art of handling people who help make stills better is equally important.

Good stills result from inspiration and an honest enthusiasm for making distinct interesting pictures. Good stillmen are those who inspire confidence in their ability by being masters of themselves—leaders, not flunkies.

Shocking as it may seem the best still photography in this country today is by amateurs. Bound by studio limitations and pressure they might not do so well as professional stillmen, but the principal reason why so many amateurs are winning competitive photographic exhibits is that they are never satisfied; they constantly strive for something new, something original; and unique; they eat, sleep and drink pictures; they have a picture-mania but they develop a keen—and most important commercial asset—individuality. They are not afraid to work to accomplish a feeling in still photography.

The amateur camera bug is often a pest but—what the hell? If the many suggestions every make to stills and the many suggestions every screen personality and every studio scene suggests doesn’t create in the stillman somewhat of a passion to get there and make pictures it is more than likely that his temperament is not suited to still work. This is an age of passion, not complacency. The complacent, self-satisfied fellow is driving an elevator, acting as museum watchman or sitting for government checks.

A few years ago the movies were a novelty. They had for stars the Arrow collar man with the perfectly chiselled features and the girl "who looked like a china doll." The movies were mechanical. So were the actors. Ten years changed that. Things warmed up. Audiences sought pictures that revealed truth; deep, honest emotions. The talking picture arrived and while it had five years of novelty (or curiosity) by giving actors a voice, it came closer

This horrible example illustrates stagey, posed type of meaningless picture derived by John LeRoy Johnston in discussing Hollywood stills.
to providing a warm, understandable human, living picture, than the movies had ever known before.

Then came the careless era. Producers felt the novelty would never wear off and a critical, more intelligent world audience began prying behind the scenes and into private lives of those who were so dominant, so forceful on the screen.

Unfortunately for Hollywood, everyone in our industry gossiped too much; thought too little of their obligations to a career and too much of their own vanity. A new brutally frank era developed—an era in which an audience of 25,000,000 people the world around, thoroughly "movie wise," demanded more than formula pictures—stills as well as motion pictures.

The sponsors of Life, Look, Pic, Click and newspaper editors realized this. They changed their perspective, lifted their sights and magazines which started out hoping for 250,000 circulation suddenly found a demand for 2,500,000 copies. That was no accident. The public mind had changed. Sponsors of motion pictures never thought to analyze the situation; few realized

that these popular pictorial magazines were catering to exactly the same clientele motion pictures cater to.

Magazine and newspaper editors created new techniques, new methods of picture presentation; they eliminated static, posey art; they demanded pictures that moved and lived and had feeling. Natural beauty replaced statuesque beauty perfection. Health, vigor and action supplanted precise, mechanical artificiality in still art.

Check over 50 newspapers of today and you will soon discover that they do not all look alike any more. You'll also find that distinctive, action art gets the big space and the stilted posed "customary clinch shots" are either
reduced in space or appear in the wastebasket instead of in the drama section.

Today still pictures must "talk" through action as motion pictures talk through a sound track; stills must approach the drama and spirit of the screen scene as much as possible. Twenty good action stills today will do more to draw patrons into a theater than 150 static stills that merely fill up the old quota column on the stillman's report sheet.

Ten years ago magazines and newspapers depended entirely upon studio material and gave...
There are some pointed criticisms of present day studio stills.

Too many stills are spoiled by too much light; too much distracting detail in the background. Simple lighting with one "effect" light on the face or on the background is the greatest help to an effective, natural looking picture.

Retouchers shouldn't try to make every portrait look perfect. Players who pose for portraits should treasure their individuality beyond perfection. Stillmen make pictures; retouchers re-make them.

Don't make subjects look bloodless and artificial; give them character. Make them relax. Don't make them hold a pose so long they get "hep" to your own uncertainty. Spontaneity is important to good stills.

Make more portraits outside even if you have to use a Graphire or a Graflex or a Leica instead of the customary 8x10. Give your subjects something to think about, to respond to in giving portraits feeling and action.

Show strength in men subjects and gentility in women. Don't let subjects fall into set poses or over-act in stills any more than a good director will let them over-act in pictures. Don't click your shutter if the subject isn't thinking about his part of the job of making interesting stills.

Don't let the subject EVER know you are worried about the mechanics of making pictures. Keep your mechanical problems to yourself; keep the interest and spirit of your subject up.

Make more out-of-doors action fashion shots; less pretty posey pictures. Unknown models—POSE in clothes; movie people belong, live and move in fashionable things.

Forget the old routine gags for off-stage art. You're wasting time. Make off-stage shots attractive through novel composition; not through angles. Make cute kids look cute things (not theatrical things) too. It is NOT the usual things people do that make interesting pictures but the Unusual things actors and actresses do in their work and in their play that makes them different—and interesting. Don't make obvious off-stage pictures.

Millions of people see motion pictures and mentally record every performance of stars and players. Their curiosity demands a knowledge of what these actors and actresses are doing with the scenes and themselves. This is an age of character and frankness and human understanding (even though paradoxically it is one of rank intolerance) and the stillman's obligation to his principals should be to make his pictures sell the idea that movie folk are intelligent, alert, human, natural people who do UNUSUAL WORK. The still picture that ridicules a news-name or news-face ridiciles the business that buys the photographer's bread and butter.

motion pictures limited space. Today they shoot their own stills and ignore the studio credit because they often make more interesting pictures outside of the studios than many of the studios do inside with control, player obligations and studio lighting.

Syndicates, magazines and newspapers are crowding Hollywood today—not just studios. The studio's job is to employ stills to sell motion pictures; the magazine, newspaper and syndicate photographers are charged only with making interesting, natural pictures of people who are news. What is ahead rests with how quickly publicity men and stillmen realize they must think like editors. Editors will give good art the biggest break it ever had but they insist (after a lot of study in many localities) they know what their readers (and movie fans) want.

It takes a pretty smart picture to sell theatre tickets today—many muckers "doesn't cut it" for publicity—as such—but, he will trade a good break or art that helps him sell his paper.

Forget yesterday's compliments and yesterday's routine. Tomorrow is the challenge our studio stillman—an answer—Directors, faced with their own problems and multiplying picture costs, don't sing out for a stillman any more; it's the stillman's job to anticipate stills and be ready and mentally prepared to get them when a break comes.

I have known stillmen who weren't interested enough in their assignments to read a script or want to read a story. This is no business for such men. The stillman is a pictorial reporter. His assignment is to cover (pictorially) a picture. His coverage must be accomplished while the picture is in work; he can't photograph it when it isn't there. He can't wait for his bosses to come to him. His way to advancement is in going to the bosses to find out. The stillman's tools today are not one camera but several cameras; not only one lighting arrangement but ANY lighting arrangement. Film has been made faster to help him. People generally are more picture conscious than ever before but the secret of better stills is in making studio still photography continuously interesting work. When a stillman fails to find a romance and an incentive in making stills, he's passe, washed-up, through. This is a fast game and it requires fast thinking and fast action. Movies don't stand still any more; neither does the audience. Still pictures must fit in too; they can't stand still.

Amateurs organize clubs, exchange ideas, tinker with dozens of experiments, have exhibitions and strut their stuff. Hollywood stillmen do far too little for their own good. Radio throughout the country has seized on photography for exploitation, as witness our successful Coast camera club program of the Columbia Broadcasting System. Movie let amateur and professional photographers and the ace men of the syndicates are invited to tell of their experiences. The radio folk have exhibitions in radio studios and make a lot of fuss about their progress. I haven't seen movie studios doing that.

Dozens of magazines have contests, open forums, means for exchanging ideas, formulas, suggestions, but here in Hollywood—professional photographic art center of the world—we do little to encourage still art, to train and help stillmen.

In this connection let me point out two examples. First, from the amateur end, to my knowl- edge, a small group of sincere enthusiasts have been laboring for several years to develop intelligent, practical and profitable infra—and and inter—studio camera club activity. They have made some little progress, but by no means what they should if the whole were supported with the enthusiasm it merits.

Secondly, in my contacts with Ed Gibbons, editor of International Photographic, and Herbert Aller, agent of International Photographers' Local 659, and managing editor of the magazine, I know they have bent earnest effort and even pleaded with stillmen and publicity men to get behind just such a program through the medium of International Photog- rapher. That's logical since every studio still- man is a member of Local 659, which publishes the magazine, and all receive it regularly. Vari- ous plans were tried, from selection of the outstanding "still of the month" to technique sym- posium discussions. I, myself, let loose a blast about still conditions that certainly was out spoken enough to provoke some interest and discussion.

But considerable apathy regarding cooperative steps to improve conditions seems to exist. Gib- bons and Aller continue with a small nucleus of able contributors to International Photog- rapher. To my mind they should be swamped with suggestions and ideas each month from stillmen members.

Today one good still is a more effective ticket seller than a hundred dollars; stills as symbols and sales punch are most important but little is actually done to give this work the impetus it needs. And the blame for this lethargy rests on managers other shoulders, besides the stillman's. If it is a tough situation today—and it is—what about tomorrow. There will be movies tomorrow, next year and the next and you can bet your idiosyncrasy and dollar that the stillman, as long as there are movies, will be making and better and better stills to help sell them. THAT'S SOMETHING FOR EVERY STILLMAN AND EVERY PERSON IN THIS INDUSTRY CONNECTED WITH PUBLICITY, SALES AND EXPLOITA- TION TO THINK ABOUT.

Let's hope the time is not far distant when there will be a motion picture still art salon. Let's hope the time will come when the Academy will give an award for "the best still portrait," and the "best action still of the year." Let's hope the Film City will really lead the world in still art as well as in moving picture art and let us all join in a campaign to SELL every body connected with motion pictures, publicity and exploitation the proper importance—and the need of greater cooperation on the set, and let us be making the stills representative of Hollywood represent the BEST of Hollywood. Let us not think of stills in point of quantity alone but rather in point of importance.

It is YOUR business, you professional readers of International Photographic. What do YOU say about it? And more important, what are you going to DO about it? I'm not a stillman. I'm just an observer—and a hoper.
NEWS OF THE MONTH

Studio stillmen plan first annual photographic exhibit and ball for this month; SMPE lining up spring convention for April in Hollywood; prize-winners in Kalart and Paramount studio club amateur contests; Zeiss awards.

New Department Announced

Starting with the March issue, International Photographer will inaugurate a new department devoted to personalities, exchange of ideas and informal gossip of the studio photographic and technical fields. This new department and the improved and distinctive format in which this issue appears, are the first steps in a program of expansion and improvement of International Photographer's service as the only international professional journal of the motion picture technical field, under the supervision of the recently appointed magazine committee of Local 659.

Chairman is Leon Shamroy, vice-president of the local. Cliff Manpin and Bob Coburn, ace still photographers, are the other members.

For this new department, International Photographer welcomes news of technical personalities, unusual assignments, promotions, new affiliations, valuable new developments and inventions by studio technicans, contributions to greater efficiency in motion picture and still photography technique; tips and suggestions, open forum discussions of technical topics. Members of Local 659, IATSE, and sister studio locals are particularly urged to contribute news and suggestions for this department. Cooperation in exchange of technical tips has been promised by the Los Angeles Press Photographers' Association, other leading news papers and symde small photographers, many of them members of Local 659.

Material already in hand from members of both organizations, including George Watson, Acma-NEA bureau chief; Charles Rhodes, Jack Albin and Hymin Fink, ace fan magazine and syndicate photographers, and enthustiastic members of Local 659, in both motion picture and still photography, indicate that this new department will be a news and worthwhile addition. HOWEVER, DON'T FORGET THAT SUCH A SECTION DEPENDS UPON GENERAL INTEREST. IF YOU HAVE A STORY SLANT, VALUABLE TECHNICAL SUGGESTION, AN UNUSUAL PICTURE OR LAYOUT IDEA, MAKE IT A POINT TO GET IN TOUCH WITH HERBERT ALLEY OR ED GIBBONS SO THAT IT CAN BE FOLLOWED UP FOR EARLY PUBLICATION!

RCA Exhibit Planned

Details will be published in the March International Photographer on plans for a special demonstration of the newest type RCA projection sound equipment, which will arrive in Los Angeles late this month. Through the cooperation of RCA and International Photographer, projectionists in the Southern California area and other interested professional workers will be brought to Los Angeles as guests of the two organizations for inspection of the new equipment and a get-acquainted session with the RCA Hollywood engineers and service experts. Projectionists and sound technicians have evinced considerable interest in our current Projection Symposium, to which RCA engineers have contributed valuable and instructive articles, presenting much material hitherto not available in such handy and instructive form. Watch for details of the RCA equipment exhibit in the March International Photographer.

SMPE Eastern Section Officers

Following a meeting last month of the Atlantic Coast Section of the Society of Motion Picture Engineers at the Hotel Pennsylvania, New York, the following officers for 1939 were announced: D. E. Hyndman, Eastman Kodak Company, chairman; George Friedl, Jr., International Project Corp., past chairman; P. J. Larson, Consulting Engineers, secretary-treasurer; H. Griffin, International Project Corp., governor for two years; R. O. Strock, Eastern Service Studios, governor for one year.

11th Academy Awards

NOMINATIONS for the various classes of achievement for the 11th annual Academy of Motion Picture Arts and Sciences awards were nearing completion as International Photographer went to press, with final voting to take place this month and the awards presentations to be made at the annual banquet February 23 at the Los Angeles Biltmore Hotel.

The nominations were being concluded just as International Photographer went to press, hence were not available for publication in this issue, but it was learned that as predicted last month, "The Young in Heart," Selznick International production, photographed by Leon Shamroy, vice-president of Local 659, IATSE, was among the nominees for the outstanding cinematography honor. "Young in Heart" will compete against other outstanding photographic achievements for the coveted statuette.

Irving Lippman, Columbia; Scotty Wilson, Warners; Bert Six, Warners; Schuyler Craw, Warner; Muky Munkaci, Warners; Elmer Fryer, Warners.

SMPE Eastern Section Officers

International Photographer for February, 1939
Zeiss Awards Winners

Winners of awards in the competition section of the Fifth Annual Zeiss Ikon Photography Exhibition, which will open in New York in February, are: Pictorial Photography Group; first prize, C. D. Ryan, for his picture "Just a Shower"; second prize, B. Russell Whitaker, Jr., for his picture "Sandra"; third prize, Fred Trussler, for his picture of a steamer against the sunset. Honorable mention award winners: L. A. Wheeler, for his picture showing in silhouette a group of girls walking; Julius Sulman, for his "Sand Dune Detail"; and Donald Blier, for his "The Champ"; judges who awarded prizes in the Pictorial Group were Don Timmons, Don Wallace, A.R.P.S., and J. Ghisham Losten.

Press and Commercial Illustration Group; first prize, Charles Pollak Regensburg, for his "The Market Goes Up"; second prize, William Vandivert, Staff Photographer for Life Magazine, for his picture of auto fenders; third prize, W. Eugene Smith, for his "Soldiers in Gas Attack". Honorable mention: Peter Stackpole, Staff Photographer for Life Magazine, for his picture of Eleanor Powell; Hans Groenhoff, for his seaplane picture titled "Sportsman Pilot"; and Roy Pinney, for his "Big Apple"; judges of the prints in this classification were: Kip Ross, Bob Leavitt, and Fenwick G. Small, editor Zeiss Magazine.

Scientific and Industrial Photography; first prize, Grace Fisher Ramsey, Ph.D., of the American Museum of Natural History, for her "Mayan Ruins"; second prize, W. Eugene Smith, for his "Jewelry Wedding"; third prize, Dr. Ernst Schwarz, for his picture of a fish. Honorable mention: G. Copeland, Neurological Institute, Columbia University, for his microphotograph, "Astrocytoma of the Frontal Lobe of the Brain"; C. C. Munro, for his chart of vibrations titled "Recurrent Noise"; and William Vandivert, Staff Photographer for Life Magazine, for his "Convoy to Assembly Line"; judges being Herbert C. McKay, Maximilian Toch, and Dr. R. W. St. Clair.

In addition to award winning prints, judges have selected 52 additional prints to make up a traveling exhibition of 100 photographs. As this exhibition goes around the country, a popular lot will be conducted for the selection in the opinion of those viewing it, of the best of the prints receiving awards from the judges. This print will be awarded an additional grand prize of $100.

In each classification was awarded a first prize of $100, a second prize of $50, and a third prize of $25, and three honorable mention awards of $10 each.

AMATEUR...

Winners in Kalart's second annual Syncro-Sunlight contest: Upper Left: $100 first prize winner, made by G. A. Carlin of Minneapolis, with Kalart Micromatic Speed Flash and Eastman Reccomar 33 camera; exposure, 1/50th second at f/8, using one No. 1 Wabash Superflash bulb, no filter; sun at left of camera; Upper Right: $50 second prize winner, made by Lt. Francis Griswold, Langley Field, Virginia, with Kalart flash and Eastman Reccomar 33 camera; 1/200th second at f/10, using one No. 1 Wabash Superflash bulb, no filter; Below: $25 third prize winner, made with Kalart Flash and 3 1/2 x 4 1/4 Speed Graphic; exposure 1/200th second at f/22, using one Press 40,000 Wabash Superflash bulb, K-2 filter.
From Paramount Studio Club's third annual grand salon, ably handled by Douglas Rudd, president, and his associates in this progressive studio club, come these prints. There were two classes of winners, one judged at last month's annual affair by Larry Lewin, secretary of Los Angeles Pictorialists; also the prints that took honors for capturing the most points during the year. Top: Douglas Rudd's "Tumblers," Class A point winner; Center, Left: William Grote's "Mountain Summit," Class A salon winner; Center, Right: "The Cat," which won Salon Class C second place for Ted Beets; Lower, Left: "Water Scene," with which Mitch Crawley won the points Class C honor; Lower, Right: Ed Blessington's "Doves," which took Class B salon trophy.

SMPE Meets in April

After an absence of two years, the Society of Motion Picture Engineers will hold another of its semi-annual conventions in Hollywood, this year April 17-21, with Hollywood Roosevelt Hotel as headquarters. Many studio technicians are participating in plans for the session, under the direction of Major Nathan Levinson, WB sound chef, who in addition to heading the Academy technicians' branch, is executive vice-president of the SMPE; Loren Ryder, Paramount sound department head, who is Pacific Coast section chairman, and Homer G. Tasker, Universal sound chief, a member of the board of governors.

As usual the various convention sessions will be open to all Hollywood studio officials and technicians. To accommodate large crowds expected for a number of the meetings on the program, the Filmart Theatre will be used. In order to accommodate studio workers who are tied up during the daytime, two special night sessions will be held at which papers on photography, sound, laboratory practice and other subjects of special interest to the studio workers will be given.

An outline of the program of papers to be presented will be published in the March issue of International Photographer.

15
CLOSE-UPS

NORMAN ALLEY: best known cameraman in the world.

Of all the photographers who have manipulated motion picture apparatus from the days of hand-cranking to 1939's modern and super-efficient equipment, probably the best known to the general public on an international basis is Norman Alley, a local 659, IATSE, veteran, who has chased news pictures the world over, whose pictures of the Panay bombing were front-page news the world over last year. Alley typifies in the public mind the romance of the newsreel game, identified in their consciousness as a screwball, exciting day-after-day adventure. Newsreelers, like newspapermen, have been the victims of the wild imaginations of scenario writers and lurid potboiler hacks, "probably the greatest refutation of the inaccurate portrayal of newsreel men from the first silent thriller to the most recent epics," MGM's "Too Hot to Handle," is walking around Hollywood every day in the person of Norman Alley.

This latest concoction of the scenario whippers-up is supposed to have had a literary springboard in the sensational experiences of Alley and Eric Mayell, another Local 659, IATSE, etc., in covering the Sino-Japanese fracas. If so, the dramatic reader must have gone up instead of down, for it is as far removed from the realities of newsreel work as the latest motion picture titanic of "the front page" is from the ordered and edacious routine of the average newspaper city room.

Alley, who is in charge of Universal's Southern California area, works from a neat business-like side-street office in the heart of Hollywood on Yucca Street near Vine. His personality is pleasant and agreeable. He reflects a keen interest in the potential news values of any development. There is no jack-in-the-box horse-play, but rather the common sense, well-informed interest with which a mature person attacks any business assignment, be it selling insurance or cutting the production costs of automobiles.

Starting in 1910 as a copy boy on the Chicago Tribune, Alley has been exercising and developing his news sense steadily; and although he has acquired considerable technical knowledge since, he believes that the fundamentals of good news work come from experience in handling news. For most work, the technical end must be absorbed to some extent, but in any job where the practitioner must deal with the public and please the public, the basic qualities for success must be judgment and diplomacy.

Technical stuff supplies the tools; the other qualities are the means of getting something useful in the way of production from the tools, is Alley's viewpoint. That's pretty simple, but like a lot of other simple things, too easily accepted without being absorbed and put into application. Result is that many fall by the wayside. The outstanding newsreelers today are those who stick to basic principles.

It's no accident, Alley points out, that a majority of the newsreel aces have come up through the newspaper ranks. Newspaper training has given them the urge to produce results against obstacles. And even on routine assignments there are plenty. Newsreel photography is, first and last, an eye-witness account. It can only tell the story by witnessing the event. It can't be rewritten or covered in any other way except having a camera present—and loaded with film! That last phrase alone packs material for an interesting yarn. Further, news has a relative value in ratio to the speed with which it reaches the consumer, hence, a complicated and highly specialized system of delivery, rapid editing, distribution of prints, etc., has been developed by the newsreel organizations. The news cameraman is the keystone of the structure. Without his intelligently photographed record of the news event, the rest is just a lot of efficient machinery with nothing to do.

Naturally, Alley believes a capable newsreeler must be master of his camera at all times, and the same in his sphere for the equally valuable soundman partner. (See Int. Photog. April, 1937.) While the newsreeler must know his camera thoroughly, there is much in the way of theory and artistic application, which, while useful, is not as essential as in studio production. The first essential is to get the picture in the time allotted, frequently very short. Whenever possible, newsreelmen see (like their production contemporaries) to achieve unusual and striking effects of lighting, angles, capturing of personalities—but only when the story itself is assured.

In most cases—apparently in proportion to the importance and news value of the story—the time limit is short. Little but straight camera reporting is possible. Alley believes that the newsreeler's mental attitude should be divided 10 per cent to photographic mechanics and 90 per cent to news values.

Despite the international publicity Alley received over the Panay incident, he believes many other experiences he has gone through were more dangerous and gave him worse scares. He points out that it's all in the day's work and that many other newsreel members of the IATSE frequently risk their lives with less glory. Insurance companies rate the work as so hazardous, that their rates are so exorbitant as to be virtually prohibitive.

Big problem of the newsreeler today is not engaging in battles of wits with his competitors, or pulling out of hair-raising scrapes. It's the dull and difficult task of injecting something new in the approach—of avoiding the trite—in the regular assignments that come his way. Newsreelers spend a lot of thought on that problem.

As Alley points out, 99 per cent of the assignments handed the newsreel photographer are of the type that have been done over and over again. Seasonal stunts, political, sports, personalities, freaks, contests, fires, disasters, floods, bathing beauties, fashion shows, are among the routine assignments that demand initiative on the part of the photographer to prevent audience boredom.

The photographer with initiative studies each situation in advance, seeking to find the particular news angle of the event that will strike a responsive chord with the public. He tries to center on this one smash value and to also build up as many contributory and supporting angles as possible. In fact, the newsreeler instead of covering "something new every day" must try to find some new angle every day for something old. And in this task he must be his own writer, director and technical expert.

Speaking of equipment, Alley says: "I personally prefer the De Vry cameras for all types of news work. I use their cameras for subjects where sound is needed for proper coverage, and the automatic hand type for shots where sound is not necessary or cannot be obtained. In all situations I have met, the De Vry equipment has never failed to deliver: and its ease of operation, in either type, is a decided asset.

After a leave of absence on a lecture tour, Alley is back at his Hollywood post. He's forgotten all about the Panay publicity. Last time I saw him he was phenagling the angles of a commercial aviation news yarn with as much enthusiasm as though it were a World War battle.—Gib.
IN OUR LAST ARTICLE we discussed amplifiers and power supplies for sound in a general way, pointing out the difference between a power amplifier and a voltage amplifier. In this discussion of Amplifier Requirements for the reproduction of sound in theatres we shall divide the article into three general classifications, viz.: (A) The Gain Required; (B) The Power Capacity Required; and (C) The Types of Tubes Most Frequently Used.

(A) GAIN REQUIRED

There have been many definitions of the gain of an amplifier. We will define the gain of the input voltage to the output voltage, or the ratio of the input power to the output power, and some have involved some complicated ratios between the output power and the impedances. All these definitions are undoubtedly correct and have their special applications, but for simplicity's sake we shall define the gain of an amplifier as its insertion gain (as described below) and will use the term "gain" from now on. It will also be assumed that the reactive components of the impedances involved are small with respect to the resistive components. All powers will be expressed in db level.

(a) Insertion Gain of an Amplifier. If we have a generator G, as shown in Figure 1-a, having an impedance R1 and delivering power to a load L, having an impedance R2, we will examine what happens when an amplifier is inserted between the generator and the load as in Figure 1-b. The effect of the amplifier will be investigated for two conditions, as follows:

1. When the load impedance R2 is equal to the generator impedance R1:

If the power delivered to the load L under condition a in Figure 1 is P1, expressed in DB, and if the power delivered to the load under condition b is P2, the gain of the amplifier is:

Gain in DB = P2 - P1.

2. When the load impedance R2 differs from the generator impedance R1:

Under these conditions the power delivered to the load is less than that of the impedance, hence we can increase the power delivered to L by inserting a matching transformer T between the generator and the load. As in 1 of Figure 1. This transformer will, of course, have an impedance ratio of R1 over R2, and its insertion will increase the power delivered to the load to some value as P3.

If we now insert an amplifier between the transformer and the load, as in d, Figure 1, the power will again be increased to a value such as P4.

Gain in DB = P4 - P1.

It should be noted that the amplifier should not be credited with the increase of power which was obtained by the use of the matching transformer. (b) Gain Requirements for Theatres. In theatre-reproducing equipment the various elements shown in the very much simplified schematic diagrams of Figure 1 are as follows:

Generator G is the photoelectric cell and its associated transformer, load L is the speaker system.

It is therefore obvious that the gain required for any particular amplifier is equal to P4 - P1, where P4 is the power which must be delivered to the load in order to produce P1 db. This is the power which could be delivered by the photoelectric cell and its transformer.

For standard soundheads the value of P4 is variable, depending upon the elements as described in the article in the September issue and is approximately minus 50 db for the RCA soundhead.

The value of P2 is influenced greatly by the size and the acoustical conditions in the particular theatre. This is illustrated in Figure 2, which shows the relationship between the smallest size of theatre in seating capacity and the recommended power P2 for the speakers.

Having now determined P1 and the value of P2 for the largest theatre for which a given equipment is being designed, there remains only one more factor to be determined before the total gain may be calculated, viz.: the factor of safety to be applied; that is, how much more gain than is absolutely necessary should be designed into the equipment, say 15 db. Assuming that the largest theatre in which the equipment is to be used has 3000 seats, Figure 2 shows that P1 should be about plus 39 db. Calculating the necessary gain for this equipment, adding of course the 15 db factor of safety, we have:

Total necessary gain = P2 - P1 + 15 db = 39 + 15 = 54 db.

As an example of such a soundhead, the RCA PG-118 reproducing equipment has a gain of 110.5 db and a power output of +39.5 db or 50 watts.

(B) POWER CAPACITY REQUIRED

When the first sound reproducers were installed in theatres, a few years ago it was considered adequate if the power amplifiers used to deliver 10 to 15 watts for the larger houses. Since that time there has been a trend to higher and higher powers until the use of two 50 watt amplifiers has become quite common. This trend has been brought about by several different factors. One of these is the tendency for the studios to release high range prints; that is, sound tracks where the louder sounds, such as gun-shots, etc., are recorded at a considerably higher level than the average dialogue. When such a print is displayed in the theatre the fader setting must be increased to bring the dialogue up to a comfortable listening level. With such a fader setting the loud sound effects will overload the amplifier system and become distorted unless a considerable power handling ability is provided. Another factor which has influenced the recommended power capacity has been the improvement in the low frequency response of the modern two-way speaker system. With the new speakers the amplifiers are called on to deliver more power at the low frequencies than ever before. The trend in the acoustic treatment of theatres seems to be toward making them more highly damped, which of course means that more power must be delivered to the speakers than the old mechanical reinforcements.

The above conditions, and much practical experience shows that the relationship between the recommended power handling capacity of the amplifier system and the size of the theatre to be as shown by Figure 2. The area which is shown shaded takes care of certain acoustic differences between theatres of approximately the same size.

The method by which the power handling capacity of an amplifier is to be specified has been under discussion for some time. The method which has been most used in the past is to state that the given amplifier will deliver 50 watts at three per cent distortion. For purposes of commercial discussion this is still the method in general use today, but it does not tell the complete story that the manufacturer must worry about. The specification mentioned above is usually based on a 400 cycle measurement and is usually checked at the same frequency, but the manufacturer has the responsibility of so designing the amplifier that it will deliver the same power with no greater distortion at all frequencies that it will be called on to amplify.

(C) TYPES OF TUBES GENERALLY USED

The first tube in the amplifier shown by Figure 3 is an RCA 1603 and is an example of the 1600 series of tubes RCA makes for special purposes. The 1603 can be used as a pentode or as a triode and for either of these uses it...
In the design of both recording and reproducing amplifiers the engineers have one problem which is little appreciated by the users of such amplifiers. In the manufacture of vacuum tubes there must of course be set up certain tolerances of variation for plate current, mutual conductance, Mu, etc., so that only tubes within the acceptable range are sold. All tubes not meeting these test specifications are rejected.

When the amplifier design engineers are working on a new product they must know these tube tolerances so that such variations as are allowable will have no appreciable effect on the operation of the amplifier. It is quite evident from the above that the indiscriminate changing from tubes of one manufacturer to those of another has distinct disadvantages.

In the advance of tube manufacturing there have been placed on the market many improved tubes which may be used to get quieter operation or longer life or other advantages. For this reason any change in tubes from those specified by the amplifier manufacturer should only be made on the recommendation of a competent service organization.

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An interesting approach to the problem of film deterioration and spoilage is being made by George J. Gage of Hollywood with a new type machine and method, which we have found useful at the Paramount exchange in Los Angeles, and which other studio technicians have found valuable for renovating old film. This latter service has proved particularly valuable recently in treating long-stored film to make it pliable, that otherwise could not have been projected. Studio process departments have been particularly interested in this phase of Gage’s work.

However, Gage is primarily interested in marketing his device for regular use in film exchanges throughout the country to insure keeping up print quality in the subsequent run houses to the standards of the first runs.

His device, which with the methods of application and materials used is fully patented, consists of a special machine, through which the film is run for cleaning; and methods of applying special cleaning solutions and application of a special thin blue coating to overcome the tendency of all film stock to develop a yellow or straw tone whether in storage or regular use.

With Gage’s system the film is subjected to a special cleaning solution, which is applied under pressure, and the solution is washed off by air pressure without any abrasion contact at the cleaning point. The film then passes to a central device which seals in moisture through heat and pressure. Application of the blue bath to counteract the yellow tinge is the last step and is optional, since this is required only a few times during the booking of a print, according to extensive tests.

Gage does not claim to be able to restore scratches and perfectly re-condition very old film, but he has accomplished some astounding results for some of the studios, laboratories and film libraries, as well as for the Los Angeles exchanges. Only model of his machine now available is installed in his headquarters in the Hollywood Storage Building on Highland Avenue in Hollywood.

While the treatment which applies the light rectifying agent lasts indefinitely, it in no way becomes part of the film, as there is no chemical reaction whatever. All of the applications and treatments described are accomplished without the aid of wiping agents or buffers, or the use of carbon tetrachloride or any chlorinated solvent.—Bill Ring, Business Representative, Exchange Local B-61, Los Angeles.

Color Series

During the past month the editors of Literature of Photography and our informal advisory committee on the examination of the situation with regard to motion picture color from the practical professional standpoint have been busy lining up facts and figures on scores of color systems, as promised in our January issue. While many discussions of various phases of still color photography have been presented in different publications, this is the first practical series of up-to-date articles on motion picture color systems, their methods and technique ever published. Following upon our analysis of the major color systems in the January issue, the next phase will cover systems in and around Hollywood, that have been developed to the status of being able to deliver some release print processes. Here is the most progress in the single film triple emulsion systems of Eastman and Agfa.

Automatic Pilot Light

Bell & Howell announces that a new automatic pilot light will be standard equipment on all Model 138 Filmsound projectors effective with January shipment. The pilot light is so situated on top of the blower housing as to very clearly illuminate the projector film-moving mechanism and amplifier controls. The light is operative as soon as the projector current supply cord is connected with current source.

The pilot light is turned on automatically simply by pulling the pilot light cap out of its housing. Pressing cap back into housing turns off the light. The lamp is easily accessible for replacement by unscrewing pilot light cap. Through use of this new ever-ready pilot light the projector operator can perform film-threading operations and see to operate amplifier controls without resorting to other illumination.

New Argus Cameras

Two New Argus Cameras, with self-calculating built-in exposure meter, which the manufacturer claims cannot be found in any other 35 mm camera in the popular price field, and a 20 per cent price reduction in the original Model A Argus, have been announced by the International Research Corporation, Ann Arbor, Mich. The two new cameras, designated as Models A2 and A2F, will make it possible to ascertain opaque opening and shutter speed accurately and quickly. Readings are taken right off the simple scale on the camera case.

The Model A2 Argus is described as having a “certified” f:4.5 triple Anastigmat lens; 1/25 to 1/200 shutter speed, and uses 35 mm film in daylight loading B8 or 36 exposure rolls. A new shutter release, which it is claimed involves less danger of camera movement when an exposure is being made, and a larger and more easily read front plate on the lens barrel, are additional features of the new models. The A2 is priced at $12.50. The Model A2F Argus, priced at $15, has a calibrated focusing mount on the lens barrel which facilitates focusing for distance. Specifications otherwise match those of the A2. The original Model A Argus, which has been the world’s largest selling miniature camera for the past three years, is now reduced to a new low price of $10.

Light-Lamp Team Tests

Bardwell & McAlister announce that after exhaustive tests at their plant that the new 750-watt globe just introduced by General Electric functions ideally with the lighting equipment firm’s popular Baby Keg-Lite. Tests showed that the new globe gives the same life as the 500-watt pre-focus projection lamp, which has been in use at the studios for some time, B & Mca engineers state. During the tests, they report, the lamp housing was not unduly hot, and there was no trace of blistering or other globe deformation. The new type 750-watt unit is in a T-24 bulb with medium bipost base. It has the same light center and is interchangeable with the 500-watt T-20 medium bipost lamp. The Bardwell & McAlister Baby Keg-Lite is regularly supplied with either this new medium bipost socket or the older pre-focus socket. Another recently adopted optional feature on the Keg-Lite is a collapsible stand, which can be carried conveniently and manipulated in a small space.

Embly Sales Deal

Intercontinental Marketing Corporation, New York, and Embly Photo and Film Machine Corporation, New York, announce that they have arrived at an agreement simplifying sales of the various products sold by both companies. Beginning this month, Intercontinental will take over the entire selling end of Embly photographic machinery and photo products within the United States. Intercontinental’s sales staff will offer the line of Embly commercial equipment and accessories to the photo finishers all over the country. Embly Photo and Film Machine Corporation has delegated its president, M. Durlin, to cooperate in the sales promotion of the products of both companies.

Travelling Leica Show

The Leica Universal Camera Exhibit, which shortly goes on the road, will consist of working set-ups of specialized Leica camera accessories, such as the photomicrographic, photomacrographic, copying, and reproduction devices, etc. In addition to the complete line of Leica cameras and more than 500 accessories.

Not only will the set-ups be in working condition, but photography fans will be able to familiarize themselves with the accessories by actually working with them and making pictures.

Anton F. Baumann, Leica expert, lecturer, and
Typical Eastman RELIABILITY

EASTMAN Plus-X for general studio work
...Super-XX for all difficult exposures...
Background-X for backgrounds and all-round exterior work.... All three of these new negative films have special features suited to their particular fields... plus the typical Eastman reliability that has served the industry so well in the past. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago. Hollywood.)

EASTMAN Plus-X...
Super-XX...Background-X
photographer, will be in personal charge of the exhibit and will make available to the amateur his aid and assistance. In addition to this, a special demonstration will be given by Mr. Baumann of his technique in making giant enlargements. Also on the same evening of the demonstration, he will give a talk on color photography, illustrating it with his own remarkable color photographs.

In each city visited, the Leica Equipment Exhibit will be on display for three days from 11:00 to 10:00 P.M., and the demonstration of giant print making and color photography talk will be given by Mr. Baumann on an evening during this exhibit.

Present itinerary of the exhibit includes Philadelphia, Pa.; Reading, Pa.; New Hartford, Conn.; Providence, R. I.; Boston, Mass.; Syracuse, N. Y.; Rochester, N. Y.; Buffalo, N. Y.; Reading, Pa.

Invitation cards and information as to the exact dates may be obtained directly from local Leica dealers or from E. Leitz, Inc., 750 Fifth Avenue, New York.

Paper Edge Protector

Protection with speed and simplicity for the edges of photographic prints, blueprints and valuable papers generally is offered by a compact new device manufactured by David White Co. of Vincennes, Ind. The machine quickly and neatly applies an opaque acetate tape to the edges.

Perutz Copying Film

INTERCONTINENTAL Marketing Corporation, New York, announces another specialized Perutz emulsion called "Perutz Graphic Film B," a miniature camera film specially designed for reproduction purposes and copy work. Graphic Film B has a very thin layer of emulsion, ultra fine grain, anti-halation, highest power of resolution and hard gradation. Its sensitivity is approximately 2°—3° degrees Schiner and color rendering is claimed to be excellent. The new film is available in cans containing 17 feet of unnotched film.

New Catalogs Out

TWO INTERESTING new catalogs are just off the press from Art Reeves and Bardwell & McAlister. These may be obtained by writing the firms at their addresses appearing in the Classified Directory on Page 26. Highlights of new additions and improvements of the Reeves and Bardwell & McAlister lines will appear in next month's issue of INTERNATIONAL PHOTOGRAPHER. Another firm to provide interesting news material for next month's TRADEWINDS is Bob Lynn. Los Angeles photographic supply dealer, who is engineering a number of new type enlargers of his own manufacture, along with some new type importations in virtually automatic enlarging equipment. Lynn now is preparing new catalogs and literature on this equipment and other additions to his line of accessories. New catalogs also are available from Willoughby's, 110 West 32nd St., New York. This firm also has available new literature on a monotone viewing filter and a rapid automatic electric print dryer.

Cinematone Rental Lot

CINEMATONE CORPORATION, headed by Dr. Gordon Keith Woodward and W. P. Falkenburg, have taken a three-year lease on Associated Cinema Studios, Company will make their own photographs and radio transcriptions, and produce series of short subjects, besides renting space to independent production units.
A COUPLE OF "MUSTS" FOR YOUR MOVIE EQUIPMENT

IN any roll of your movie films you'll find many a "frame" that is a good picture in itself. It may be a scenic, or it may be a close-up of some such important person as The Baby—or the baby's doting family. With the Kodak 16 mm. Enlarger it is a swift and simple matter to make an enlarged negative, about $3_{3}^{5}$ by $3_{4}^{5}$", of any desired 16 mm. movie frame. Eight such enlarged negatives can be made on a single roll of 616 Kodak Film. And from those films, prints and enlargements can be had as you please. The Enlarger works, by the way, equally well for black-and-white results with either Kodachrome or regular 16 mm. film. Price, $15.

Another important Cine-Kodak accessory is the Kodascope Movie Viewer, an ingenious little editing device that shows you your films in action. Added to your film editing equipment, it gives you instant check not only on photographic quality, but on the flow of action in your films. The enlarged film image is shown on a hooded ground glass, $1^\prime\times 1^\frac{1}{4}^\prime$ in size. Incorporated in the Movie Viewer is a spring-punch for edge-notching the film, as a means of identifying future placement of titles, etc. The price of the Kodascope Movie Viewer is $20, in either the 8 mm. or the 16 mm. model.

THE Kodak 16 mm. Enlarger in use. Right, above, the to-be-enlarged movie frame is clamped into place between a diffuser and the special 13 mm. lens in the Enlarger. Then the exposure is made, with the Enlarger held close to a No. 1 Photoflood. From the resulting negative, prints and enlargements can be made as desired.

THE Kodascope Movie Viewer is shown, below, as used in conjunction with the Kodascope Master Rewind. With the Viewer are three other items of interest—the Kodascope Editing Bracket ($1.35), the Universal Splicer ($12.50), and the new 1600-ft. film reel ($4.90). The Master Rewind itself is priced at $30. At the left is the viewing hood of the Viewer in which the film image is seen brilliantly and in action.
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Has built-in motor, automatic dissolve,
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1000-ft. magazines—50 mm., 50 mm.,
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$9,500. Shown by appointment only.

CALL RAY JONES, STANLEY
71211 or HILLSIDE 3481.
Panatomic-X in Roll, Packs

Kodak Panatomic-X Film is now available in a wide range of roll film and film pack sizes. Panatomic-X has appreciably finer grain than that which won high regard for the present Kodak anatomic Film. This improvement in grain is obtained without sacrifice in speed, as compared to Panatomic, and Panatomic-X roll films and packs are established as all-around, high-quality fine-grain panchromatic films of ample speed for nearly all conditions other than those requiring the extreme speed of Kodak Super-XX.

This fine-grain film is of special interest to users of cameras making vest pocket or half-20 negatives, and other smaller roll film and film pack cameras producing negatives from which enlargements are desired. It is recommended not only for high-quality results with ordinary subjects, but also for copying photographs, half-tone productions and documents, for technical photography, and for salon and exhibition work.

Acoustical Compound

A recent addition to many acoustical materials available for interior construction is Berry-Cel, a synthetic composition of limestone and silicate of soda manufactured by F. E. Berry, Jr. & Co., Everett, Mass. It is claimed to hold high qualities of sound absorption and light reflection and can be easily cleaned by a special appliance of an unusual nature. This pump sprays soap water and a rinse through the inter-connecting cells and recovers the water by a vacuum device to prevent any dripping.

Dianfant’s New Model

Dianfant Mini-Projector Via, a new addition to the line of Dianfant Projection Apparatus, has just been announced by International Marketing Corporation, New York. The new model Via 5 constructed for the use of transparencies of 1½ x 3½ inch size and is claimed to be the only mini-projector of this kind on the American market at present. Intercontinental also announces that the Dianfant Model 1 is now available with a greater variety of lenses. Besides the Omar f:3.5—100 mm—standard equipment, the following lenses are available: f:3.5, 120 mm focal length; Omar f:3.5, 150 mm focal length.

DuPont’s Zelan

From DuPont comes a new finish for cloth garments and fabrics, known as Zelan, which is said to be very effective in repelling moisture. Not only does it maintain freshness of garments, and resist dirt and moisture spots, but it also is said to stand up for the normal life of any garment through repeated laundering or dry cleaning.

Weather-proof Bolts

New type patented bolts, manufactured by Lamson & Sessions Co. of Cleveland, feature tapered grooved shanks between the threading and the head, which when drawn down flush without counter-hooping, are said to provide moisture resistant, smooth surfaces for wooden equipment or construction that is exposed to the elements.
Classified Directory

Camera-Accessory Dealers

Camera Equipment, Inc.
1060 Broadway, N.Y. (Circle 6-5800)

Camera Supply Co.
1315 N. Calhoun, Hollywood. (Gladstone 2404)

Faxon Dean
4516 Sunset Blvd., Hollywood
(Morningside 11838)

Hollywood Camera Exchange
1600 N. Calhoun, Hollywood
(Hollywood 3651)

Motion Picture Camera Sup. Co.
723 Seventh Avenue, N. Y.
(Blury 9-7754)

Morgan Camera Shop
603 Sunset Blvd., Hollywood
(Gladstone 3101)

Camera-Accessory Mfrs.

Bell & Howell Co.
1848 Larchmont Ave, Chicago
Hollywood, 716 N. La Brea
(Woming 3124)

Duplex Cinema Equipment Co.
4572 Santa Monica Blvd, Hollywood
(Morningside 14717)

Eastman Kodak Company
Rochester, N. Y.

Kalart Company
915 Broadway, New York
Hollywood, Taft Bldg.

Devry Corporation
111 Armitage Ave, Chicago

Mitchell Camera Corp.
665 N. Robinson Blvd, West Hollywood
(Oxford 1051)

Sun Ray Photo Company
138 Centre Street, N. Y.

Fried Camera Company
61545 Santa Monica Blvd, Hollywood
(HE 6146)

Camera Rentals

Faxon Dean, Inc.
4516 Sunset Blvd., Hollywood
(MO 11838)

Landers & Trissel, Inc.
6311 Sunset Blvd., Hollywood
(Hillside 8311)

Chemical Engineering

Allison, D. K.
930 South Santa Monica Blvd., Beverly Hills
(Oxford 2311)

Film

DuPont Film Mfg. Corp.
Parlin, N. J.

Smith & Aller, Ltd.
6656 Santa Monica Blvd, Hollywood
(HE 5147)

Eastman Kodak Company
Rochester, N. Y.

Agfa-Anseo Corp.
Binghamton, N. Y.

Agfa Raw Film Corporation
6706 Santa Monica Blvd, Hollywood
(HI 6131)

Filters

Scheibe, George H.
1527 W. 78th St, L. A. (TW 2102)

For Sale or Rent—Cameras

FOR SALE OR RENT—Bell & Howell silent cameras, focus
镜头. Pan lenses, free head, corrected new aperture. Akley, De Brie, Pathe, Universal, Prevost, Willard, De Vry, Eye-

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BELL & HOLLOW SINGLE SYSTEM, COMPLETE; Bell & Howell silent camera with shift-over focus. Wall Single System, complete; rebuilt B & H sound printers; rebuilt Duplex sound and picture printers; 200 ft. Stiemmen developing reels; used measuring machines. Complete Akley camera equipment. Akley 1000 ft. magazines, synchrononous cameras motor. Motors, synchrononous finders, lenses and all accessories. Write, wire or cable MOTION PICTURE CAMERA SUPPLY, INC.

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Bell & Howell Co.

Herron Optical Co.
765 W. Jefferson Ave., Los Angeles
(PR 3822)

American Telescope Lab, Inc.
5870 Hollywood Blvd.
(OR dway 8707)

Lighting—Electrical Equipment

Bardwell & McAlister
7836 Santa Monica Blvd, Hollywood
(Hollywood 6215)

General Electric Company
Nels Park, Cleveland. Ohio

Mole-Richardson, Inc.
941 N. Sycamore, Hollywood

National Carbon Company
Carbon Sales Div., Cleveland, Ohio

Union Carbide & Carbon Corp.
Cleveland, Ohio

Manufacturing Machine Shops

Clintan Arts-Crafts
814 N. Fairfax, Hollywood
(HE 1984)

Duplex Cinema Equipment
4573 Santa Monica Blvd, Hollywood
(MO 14717)

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7512 Santa Monica Blvd. (Hillside 1492)

Studio Equipment Co.
11215 Broadway, Hollywood
(Granite 6844)

Fred Hoefner
5139 Santa Monica Blvd, Hollywood
(GL 0253)

Patent Attorneys

Robert W. Fulwider
5225 Wilshire Blvd., L. A. (COR 1265)

Projection

International Projector Corp.
88-96 Gold St., N. Y.

Sound Equipment

Blue Seal Sound Devices
725 7th Ave. N. Y.

Canady Sound Appliance Co.
19570 S. Sagamore Rd., Cleveland, Ohio

290 Turk St., San Francisco
(OR Doory 6999)

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International Photographer for February, 1935
**NEW PATENTS**

Latest patents of interest to photographers and motion picture technicians; color, anti-static film, printing on plurality of positives; other new inventions.

By ROBERT FULWIDER

Last month the following patents of interest to readers of International Photographer were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.


A working distance of 3 1/2 and 4 feet; and is adjustable for interchangeable use of lenses to 30 cm telephoto.

In addition to its new features the Kalart Syncroized Range Finder Model "F" has still another advantage of great value. The mechanically inclined Speed Graphic owner does not have to send his camera to the factory like the Model "K" for other cameras, complete instructions accompany each Model "F" outfit. The complete line of Speed Graphic cameras can now be ordered complete with this new Model "F" Range Finder from followed Graflex Corp., who are factory installing the new range finder on all their models. The Model "F" complete with installation instructions retails for $24.00. It will be ready for delivery February 15, 1939.

**Resistant Alloy**

A NEW ALLOY, labeled Copper-Uranium-Ternary Alloy, by its manufacturers, P. R. Mallory Co., of Indianapolis, is claimed to offer superior performance and longer life for current carrying or heat-carrying elements of electrical machinery; and it also is said to have unusual resistance of many corrosive gases and liquids.

**Top Range Finder**

The Kalart Camera Company announces a new Model "F" Range Finder, designed for use on the 4x3 1/4 and 4x5 Speed Graphic cameras. This new range finder is similar in construction to the Model "F," now being installed on the 4x3 1/4 Miniature Speed Graphic cameras at the Calyx factory.

The new Kalart Model "F" Range Finder has an adjustment range for accommodating auxiliary lenses and will automatically focus a lens closely as 3 1/2 and 4 feet! It is possible to just this new range finder for use with lenses of 10.5 cm to 30 cm Telephoto lenses. The accompanying table shows its remarkable versatility.

It is claimed that no range finder previously made would operate over such a lens range. The Model "F" will focus down to four feet than 18 cm lens; whereas range finders in the 4x have been limited to a near distance of 4 feet. Now Kalart claims that this is the first time in photographic history that a range finder has been produced which can accurately focus lenses of these focal lengths down to such close distances. The new device will automatically focus a film pack and cut film camera to 35mm . . . 16mm . . . Color

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INSIDE FACTS ABOUT NEW HOLLYWOOD TWOSOME

By CHOLLY CATWALKER

In the short time he has been getting around in Hollywood, young Fast Film has become known as a chooey boy. He doesn't go for the bright lights or did any of his respected ancestors. Oh dear me!

What illumination he has, must be smooth and discreet, without a trace of shadows or 'hot spots'.

That is where young 'Baby' Junior of the Solar-spot made a big hit with the newcomer. "Baby" Junior isn't very big, and never has been a bright light type herself, but true to Solar-spot family tradition, she's always blaming, with never a shadow or the slightest suggestion of a 'hot spot'. No wonder everyone says, 'They seem made for each other!'
POSITIVELY

The World's greatest and best negative in every respect

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PLUS X
PANCHROMATIC

—is the verdict of every cameraman who has used it——

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AN AL LANE PRODUCTION

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Our present experimental plant in Hollywood with a capacity of 20,000 ft. per day is virtually contracted for the next year and only a limited number of release prints arrangements can be considered.

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The name of the Film that will lengthen your actual working day is AGFA SUPREME. Winner of the Academy Award a year ago, SUPREME is a high-speed film that is outstanding in grain size, color balance and gradation.

For news reel work or the shots where speed is the factor of first importance, use AGFA ULTRA-SPEED PAN. It's the fastest 35mm film manufactured.

Specify these two great Agfa films from now on. Made by Agfa Ansco Corporation in Binghamton, New York.

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Roll-O-Wraper M3, for 35 mm., including deep saturating tank and developer. $17.50
Roll-O-Wraper R6, for 127-120-116 (specify size) roll film, including deep saturating tank and developer. $17.00
Perl No. 7 P&H Developer. 65c

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Editor, Ed Gibbons; Managing Editor, Herbert Aller; Art Editor, John Corydon Hill; Business Manager, Helen Boyce.
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Entered as Second Class matter, Sept. 30, 1930, at the Post Office at Los Angeles, California, under the Act of March 3, 1879.

International Photographer, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. International Photographer assumes no responsibility for the return of unsolicited manuscripts or material.

Subscription Rates: U.S.A., $2.50; Canada-foreign, $3.00 per year. Single Copy, 25 cents.

Office of Publication: 508 Taft Building, Hollywood, California
Telephone: Hillside 7221
Publication Date: 5th of Each Month

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Vol. 11 March, 1939 No. 2

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Top Strip: Hal Mohr and crew with cast of “Back Door to Heaven,” shooting R.R. station scenes; Left, on location; Right, on studio set duplicating location; Center Strip: Left, Hal Mohr with a light effect device; Right, Mohr, Wallace Ford, featured in picture, and triple-threat producer-director-author William K. Howard; Bottom, Left: Special elevator platform rigged to shoot scenes at Republic burlesque house on 42nd Street off Broadway; Bottom Right: Mohr with his camera crew on location in Cleveland; at left, William Kelly, operative cameraman; center, George Steitzel, assistant; latter pair are members of Local 631, IATSE.
NEW YORK TECHNICAL FACILITIES O. K.

Authoritative and factual report on the production situation in New York by a veteran Hollywood cameraman, with particular emphasis on service, technical crews, equipment available and comparative production expenditures.

By HAL MOHR
President, Local 659, IATSE

The studio’s big building includes one really big stage—as large as any in Hollywood—with several smaller stages in the basement beneath. Most of our sets were to be large, so we used the big stage almost all the time. The studio itself was all right, but my heart fell when I looked over the lighting equipment. There hasn’t been much feature production in New York for many years, and the lamps were largely old-style 18s and 24s—lamps which had been the last word nine or ten years ago, but which are now obsolete.

At this point, Eddie Fitzgerald, the studio’s chief electrician, took me in hand. “Don’t say it!” he told me. “I know what you’re looking for. We haven’t got it—but come along and I’ll introduce you to the man who has.” And he took me over to meet Charlie Ross.

Officially, Charlie Ross is the head of Charles Ross, Inc., the east coast distributor of the familiar Mole-Richardson equipment. To my delight, he had a plentiful supply of all the latest M-R lamps—Juniors, Seniors, Baby Juniors, H. I., Arcs and everything. We simply moved the biggest part of his rental stock over to the studio—and the lighting equipment problem was solved.

I can’t say too much about the way Ross cooperated with us. Whatever we wanted, he provided somehow. If he didn’t have it, he either made it or got it in a hurry from the M-R plant in Hollywood. For example, when I left Hollywood I had taken samples of all the little accessories which simplify work on the set—“horns”, “cellor” and similar holders for “jelly”、“color” and similar filters, “goose-neck” flags and gobos, and the like. Some of them Ross was familiar with. Others were new to him. But he saw to it that when we were ready to shoot, we started off with everything we needed, down to the last detail.

With that off my mind, the next thought was for the laboratory problem. Our work was to go through Paramount’s eastern laboratory, so I immediately put my problems up to Frank La Grande, the laboratory chief. Here again I was met with incredible cooperation. I didn’t think the plant’s routine methods were getting everything from the negative! Very well, La Grande took time off from his regular routine to make test after test until things were coming through the way I wanted them. All this was done weeks before we started shooting.

At one time, when we were preparing to go into the process sequences, La Grande practically disrupted the whole plant’s routine for a week to check his apparatus, and made tests of half-a-dozen different types of film, including Eastman Super-X, Plus-X and Super-XX, Agfa Supreme, Agfa Ultra Speed, and Dufoni. For each of these he emptied his tanks and compounded one or more special developers, usually beginning with the solutions specified by the film-makers, and then modifying the solutions and timing until we were getting what we felt was the most out of each film.

If, as we did on occasion, we were shooting special effect scenes, and wanted special negative development, La Grande would see to it that our negative got precisely the special treatment we wanted. In a word, he gave us laboratory cooperation of the sort that is too rarely seen anywhere nowadays. It goes without saying that he gave us a fine job.

During all this time, I had also been cooperating with Howard in preparing the script and schedule for production. Howard was in the enviable position of being not only the director, but also the author of the story and producer of the picture. He is one of the men in this industry who appreciates not only the necessity of careful, pre-production preparation, but also the value of keeping the cameraman as a co-worker during this preparatory period. There was plenty of details where my own experience could suggest short-cuts or economies which
From the equipment standpoint, as I've tried to point out, a cameraman from Hollywood can feel quite at home. The big raw film companies offer the same service in New York that they find in California. Most of Hollywood's key equipment firms have capable, cooperative representatives in New York for the same sort of service. And these representatives are men of the cloth, to carry the phrase, who was so helpful in solving my lighting problems, a man every cameraman ought to know—and would like when he knew him. And he gives us the benefit of his well-informed shipping equipment service that his associates, Pete Mode and Elmer Richardson give us here in Hollywood.

Far as cameras and camera equipment and service go, Frank Zucker's Camera Equipment Company deserves the same sort of praise. What the studio didn't have in the way of camera accessories Frank had in bulk. And he let me in on a neat little trick for rectifying any mechanical trouble that may arise.

The laboratories, as represented by my experience with Frank La Grande and the Paramount lab, know more about cooperation than some local plants I could name.

In fact, the only technical weak spot I detected was in the matter of process equipment. For our process work, I had to send to Detroit to have it done. New York wasn't equal to the precision demands of our job. It would really pay some of Hollywood's process firms to follow the example of some of our East Coast friends, and establish an eastern representative who could supply their latest equipment as Ross does lamps or Zacker cameras.

But to return, all to the simplest phrase, to the New York know the real meaning of cooperation. If you go there to make a picture, you'll find everyone in doing his best to help you make it a good one—striving to make your production picture to be fine.

CINECOLOR's new $250,000 Burbank plant, covering 45,000 square feet of a three-acre site, opened last month for operation. The modern concrete reinforced structure was designed by Architect Robert V. Darrah. New facilities and equipment provide new accuracy, flexibility, economy and speed. The new set will immediately make the plant capable of putting out a rate of a million feet per day. Accompanying illustration show air view and front elevation of new plant. Continuing under the leadership of the well-known in the field of colored motion pictures, Cinecolor's technical division embraces a complete patent research department, technical library, research room, control room, optical rooms and darkrooms. The plant has been designed to bring 100 per cent efficiency to handling of film. Modern dental equipment is used for cutting out for camera unloading, negative polishing, printing, waxing, positive cutting, optical printing, inspection and shipping. Inclusion of new building inter alia, the camera department and private cutting rooms. Processing of all types of color negatives is carried out in one room 70 feet wide by 200 feet long, containing machinery for printing positive films in 16 mm and 35 mm—in both two and three colors. Base ment in the new plant has been specially designed for washing, bleaching, and mixing in chemicals for developing. Vats range in capacity from 1,000 to 20,000 gallons. Circulation in each is controlled by a bank of electrically operated stirring and pipes for water, gas and fire sprinkler system have been installed in a scientifically ventilated tunnel, to prevent possibility of their being affected by chemical fumes. DC sets are also located in this tunnel. With an auxiliary power plant for use in emergencies, in the event of power failure, the new plant is put up the task of supplying current with a maximum interruption of only 10 seconds. An unirrigible steel door seals the entrance of huge new plant. The plant is equipped with a fire sprinkler system and other noise safety devices, they assure full protection. Special air-conditioning equipment has been designed for regulating humidity and temperature throughout the building, with individual sectional control. For convenient viewing of rushes and test prints, a theater section is provided in the main plant. The remainder has been made of equipment in general use to insure projected picture being consistent with standard theatre projection. Business staff, headed by Mr. Walter Creswell, treasurer, includes: Alan Guldahlsinger, vice-president in charge of research; W. T. Creswell, vice-president; and J. H. Kruse, sales manager. Construction and installation of equipment was under the supervision of William Pryne, secretary of the company.
NEW P & H DEVELOPING PROCESS

Amazing results in exposure latitude, sharpness, contrast control, depth and quality for engraving reproduction demonstrated in special tests made exclusively for International Photographer under technical supervision.

Amidst the welter of claims and arguments over film development methods, practices and materials, a new technique developed in Hollywood, and now available commercially, strikes off on a slant that, in addition to its interesting and simple theoretical approach, has produced amazing practical results. The new system is known as the P & H Process. It is now available for all types of still photography development, and has been tested satisfactorily in experiments in motion picture development.

Results obtained with badly exposed negatives over a wide range of stops and speeds, plus the enhancing effect the process has on good negatives, are illustrated most effectively in the accompanying illustrations. Also, contact prints of a Leica roll, photographed especially for International Photographer under prescribed conditions, are published herewith. All these pictures were photographed on one roll, and all were processed on the one roll in one opera-

The scenes were photographed consecutively, from the same position and under a virtually constant light value. All lens stops from f:3.5 to f:16 were used, with shutter speeds ranging from 1/20 to 1/500 of a second over each stop. The processed roll and the contact prints were examined by a number of technicians before being sent to the engraver and the printed record published herewith was absolutely un-retouched. The layout was photographed by the engraver’s camera in one operation. Note that all these contact prints from the negative could be handled in enlargement to get a possible reproduction.

The P & H Process introduces an entirely different technique to laboratory practice. Briefly, the process is a simple means of incorporating into the emulsion the active developing agent, in a quantity only necessary for the development to a predetermined density. This is based upon the fact that a fixed quantity of developing agent can only do a fixed amount of work.

To develop by the P & H Process the film is immersed into a solution of active ingredients for a short time (only for saturating the emulsion) and then passed through a combined squeegee and wrapping device in which the emulsion is sealed onto a smooth chemically inactive surface where the development takes place.

Development then proceeds as follows:
The highly-exposed areas or highlights quickly exhaust the developing agent in those areas and development stops; while the action in the lower exposures is slower and development continues until the developing solution in these areas becomes inert.

By controlling the concentration of the solution the development of the highlights can be stopped at any predetermined point, while the shadow detail and middletones are built up — thus providing a simple means of control of contrast.

However, the process makes possible much more than this. In its use the film is differentially developed. This is due to the fact that the process utilizes advantageously the bromides and iodides thrown off in the chemical reaction that takes place in re-
This demonstration of the P&H process development of one Leica roll to secure negative over a wide range of stops and speeds with every shot printable, is fully described in accompanying story.

ducing the silver halide in the emulsion to metallic silver.

The quantity of these products thrown off in the reaction are in exact proportion to the amount of silver reduced, and the amount of silver reduced is in exact relation to the light striking the film in exposure. Hence, as the solution sealed into the emulsion combines with these products of reaction a differential development takes place in each area of different density. Each density area generates and balances its own formula in the exact relation to the exposure of that area. This results not only in contrast or grain control, but also greater depth, finer detail with sharp lines of separation and third dimensional effect, which is apparent in the comparison sample prints on Page 9.

In the development of Leica, Contax, Argus, Kodak, and other miniature camera rolls and cut film the process is very simple and fool-proof. Time of development is unimportant, as development cannot proceed further than the quantity of active ingredients incorporated into the emulsion. Fine grain is a natural characteristic of the process because the quantity of solution used is not enough to cause a swelling or softening of the emulsion which permits the silver grains to group or clump.

Another important characteristic is an increase in film speed. Using the fastest film, tests have shown an increase in film speed to 100 percent. In photographing, one has much greater latitude in making exposures. If within 200 percent over or under the correct exposure, one can still be sure of a negative that will produce a good print.

A balanced formula is used in the process to combine with the products thrown off in the chemical reaction which takes place, and although different from the conventional formulas, it is very simple and inexpensive. Chemical costs are much lower for the reason that all of the solution is actually used, and not much as no development takes place in the solution it never becomes contaminated with the products of development.

Apparatus has been built and now is available for roll and cut film. Work is being done on equipment for the commercial photographer and motion picture film, which will be available in the near future.

The new system, which has already provoked astonishment interest from a wide variety of studio technical experts in preview tests and demonstrations, is a development by its inventor, Frank Perry, in association with Herbert Houston. Perry is a commercial photographer and photo finisher: while Houston is well-known to readers of INTERNATIONAL PHOTOGRAPHER as the designer and manufacturer of much special Hollywood studio equipment from laboratory machines and optical printers to camera cranes. He recently returned from three years spent in the various film production centers of the world on assignments to design and install equipment. The new process derives its trade name from the Perry-Houston initials.

Further details of this system, particularly its application to continuous motion picture processing, along with technical data on tests now in progress, will appear in early issues of INTERNATIONAL PHOTOGRAPHER. A salient point is that the procedure cannot be accomplished successfully without the use of patented devices marketed by the P&H organization.

For comparison of P&H with usual development, see opposite page, technical data on which follows:


(A) Film, Agfa Superpan Press: Weston meter reading zero; exposure: f.22—2 seconds; development normal, D-7 formula.

(2) Negative: Eastman Portrait Pan; exposure: 1 second, f.22; camera Eastman View Camera, 5x7; negatives for prints (2) and (B) were made under average lighting conditions; the overall density of both were about the same, but note the sharper detail and definition in print (2) as compared with (B).

(B) Negative: Eastman Portrait Pan; exposure: 1 second, f.22; camera: Eastman View Camera, 5x7; developed in Eastman D-7 formula.

(3) Film: Eastman Portrait Panchrome: light meter reading 31/2 Weston; exposure: f.32—9 seconds; development, P&H processed.

(C) Film: Eastman Portrait Panchromatic: light meter reading 31/2 Weston; exposure: f.32—9 seconds; development normal, D-7 formula.

(1) Negative: Agfa Superpan Press; exposure: 1/25 second, f.16; camera, 4x5 Speed Graflex; developed by P&H process.

(4) Negative: Agfa Superpan Press; exposure: 1/25 second, f.16; camera, 4x5 Graflex; developed in Eastman D-72 for-
For technical data on these comparison shots of development of same scenes by standard methods and P&H system, see Page 8, Column 3.

The comparison between (4) and the print (D) shows great latitude of the P&H process: portions of these negatives were both over-exposed and under-exposed; also, note shadow detail and definition of print (4) as compared with (D); note that highlights of (D) are washed out, while good detail is retained in (1).
IN ALL THE WEALTH OF PHOTOGRAPHIC LITERATURE NO SPACE HAS BEEN DEVOTED TO PHOTOGRAPHIC PHYSICS; AND EVERY EXPERT TECHNICIAN HAS HIS FAVORITE REFERENCE VOLUMES ON THE SUBJECT. THE ONLY BOOK I KNEW OF WAS DISCONTINUED FOR ASSURANCE ON ONE POINT OR ANOTHER. SEDON, HOWEVER, HAVE THE SIMPLE FUNDAMENTAL PHOTOGRAPHIC PHYSICS FACTS BEEN COUPLED IN SUCH NEAT HANDY FORM FOR EASY REFERENCE AS THEY APPEAR IN CHAPTER II OF "BASIC PHOTOGRAPHY," PUBLISHED LAST MONTH BY DON HOOPER, A FREQUENT CONTRIBUTOR TO INTERNATIONAL PHOTOGRAPHER.

This comprehensive volume is the result of much research work done by Hooper in connection with the presentation of photography education courses in the Los Angeles High Schools and in private classes on photography. In line with International Photographer's policy of presenting reference-worthy material, and through the courtesy of the author of "Basic Photography," the verbatim text of Hooper's Chapter II on Photographic Physics will be published in this and succeeding articles along with the illustrations that accompany the text in the published work.

The numericals in parentheses in the following text refer to the page numbers on which the material appears in the original edition of "Basic Photography."—Ed.

INTRODUCTION

We have said that photography is the art and science of forming images by the agency of light. This chapter will deal with the subjects of light, and they involve the study of physical photography. Optics is a branch of Physics which deals with the formation of images by means of lenses. It is beyond the scope of this text to cover these subjects thoroughly enough to enable the student to make calculations of lens curves, spectroscopic tests and other matters requiring a high degree of technical knowledge. However, a fairly comprehensive study will be made of the properties of light, the formation of images, the various types of lenses, and their errors, corrections, care and uses. It is the idea of this chapter to have the student regard lenses not as pieces of ordinary glass, suitably shaped and mounted, but as the cumulative result of a century of mathematical calculations and experiments by many scientists. With this in mind, and having a working knowledge of the properties of light and its application in photography, the student is prepared for the proper use of his photographic equipment later on.

LIGHT

It is difficult to give a clear and simple definition of light. However, for our purposes, it is sufficient regard light as being caused by vibrations or waves in a hypothetical substance which permeates all space, and which is called by scientists the ether.

TRAVEL BY LIGHT

When direct sunlight enters a darkened room through a small opening, the path of the light can be traced along its course by means of the lighted dust particles in the air. It will be observed that a beam of light travels in a straight line when viewed from any angle. Various theories have been advanced and upheld to prove that light does not travel in a straight line, but for our purpose we are entirely safe in stating that light travels in straight lines from its source. We will call the sunlight coming into the room a beam of light. A slender beam is denoted as a pencil, and the finest portion of a pencil is called a ray of light. For our purpose a ray will be designated as a straight line. Thus, we can represent light from a minute source as an infinite number of rays, or straight lines radiating in all directions from the source. At or near the source, they will be close together, producing strong light waves, but farther from the source, they gradually spread out, corresponding to weakening of the light waves.

(6) REQUIREMENTS FOR TAKING A PHOTOGRAPH

We have discussed the essential parts of a camera, and found that in the pinhole camera, these are few. Modern cameras employing lenses require an accurate method of controlling the light admitted to the sensitive materials, and means of focusing, or securing a sharp image. The six requirements for taking photographs are as follows: (1) LIGHT; (2) the SUBJECT, of which the photograph is taken; (3) the LENS; (4) the SHUTTER, for controlling the amount of light admitted into (5) the DARK BOX, forming the image on (6) the LIGHT-SENSITIVE MATERIAL. Many other features are incorporated into modern cameras, but they merely add to the case of taking photographs, without being absolute requirements.

VISION

Although there are many sources of light known to us, we are accustomed to think of the sun as the main source of light. In passing through a finite medium, light waves are either TRANSMITTED, ABSORBED, or REFLECTED. All substances which transmit, or allow the passage of light waves through them, are called transparent. Substances which do not transmit or allow the passage of any light waves through them at all are called opaque. Light waves will neither absorb nor reflect the light waves that fall upon them. Black is not, as is commonly thought, a color, but rather, the absence of color. In other words, objects appear black because they absorb practically all the light waves falling on them. Light waves that are neither transmitted nor absorbed, are reflected, and it is by reflecting light waves that objects, which are not sources of light, are visible.

Very few objects that we see, shine by their own light, as can readily be found by taking them into a dark room. They merely reflect the light that shines on them. This light is reflected from them in all directions, and they are visible by means of the particular rays of light that shine from them which pass into our eyes.

REFRACTION

The ability of a lens to form an image is dependent on the power of glass to refract light rays. Refraction is the deflection of a ray of light from a straight line when it enters a transparent medium of different density at an oblique angle. Rays of light, when bent upon entering the medium, the most common example of this is the apparent bending of a straight stick standing at an angle in clear water. Light waves are refracted in different transparent substances. They travel slower through glass than when in space.

There is a simple rule for determining the direction in which a ray of light is bent in passing from one transparent medium to another. In passing from the air into a denser medium, such as glass, the ray of light is bent TOWARD the NORMAL. Passing from glass out to the air, it is bent AWAY from the NORMAL. By the NORMAL, we mean a line perpendicular, or at right angles, to the surface at that point. Referring to Figure 1, we have the oblique ray of light AB striking the surface of the glass plate P at an oblique angle. H the ray were to continue in a straight line, it would emerge at the point E. But following the rule just given, it is bent to the normal RS and emerges from the other surface at C. Upon entering the air, the ray CD will be parallel to the ray AB, but slightly offset. Let us consider now the ray MN, which enters the glass normal, or at right angles to the surface. In this case, there is no refraction of the ray, and it continues straight on through the glass and emerges into the air at O and continues on in a straight line toward P.

FORMATION OF IMAGE OF A POINT

Figure 4 is represented by a thin circle of glass, having spherical surfaces, and forming what is known as a double convex lens. Owing to the constantly changing angles at which parallel rays enter and emerge from this lens, these rays will all meet at, or near, the same point. This means that the rays are "brought to a focus." For example, we will take two rays AA and BB, which intersect at a focus, or point intersect at A'. Now let us take the point B nearer the lens than the point from the parallel rays AA came. Rays of light, represented by the line AB, parallel to BB, upon passing through the lens, find them intersecting at the Point B'. FARTHER from the lens than the point C which are nearer the lens than B will, upon passing through the lens, intersect at C', farther from the lens than B'. From the above, we
notice that rays of light from a point are brought to a focus by the lens, and that the position of this point is determined by the position of the point from which the rays come. We also observe that parallel rays of light, coming from a point, appear to diverge or to be refracted outward by the lens. These parallel light rays we assume are coming from a source at an infinite distance from the lens, and after passing through the lens, the points of the lens to the intersection of these rays is called the FOCAL LENGTH, or "infinity focus" for that particular lens. This focal length is the same for each lens, and cannot be changed.

FORMATION OF ACTUAL IMAGE

Having learned how an image is formed by rays of light coming from a single point, we will contemplate the formation of an image composed of a (9) number of these points. In Figure 5, we can consider the arrow AB as reflecting rays of light from all directions from its entire surface. Some of these rays strike the surface of the lens and are refracted in passing through it. We will take two rays of light from the head of the arrow which strike the surface of the lens at different points, and two rays from the tail of the arrow which also pass through different parts of the lens. We find that the rays from the tail which pass through a point on the image of the head of the arrow, and that rays from the lens intersect at B′, forming an image of the tail. Between A′ and B′ we might draw another axis and imagine a number of rays coming from points along the shaft of the arrow AB. Thus an inverted image of the arrow is formed on the opposite side of the lens.

SIMPLE LENSES

A LENS is a thin piece of a double refracting medium (usually glass) bounded by a plane and a spherical surface, or two spherical surfaces, which have a common axis. Thus far in our discussion we have been considering double convex lenses. We will now take up the various types of simple lens forms, in preparation for a study of the combination of these lenses into double convex lenses. In Figure 6 are shown three simple lens forms, which are divided into two groups. These are the CONVEX, or CONVEX-CONCAVE; the CONCAVE, or CONVEX-CONCAVE; and the BARREL or DISC encouraging lenses. These two groups are often referred to as POSITIVE and NEGATIVE lenses, respectively. Very convex lenses have the power of bringing parallel rays of light to a focus, or converging light through the lens. The concave lenses, however, do not bring parallel rays of light to a focus, but diverge or spread, when passing through the lens.

(10) LIMITATIONS, DEFECTS OF SIMPLE LENSES

The image formed by a simple lens consisting of that one of the forms shown in Figure 6 is subject to several serious defects except when it is formed in the following manner: The lens used being very thin in comparison to its diameters, only the central portion of the lens being used, and light rays of but one wave-length being transmitted to form the image. Obviously, modern photography would not be possible with such a lens. It is true that the limitations of the lens would greatly reduce the errors inherent in the simple type. For this reason, modern photography is not based on the use of a single lens, but rather the use of a combination of eight or more of the various simple forms, or elements.

These elements are mounted in CELLS, and one or two of these cells form the complete lens. The number of cells employed in forming the complete lens will now be extended to include any combination of simple lens forms which go to make up modern complex lenses.


SPHERICAL ABERRATION

This may be defined as the inability of the lens to bring to a focus all parts of an edge of the lens to the same focus as those which pass through its center. (See Figure 7.) This will prevent the formation of a sharp image at any point except that point in the lens, or less have in outline. The trouble is overcome in the simple lenses by limiting the size of the diaphragm, or stop, it is often called, to an opening considerably smaller in diameter than the lens. This will shut out the marginal rays and prevent them from functioning in the formation of the image. It introduces the lens to a great extent in the better lenses by combinations of negative and positive elements.

CHROMATIC ABERRATION OR COLOR DISEASE

When rays of what we call white light pass through a simple lens, they are separated into their component colors, and these colored rays come to an intersection at different points along the axis. In Figure 8 it will be noted that the red rays intersect further away from the lens than the blue-violet rays, and the various other colors are found somewhere between these points. These colors are broadly divided into two groups, one composed of blue and its related tints, the other of the reds and yellows. The rays are bent more, or are retained in a plane nearer the lens than the others. Summing up, we may say that CHROMATIC ABERRATION IS THE INABILITY OF A LENS TO BRING THE VARIOUS COLORS TO THE SAME POINT OR PLANE. This defect is overcome or greatly reduced by making lenses of two elements which have different refractive powers, and with their curvatures so calculated that each neutralizes the color aberration of the other.

(12) DISTORTION

This error causes straight lines in the subject to appear bent when they occur near the margin of the simple lens. Distortion is primarily a consequence of spherical aberration. The lines tend to bow outward, forming what is called BARRIEL DISTORTION, or to move inward forming the PIN-CUSHION DISTORTION. Barrel distortion is produced by having the stop placed in front of the lens, while the Pin-Cushion distortion occurs when the stop is placed in the rear of the lens. Figure 9 illustrates barrel and pin-cushion distortion of a square. This effect is readily overcome by placing the diaphragm between two simple lenses, or between a double convex and a double concave, and having their convex surfaces outward. Such a combination is called a RECTILINEAR LENS. Such a combination can be used alone to overcome the central portion of the lens, distortion can be considerably minimized.

(13) CURVATURE OF FIELD

As the distance from the lens to the edges of the image field is greater than the distance to the center of this field, the area of sharp focus is naturally concave, or caved shaped, instead of being limited to the central portion of the lens represented by the focusing screen or the surface of the film. As a result, when the center of the field is in sharp focus, there is a gradual falloff of sharpness with distance in the image toward the edges. Conversely, when the edges are sharp focus, the center of the image is more or less blurred. Figure 8 illustrates the lens formed by a simple lens B′ and A′ from the position of sharp focus of the image of the arrow AB. Curvature of Field can be reduced, as in spherical aberration, by the combination of negative and positive elements, and also by using only the central portion of the lens. Curvature of Field is more pronounced when the lens covers a large angle. Astigmatic lenses also have the defect of an appreciable degree when used at their widest opening. When a lens has been corrected for curvature of field, it is said to have a "flat field."

FLARE

This defect exhibits itself as a circular or semi-circular patch of light appearing on the focusing glass, and consequently on the finished photograph. It can be due to many causes, but can, in most cases, be attributed to light rays of very high intensity which are not otherwise confined. Achromatic lenses double reflection, appear as a double image, the false image being blurred and irregular in shape (diaphragm). This defect is called the diaphragm aperture being worn bright, and this may account for its sudden appearance in a photograph. COMA, a form of FLARE, is the situation where a straight line of the field, of a pear-shaped (11) blur of light, caused by spherical aberration of oblique pencils of bright light. When a distinct double image in widely separated, light is the case, the phenomenon is called a GHOST. These defects are largely overcome by careful lens manufacture, and the avoidance of any strong lights in the neighborhood of the lens and the diaphragm opening blackened. Figure 13 illustrates Flare.

ASTIGMATISM

This is the inability of the lens to bring to a sharp focus at the same time, lines running at different angles to one another, especially when they appear near the margin of the field. If a wheel-shaped diaphragm, as in Figure 12, is employed, the effect may be increased. FLARE can also be caused by the edges of the central portion of the lens. Astigmatism is corrected in the manufacture of lenses by carefully selecting the optical glass used, accurate calculation of lens elements, the highest degree of skill possible being employed in the lens manufacture. Lenses corrected for this defect are called ANASTIGMATIC. These lenses, embody corrections for all other defects previously discussed.

(15) TYPES OF LENSES

Practically all lenses in professional use now are of the Anastigmat type, although lenses that are not so highly corrected are occasionally used. Following will be given a brief description of LENSES, which are so frequently used, with illustrations of each type.

(16) SINGLE ACHROMATIC LENS

This type of lens is not, as its name may imply, composed of a single piece of glass, or three elements having different curvature and refractive powers being cemented together into one cell which is positive meniscus in form. A typical single achromatic lens consists of a flint glass and a negative meniscus of flint glass. Another combination is a flat glass negative meniscus element between two crown glass positive elements. Achromatic lenses, as their names indicate, are corrected for chromatic aberration. They are, however, subject to all other lens defects. The chief objection to this type of lens is its excessive spherical aberration and distortion when used at full lens opening. To secure an image that is sharp to the margins and free from distortion with this lens, it is necessary to reduce all lens opening. Achromatic lenses are usually mounted with their convex surfaces facing the film and with the diaphragm placed a short distance in front of the lens. Within these limits, however, they are capable of producing very good results, and because of their low cost, they are usually fitted to the less expensive cameras.

(17) SINGLE RECTILINEAR LENS

This type of lens gets its name from possessing a greater speed at full aperture than the single achronatic lens and also because of the greater angular field. FLARE is essentially a double coated of two single achronetic lens cells placed a suitable distance apart with their concave surfaces
facing each other and with the diaphragm between them. The reverse position of these cells supply the correction for distortion. When both cells are of the same construction and focal length, the doublet is termed SYMMETRICAL. With this type, either of the cells can be used as a single achromatic lens and the focal length of each would be approximately twice that of the doublet. The cells of the rapid rectilinear lens may be of different focal lengths and when this is the case, the lens is called a Triple Convertible, since either or both cells may be used to give a choice of three focal lengths. The focal length is the shortest when the two cells are used together. The medium focal length is generally with the front cell removed, using only the rear cell; and the longer focal length is generally with the rear cell removed, using only the front cell. Spherical aberration in the rapid rectilinear lens is considerably reduced, which permits the use of a larger aperture than when using the single achromatic lens. It must be remembered though, that when but one cell of a rapid rectilinear lens is used, it is subject to the same limitations as the single achromatic lens.

ANASTIGMAT LENS

Lenses of this type possess all the corrections for the defects previously mentioned. The anastigmat lenses from reliable firms are made of the highest grade material and by the most skilled workmanship possible. Anastigmat lenses have a flat field and should be used, when copying maps, drawings, etc., where sharp focusing is required over the entire image. The corrections for astigmatism were made possible by the introduction of Jena glass. However, there are other varieties of high grade optical glass which have been introduced and used during recent years. Anastigmat lenses vary greatly in details of construction, some being composed of two corrected combinations which may be used separately as in the triple convertible rapid rectilinear lens, while others are complete in one piece, which is composed of many elements of different construction and refractive powers, these being dependent upon each other for full correction. Sometimes these elements are so arranged that one element is slightly separated from a cemented pair of elements, making what is called the air-space type. In this type, the air space acts as an additional element. In other types of anastigmats, these elements are all cemented together. An anastigmat doublet lens may be composed of two of the cemented type cells, or two of the air-space type cells, or one of each type.

Various manufacturers use different lens formulas in order to achieve or embody all these corrections. It does not matter which type of anastigmat lens you use, as all of them are corrected for the same lens errors.

SIZE OF THE IMAGE

The size of an image formed by a lens is dependent upon two things: the distance of the object from the lens and the focal length of the lens. For example, if we find the image to be two inches long when the object is 100 feet from the lens it will be only one inch long when the object is 200 feet from the lens. Now keeping the same distance of 100 feet from the object, the image is one inch long when using a lens of six inches focal length, it will be two inches long when using a lens of twelve inches focal length.

DETERMINING FOCAL LENGTH OF LENS

Of the many methods of determining the focal length of a lens, only two will be given here. Both of these require the use of a camera with a long bellows extension. In the first method, the camera is adjusted so that the image of a well marked scale will be exactly life size. A ruler marked in inches is a good scale to use for this. When this has been done, remove the lens from the camera, and measure the distance from the inner surface of the ground-glass to the surface of the scale. One-fourth of this distance is the focal length of the lens used.

The second method is as follows: focus the lens on a very distant object, and when a sharp image is obtained, mark the position of the camera front on its bed. Without moving the ground-glass, focus the lens on a scale until a life-sized image is obtained. Again mark the position of the camera front on the bed. The distance between these marks will be the focal length of the lens. This method is not as accurate as the first one, but will be sufficiently accurate for most purposes. In all methods for determining the focal length of a lens, the diaphragm should be used at its greatest opening.

FOCUSING

We have stated that for each lens there is but one focal length, which is constant for that
These illustrations of the photographic effectiveness of properly used fog filters, were made by George Scheibe to illustrate accompanying story. To secure most effective printed comparison, ordinary shot at left was printed on matte paper, while fog effect shot of same scene at right was a glossy print.

FOG EFFECT FILTERS

By GEORGE SCHEIBE

My first order for a fog filter came in 1916. I was rather puzzled at the idea. After all, why should anyone want a fog filter, when the real thing could be photographed? On further investigation the subject is not so simple. Natural fog cannot be controlled easily to give the fog effect photographically, especially at night, when the lights used for motion picture production, and even street light and other illumination, shine through the fog like so many searchlights. During the daytime, natural fog does not show up strongly in a picture, most especially in those taken at close range.

So I set to work to try my luck at making fog filters. After considerable practical experimentation, I gradually developed various densities of fog filters that satisfied the demands of the motion picture cameramen, who are always looking for some new and improved technical adjunct to their work.

The effects obtained with these filters were ideal, natural as the real fog would be. The fog filters did the trick of producing fog for film at any time, day or night. Whenever the script calls for fog, cameramen now put on the proper density of filter. There's no waiting for fog. It can be had at a moment's notice. The fog filters are here to stay and are getting more popular every day. Properly made fog filters require no increase in exposure and will give you the kind of fog you want in your pictures.

The following filters are the ones to be had: No. 3/4 and 3/4 are for early morning mist or atmospheric haze. The No. 3/2 is for very light fog effect. The No. 1 is for fairly light effects. The No. 2 for medium, and the No. 3 for heavy effects. No. 4 is for a "London fog" effect; and I send many fog filters to London where they have plenty of fog.

The No. 5 is a graduated type and will produce effects heavy in the distance and very light in the foreground. They can be used from any side of the camera—a high fog or low fog and an incoming effect. Any kind of an effect can be had with these filters. I once made a graduated fog filter for a Hollywood studio 5 x 22", and it was successfully used. It showed an incoming fog effect in the scene and it became more foggy as the filter was drawn before the camera. Since 1916 our organization has made thousands of fog filters, and they have done wonderful work. Try them on miniature cameras and in fact on any kind of camera and you will find that they produce fine results. The lighter fog filters, up to No. 1, can be used at night.

(This is another of a series of short articles on effect filters by Hollywood's long-time expert manufacturer of unusual filters for special studio use. Watch for another shot at filters by Scheibe in an early issue of International Photographer.)
Bob Coburn, ace stillman member of Local 659, IATSE, this month's CLOSE-UPS subject, photographed by brother member Ned Scott.
Bob Coburn: High school pole-vaulting got him into pictures

Bob Coburn grew up with photography and the motion picture industry, but what plopped him into his present position as one of Hollywood’s outstanding still photographers was entirely outside the sphere of either. As a youngster at Hollywood High School, Coburn developed quite a reputation as a pole-vaulter. His first picture job was earned on his soaring talents.

In 1916, two-reel comedies, which like vaudeville have passed into the show business limbo of nostalgic dodo-ism, were being ground out on every lot, and Jack White, producing Ben Turpin comedies, called the high school to get an expert pole-vaulter to double for the cross-eyed comic. School authorities sent Coburn. He must have made good in more ways than pole-vaulting, for he spent succeeding school vacations as film-loader, assistant and all-around stooge to Billy Beckway, well-remembered by members of Local 659 as an able first cameraman.

In those days the cameraman shot his own stills. Coburn had been a camera bug since his boyhood on a Montana ranch, and he showed such an enthusiasm for this branch of the game that Beckway turned the still photography over to the youngster. Still photography became Coburn’s hobby as well as work, and when Local 659 was organized and the various classifications of work laid down, he chose still photography. He’s been at it ever since, and pretty regularly, for Coburn is the type of thoughtful, modest and quietly competent craftsman whose talents usually are in demand.

Coburn’s personality is reflected in his neat offices and darkroom headquarters on the United Artists lot. The walls are shared equally by specimens of expert shooting for big game and still pictures. Photography and hunting split honors among the journals on his desk. Coburn is an unusual type, reflecting sincere artistic enthusiasm without any of the temperament and “aestheticisms” so frequently flouted by artistically personalites.

These qualities, which enabled him to “get along” with such a pronouncedly masculine director as John Ford as his favorite still photographer for many years, probably trace back to his boyhood on a Montana ranch, from which his father, Wallace A. Coburn took the family to Hollywood during his high school days. His boyhood hunting and fishing developed into his favorite hobby while his favorite boyhood hobby, photography, became his life work. At the age of ten, Coburn had a homemade darkroom in which to experiment with the shots snapped from a camera he carried on his saddle-bag. He learned his photography through the practical trial-and-error method, without picking up any of the cant and poseur technique that marks so much photography today.

Coburn believes in the theory that the photographer should himself do as much of every phase of the work as possible. Working on the UA lot, under Samuel Goldwyn, a producer, who knows, not only the business values of good stills, but also their good and bad points technically to a surprising degree. Coburn and his fellow stillmen at UA are permitted to do just that. They frankly attribute the results they get as much to the system as to their own efforts. No reformer, Coburn believes the big mass production lots might benefit in their still results from switching over to some sort of more personalized unit system, such as has worked out so successfully at UA.

Coburn is under personal contract to Goldwyn, and without red-apple-ing the boss, believes that other producers might well follow the examples of Goldwyn, DeMille and others of a small group of alert production minds, who personally examine the still results every morning and make it a point to know the practical, technical, artistic and exploitation angles of still photography. Such producers consider the stillman as an important part of their sales program. How right they are is indicated in the quality standing their productions have in the industry.

Technically, Coburn believes in simplicity, accuracy and complete mastery of the technical aspects of photography to the point of routine so that the photographer is free to let his mind work on the set toward composition, characterization and emotionally effective still pictures. This again is a reflection of his personal practical study of photography as a boy.

His regularly used equipment consists of an 8x10 Ansco, rebuilt to his own specifications to insure absolute sturdiness in operation, and with a carefully selected array of lenses; another 8x10 for portraits, also with special lenses and a conveniently operated tilt-head; a Contax III; and the press style 4x5 Speed Graphic. Coburn’s equipment is as devoid of accessories as possible. His insistence upon simple, practical equipment amounts almost to an anti-gadget mania.

Technically, Coburn matches this equipment with careful and lengthy test of the characteristics of various films and what his favorite lenses will do with such films. Every element of photography—films, lenses, laboratory handling—have been tested to insure as much depth of field as is possible and logical for every picture. And that, in a nutshell, is why Coburn’s stills stand out. They are not composed on the routine flat plane that marks so much still and newspaper photography. This technical mastery of the exact stop and speed permissible—until a routine handling of these elements is possible—permits full freedom to get the best composition, the most dramatic effect and a general roundness and third-dimensional effect that characterizes Coburn’s stills.

Coburn is not inclined to get involved in the purist vs. what’s controversy over photographic technique, but he obviously leans toward the group that believes the composition and general effect should be planned and determined at the time of snapping the bulb. His insistence on methodical and thorough knowledge of what the photographic equipment will do is mixed with the natural resistance of most practical photographers toward playing too much with the negative. He seldom takes a chance on revising or improving the composition or the technical factors in blowup.

All of which adds up to the fact that Coburn believes that good photography is a worthwhile artistic accomplishment, and like any medium where technique is important—be it playwriting, football, golf, hunting, brick-laying or motion picture production—it can best be mastered by doing, and not by reading or talking about. Trial and error—with emphasis on the error. That’s what teaches the burnt print to avoid overexposure.

Surprisingly enough for so practically-minded a photographer Coburn is one of the few Hollywood still photographers who never had any newspaper experience. He grew up with the picture business, and is still willing to learn. And as a member of the magazine committee in charge of the management of INTERNATIONAL PHOTOGRAPHER under the chairmanship of Leon Shanroy, he believes that the present discussion about Hollywood stills, started by John LeRoy Johnston and carried on by Jimmy Doolittle this month should result in a continued open forum that all readers of INTERNATIONAL PHOTOGRAPHER should join in for the betterment of the craft. —Gib.
They Mustn't Stand Still

A few "impertinent remarks" directed to the industry's "recognized publicity expert" on still photography, anent his much discussed article taking the Hollywood still situation apart in February issue of International Photographer.

By JAMES N. DOOLITTLE

Last month we introduced "a man with a mind as unapproachable as a LeRoy Johnston, Walter Wanger's publicity director, who leaped onto the Hollywood still picture situation with both feet; and this month "here we go again," with apologies to Phil Harris. Jimmy Doolittle needs no introduction to any reader of International Photographer. A founder member of Local 659, his outstanding photographic work, including scores of color magazine covers, and his uniqueness in still photography is evidenced by articles in such national journals as Popular Photography and the accompanying follow-up on "John LeRoy"--stamped him as one of the ace's of the photographic game or "acket," as Jimmy loves to describe it. No story in International Photographer in recent years has created quite the much attention as did Johnston's article last month. We hope to continue this series indefinitely, with Johnny and Jimmy as the characters, as this is the subject of International Photographer, and suggest that they wield their facile pens over it!

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While I concede some merit to the posed shots of the "whispering chorus" accompanying your article illustrative of the technique of sotto voce dialogue as practiced by the lesser actors, I harbor some doubts in that an editor would find much to rave about from a news angle without some stellar "weight." However, the point is well taken until we start to speculate as to what might happen if they had been posed with dumbbells and all the dramatic lighting that distinguishes most of these wouldn't have done at all for the "big name." But the drammatic lighting of which the cameraman is capable, and that means broad concessions to the little lady whose name burns up so many amps on a theatre marquee. Let the stillman step in there, start pushing lamps around for about five minutes in an effort to light the shot some "character" and the Local would have another member on the "available" list!

Your advice to do more outdoor fashion photography is the best you've offered because it is entirely feasible, but let the subject be models rather than stars. To be sure, the latter wear the best and are accustomed to the atmosphere of the show-case, but compared to a trained model they are the poorest posies one could encounter. Exceptions, to be sure, but I'm speaking broadly.

The amateur is indeed a pest who "eats, sleeps and drinks pictures"—and, in all probability, would make a lousy still photographer. But he has only one idea to please and he is easily satisfied. The stillman can be an amateur at heart and convey all his enthusiasm to the studio with him but, too often, he might just as well check it at the gate when he returns home he can eat, sleep, and drink—if he can find nothing better to do.

I honestly believe the best boys in the game may be photographed in night spots behind a barricade of glasses and bottles and with expressions that creep upon one after the other. Sure, the public goes for it; just the difference for the early motion pictures when a lady had no more secrets than a goldfish.

And by large, editors crave pictorial matter as near to the pornographic as they can get by with. Also that he will look at the film he is watching and imagine a stillman shooting that kind of stuff on a picture set? Not twice, you can't. We deplore the "pollyanna" in the run of production stills, but how binding is the script and the story of the picture that might be gotten with a candid camera would pass the critical scrutiny of the star who is privileged to O.K. the stills in which she appears. Haven't you seen them rip off the corners of thousands of prints simply because a teeny-weeny shadow crossed the Luxefed, Factorized check? And did you ever encounter that exalted individual who had no faith in his fact and insisted upon presenting this one phase to the camera? Fat chance of getting anything striking from such material no matter what one's fund of passion, enthusiasm or inspiration. I work for stills.
THREE NEW STARS

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EASTMAN Plus-X...
Super-XX...Background-X
are not doing the best work of which they are capable. I think, too, they'll admit it. And I know the answers. They alone, of the entire production staff, are the individuals who, with a responsibility far above their salaries, work almost without cooperation from the front office downward.

Does a cameraman have to exercise tact, diplomacy, aggression or passion to do his stuff? And does his art sell a single picture? Or even help to? A good story, well directed, adequately cast and properly staged, will sell despite ordinary photography, but you cannot give away ordinary stills. And stills are the honey that draws the flies.

In the field of advertising photography a single photograph of a group of paid models will command a price not far below the weekly salary of a star and appear on the printed page as a salutation for a five-cent article, yet the photographer whose product helps to sell a million-dollar production is called upon to "grab a still."

The idea seems to prevail that shooting stills is but the matter of setting up a camera, boudoiring for the lights, coaxes the cast into position and shooting some simulation of fragments of action as occurring before the movie camera. Such, indeed, has been the usual procedure; hence the usual stills.

But let's see. Right off, motion picture lighting is all wrong for stills. It has been arranged for a certain continuity of action where the individuals move about and that at no time run into dark spots or find with a turn of the head an unfavorable shadow where a shadow has no right to be. In short, light must be everywhere. There's too much light. Not in over-all intensity but graphically, if you follow me.

Then there's the matter of backgrounds. Continuity demands that actors be photographed with careful attention in logical progression through a given sequence. On the screen this is so damned important that a slight slip-up would hopelessly confuse an audience. But in a still, it is of no consequence whatever; unless the shot depends upon that background for its pictorial effectiveness. The latter consideration has reference to "location" stuff rather than studio set-ups. But on the stage, the still photographer has little opportunity to interrupt the show long enough to pose the subjects where the background would be an accessory rather than an interference to the principal.

Back in the dark ages, actors knew at least some of the rudiments of pantomime. The older trouper still hasn't forgotten. But just let a stillman try to wheedle the latter-day artists into a few simple gestures that would create an idea without dialogue and they'd better start looking into that museum watchman's vacation!

So what? Nothing. Things are going on and on just as they have been. Stillmen will still shoot stills under the same handicap as always or until some director of publicity goes into a huddle with the PRESENCE and says in a firm voice, "Lissen here, chief, you've got a million dollars invested in this here production. I gotta have a good photographer — not just one who will work at the scale — but a hot shot; a high-priced guy with a lotta art so I can get a heckuva still that'll help you get some of your money back."

After the D. of P. has picked himself up and dusted himself off, let him go right back into the office with grim determination and, thumping the desk, just as though nothing had happened, continue: "And I want you to go down on the set and tell that director, the star and the staff that the artist of the still camera (not the stillman — mercy me, no!) is to be given a reasonable amount of time to light, compose and shoot every situation in which he recognizes sales possibilities."

Then, when the director of publicity returns from the hospital, let him call me up some evening; we'll put our carpet slippers on, light up our pipes and go passionately complimentary.

RCA equipment preview

Last month Southern California projectionists came to Hollywood as guests of International Photographer and RCA for a midnight preview party to inspect the new RCA Photophone projection equipment, and to hear it ably described in an authoritative manner by L. A. Goodman, national service expert, who visited Hollywood for several weeks with E. C. Cahill, national service executive.

Fred Parrish, stillman on Selznick International's "With the Wind," dropped in on the party with the editor, and snapped the shots for the layout on Page 20, of studio projectionists and their RCA hosts, rushed the prints up the day after — then the trouble began. After a morning of trying to identify all the visitors, the editor and Paul E. Cramer, contributing editor on projection matters, decided to let the projectionists write their own captions.

Hence, International Photographer offers a year's free subscription to the first ten near­ly accurate lists of names of projectionists pic­tured on Page 20, submitted to the Interna­tional Photographer office by midnight of March 25, 1939. Final decision in event of dis­putes will be rendered by the business agents or secretaries of the various Southern California projectionist locals of the IATSE, who should know their own members, if anybody does.

In order to make the going easier, projection­ists need not identify the group in the upper

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Kodachrome is available in two types—regular and Type A. Regular Kodachrome is color-balanced for daylight, Type A for Photoflood light. Either type can be adapted for use in the other’s special field.

Because the Kodachrome process practically eliminates film grain, the projected movies are exceptionally clear. Add its technical excellence to its ease of use and capacity for great beauty—and it is easy to understand why Kodachrome has put new zest into movie making.
This layout by Fred Parrish, Local 659, IATSE, of preview showing of new RCA equipment staged last month by RCA and International Photographer, is described in story on Page 18. Projectionists! Name your brother members shown here and win a free subscription to International Photographer!
FIRST REAR PROJECTION SPECIFICATIONS

First installment of the complete text of the Academy Research Council's special subcommittee's report on the industry's initial agreements by studio and manufacturing company experts on minimum standards for process effects.

LAST MONTH the Academy Research Council released to the industry the first authoritative report on rear projection process equipment, laying down minimum specifications agreed on by the industry's experts. Full text of the report will be published in INTERNATIONAL PHOTOGRAPHER in installments during the next few months. Each installment will be accompanied by pictorial layouts featuring the outstanding experts in the process field and the modern new equipment developed for this important branch of motion picture production. In the following text, the numerals at the left in parenthesis indicate the actual page numbers of the Academy report, which are referred to frequently in the text.—Ed.

PREFACE

In furthering developments in process projection equipment and technology, the Research Council of the Academy of Motion Picture Arts and Sciences is carrying out its fundamental purpose of assisting to achieve new production economies and furthering technical progress.

Process projection methods continue to become increasingly important:

Economically, they offer opportunities for still greater savings in production costs.

Technically, developments in equipment and technique continue to expand the possibilities in this field until, some day, it will be the exception, rather than the rule, to send a cast on a distant location.

Artistically, as this equipment and technique is further developed the extent of its use will be limited only by the imagination of the production personnel: whereas, up to the present time, the equipment has been the limiting factor and only the ingenuity and resourcefulness of the technicians have made its wide use possible.

The Process Projection Equipment Committee of the Research Council, under the chairmanship of Farcot Edouart, of Paramount Studios, was appointed in March, 1939. The committee went into immediate conference to plan its program.

Eleven meetings and two demonstrations, consuming approximately one thousand man hours, were held, and at least an equal amount of time was consumed by the committee chairman and members in conferences, preparing for meetings, tests, and demonstrations, and preparing this report.

This report, therefore, represents over two thousand man hours of technical effort and combines the views of approximately fifty experts in the field of process projection.

The Research Council gratefully acknowledges the cooperation of the National Carbon Company for sending its Research Director, Mr. David Joy, to Hollywood in connection with the development of carbons for process projection work. Mr. Joy remained in Hollywood approximately three weeks conferring with the committee.

The Research Council also gratefully acknowledges the cooperation of the Bausch & Lomb Optical Company in sending its representatives, Mr. Haller Belt and Mr. Alan Cook, to Hollywood in connection with the development and standardization of optical systems for process projection work. These men remained in Hollywood for several weeks confering with the committee and individual members of the committee.

The Council also gratefully acknowledges the cooperation of the International Projector Corporation, the Mitchell Camera Company, the Technicolor Motion Picture Corporation, the General Electric Company, the Mole-Richardson Company, Paramount Studios, RKO-Radio Studios, and Selznick International Studios, in the work of this committee to a far greater extent than is ordinarily required of participants in the Council's program.

In presenting this report to the industry, it is only proper that the Research Council commend every active member of the committee for his part in this important project.

The report presents, for the first time, the coordinated viewpoint of the majority of the Hollywood studios on this subject and should be of great value to all the studios and to the manufacturers of process projection equipment.

NATHAN LEVINSON,
Acting Chairman, Research Council.

FOREWORD

The material included in this report has been prepared by the committee after thorough consideration of the basic requirements necessary for such equipment as well as the refinements and developments to be expected in the future. The specifications and recommendations contained in this report have been prepared in the light of the engineering departments of the producing companies participating in the Research Council cooperative technical program in purchasing new process projection equipment.

Copies of the report have been distributed through each company's representative on the Council to the proper officials in each company.

Copies of the report are also available, upon request, to all process projection equipment manufacturers, or companies manufacturing parts of such equipment, to be used as a guide in the designing, testing, and manufacturing of equipment, and to commercial organizations doing background process or miniature work for the motion picture producing companies.

As part of the program, the committee has made tests on a number of particular recommendations contained in this report to determine their practicability before inclusion in the report.

In order to clearly specify the relative importance of the various recommendations included in the report, each sub-heading in each part is indicated by one of the three following classifications:

BASIC

Recommendations so indicated incorporate definite requirements and principles. (Printed in bold face type.)

AUXILIARY

Recommendations so indicated are suggested
methods of meeting basic requirements. (Printed in light face type.)

ACCESSORY

Indicates optional special refinements which add to the ease of operation of equipment. (Printed in italic type.)

Since the very inception of transparency process projection methods, it has been found in general that available projection equipment for this type of work is principally composed of an assembly of units never originally designed in their entirety nor engineers to be combined and worked together in such capacity. Basic elements of these assemblages were never intended to fulfill and meet such strict requirements as have been imposed upon such equipment by the consistent demand for higher quality rear projection results, and of the ever increasing scope required in the present stage of the motion picture art.

These recommendations are based upon MAXIMUM LIGHT DELIVERY with the following primary requisites: ABSOLUTE STEADINESS of the projected picture with a MINIMUM OF LIGHT VARIATION on the screen, and INCREASED EFFICIENCY OF THE LIGHT.

The designer and manufacturer should regard any tolerances affecting these three principles as concessions to practicability, and any method of decreasing these concessions will be considered definite advancement in design.

FARCIOT EDOUART, Chairman, Process Projection Equipment Committee.
PART I THE BASE

CONSTRUCTION (Basic)

The base shall be so designed that it provides (1) a rigid and secure operating position, when locked off, and facilities for panning and tilting with absolute smoothness and precision; and (2), sufficient portability so that it can be easily moved about on its special carrier or dolly on the recording stage by not more than two men.

CONSTRUCTION (Accessory): It has been sug-
gested that this be accomplished by the use of a special carrier or dolly of the four-wheel type (on which the base will be mounted), equipped with solid rubber tires to provide sufficient safety during operation of the equipment. The wheels should have the ability, free from any side play or sway, to move and lock off in any direction for possible dolly movement. The provision of rear wheels should be provided to lift the equipment off the wheels for stationary stations. Adequate lubrication levels should be provided for leveling up the equipment.

PAN AND TILT MECHANISM (Basic)

In the design of the base, provision shall be made for a free-moving and easily operated pan and tilt mechanism, giving smooth movement when in operation, but including a positive locking device, giving locked-off stability equal to the stability obtained with the tilting mechanism not provided. There should be no backlash or play whatsoever in the pan and tilt mechanism and means for adjustment should be provided to keep all working parts tight at all times. (See “Rotation of the Projector Head,” page 18.)

PAN AND TILT MECHANISM (Accessory)

The design of the base should also provide for the addition, when required, of a variable speed motor control of the pan and tilt mechanism, operating remotely from the camera position. The design of this remote control mechanism should provide for a gear ratio in the order of 900 to 1 between the drive motor speed and the speed of operation of the tilt and pan mechanism (to minimize over-control) as well as a gear box providing two lower gear ratios, making available all the necessary different speeds of operation.

PAN AND TILT MECHANISM (Accessory) MINIMUM DEGREE PAN AND TILT (Basic)

The base shall be designed to provide an angle of visibility of 30° right and left of the center line between the projector and the screen, making a total minimum horizontal coverage of 60° and to provide an angle of visibility of 5° above and below the horizon, making a total minimum vertical coverage of 60°.

INTERCHANGEABILITY (Basic)

The base shall be so designed as to allow for free, quick interchange of projection heads and lamphouses, registered with dowel pins or other positive means so that a minimum of adjustment is required for lining up the arbor of the lamp when a change in head or lamphouse is made.

INTERCHANGEABILITY (Accessory):

In the event that devices other than the regular base mentioned above are provided to hold the projector head and lamphouse, the base on which the projection head and lamphouses rests should be designed so that projection heads and lamphouses are easily and quickly interchangeable without special tools.

SOUND INSULATION (Basic)

The base shall include sound insulation to eliminate the transmission of noise. (It has been observed that sufficient sound insulation has been provided by insulating the setting jacks of the dolly with hard rubber. However, it must be remembered that any material so used must not, in any way, detract from the absolute steadiness of the whole equipment.) (See “Maximum Noise Level,” page 21.)

HEIGHT OF OPTICAL AXIS (Basic)

The base and special carrier shall be so designed that the equipment’s optical axis, when parallel to the stage floor, shall be 5' 6" from the stage floor.

PART II THE LIGHT SOURCE

EFFICIENCY OF THE CARBON LIGHT SOURCE (Basic)

The life of this type of carbon shall be carefully chosen for maximum efficiency in relation to the selected type of optical system and lamphouse.

EFFICIENCY OF THE CARBON LIGHT SOURCE (Accessory):

It is recommended that all motion picture producing companies and commercial organizations using process projection equipment follow the manufacturers’ rated burning conditions under which the maximum efficiency and minimum fusher and flicker are obtained from the carbon light source. (See “Light Control,” Page 14.) It is further recommended, to insure freedom from moisture or dampness, that carbons be kept for 48 hours before use in an electric heating oven operating at not to exceed 125°F.

TOLERANCES IN THE STRAIGHTNESS OF CARBONS (Basic)

Carbons for process projection shall be so selected by the manufacturer for straightness and concentricity of the core, that when burned in a lamphouse developed and constructed to meet these Recommendations, the equipment shall be able to fulfill the tolerances under “The Feeding Mechanism,” page 16, as well as the recommended tolerances in Light Variation of the Light Output, page 4.

MAGNETIC SHIELDING (Basic)

The current to the arc shall be so conducted into the lamphouse that no magnetic field disturbing to the arc are set up.

INCANDESCENT LIGHT SOURCE (Basic)

It is recommended that further development work be conducted on incandescent and mercury vapor lamps for general and special application to background process projection.

POWER SUPPLY (Auxiliary):

It has been suggested that a separate power supply be provided for the light source, having such much as a constant line voltage to the arc is imperative to accomplish the results to be obtained from equipment meeting these recommendations.

PART III MAXIMUM VARIATION IN LIGHT OUTPUT OF EQUIPMENT

TOLERANCES IN LIGHT VARIATION OF THE LIGHT OUTPUT (Basic)

The design of the whole equipment shall be such that the illumination from the carbons in light use is not greater than ±2% per minute but with a maximum of ±5% for any consecutive nine minute shooting period. This tolerance is to apply only after proper carbon has been established in the arc.

DEFINITION OF LIGHT VARIATION (Basic)

There are two distinct types of variation in the light output of an arc lamp, which may be designated as "flicker," viz: a sudden spatter or brief increase or decrease in brightness, and as "fluctuation" (flicker) may be caused by the core of the positive carbon having different consistency in various spots, causing the arc to momentarily sputter, or by sudden air drafts or misted magnetic flux, or by misalignment of the positive current with respect to the crater. Flickeration is a mechanical or electrical problem and is caused by off-center rotation of the crater, the carbon feeding in an irregular manner (skewed carbon, or distortions in the line voltage), viz, moving in a slow wave of increasing or decreasing brightness.

FLICKER — METHOD OF MEASUREMENT (Basic)

Flickers are generally too fast to be measured by any presently known meters, but an irregular manner of photographing a clear screen illuminated by the arc lamp source. Each frame of the exposed, developed negative, over given portions, can then be read on a densitometer. (It is recommended that this method of measuring flicker may not be the most accurate, due to variations in film development; but one simple means available at present. The committee will welcome suggestions on more accurate methods which may be devised.)

FLUCTUATION — METHOD OF MEASUREMENT (Basic)

Flickers can be easily read and recorded with an accurate, sensitive light-recording photometer.

PART IV THE LAMPHOUSE

General Recommendations Applying To Both Mirror and Condunder Type Lamphouses

CAPACITY AND OPTICAL SPEED (Basic)

It is recommended that the speed of the optical speed for each type of lamphouse are given in that Section of this Part of the Report specifically applying to each type of lamphouse.

NOISE LEVEL (Basic)

The noise level of the lamphouse in operation shall be 3db below the noise level specification given for the whole equipment in that Part (“Noise Level,” page 21) of these Recommendations. This specification must be met without the use of booth or blimp on the lamphouse.

NOISE LEVEL (Auxiliary):

It has been suggested that acoustic treatment of the lamphouse may prove effective in meeting the above basic Noise Level Recommendations.

STRIKER MEANS (Basic)

The lamphouse shall be provided with a striker, hand or motor, which produces no detrimental magnetic effects on the burning of the arc and which will not shatter the crater.

VIEWING PORTS (Basic)

Large adequate viewing ports shall be provided in both sides of the lamphouse, located at the most advantageous position.

LAMPHOUSE DOORS (Basic)

The lamphouse door shall open upward rather than outward (forward or backward) and shall be provided with a positive holding device when open. (It has been suggested that the lamphouse doors be of the type which fold or collapse into a smaller unit when opened.)

CONTROL AND METER PANEL (Basic)

Controls and meters shall be centrally located at one position on the operating side during the course of the use of the equipment (except for special purposes).

OPERATING POSITION (Accessory): The lamphouse should be adaptable to operation from either the right or the left side for special purposes.
LINING UP METHOD (Basic)
A small port shall be included in the rear housing of the lamp in line with the optical center of the equipment so that, with no carbon in the mechanism, preliminary lining up may be accomplished by sighting through the carbon jaws and aperture.

INTERCHANGEABILITY OF BURNER ELEMENTS (Basic)
The burner elements, both the positive and negative, shall be easily removable from the lamphead in order to replace parts and to facilitate cleaning, and shall be interchangeable between lamphouses of the same type.

ASH TRAYS (Accessory): — Removable trays in the bottom of the lamphouse should be provided to catch debris and to facilitate keeping the lamphouse clean.

(7) VENTILATION FOR MAXIMUM DEGREE TILT (Basic)
The design of the ventilating system shall be such that the ventilation will not be reduced when using the lamp at a maximum angle of tilt of 30° above or below the horizon. (In the opinion of the committee, a 30° angle is the maximum tilt at which it will be necessary to burn the lamp. This angle is greater than the minimum degree of tilt specified on page 2 for the projector, but may at times be reached in operation due to the equipment as a whole being purposely set off-level in some particular setup.)

HEAT INSULATION (Basic)
The walls of both type lamphouses shall be so designed and treated that the heat will be conducted through the chimney rather than radiated out through the side of the lamp, thus lowering the temperature of the lamphouse.

HEAT INSULATION (Auxiliary): — It has been suggested, that should the lamphouse not be used with a portable equipment, that a metal cover be provided over the upper part of the lamphouse with sufficient clearance to set up a draft between this cover and the lamphouse to carry the heat transmitted through the lamphouse up the chimney.

MATERIALS OF CONSTRUCTION (Basic)
All parts of the lamphouse and shield (haffle) shall be constructed to distribute the magnetic flux in a manner that will not disturb the proper burning of the arc.

VISUAL INDICATOR DEVICES (Basic)
An indicator shall be provided comprising a compact solid optical system having a visual target index to show the burning relation between the carbons. An indicator shall also be provided to show the length of trim left in the lamp.

METERING FACILITIES (Basic)
An accurately calibrated and dependable ammeter and voltmeter shall be provided in the electrical circuit to show the arc current and voltage.

Recommendations Applying Only To The Condenser Type Lamphouse
CAPACITY (Basic) — The lamphouse shall be so designed that sufficient ventilation will be provided for the use of currents as high as 250 amperes without detrimental heating, this to be accomplished with minimum draft at the carbon arc so as not to impair the arc steadiness. (See note, “Flicker,” page 4.)

Feeding Mechanism and Accessories (Applying to Both Type Lamphouses)
CAPACITY OF, AND TOLERANCES IN, LIGHT VARIATION FROM THE FEEDING MECHANISM (Basic) — The carbon feeding mechanism shall be so designed that the light projected on the screen is not subject to periodic changes of level attributable to the feeding mechanism (see “Light Variation,” page 4), and must be capable of changing the carbon sizes specified under “Capacity,” page 8.

TOOLENS (Basic)
Feed and contact brushes for the positive carbon shall be so designed and made that the carbon, during operation, will not change its focal position by more than ±0.025”.

The positive head shall be designed so that the positive carbon will rotate within a circle of a radius of 0.010”, and the burning position of carbon (Basic)

The feeding mechanism shall be so designed that the negative carbon will burn at an angle, in relation to the real axis of the positive carbon, to obtain optimum efficiency. With present equipment and carbons this angle is approximately 55°.

To be continued in the April issue.
Kodaslide Projector

A new compact modestly priced projector for 2x2 slides, suited for showing either Kodachrome transparencies or black-and-white positives, is announced by Eastman Kodak Company. The Kodaslide Projector, Model 2, achieves minimum bulk compatible with high-efficient performance of its illumination and optical system.

The base of the Model 2 Projector measures 465 inches, and height of the lamp housing is only 5 inches. Base, turret head and housing are of die-cast aluminum with glassy, jet-black finish, contrasting with bright, natural aluminum turn finish of the 5-inch lens tube. The optical system consists of a spherical glass reflector; a 100-watt, line voltage, candleabra bayonet base, 4c filament lamp; three condensing lenses, and a 5-inch f/3.7 projection lens. A special heat-absorbing glass prevents overheating of the slide during projection.

Price of the Kodaslide Projector, Model 2, with 5-inch f/3.7 lens, is $33.50, including lamp. With the 7½-inch projection lens, the projector is priced at $52.

Improved Glow Lamps

With increasing interest being shown by sound engineers in glow-lamp recording methods, Art Reeves, who has pioneered in large scale manufacture of accurately controlled long-life glow-lamps, is completing engineering to offer his modern type lamps to the trade on a mass-production scale at reasonable prices. Interested technicians should visit the Reeves Hollywood plant and they will be surprised at the amount of research and engineering application that has gone into the lamp department. Watch for an early technical article in International Photographer on the modern improved glow-lamp as manufactured by the Reeves organization, along with notes on the new technique of using this system for recording.

Agfa Cykon, Cykora Papers

Two new photographic papers from Agfa Anseco are Cykon for contact prints and Cykora for projection prints. The emulsions of the new papers incorporate an improved, full-scale range of tones that results in greater beauty and better accuracy of tone reproduction in the final print.

A wide developing latitude may be obtained in standard formulas with usual processing techniques. The new papers are now being stocked by photographic dealers in all standard sizes; Cykon at the regular prices listed for Agfa Cykora Paper (Double Weight) and Cykora at the same prices listed for Agfa Brovira Paper (Double Weight).

Four New G-E Lamps

Two new photoflash lamps—a foil-filled "Synchro Press No. 11" and a wire-filled "Synchro Press No. 16," each designed primarily for news photography, were announced last month by G-E's incandescent lamp department at Nela Park, Cleveland. Also announced was development of a greatly improved No. 7 wire-filled photoflash lamp, designed for news camera men and others. All three lamps will be made available March 1.

Also, a new self-reflecting photoflood lamp—designed to simplify taking of better motion pictures, snapshots, and time exposures by professional and amateur photographers—was announced.

The compact bell-shaped unit, consuming 500 watts, is called GE Mazda Reflectod Lamp No. R2. It is equipped with the conventional medium-screw base and may be used on ordinary lighting circuits (105-120 volts).

For the purpose of distributing evenly the high amounts of reflected light, the circular end of Photoflood R2's all-glass bulb is inside frosted. Despite the new lamp's compact size—maximum all-over length, 6½ inches; greatest width, 5 inches—it produces smooth illumination over a spread of approximately sixty degrees. Color quality of the light is similar to that of the standard 500-watt Photoflood No. 2.

Garfield by Hurrell

The April issue of International Photographer will feature another striking personality portfolio from the camera of George Hurrell, contributing editor, and are portrait photographer of Warners' stars. There will be eight strikingly effective and typically Hurrell shots of John Garfield, the studio's recent star discovery.


**Classification Directory**

**Camera-Accessory Dealers**

**Camera Equipment, Inc.**
1600 Broadway, N. Y. (Circle 6-5089)

**Camera Supply Co.**
3315 N. Calhoun, Hollywood. (GLadstone 2304)

**Faxon Dean**
4516 Sunset Blvd., Hollywood (MOrginmore 11838)

**Hollywood Camera Exchange**
1600 N. Cahuenga, Hollywood. (Hollywood 3651)

**Motion Picture Camera Sup. Co.**
723 Seventh Avenue, N. Y. (BRyant 9-7754)

**Morgan Camera Shop**
6305 Sunset Blvd., Hollywood. (GLadstone 3101)

**Camera-Accessory Mfrs.**

**Bell & Howell Co.**
1848 Larchmont Ave., Chicago. Hollywood, 716 N. LaBrea. (WYoming 3134)

**Duplex Cinema Equipment Co.**
4572 Santa Monica Blvd., Hollywood. (MOrningrose 1415)

**Eastman Kodak Company**
Rochester, N. Y. Hollywood, 6076 Sta. Monica. (HEmpsted 3171)

**Kalart Company**

**Devyr Corporation**
111 Armitage Ave., Chicago.

**Mitchell Camera Corp.**
665 N. Robertson Blvd., West Hollywood. (OXford 1051)

**Sun Ray Photo Company**
138 Centre Street, N. Y.

**Fried Camera Company**
61545 Santa Monica Blvd., Hollywood. (HE 4716)

**Camera Rentals**

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6313 Sunset Blvd., Hollywood. (HIllside 8333)

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REGULAR DEPARTMENTS

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CLOSE-UPS

Guy Bennett: Operative Cameraman

Every time a sound motion picture scene is "taken" there are two men who must give their O.K., for they are the only ones who actually see and hear the scene as it will appear when projected in the theater. The man who sees it is the operative cameraman. The man who hears it is the sound man. Looking through the camera view-finder, the operative cameraman is the final observer of the enactment of the action, composition, dramatic, lighting and other effects that have been devised by scenarist, director, players and director of photography. He and the soundman must decide from their own personal sensory observation through view-finder and head phones whether or not a satisfactory compromise with all creative factors has been realized.

Typical of the several hundred operative cameramen members of Local 659 is Guy Bennett, familiar to everyone on the Paramount lot, who is seen in action on the set in accompanying shots by G. E. Richardson, stillman member of Local 659. Alertness, long experience and thorough knowledge and understanding of the aims of director and director of photography are among the qualities that make these men so valuable. They must be ever on the watch that no unexpected or unplanned action by the players or background changes from the originally planned movement and lighting of the set, occur during shooting. They sit behind the camera, like the engineer at his throttle, ever watching for danger signals.

Typical also of the average operative cameraman is Bennett’s record. Like many another he virtually grew up with the business. Born in Tombstone, Arizona, he came to California as a youngster, went to high school, in Glendale, spent several years at Stanford University and found an entering wedge into the picture industry through the laboratory. His first job was at the old Standard lab, since absorbed by Consolidated, thence to the loading room at Paramount. By gradual progress, working in that studio’s camera department, since 1924, reached his present classification.

During production the average scene runs 50 to 60 feet in length as photographed, which of course is trimmed considerably in the final cutting. After placement of camera and lighting and two to seven rehearsals, the scene is generally photographed two to three times, sometimes more. During all this activity, the operative cameraman must familiarize himself with the composite aims and wishes of director and first cameraman, and see that
it is recorded on the film.

Bennett is an enthusiast for the use of the viewfinder to determine camera setups in advance. He is shown on Page 3 at left using the viewfinder detached from the camera, and at left behind the viewfinder during actual shooting. This practice is used by about 50 per cent of the directors in the industry and Bennett believes it saves 10 to 15 minutes on each setup by showing the director any possible "bugs" in a contemplated setup and thus avoiding waste motion by the camera and electrical crews.

He also favors the use of the photronic light meter, another practice on which the industry is about 50-50 divided. At Paramount, studio executives favor a system which controls the entire setup as a unit. Bennett is usually works with Ted Sparkuhl, director of photography, and Laughow, assistant cameraman. Both Bennett and Sparkuhl carry Weston meters, which are regularly checked to insure efficient operation.

Recent productions on which this crew has worked were "If I Were King" and "Wells Fargo," directed by Frank Lloyd, "St. Louis Blues," directed by Raoul Walsh, and "The Gambler and the Lady," directed by Alexander Hall. While Bennett is emphatic in his views on use of the viewfinder in lining up scenes in advance and the electric meter to determine proper exposure and lighting values, he refuses to take sides in the old and endless debate over action vs. composition. He believes each important, with emphasis on one or the other dependent upon the particular scene.

The operative cameraman's duty is to strike a balance in his actual photography between the box-office and dramatic flair of the director and the artistic demands of the director of photography. In this Bennett, is typical of the run of able operative cameramen. They're competent in this respect but also good diplomats. They have to be, since under their cool and watchful eye the final result of a lot of conflicting temperament and creative inspiration—Gib.

**On the Cover**

Fred Astaire and Ginger Rogers in their roles as Vernon and Irene Castle from the latest RKO-Radio picture, photographed by John Miehle, stillman member of Local 659, IATSE. Turn to Pages 14-15 for layout of shots by Miehle of the stars in dance sequences from the picture.

**soft focus**

By GEORGE SCHEIBE

Soft-focus or diffusion is the most popular of all photography with professionals. Hardly a single scene is photographed today—either in the studio or on location—without the use of a Diffusing Screen. In full half of these scenes, the diffusion is so delicate that it is noticeable only to the trained technician; yet it is the presence of this all but imperceptible diffusion which is responsible for the charm, naturalness, and "quality" of modern studio cinematography.

Our lens makers have so perfected their lenses that even the fastest objectives now in use render an object with a greater degree of sharpness and detail than the human eye ever perceives in nature. Thus, the pictures made with these lenses are frequently jarring to our optic sensibilities; we see details—imperfections—the texture of skin and make-up, and so on, which detract from our enjoyment of the picture and its message. Diffusing Screens have been devised to delicately soften the image cast by the lens, obscuring these defects, and giving a satisfyingly natural picture without sacrifice of any of the essential characteristics of the lens—its speed, correction, and general quality.

In studio practice, these screens smooth out facial wrinkles, banish the flaws in makeup, and make the picture generally more pleasing. These Diffusing Screens are made in a number of grades, giving diffused effects ranging from the very lightest to the heaviest permissible softness. The basic numbers of the series—Nos. 1/256 and 1/128 give a very slight degree of diffusion, very pleasing to the eye. 1/64 and 1/32 give a moderate and pleasing effect, while the 1/16 and 1/8 go into heavier diffusion. The heavier ones—1/4, 1/2 and 1 give effects that are pleasing but very heavy diffusion. Nos. 2 and 3 are used for extreme effects.

Many famous cinematographers use the lighter screens for all scenes, applying heavier one for close-ups—and never working without a Diffusing Screen. Users of mm. 16 will find the lighter gradations extremely beneficial to their camerawork. Users of Leica, Contax and other miniature cameras will find these Diffusing Screens very useful too, in making their enlargements. Several users have told me that the use of No. 1/64 on the lens of the enlarger when making big bromides tends to minimize the grain-effect so injurious to their work.

Comparison between unfiltered shot and No. 1/16 Schiebe soft focus filter.
“DR. LIVINGSTONE, I PRESUME”

Modern location jaunt to Africa insures authentic backgrounds for 20th-Fox picture based on Stanley’s famous search for long lost Livingstone.

By SOL HALPRIN

The was the most thrilling mob scene I had ever filmed! Some 5,000 painted African savages, brandishing spears, came swarming down a hill, racing toward the camera, which we had mounted on a small platform. They were yelling and tearing the air with a howling that I, having been on the back seat, didn’t hear. And they looked like the kind of devils who inhabit the rest of African nightmares.

As they passed the camera, some of them held their spears at us. I could hear them hissing by me and saw them missing Director Brower and Sid Wagner, my fellow cinematographer, only by inches. I turned as white as if I were a alabaster statue.

The natives, of course, were only ogling, but one of us could quite appreciate their macabre sense of humor. They were trying to scare us, and succeeding quite admirably.

They were the Masai, fierce warriors until the white came among them a few years ago. We followed them for 40 days out of Nairobi in Tanganyika to reach their country—40 days of rain and dust, and hymns howling outside our tents night and day roaring from hundreds of yards away.

Our party numbered 27, besides the 300 safari vehicles, and we comprised an expedition that 20th Century-Fox had sent out to shoot 100,000 feet of background material for “Stanley and Livingstone,” a two million dollar picture that was to tell the story of the epic search in 1871 by Henry Stanley, the New York newspaper reporter, for Dr. David Livingstone, a missionary who explored and wrote in 1866.

Working from Stanley’s own diaries and recollections, we were retracing by mile by mile the historic route he had taken before he found Livingstone in the village of Ujiji, 1,300 miles from the coast. But where Stanley had traveled on foot, we were riding in a fleet of 27 trucks. As we retraced the plains and jungles, we were forced to build our own roads, which were often delayed for days at a time by such engineering feats. It took Stanley 10 months to reach Ujiji from the island of Zanzibar. We made the trip in 12 days.

Equipped with two Mitchell cameras and an kley, we were more interested in obtaining scenes of native battles, grass fires and other spectacular events that periled Stanley, than in aged animal scenes. We took our hippopotamuses, cheetahs and other plains and jungle beasts and we encountered them, hoping to get a true picture of African animal life rather than a succession of concerted thrills.

The sunlight proved so similar to California light that we could work almost without tests. Although we carried a test truck where we developed samples each day to make certain everything was all right with our equipment. By degrading the film after each sequence and scaling it in cans, to ship back to Hollywood, we avoided the fogging that had beset other expeditions into hot lands.

The farther we traveled from Nairobi, the more troubles multiplied. Heavy rains fell day after day in the first month, bogging us down in the Masai country, and after the rains the grass got up to a man’s chest, providing excellent ambushes for wild animals. The worst followed, when we were forced to drive straight through the Tanganyika plains clear. For days and nights, the conflagration raged as far as one could see. It was just the kind of a spectacle we wanted, since Stanley and his safari had almost been trapped at one time by such a blaze, and we unrolled thousands of feet of film.

The fire, of course, was dangerous. We laid fire breaks at night around our trucks and in the day time sent natives far ahead to spot blazes that might be roaring toward us. On three occasions we circumvented the flames just in the nick of time.

The fires naturally swept right through Masai villages and burned the huts, but the men didn’t care. For the women, who are the beasts of burden in that country, would rebuild them.

The Masai were suspicious of us at first, but, when they learned that we would pay them a copper wire, sugar and meat, as well as in shillings, they were willing to become movie extras.

The shillings, of course, were merely ornaments to them which they shunned about their necks, as they did the copper wire, which the women prize more highly than anything else.

Sugar and meat meant more to them. They were starved for sweets and we rationed every one cup a day. They were hungry, too, for meat. Although the men own cattle, which is the principal medium of exchange between the tribes, they hoard them until they get enough to pay for a wife. Ten cows or 90 goats will buy a girl.

For our big mob scenes, which were picture to the tribemen attacking Stanley and his fever-stricken elephant, we rounded up Masai from 80 miles around. They came in their ceremonial garb, and hid them behind a hill. Brower told them that when we were ready, he would fire a gun. Like children, they were too anxious to perform for the great white men and they came pouring down the hill before we were set up. It took us five hours to get them hidden again and then the sun went under. We were waiting for the cloud to pass when once again they piddled down on us. That roar continued for two days, but eventually we got a mob scene for “Stanley and Livingstone,” which should give movies a thrill. Our white hunters told us that never before in Africa had so many natives been rounded up for a film scene.

The tribemen naturally had no idea what we were doing. They knew nothing about movies and consequently thought that we were slightly bananas, especially when we insisted on them doing the same thing over and over so that we could get our shots from all angles. We gave our orders to interpreters, who passed them on in swahili and eventually they were translated by other interpreters into the native tongues. Goodhearted fellows that they were, our interpreters often changed our instructions so that the tribemen wouldn’t realize just how crazy we were. Eventually we had to pammam all we wanted done. If we wanted them to come by the camera dancing, Brower would start dancing with them and lead them by our camera set-up.

At Ujiji we found some natives who were so mechanically gifted that they could help us build a dolly and a camera crane out of wood. We got the first camera and dolly shots ever taken in the African jungles.

Twentieth Century-Fox will use about 5,000 feet of what we filmed in Africa. Another 5,000 feet of interior scenes, with Spencer Tracy as Stanley and Sir Cedric Hardwicke as Livingstone, who are being filmed for “Stanley and Livingstone,” were burned in Hollywood with Henry King, who recently created “Jesse James,” as the director. The cast includes Nancy Kelly, Richard Greene and Walter Brennan.

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shots. Note wooden camera crane built by natives, which with other scenes illustrated is described in accompanying story by Sol Halprin, member of Local 639, IATSE. Otto Brower and Mrs. Osa Johnson were in charge of the unit.
George Hurrell unveils striking series of character studies of John Garfield, Warners' dynamic new star discovery
THE DIAPHRAGM AND LENS APERTURES

The device used for varying the size of the opening through which light rays are admitted through the lens is called the diaphragm. It consists of a number of thin metal or composition sheets, so arranged that the size of the opening they surround, can be varied at the will of the operator. This opening is approximately circular, concentric with, and normal to, the axis of the lens. (The axis of the lens is an imaginary straight line through its center, at right angles, perpendicular, or normal to the surface of the lens at the center.) In doubles, the diaphragm is always between the cells, its position being optically chosen for that particular lens combination. The diaphragm is often referred to as the lens "stop," and the act of reducing the size of its aperture as "stopping down." The relative size of the largest opening fixes the maximum working speed of the lens, and the better the optical correction, the larger this may be. When the diaphragm is at its largest opening, it is said to be at its widest aperture, or the lens is "wide open."

SPEED OF A LENS

It is obvious that the larger the effective aperture of a lens, or the size of the diaphragm opening, the greater will be the amount of light admitted to the sensitive material, in a given length of time. Therefore, the exposure required to produce the latent image with any given amount of light, will be shortest when the lens is wide open and will increase in duration in proportion to the amount the lens is stopped down. Also, since the light rays, after passing through the lens, spread out in the shape of a cone with its base at the focal plane, their intensity decreases as they get farther away from the lens. Thus, with the same size diaphragm opening, the intensity of light on the focal plane decreases as its distance from the lens is increased. Summing up the above, the SPEED OF A LENS is determined by two factors, the size of the effective aperture, and the focal length of that lens.

THE F SYSTEM OF DIAPHRAGM STOPS

The speed of a lens, as was just stated, depends upon the diameter of the effective aperture and its focal length. It is expressed according to what is known as the f, system, which is nothing more than the ratio between the focal length and the effective aperture. For example, if the effective aperture of a lens is one inch, and its focal length, eight inches, the f value would be 8, or in the term commonly used, the lens would be working at an F8. From simple arithmetic we know that the area of a circle varies as the square of its diameter. In photographic terms this means that if the diameter of the diaphragm opening is reduced by one-half, one-quarter of the previous amount of light will be admitted and four times the previous exposure will be required.

Now, by halving the diameter of the diaphragm opening, we have increased the ratio between the focal length and the aperture, or the f value has been increased. In the example given above, if the effective aperture of the eight-inch focal length lens is decreased from one inch to one-half inch, the f value will be increased from 8 to 16. The diameter of the diaphragm on most lenses is controlled by a ring on the barrel, which has an index mark on it. This mark can be placed opposite any value of the series of numbers corresponding to the f value for the different diaphragm openings of that particular lens. It will be noted that, as the numbers increase in value, the size of the opening decreases. With the usual exception of the lowest number, which gives the f value for the maximum effective aperture, these numbers are so chosen that as the index pointer is moved on to the next larger number the amount of light admitted through the diaphragm is decreased by half. These numbers in cases (20)
values, amount of light, and exposure required.

Number 1 is based on a correct exposure of 1 second at f.8. They both show the amount of light admitted, and the exposures required for different f. values, commonly used.

\[
\begin{array}{c|ccc}
\text{f. value} & \text{Amount of light} & \text{Exposure} & \text{squared} & \text{admitted} & \text{seconds} \\
\hline
1.5 & 2.25 & 32 & \frac{1}{32} & 1/32 \\
2.0 & 4.00 & 16 & \frac{1}{16} & 1/16 \\
2.8 & 7.8 & 8 & \frac{1}{8} & 1/8 \\
4.0 & 16 & 4 & \frac{1}{4} & 1/4 \\
5.6 & 31.36 & 2 & \frac{1}{2} & 1/2 \\
8.0 & 64 & 1 & \frac{1}{1} & 1 \\
11.2 & 127.69 & \frac{1}{2} & 2 \\
16.0 & 256 & \frac{1}{4} & 4 \\
22.6 & 510.76 & \frac{1}{8} & 8 \\
32.0 & 1024 & \frac{1}{16} & 16 \\
\end{array}
\]

Number 2 is based on a correct exposure of 1 second at f.1.8.

\[
\begin{array}{c|ccc}
\text{f. value} & \text{Amount of light} & \text{Exposure} & \text{squared} & \text{admitted} & \text{seconds} \\
\hline
1.9 & 3.6 & 32 & \frac{1}{32} & 1/32 \\
2.5 & 6.25 & 16 & \frac{1}{16} & 1/16 \\
3.5 & 12.25 & 8 & \frac{1}{8} & 1/8 \\
4.5 & 20.25 & 4 & \frac{1}{4} & 1/4 \\
6.3 & 39.69 & 2 & \frac{1}{2} & 1/2 \\
9.0 & 81 & 1 & \frac{1}{1} & 1 \\
12.5 & 226.25 & \frac{1}{2} & 2 \\
18.0 & 324 & \frac{1}{4} & 4 \\
25.0 & 625 & \frac{1}{8} & 8 \\
\end{array}
\]

It will be noted from a study of this table that a given amount of light admitted is inversely proportional to the square of the f. value, and that the exposure required is directly proportional to the square of the f. value. It will also be noted that or each larger f. value, the exposure required is increased.

It is a fact not generally taken into cognizance, but these diaphragm markings are only true when the lens is focused on infinity. As the lens is focused forward (i.e., to nearer objects) the ratio between the focal length (distance from the lens to the film) and the diaphragm opening is increased, until it may be many times the distance on the lens barrel. When photographing near objects, the size of the circle, the object, the lens is two focal lengths from the film, and the f. value of the lens is double what it was at infinity. It has thus become f.16, and the size of the diaphragm has not changed at all in the meantime. An exposure which was correct in the first case will be only one-fourth enough in the second case. But regardless of where the lens is focused, the relation between the markings on the lens barrel will always remain the same. The exposure will be incorrect for any f. value, it will be correct if multiplied or divided by the factor of any other f. value on the lens.

(21) DEPTH OF FOCUS

When a camera is focused on an object at a certain distance away, objects closer or farther away will appear blurred, depending upon their distance from the plane of sharp focus. Theoretically, objects either side of this plane of sharp focus are blurred or out of focus, but practically, the object side at which objects appear sharp is controlled by the tolerance of the eye to the blurring. In other words, we consider objects either side of the plane of sharp focus, to be also in sufficiently sharp focus until they become blurred to the unaided eye, or as it can be expressed, until the circle of confusion becomes of appreciable size about 1/200 inch in diameter.

The distance between which objects near and far are in visually sharp focus is called DEPTH OF FOCUS. Depth of focus is controlled by the following:

1. Lens Aperture or Diaphragm Opening.
2. Focal Length of Lens Used.
3. Distance of Object from Lens within Infinity.

A large lens aperture gives less depth of focus than a small one. Depth of focus, therefore, is increased by stopping down. In Figure 15, the upper drawing shows the focal plane for near and distant objects, the lens being used at its full aperture. It will be noted that the marginal rays intersect at a large angle, rapidly converging and diverging. Therefore, the size of the circle of confusion is large enough to cause appreciable blurring. In the lower drawing, using only the central portion of the lens, it will be noted that the rays intersect at a small angle, giving greater depth of focus. At the same time, it will be noted that the circle of confusion for the best focus is much smaller.

(22) HYPERFOCAL DISTANCE

When the lens is focused on infinity, there is an allowable variation from true focus which is governed by the size of the circle of confusion. This variation can be considered as a depth of focus, but it occurs in only one direction and that is toward the lens. Hyperfocal distance, then, is controlled by two factors: the focal length of the lens used and the size of the aperture used; i.e., the greater the focal length, the greater the hyperfocal distance; or the smaller the lens aperture, the less the distance, or, vice versa on either of these. Figure 16 gives the hyperfocal distance for lenses of various focal lengths and at various lens stops.

(23) DEFINITION

Definition is that quality in a lens which produces clear, sharp detail. It is obtained by correct design and careful workmanship in the manufacture of the lens and also by using it properly when taking photographs. Definition should not be confused with depth of focus. Whether the camera for making pictures the enlarger for making projection prints, stopping down will not increase the definition of that lens. Stopping down merely extends the plane of sharpness a greater distance. Most lenses define the sharpest detail at, or near, their largest openings, and the between those loss in definition as the lens is stopped down, even though there is an extension in the plane of sharpness.

FIELD OF A LENS

The field of a lens may be expressed as the diameter of the illuminated circle of light rays falling on the focal plane when it is adjusted for infinity focus. In other words, the circumference of this circle marks the limit of light rays passed through the lens and falling on the focal plane. The field of the lens like its focal length, is fixed and unchanging, and depends upon the lens curvature, and the ratio of the lens diameter to the length of the lens barrel. A lens with abrupt curvature has less field. which will have a larger field than one with slight curvatures and a short barrel. A long lens barrel gives greater separation between the elements and this tends to cut off the diameter of the lens field.

ILLUMINATION OF A PLATE

The strength of light falling on a plate is not uniform, but is strongest at the edge of the lens and decreases toward the margins of the field. This is due to the fact that light rays striking the plate at the lens axis are perpendicular to the surface, while those nearer the margins of the plate strike the surface at an angle from the vertical and must cover a greater area. Again, these marginal rays in traveling a greater distance from the lens are more spread out and each must cover a greater area than those near the axis. This variation in illumination is rarely noticeable in negatives made with narrow or medium angles, but becomes more noticeable as the strength of light decreases rapidly for larger angles, this loss in illumination is quite noticeable in negatives made with extreme wide angle lenses. This can be compensated for by uniformity of exposure by using an increased amount of light near the edges of the scene, or when making projection prints with the enlarger by dodging or holding back the light around the edges of the print. (To Be Continued in May)

GRID EQUIPMENT

Slater lines up valuable array of equipment on Paramount lot.

By GEORGE M. HAINES

Technical superiority and polish of Hollywood pictures generally comes from devotion to the "little things." This is particularly evident in the devices that clever technical workers have evolved for making the photography of scenes from special angles possible and the production of the most efficient manner. However, ideas developed at one studio may not come to attention of craftsmen on another lot; hence, the idea of the Studio Mechanic's Handbook as a central source of information and as a medium for the exchange of ideas of practical value in production.

Recently we have shown devices and gadgets used in the 20th Century Fox lot, and will show some special devices used at Paramount. Some studios prefer variations of the devices we have shown or plan to describe in coming issues of International Photographer. Out in every case the equipment shown is practical, sturdy and time-saving.

Before describing the array of Paramount devices illustrated on Page 12, let us again take time out to remind our professional readers that this information is being presented in International Photographer, not as an idea for publication in handbook form as a practical reference manual. This is a monumental task, as we intend to classify and describe over 5,000 items used in studio work. From specialized camera equipment to specialized gadgets of every type. We therefore welcome and encourage any suggestions or comment from professional technicians either in the way of solid information or by question.
tional variations or descriptive data and minimum specification on the devices and equipment now appearing in this series or suggestions as to equipment worth covering in forthcoming installments.

We also would like to announce that as part of the handbook program we are working in cooperation with studio department heads or questionnaire covering the proper technical name, slang names, purpose, handling and minimum specifications of all types of studio equipment. These questionnaires will be in circulation within a short time.

The Paramount equipment illustrated is under the watchful eye of the studio's able grip department chief, Clarence Slater. Topping the left-hand column are four handy devices:

1. 6 ft. portable parallel, a collapsible setup for location and work in close space, which knocks down very compactly for easy transportation.

2. 3 ft. roller parallel, very handy under many circumstances and easily movable.

3. Sound flat screen of modern improved design, which is easily moved about.

4. The "hay-rack" or grip equipment box; these are used at every studio; Paramount's is a typical example of neatness and portability.

The two items at the bottom of the left-hand column are extremely valuable for permitting the camera crew to get rapid setups on flooring that otherwise would require special temporary floors being moved in, since either the surface must not be marred (such as glass, leather, expensive rugs, etc.), or is of concrete, dirt fills, tile, etc., which would make an ordinary tripod or dolly setup difficult.

A more complicated device is shown in (7) with a gimbal tripod mounted on a banjo. This tripod works like a ship's gyroscope and keeps the camera on a steady keel when such is desirable in photographing on a ship's deck, railroad, train, camera car, special effects rodders, and in similar circumstances. Note the heavy lead weights, which with the special design of the tripod and banjo equalizes against any movement of the originally set camera level. Shown with the device is Gordon Palmer, foreman in the Paramount grip department, a veteran of 12 years with that studio, who is credited with many innovations in the field of grip equipment.

Another interesting combination is shown in (8) and (9). The "New York camera pancake" shown in (8) is very valuable for use in low shots, particularly in dirt for exteriors such as horse race finishes, sports scenes, etc. It is heavy enough to give the camera a solid support. For quick change to a slightly higher angle, a number of different, simply-adjusted metal extensions are used with the pancake, one of which is illustrated in (9).

(10) shows another low angle device that is very handy, the "New York camera high hat." In (10) is shown a slightly higher angle, through use of the quickly adjustable legs.

A very handy gadget is the small stair-case platform, shown in (11). This provides an almost immediately available steady base on a stair-case for placing camera, lamps and similar equipment. The open end is placed firmly over a stair tread, and the large white pins are adjusted to level, then the whole setup is quickly nailed into place.

A gadget of many uses is the "hip bracket" in (12), which can be used on a camera dolly, velocipede, crane or boom, for special spotlighting, which must be kept in fixed relationship to the camera lens through a moving shot. The long bar is fastened to the dolly or crane, and the spot is adjusted and locked in place by the friction knobs.

Paramount studio grip equipment illustrated on this page is described by number in the accompanying story by George M. Haines, beginning on Page 11.
PROJECTION SYMPOSIUM, PART VI.

The problem of installing a given speaker system in theatres of different design and acoustic properties with the idea of having a single system of reproducing music or sound of reproducing music of reasonable quality is of considerable work of one nature or another. There are many causes contributing to variation in reproduction in theatres having identical reproducing systems. These causes include acoustic, stage settings, size and shape of auditorium and stage layout, type of reproducer system used and level of sound reproduction. These items will be examined more fully in the following paragraphs.

During the early days of sound motion pictures little was known of the requirements necessary for a theatre type loudspeaker. It was generally assumed that a speaker system that gave good music reproduction in a theatre was satisfactory. However, this was not necessarily true when reproduction was taken into account. The first RCA Photophone speaker systems consisted of groups of 12-inch cone units mounted in flat baffles and placed back of a porous screen. It might be mentioned here that the early type of sound screens would be found very unsatisfactory today. This improved speaker system did eliminate some of the early problems but was still a certain amount lacking which indicated itself by the fact that a good sound system reproducing a high quality of film sound was not available for theatre use and not in another. This was largely due to the difference in acoustic properties of the theatre and the fact that the speaker systems did not have a satisfactory directional characteristic. Further improvements were made by adding a fractional baffle to the speaker units and this proved the distribution and speech reproduction to a great degree. By this time theatre acousticians began to receive some recognition and acoustic surveys were made which indicated a high percentage of theatres needed treatment. After many years of experimentation and research the need for such a system was evident. The results of all these years requisites for a satisfactory speaker system for theatre work became more apparent. The major requirements were as follows:

1. Suitable frequency response.
2. Adequate power handling capacity.
3. Units with different angular coverages for various size theatres.
4. Speaker system to have such dimensions that will allow its use in the average theatre.
5. Efficiency. With these ideas in mind the present two-way speaker systems were developed.

RCA Two-Way Speaker System

The standard RCA Two-Way Speaker System consists of a high frequency baffle and two high frequency units, one or two low frequency baffles and units, a flat baffle extension and a dividing network and matching transformers. Figure 1 in the April issue of *International Photographer* is an excellent example of such a system.

The high frequency baffle is a metal cellular horn having from nine to eighteen cells, depending upon the angular coverage desired. Each baffle is positioned at the proper position and distance to the loudspeaker. Each of the cells is designed to provide the proper angular coverage of the high frequency sounds. The RCA high frequency unit is a non-metallic cone type speaker capable of handling high power and not susceptible to damage due to impact type sounds having peaks of high order. To the rugged type of construction of this unit it is possible for the field service engineers to make repairs in the field where necessary. The low frequency baffles are of the type of horn capable of reproducing the lowest frequency necessary for theatre work. This baffle is so constructed that its depth is only 30 inches, a desirable feature where a minimum of space is available back of the picture screen, and is powered by two low frequency units. Generally the two-way speaker system is installed with two MI-1456 low frequency baffles and an MI-1459 flat baffle extension which provides a mounting for the two baffles and also extends the extreme low frequency response of the speaker system.

A block schematic of a standard two-way speaker setup is shown in Figure 3. In any two-way speaker system the frequencies below a certain value are fed to one set of speakers and frequencies above that value are fed to another set of speakers; this is accomplished by means of a dividing network. In the RCA system the MI-1483A network is generally set for a 300 cycle crossover. The matching transformers shown in Figure 3 are for matching the 15 ohm network output to any desired number of speakers.

In setting up a standard theatre speaker system there are certain rules to be followed. A very important factor in this connection is to have an approved sound system and to ensure that high frequencies and definition are as low as possible, they should be ideally mated to make the projection room noise as low as possible.

The speaker assembly should be mounted in such a way that the center of the frequency baffle is two thirds of the picture height. Due to differences in acoustic properties between theatres, some change in the electrical characteristic of the amplifying system supplying power to the speakers is sometimes necessary.

Noise Level in Theatre Auditoriums

The noise level in theatre auditoriums is much to do with the resultant sound obtained in theatres. Volume setting of the reproducing system in the theatre is generally adjusted to give satisfactory loudness and clarity to the audience. When a recording which has an excessive dialogue volume range is played under such a condition the low level passages will be below the noise level in the theatre and therefore unintelligible. If the reproducing system volume setting is increased to get intelligibility on the low level passages, the high level passages become too loud and the audience becomes accustomed to such a condition. This latter condition also tends to decrease intelligibility in theatres with poor acoustic properties due to increased echo and reverberation.

There are a number of sources of noise in theatre auditoriums, such as ventilating and heating systems, audience noise, outside noises such as street traffic, air conditioning, and others. It is well worthwhile to eliminate as much noise as possible in the theatre as possible since there is a certain amount of noise which cannot be controlled and these uncontrollable sources of noise alone generally keep the noise level up to the maximum point for satisfactory reproduction of high volume range recordings.

Ventilating and heating system noises are usually of a low frequency nature and are caused by the fans and motor vibrations being transmitted to the air ducts and building proper. This can be corrected by proper mounting of motor and fan units on cushioned mountings, balancing motor armature and fan propellers and using a flexible type of connection between fan and air ducts. In some cases it may be necessary to line the inside of the air duct nearest the fan with absorptive material. Audience noise is something that goes with theatre operation and although its effect is somewhat limited by the amount of absorption in the theatre, it is still a major item in the overall theatre noise level. Street traffic noises are generally of a low frequency nature and rumble and are caused by the vibrations of the building or sidewalks and streets. The traffic noise entering through doors and other openings can be almost entirely eliminated by proper acoustic treatment and type of construction. Traffic noise is generally much higher in theatres during the summer season due to open doors and windows. This type of noise is very objectionable due to its erratic nature. By the use of suitable double doors in front of doors, and acoustic openings the traffic noise can be decreased to a satisfactory level. This of course requires some type of ventilating and cooling system for summer use.

Projection room noise in the auditorium is something that the majority of theatres seem to have put up with, and it is something that can be corrected at a small cost. The reasons we may have put up with this condition for so long are that the projectionist is always in the projection room and seldom gets out to check the sound in the auditorium, and the managers on the other hand become accustomed to the noise and do not notice it. By the use of approved cushioned mountings for projectors, double-pane glass in projector windows, and acoustic insulation for the front projection wall, the noise can be reduced to a satisfactory level.

Acoustics

The study of acoustics and its application to rooms or auditoriums received little attention until recent years when radio broadcasting and sound motion pictures became of importance. Since that time many methods and devices have been developed to further the study of acoustics and make measurements a relatively simple matter.

When sound motion picture reproducing equipment was first used in theatres it was noticed that the auditoriums were varying from poor to excellent as far as sound and acoustics went. This can now be largely accounted for by a proper acoustic analysis of the theatres in question. Such a condition can be corrected by proper application of acoustic materials. This procedure is generally costly and theatre management usually object to an ex...
ASTAIRE and ROGERS
as the DANCING CASTLES
Pictures by MIEHLE

These striking shots of Fred Astaire and Ginger Rogers as the "E Castles," Vernon and Irene, in RKO Radio's sensational musical hit on the career of the famous dance team of pre-war days, are by John Stillman member of Local 659, IATSE. They feature the many dance r
The stars in the film, and complete an outstanding series of exploita-
pictures that have already been seen in newspapers, magazines,
and effective billboards, exploiting the picture. The clean-cut
of these stills is particularly interesting as an example of modern
still photography, taking full advantage of fast films and new style tech-
nique, since so many of these shots capture the lively personalities of this
famous dancing pair, not only with unusual clarity, but also with excellent
timing to secure the most impressive effect.
expenditure for this purpose. Management objection may be traced to the early days of sound pictures when "acoustic surveys" were possibly oversold. It must be kept in mind, however, that a theatre can be corrected acoustically, and better sound projection will result. Improved sound recordings have been made with the idea of giving better sound in the theatre, but this improvement can never be fully realized unless the theatre has optimum acoustic properties.

If a source of sound is set up in an auditorium, the intensity at a given point does not build up instantaneously but requires a certain time, depending upon the frequency of the sound and the acoustic properties of the auditorium. The sound which leaves a given source is reflected many times from various surfaces in the auditorium before it is completely absorbed. These reflections add to the intensity at a given point and a steady state condition is reached when
Rear Projection Report
Due to lack of space the second installment of the Academy Research Council's recommendations on rear projection equipment standards is held over until the May issue. Full text of this important report is being published in International Photographer as a service "for the record" for the benefit of our international readers and those studio technicians who like to have material conveniently available for reference in their files of the magazine.

he rate at which sound is absorbed is equal to the rate at which sound is being given out by the source. These conditions apply to the decay of sound in an auditorium except in the reverse order; that is, the sound persists for a certain time after the source is stopped. This prolongation of sound in an auditorium is known as reverberation, and it is the most important item in the consideration of auditorium acoustics.

The reverberation time for a given frequency depends upon the volume of the auditorium and the amount of absorption in same. If an auditorium has a long reverberation time it produces poor speech intelligibility due to a "piling up" of successive spoken syllables. This condition can be carried to the other extreme with a result that a very low reverberation time will give good intelligibility; however a lack of brilliance will be noticed on speech and especially on music. This latter condition calls for much more power from the speaker for a given volume effect. Due to the difficulties encountered with too long or too short reverberation time, it has been found that for given sizes of auditoriums optimum time as shown by Figure 4 will give best results for sound motion picture theatres. It has also been found that the reverberation time should increase as the frequency decreases below 1000 cycles, as shown by Figure 5, so that all equally loud components of speech and music will decay at equal rates.

The use of heavy carpets and padding in all aisles in the theatre decreases the noise level and at the same time adds to the total absorption in the theatre. Good upholstered seats in the theatre add greatly to the total absorption. This also provides the theatre with a more uniform acoustic characteristic whether the seats are occupied or not.

The stage or space back of the screen should also receive some acoustic consideration. Generally the surface in back of the speaker should be treated with a highly absorbent material. This acoustic treatment should be such that very little sound can be heard backstage. When this is so, very little "booming" or stage rumble will result.

In general it can be said that good sound projection in theatres depends very much upon good acoustic properties and a suitable speaker system correctly installed.

Showdown on Color
International Photographer to start series of articles covering all angles of color situation, bringing technical and shooting ideas up to date.

Unquestionably the outstanding topic of discussion in studio technical circles is color. There is much rumor and conjecture as to the early announcement of radical and important improvements in color photography and laboratory processing for feature production. In answer to intensive reader demand from both technicians and executives, International Photographer begins a complete analysis of the color situation with the May issue.

This series is the result of months of study and matching of notes by technicians and executives from all branches of the industry, who are in a position to talk with authority, who have been cooperating with the editors of International Photographer. As a result we have available much information on the plans, methods, photographic technique and laboratory processing principles of all the companies actively engaged in color work. This is supplemented with a wealth of practical information and production tips on the proper technique for exposing color negative.

A great deal of this information has been in our files for some time and has been withheld from publication as a courtesy to research workers of the leading color concerns who have been completing experiments on new and improved methods.

Within the next few months these researches will result in a series of sensational developments from the leading color concerns.

We are convinced that this series will answer the keen demand throughout the industry for a clear, concise, factual presentation of the color situation from all angles.

In announcing this series, the editors of International Photographer also wish to throw open its pages to any and every bona fide worker in the color field who has anything important to say on the subject. The purpose of this series is to give every organization or individual researcher an opportunity to frankly and honestly present their claims and plans and to provide readers of International Photographer with an authoritative picture of the situation as it stands today.

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International Photographer for April, 1939

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NEWSREELING THE BATMEN. Above: Newsreel photographers of Local 644, IATSE, down in Florida to shoot the World's Champion New York Yankees in spring training, left to right: Jim Buchanan, Paramount; Ty Sanders, Universal; Leo Rossi, News of the Day; Emile Montemurrio, Fox; Joe Gibson, Pathé; picture by John Ludwick News Service, St. Petersburg, Florida. Below: Charles Perryman, member of Local 659, IATSE, photographs for News of the Day, the famed "bat-man" ski expert, Bill Dean, in Washington snow country.
Fernstrom back from color photography jaunt; Society of Motion Picture Engineers bringing latest dope on television o Hollywood; studio technicians invited to attend sessions April 17-21; cooperation with news photographers.

Fernstrom's Color Jaunt

Back from a nine month's trip shooting unusual pictures in Cinecolor for Scientific Films, inc., producers of Popular Science and Unusual Occupations on the screen, and released by Paramount, is Ray Fernstrom, veteran member of Local 659. While photographing the Texas Rangers in the Lone Star state they made him a member, presenting him with gun, belts and other paraphernalia. It took four days to round up 200 head of cattle for one sequence in this picture. He made air shots and ground shots along the Rio Grande over a period of about three weeks and every one had beautiful cloud effects. From Texas, Fernstrom hopped to the penitentiary at Parchman, Miss., making Popular Science subjects there.

Three weeks was spent in shooting submarines interiors and exteriors in New London, Conn., at the United States submarine base. He made three lives, lashed to the periscope, to get certain angles he wanted. Fernstrom says this is the first time a submarine picture has been made in color. This may be seen in the current issue of Popular Science on the screen.

Another assignment was a picture on television a Philadelphia. In Provincetown he visited a woman who makes a living making gloves, hats, etc., out of ordinary fish nets. In this connection in Texas he found a man who raises armadillos for the purpose of making everything from bank notes to hats out of them. He also photographed Texas youngsters making paintings with colored mud. Another photographed feature was of a man in Guilford, Conn., who has a complete fire department as a hobby. He claims to have the most powerful pumping engine in the United States. This enthusiast has a tie-up with the fire department whereby he goes to the fire with his equipment just the same as they do.

In Washington, D.C., Fernstrom photographed he only person who signs the President's name, Miss Jeanne Kavanagh.

A former newsreel ace, Fernstrom prepares his own script, submits it for O.K. and then works from that. He expects to start out again a short time when he will freelance for Popular Science and Unusual Occupations, produced by Jerry Fairbanks and Bob Carlisle, and other Paramount novelty shorts reels.

SMPE Invites Technicians

Bringing an important demonstration and discussion of television to the studio doors in Hollywood, annual spring convention of the Society of Motion Picture Engineers will be held April 17-21 in Hollywood, with headquarters at the Hollywood Roosevelt Hotel. Studio technicians are invited by the SMPE to attend the sessions tentative program for which is announced as follows:

Monday, April 17th

9:00 a.m.—Registration; Blossom Room.

TIP FROM WATSON. Illustrated herewith is a device that will appeal to professional and amateur still photographers who turn out a large number of prints and are bothered by the cracking that occurs during hot, dry weather. This inexpensive steaming device to insure scaling in proper moisture when running prints through the ferrotype was developed by George Watson, head of the Acme-NEA bureau at Los Angeles. Details may be obtained by writing him care of Acme-Nea at the Illustrated Daily News Building, Los Angeles. Watson is past president of the Los Angeles Press Photographers Association and plans are underway through this organization and Local 659 for a cooperative exchange of technical information between studio and newspaper cameramen through the medium of International Photographer.
Another OPCO Product

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Perry’s P & H Process
OF FILM DEVELOPMENT

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Roll-O-Winger C5, for cut film and film packs up to 4 x 5”, including saturating and processing 5 tanks with necessary plates and developer $175.50

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Para No. 7 P&H Developer $65.00

Beverly Hills, Calif.

Rotating High-Intensity Carbon and their Possible Application to Motion Picture Projection; D. R. Joy, W. W. Lazier, and R. Simon, National Carbon Co., Fostoria, Ohio (15 min.)

Report of the Projection Practice Committee; H. Rubin, Chairman (15 min.)

Report of the Exchange Practice Committee; A. L. West, Chairman (10 min.)

The The Motion Picture in Education; A. Shapiro, Ampco Corp., Chicago (20 min.)

A Reel and Tray Developing Machine; R. S. Leonard, Municipal Light and Power System, Seattle, Wash. (12 min.)

New 16 MM Recording Equipment; D. Candy, Canady Sound Appliance Co., Cleveland (10 min.)

Notes on French 16 MM Equipment; D. Candy, Canady Sound Appliance Co., Cleveland (10 min.)

2:30 p.m. to 5:30 p.m.—Visit to Paramount Public Studios, Hollywood, Calif.; under the direction of Loren L. Ryder, Director of Recording. This visit will be restricted to the eastern delegates to the convention, in view of the fact that the facilities at the studio will permit the reception of not more than 250 persons. The visit will include an opportunity of viewing projection background shooting and visiting the stages where special effects and miniature work are carried out. Visits will be made also to the Sound Department, Dubbing Department, and the production stages where picture shooting will be witnessed.

8:00 p.m. to 10:30 p.m.—FILMARE THEATRE; GENERAL SESSION, "Fluorescent Lighting; Aman and R. H. Robinson, Jr., General Electric Co., Los Angeles (15 min.)

The Present Technic Status of 16 MM Sound-on-Film; A. Maurer, Bender-Maurer Co., New York, V. F. (30 min.)

Recording and Reproducing Characteristics; K. F. Morgan and D. P. Love, Electrical Research Products, Inc., Hollywood (20 min.)


Entering into Their Design; A. L. Williams, The Brush Development Co., Cleveland (20 min.)

"New Method for Determining of Bias Current for Light-Values"; C. R. Dally, Paramount Productions, Hollywood (15 min.)

"New Method of Checking Variable-ARE Track Processing"; C. R. Dally, Paramount Productions, Hollywood (15 min.)

Thursday, April 20th

10:00 a.m. to 12:30 p.m.—BLOSSOM ROOM: LABORATORY AND PHOTOGRAPHIC, "Direct-Reading Photoelectric Densitometer"; D. R. White, RCA Manufacturing Co., Paramus, N. J. (15 min.)


"Mathematical Expression of Development Behavior"; J. R. Albarg, RCA Manufacturing Co., Camden, N. J. (30 min.)

"Some Factors Governing the Design, Construction and Operation of a Motion Picture Laboratory"; Report of the Committee on Laboratory Practice; D. E. Hyndman, Chairman (20 min.)

"Simplifying and Controlling Film Travel Through a Developing Machine"; J. C. Rubin, Pacific Motion Picture Co., Los Angeles (10 min.)

"Warner Bros. Laboratory"; F. Gage, Warner Bros. Studio, Burbank (15 min.)

2:30 p.m. to 5:30 p.m.—Visit to Warner Bros. First National Studio, Culver City, Calif.; under the direction of Sanford Levinson, Director of Recording. Visits will be made to the Wardrobe and Property Departments, and also to the new unit of the Crafts Building. An opportunity will also be afforded visits to the newest and most modern laboratory, in addition to a general sightseeing tour of the lot.

8:30 p.m.—BLOSSOM ROOM; SEMINAR BANQUET. Short addresses by eminent members of the industry, names to be announced later. Introduction of stars and prominent guests. Dancing and entertainment.

Friday, April 21st

10:00 a.m. to 12:30 p.m.—Open morning.

2:30 p.m. to 3:30 p.m.—BLOSSOM ROOM; STUDIO PRACTICE. "Methods of Key Lighting on Motion Picture Sets"; D. R. Clark, Twentieth Century-Fox Film Corp., Hollywood. (15 min.)

"Recent Improvements in Carbons for Motion Picture Set Lighting"; D. R. Joy, W. W. Lazier, and R. J. Zuckovsky, National Carbon Co., Fostoria, Ohio (15 min.)


"Silent Camera"; D. Clark, Twentieth Century-Fox Film Corp., Hollywood (20 min.)

"Flicker in Motion Pictures"; L. D. Gram, Paramount Productions, Inc., Hollywood (15 min.)

8:00 p.m. to 10:30 p.m.—BLOSSOM ROOM; TELEVISION SESSION. "An Introduction to Television Production"; H. R. Labeke, Don Lee Broadcasting Co., Los Angeles (20 min.)

Report of the Television Committee; Dr. A. N. Goldsmith, Chairman (10 min.)

"Application of Motion Picture Film to Television"; E. W. Engstron and G. L. Beers, RCA Manufacturing Co. (5 min.)

"Continuous Type Film Scanner for Television"; P. T. Goldman, Columbia Broadcasting Co., New York (15 min.)

"Television Stunts and Gimmicks"; W. F. Pratt, National Broadcasting Co., New York (15 min.)

"Television Lighting"; William C. Eldy, National Broadcasting Co., New York (15 min.)

"Dumont Television"; A. R. Dunn, Allen B. Dumont Laboratories, Paterson, N. J. (15 min.)
SETTING new standards of quality and performance, Eastman’s latest negative films have met with instant approval. Each makes its special contribution... fast, fine-grained Plus-X, for general studio work... high-speed Super-XX, for all difficult exposures... ultra-fine-grained Background-X, for backgrounds and all-round exterior work. All three offer the high reliability and photographic quality typical of Eastman sensitized materials. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN Plus-X... Super-XX... Background-X
News of New Products: Robot II. Eastman expansion. Argostat enlarger, new Omega model, B&H geared projector, Canady Turbo-Turbulator, new Wabash Superflash bulbs, Leica synchronizer; Bardwell & McAllister Spots; Price Changes.

1) 35mm Robot II
- The pioneer sequence miniature camera, the Robot, now has a companion model Robot II on the American market, providing the larger standard miniature camera frame size as against the 22mm size of the original Robot. Features of the larger Robot include a built-in sequence feature for synchronization of flash bulbs in getting right shots, a new type shutter-setting knob, with speeds of 1/500, 1/250, 1/100, 1/400, 1/15, 1/5, 1/2 second and bulb, new film magazines for Robot daylight loading spools and other standard 8mm cores. The lens is the Meyer Primotar f:3,5, but at additional cost a Zeiss Biotar f:2 and Zeiss Sonnar f:4,5, 7.5 cm, tele-lens are available. U.S. distribution is through Intercontinental Marketing Corp. of N. Y.

2) Eastman Factory Additions
- Eastman camera factory at Rochester is being expanded, providing production facilities for the largest group of American craftsmen ever assembled in the photographic industry. In line with the expansion program, Eastman put through a wide slash in prices through their camera line, effective last month, as a result of the increased efficiency in production toward lowered manufacturing costs.

3) Argostat Enlarger
- Feature of the new Argostat Enlarger for use with the Argus Model F and C2 Argus f:3,5 camera lens as the objective lens, is a new type remote control device for critical focusing. While the lamphouse and lens are moved up and down on the column for general focusing, through the focusing disk at the base of the column a vernier-drive mechanism makes it possible to attain critical focusing of the objective lens without turning the lens mount itself. The Argostat enlarges to 12x18 on the base and to 11x14 on the Argus Microgram Easel, which is illustrated with the new type enlarger. As in other Argus enlargers, reflected light is used instead of direct light, with the 100-watt projection lamp reflecting from a 45-degree angle mirror for flat field illumination and maximum coolness. The Argostat will sell in the $50 price range.

4) Model C Omega
- Handling film up to 2½ x 3½, the Model C Omega enlarger, introduced last month by Simon mon Brothers of Long Island City, N. Y., is especially designed for the photographer who works in more than one miniature film size. Interchangeable dust-free negative carriers, double condenser assemblies and lens boards allow easy and speedy change-over from one film size to another. A 75-watt 110-volt G.E. projection bulb and the double condenser system permit short exposures on the slower enlarging papers. Simon and Bausch & Lomb Tessar lenses are available. Price is $97.50, with detachable lens board, but without lens.

5) Gear-Driven Filmaster
- Bell & Howell has replaced three former 16mm projector models with a new entirely gear-driven moderately priced machine, to be known as the Filmaster, announcing that this is the first 16mm projector with such specifications to appear on the American market in the low-priced field. Gears are very silent, being enclosed in rigid aluminum alloy castings. Through shifting of one lever, the gear system rewinds film quickly and silently. Either 300, 400, 500 or 750-watt lamps may be used. The lens furnished at the regular price of $139 is a 2-inch f:1,6, which is interchangeable with eight different focal length lenses. No glare pilot light illuminates the mechanism when required. An automatic safety shutter permits projection of any frame as a still. Reels furnished are 400 ft., and a drop front, compartmented carrying case is furnished at the price quoted.

6) Turbo-Turbulator
- Don Canady’s Sound Appliance Company of Cleveland, Ohio, is marketing with considerable success a scientifically designed water-powered Turbo-Turbulator, for turbulizing of development solutions during development of miniature films. It produces the non-directional turbulation recommended by experts. Degree of turbulation is controlled by the water faucet handle. Model A illustrated will accommodate tanks 5½ inches in diameter. The frame and turbine housing is one piece of cast aluminum, with baked enamel finish. Faucet connector and 2½-foot high grade rubber hose are included at the new low price of $5.50, to be announced, but not the developing tank. A larger model for professional use soon will be on the market.

7) New Wabash Superflash Bulbs
- Wabash Photolamp Corporation of Brooklyn, N. Y., has added two new sizes to their line of Superflash bulbs, the No. 2A and No. 3A sizes. The new No. 2A Superflash enables the press photographer to use his standard 4x5-inch focal plane Graflex and Speed Graphic for "freezing" high-speed action at 1/1000th of a second. New York newspapers now using the new No. 2A with the 4x5-inch focal plane Speed Graphic are securing excellent negatives with uniform over-all density at speeds of 1/1000th, 1/800th and 1/600th of a second, with stops varying from f:4.5 to f:11, and distances from 4 to 45 feet indoors and at night outdoors. The "plateau" of uniform peak light from this new size lasts a full 1/16th of a second, while most of its high light output of 75,000 lumen seconds is usable peak-light illumination spread over practically the entire duration of the flash. The No. 3A Superflash is a new that is encased in one compact size practically every requirement of the commercial and professional photographer in the studio or on location. Although much smaller and handier than ordinary sizes, it is packed with extra power and greater photographically effective illumination in a brilliant, "high-peak" flash that penetrates distance and covers large, wide areas. Since the No. 3A is the same synchronization band as the No. 2 and No. 3, it can be used successfully in multiple flashings with either or both of these flashes. The total light output of the No. 3A is 100,000 lumen seconds.

8) Leica Flash Unit Model V
- Increased latitude and new operating conveniences are provided by the new Leica Synchronized Flash Unit Model V, recently marketed by E. Leitz, Inc. In use, the battery and reflector of this new model is firmly attached to the tripod socket of the camera baseplate, while the compact synchronizing head slips into the accessories clip and lies almost flush against the back of the camera. A short length of electric cord, extending behind the camera, joins the two parts of the flash unit.

The Model V may be mounted for use, or dismounted, in less than a minute. Bulbs may be slipped into the springed lamp socket, discharged, and replaced in quick succession. A 2.5-volt test lamp, situated in the lamp socket head, indicates when the battery current is flowing. The film and shutter transport of the Leica may be wound either before or after the flash bulb has been inserted into its socket without discharging the bulb prematurely.

The Model V is designed for use with long-period life pentium wire-filled bulbs. The lamp reflector may be set in two positions—a low position for properly centering Superflash Press 40,000 bulbs and a higher position for Superflash No. 2 lamps. Retail price is $19.50.

New products illustrated on opposite page are described in the Tradewinds section and identified by numerals.
Fast Lamps for Fast Films

- Visitors to studio sets who haven’t watched recently are amazed at the new type lighting setups, with their smaller and more efficient lamps. A typical instance is Edward Small’s production of “The Man in the Iron Mask,” co-starring Louis Hayward and Joan Bennett, which Robert Planck is photographing, with a camera crew consisting of: R. A. Webb, operative cameraman; Van Worner, first assistant; Russ Hovey, second assistant; all members of Local 659, IATSE.

There are no clumsy big kliegs or old-fashioned arcs on Planck’s set. Using the new Eastman Super X, with its terrific speed and definition, lighting must be cut down in combination with the clever use of diffusion filters and new type make-ups. Lighting engineers have been well in tune with the times, matching the new type negative emulsions with new type lamps. Planck is using a battery of Bardwell-McAlister Baby Ket Lites for many of his scenes.

These new 500 and 750-watt Baby Ket-Lites have won high regard from camera departments in many studios for their better-controlled light and virtual elimination of stray rays so easily picked up by the new fast films.

Planck’s experience with the new lamps is highlighted, he says, by the ease of operation through the quick focussing device, illustrated herewith, on which patents are pending. This consists of a lever arm, protruding from both the front and rear, which is moved from side to side for focusing the spot. So simple is this mechanism that a highly placed lamp may be focussed by merely exerting a slight pressure against the protruding lever.

The saving in time over the old fashioned method of knob-twisting with it’s annoying noise adds considerably to the economic feature of this latest lamp development, although quick focussing devices have always been an exclusive feature of Bardwell & McAlister products.

Studies are finding particularly interesting, the fact that proper ventilation in the Baby Ket lowers burning temperature, thereby increasing the life of the globe and reducing softening or blistering to a minimum. Light output will focus from a 4 degree spot to a 44 degree flood. Photometric tests show the spectral quality of the light to be of correct color temperature for color stills, and they also are finding much use in this brand of photography. A spherical mirror and frame is adjusted and locked in proper focus at the factory. The lamp may be supplied with either medium prefocuss or medium bipost socket.

Baby Ket-Lites are now in use by Warner Bros., 20th Century Fox, Paramount, General Service Studios, R. K. O. and other production units.

Film Libraries Switch

- Eastman Kodak last month announced discontinuation of their Kodascope libraries division and simultaneously Bell & Howell announced taking over distribution of the Kodascope distributed Universal and other independent releases of 18 features and 15 short subjects, including “Show Boat” and “My Man Godfrey,” outstanding Universal hits of recent years. Eastman announcement stated the move was due to most leading dealers in amateur movie equipment now having their own libraries of sound and silent films for home entertainment purposes, and frequently represent other sources of 8 mm and 16 mm releases. Bell & Howell stated that conditions under which the films were distributed will remain virtually unchanged.

New Memo Cameras

- New American-made Agfa Memo miniature camera now at photographic dealers, is the result of several years’ work in refining and improving the well-known original Memo camera. The new model, selling at $35, is the answer to almost imnumerable inquiries and requests for an advanced and modernized version of the original Memo, retaining features of the old model combined with improvements expected and furnished in the new. A “double-frame” miniature, using perforated 35 mm film, the new Memo gives 24 pictures, 1-7/16 x 15/16 inches in size, per cartridge of film. The new model is equipped with an Agfa planar 13.5 corrected anastigmat lens focusing from 1/2 feet to infinity, and is fitted with a new and improved type of shutter designed for greater accuracy and giving speeds of 1/2 to 1/200 second, bulb and time.

Two exclusive features of the Memo are the arrangements for loading and transporting the film. The already widely sold Memo cartridge, which is used, eliminates threading and greatly simplifies loading. The film transport mechanism employs a patented sliding lever which advances film in one rapid motion without winding or window watching.

The Memo is finished in polished metal, black lacquer and black morocco leather. Its compactness is achieved by a pressed-steel frame and a hinged front platform that snaps quickly into picture-taking position. Other details include as standard equipment: brilliant, direct view finder; neckcord and eyecups; accessory clip; tripod socket; automatic exposure counter and built-in depth of field scale. In addition, color filters, sunshades and everready leather carrying cases will be available as regular accessories.

Following closely on introduction of the new Agfa Memo camera, comes also a second model. This latest addition to the Agfa camera line is...
RPI's Light Portable Unit

A new portable sound recording channel for location work which weighs 84 percent less than equipment now in use with performance approaching the finest studio installations, has been designed by Electrical Research Products Inc., in collaboration with the MGM sound department. In contrast with earlier location equipment, which is housed in nine separate cases and weighed pounds complete, the two units of new apparatus weigh 150 pounds. The larger cabinet contains recording machine and associated controls including those for the camera motors. This weighs 102 pounds. Smaller case, weighing 48 pounds, contains all mixer, amplifier and noise reduction equipment. The new channel, while developed primarily for location sound recording, gives a degree of naturalness in recorded sound that is comparable with the most elaborate permanent channel installed for studio production.

11th SVE Session in June

Ninth national conference of the Society for Visual Education, sponsored by the DeVry Foundation, has been set for June 19-22 with advance information headquarters at 1111 Armitage Ave., Chicago, Ill. Convention is held annually at the Francis W. Parker school in Chicago, where programs of this organization always have interested and present much constructive material and information. Already announced to appear are the following:

- Mrs. Charles Joe Moore, director of Visual Instruction Bureau, University of Texas, Austin, Texas, who will tell of the outstanding work of her department in Texas schools;
- Dr. I. E. Deer, of the MPPDA, who has done fine work with the "Secret of Success" character building films released by that organization;
- Mrs. Richard M. McClure, president of the latter Films Council of Chicagooland, whose institutional addresses have shown a new way to handle through motion pictures;
- Dr. James E. Bliss of Western Reserve University who has done remarkable work in color, notably in dentistry, but in athletics and other school subjects;
- Professor L. W. Cochran, of Iowa University, who will exhibit and explain Professor Barnes' instruction studies, which have excited intense interest in engineering and industrial circles;
- A. P. Helfin of the Lane Technical High School, Chicago, III., who will exhibit some of his own films and describe their production and use;
- Wm. G. Hart, director of Visual Education in a Harvey H. Lowery School of the Fordson Council of Education, Dearborn, Michigan, who will exhibit and discuss some original film production in public school relations;
- Alvin B. Roberts of the Gilson, Illinois Schools, who has conducted a valuable research study on the status of visual education in Illinois; he will describe the Conference the results of this study;
- B. A. Aughtinbaugh, producer of the famous "Travelogues," and director of the State Department of Visual Education, Columbus, Ohio; Miss Kathryn Troy, who will be welcomed for her unique films on Marionettes; William L. Zeller, cinematographer of wild birds color, who will present new marvels of his skill, patience and imagination;
- E. W. Cooley, director of Cinematography, Watertown, Wisconsin, who will show his Indian scenes in color; Walter L. Grabski, Cleveland, Ohio, travel films in color.

DeForest Training, Inc., will demonstrate their paratus used in teaching television. International Harvester Co. is sending L. A. Hawkins and W. M. Bastable to explain and show their w films.
Camera-Accessory Dealers

Camera Equipment, Inc. 1600 Broadway, N. Y. (Circle 6-5080)
Camera Supply Co. 1515 N. Cabrenga, Hollywood. (Gladstone 2404)
Faxon Dean 6156 Sunset Blvd., Hollywood (Morningside 11838)
Motion Picture Camera Sup. Co. 723 Seventh Avenue, N. Y. (Bryant 9-7754)

Camera-Accessory Mfrs.

Eastman Kodak Company Rochester, N. Y. Hollywood, 806 Sta. Monica. (Hollywood 3171)
Devy Corporation 111 Armenia Ave., Chicago.
Fried Camera Company 6154½ Santa Monica Blvd., Hollywood. (HE 6716)

Camera Rentals

Faxon Dean, Inc. 4516 Sunset Blvd., Hollywood. (MO 11838)
Landers & Trissel, Inc. 6313 Sunset Blvd., Hollywood. (Hollywood 8333)

CHEMICAL ENGINEERING

ALLISON, D. K. 9300 Santa Monica Blvd., Beverly Hills. (OXford 2381)

Film

DuPont Film Mfg. Corp. Parkin, N. J.

Smith & Aller, Ltd. 6656 Santa Monica Blvd., Hollywood. (HO 5147)
Eastman Kodak Company Rochester, N. Y.
J. E. Brulatour, Inc. 6706 Santa Monica Blvd., Hollywood. (HOL 6131)
Agfa-Ansco Corp. Binghampton, N. Y.
Agfa Raw Film Corporation 6424 Santa Monica Blvd. (HO 2918)

Filters

Scheibe, George H. 1927 W. 78th St., L. A. (TW 2102)

FOR SALE OR RENT—Cameras


BELLS & HOWELL SINGLE SYSTEM COMPLETE: Bell & Howell silent camera, follow focus. Single System, complete; rebuilt B & H sound printers; rebuilt Duplex sound and picture printers; 200 ft. Stineham developing tanks; used measuring machines. Complete Akeley camera equipment. Akeley 1000-ft. magazines, synchronous camera motors, Motors, sunshades, finders, lenses and all accessories. Write, wire or cable. MOTION PICTURE CAMERA SUPPLY, INC. 723 Seventh Avenue, New York City Cable: Cinemecam

METAL DEBRIE, MODEL J 5 lenses, dual magazines, 2 cases, tripod, like new, $300.00. Other Debrie from $125.00 up. Leicas, Contax, Graflex, Graphics, also many used bargains. Time payments arranged. CAMERA MART, INC. 70 WEST 45TH STREET, NEW YORK

WESTERN ELECTRIC INTERLOCK MOTOR mounted on door for Mitchell single lens cameras. CAMER A EQUIPMENT COMPANY 1600 Broadway New York City Tel. Circle 6-3800. Cable: CINEQUIP

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Bell & Howell Co.

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General Electric Company Nela Park, Cleveland, Ohio.
Mole-Richardson, Inc. 941 N. Sycamore, Hollywood. (Hollywood 3833)
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Union Carbide & Carbon Corp. Union Carbide & Carbon Corp.

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Art Reeves 7512 Santa Monica Blvd. (Hillside 1492)
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BELLS & HOWELL 170 CAMERAS—High speed shutters—high speed gear boxes—400 and 1000 foot Bell & Howell magazines—Bell & Howell tripods—motors with Mitchell Independent silenced cameras. Akeley and De RIE Cameras. Akeley motors. High speed motors. Sunshades, fixed finders, Wire or Wire. CAMER A EQUIPMENT COMPANY 1600 Broadway New York City Tel. Circle 6-3800. Cable: Cinequip

Classified Rates: 45 cents per line; minimum insertion, $1.00. Bold caps Directory listing: $2.00 per insertion. All display advertisers receive free Directory listing.

As usual, various government departments will be well represented. George T. Van der Hoe sind will exhibit the new FHA films; Mrs. Rebecca Howard Reedewy, the WPA; A. A. Mercey, of "How the Town Broke the Plains," and "The River," will exhibit and explain the latest government documentaries.

News of Technicians Wanted

About our new department for news of studio technicians, particularly members of Local 659, IATSE, and allied studio and theatre locals of the International Alliance, the editors of International Photographic and the magazine committee, under the chairmanship of Leon Shamary, regret that space devoted to the program of the SMPA convention caused the withholding of a number of stories for this issue, and wish to encourage professional workers to let us know interesting news of their activities. If you have a newsworthy item of technical interest communicate with Herbel Aller or Ed Gibbons at the International Photographer office.

Jack Wade will be on hand from the Allischalmers Manufacturing Co. with their latest film, "Hold That Farm," Also A. C. Weitzel from Firestone Tire & Rubber Co., H. C. Lamborn from Ford Motor Co., P. C. Smith from Laublager Tractor Co., and Stuart Grant from the Pure Oil Co.

The Chesapeake & Ohio Railroad will send a representative with their latest travel film and E. D. McGlone will represent United Air Lines. R. C. Anderson will show the new Technicolor films of the California Fruit Growers Association.
Roxalin Protective Finish

The new Roxalin enamel finish, announced by Hill & Howell, has been exhaustively tested and adopted as standard on all Filmo 8 mm cameras, may be specified at time of purchase for Filmo 70, 16 and 35 mm cameras and Eymo 35 mm cameras likely to see tropical use. It is claimed for the new finish that it proves highly resistant to conditions of heat and humidity which cause quick deterioration in other types of camera enamel.

Agfa Film Clips

Two new-type stainless steel film clips have been added to Agfa photographic equipment. The "Easy-Clips," are furnished in two sizes: the first 3 inches wide selling at $1.20 per dozen; and the second 2 inches wide selling at $1.00 per dozen. Special lead weights to fit these clips are also available at $1.20 per dozen. The new Agfa film clips provide both hooks and holes for hanging purposes, have smooth rounded corners to prevent scratching, and allow for easy attachment of lead weights.

Super-XX 16 mm. Negative

Safety Super-XX Panchromatic Negative Cineladk Film is now available in 100-foot and 200-foot rolls for daylight loading, and 400-foot rolls with darkroom loading, the Eastman Kodak Company announces from Rochester, New York. Safety Super-XX Panchromatic Negative Cineladk Film is not processed by the Eastman Company. It is not intended for reversal processing, but for development to a negative from which any number of positive prints may be made.

Last month the following patents of interest to readers of International Photographer were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.


Light filter consisting of two polarizing elements rotatably mounted with respect to each other.


Photographic bleaching-out dye layer having a baking accelerator having a compound of dysbenen, chromium, tungsten, and uranium.

3. 2,146,010 — DEXEDRAL TREATMENT OF SILVER HALIDE EMULSIONS IN COLOR. Gustav Willmanns, Wiesbadenkreis Bitterfeld, and Wilhelm Schneider, Germany, assignors to Agfa Anseco Corp. Application April 16, 1936. In Germany April 17, 1935. 3 claims.

Color developing process in which a dye is de-
No. 2,146,315—APPARATUS FOR PRODUCING STEREOSCOPIC EFFECTS IN MOTION PICTURES. HAROLD A. ADAMS, Bakersfield, and RALPH D. LEMERT, Los Angeles, Calif. Application Aug. 3, 1936. 3 claims.

A stereoscopic attachment for motion picture cameras which includes an optical flat in the optical axis of the lens and means for swinging the flat right and left.


A film supporting and driving means having two sets of rollers, one different Sept. 12, 1936 and means for disengaging one set of rollers when the film tension exceeds a certain amount.


A color motion picture camera in which a pair of color filters is oscillated in front of the same.


A color motion picture projector in which a pair of color filters is oscillated in front of the film.


An optical system for producing a uniformly intense line of light and including a wide aperture objective and a toric lens.


An apparatus for enlarging or reducing the size of an image on a motion picture film, the distance between subject and the camera remaining constant, made for producing the effect.


A color motion picture camera making use of a number of different colored filters mounted on a rotatable shaft, and means for automatically disconnecting the filter disc after a predetermined number of pictures have been taken.


An apparatus for producing stereoscopic motion pictures which makes use of a revolving member having a number of mirrors in the optical path of the image.


A method of producing animated sound motion pictures which makes use of an indexed sound chart and a condensed word record of the sound.


A sound recording system wherein two beams of light are directed at opposite ends of the film move toward and away from a finder in which are reflected light from the picture, and the finder in which a mirror alternately reflects light from the camera lens and the finder lens to the finder eyepieces.


Color printing with imitation matrices which are overexposed, and counteracting the effect of overexposure by removing some of the dye from the matrices.


A motion picture camera in which the view through the view finder is cut off when the film is exhausted.


A three-dimensional projection system making use of a yellow projection light and a special copper coated screen indirectly lighted with polychromatic light.


Motion picture apparatus in which a part of the film is first exposed, the film is reversed and a second part-width exposed.


A method of making diffusing effects in motion pictures by moving a graduated filter in front of the lens so that the image may change from a clear image to a completely diffused gray field.


A film handling device having a pair of connectable housings each having a light-tight compartment for a film reel, and means for rotating the reels from the outside.

No. 2,148,814—CINEMATOGRAPHIC CAMERA. RUDOLPH ALTMAI; Vienna, Austria, assignor to Gebruder Ziegler, Austria. Application Nov. 1, 1935. In Austria Nov. 16, 1934. 3 claims.

A speed control for a multi-speed camera having frictional brakes which apply different amounts of frictional braking effect.

No. 2,148,979—COLOR PHOTOGRAPHY. WALTER DIETEL, Germany, assignor to Agfa Anscor Corp. Application May 27, 1937. In Germany May 29, 1936. 4 claims.

A multi-layer film for color photography which contains a red sensitive emulsion containing a color-former for the blue-green picture and capable of forming a dye-stuff, and a yellow-green sensitive emulsion containing a color-former for the purple picture and capable of forming a dye-stuff.

No. 2,148,989—PHOTOGRAPHIC MATERIAL FOR COLOR PHOTOGRAPHY. WALTER DIELER, Germany, assignor to Agfa Anscor Corp. Application July 14, 1937. In Germany July 17, 1936. 2 claims.

A film for color photography which comprises a red sensitive emulsion containing a dye-stuff-former capable of forming a blue-green picture and a dye-stuff.

No. 2,149,217—MOTION PICTURE CAMERA. PAUL HEINICH, and KARL SCHENKE, Germany, assignors to Askaniawerke A. G. Application May 29, 1936. In Germany June 1, 1936. 4 claims.

A motion picture camera having a finder in which a mirror alternately reflects light from the camera lens and the finder lens to the finder eyepieces.

No. 2,149,218—MOTION PICTURE CAMERA. PAUL HEINICH, and KARL SCHENKE, Germany, assignors to Askaniawerke A. G. Application May 29, 1936. In Germany June 8, 1936. 6 claims.

A motion picture camera having a film gate which rocks through a small angle in synchronism with the intermittent motion.
POSITIVELY
The World's greatest and best negative in every respect
EASTMAN PLUS X PANCHROMATIC
—is the verdict of every cameraman who has used it——

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CINÉ-KODAK EIGHT and KODASCOPE EIGHT, Models 20—the “Eights” that popularized 8 mm. movies—are now reduced to $29.50 for the camera, and $24 for the projector. A thoroughly competent 8 mm. movie outfit for just a fraction over $50!

And the famous Ciné-Kodak K f.1.9—the 16 mm. camera that is used by most movie makers—is now priced at only $80.

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Ciné-Kodak Eight, Model 30, makes movies in black-and-white or full-color Kodachrome, is fitted with a precision-made Kodak Anastigmat f.3.5 lens—fixed focus, automatic footage indicator, full-vision eye-level finder incorporated in snap-back carrying handle, securely fastened winding key, built-in exposure guide, self-locking exposure button that permits operator to get into picture. Now only $29.50.

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More and more cinematographers are turning to Superior Pan, not because of any single outstanding quality, but because it offers an excellent combination of all photographic qualities.

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(Director of make-up for 20th Century-Fox)

"It's the best lighting system that I have ever used."

This new lighting system pioneered at 20th Century-Fox, using Daylight Fluorescent MAZDA lamps, is typical of recent installations in make-up departments of several studios. It provides over 150 footcandles of glareless illumination...with a heat reduction of 50% over conventional tungsten lighting. Obviously, this contributes greatly to the comfort of the make-up staff, film artist and studio officials.

In addition, the color quality of this new Fluorescent lighting...the nearest approach to natural daylight ever achieved directly by any artificial illuminant...has proved excellent for both Technicolor and black-and-white make-up.

**Good for close-up shots.** Used as a front light for close-ups of faces, the new Daylight Fluorescent MAZDA lamps provide a splendid glareless foundation light...particularly with the new, faster film. Cinematographers say that the way its soft, blue-white light tends to iron out wrinkles is marvelous! Have you tried it?

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G.E. Fluorescent MAZDA lamps are available in daylight, red, blue, green, pink, gold and white; and in 18, 24 and 36 inch lengths.

---

This installation was designed and constructed by W.T. Strohm, Chief Engineer of 20th Century-Fox. It employs twenty-eight of the new Daylight Fluorescent MAZDA lamps...to provide glareless light, of daylight quality. Clay Campbell, Director of Make-Up for 20th Century-Fox, is shown applying make-up to Binnie Barnes, popular screen artist, for her latest picture, "WIFE, HUSBAND AND FRIEND."
LEADING ARTICLES IN THIS ISSUE

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On the Cover

Proving that an off-stage shot of a camera crew at work can get away from the routine and dramatize the vital instrument itself, is this effective still, featuring the new BNC Mitchell, which is described by Sol Polito beginning on Page 7. The picture is from the camera of Schuyler Crail, stillman member of Local 659, IATSE.

editor, Ed Gibbons; Managing Editor, Herbert Aller; Art Editor, John Corydon Hill; Business Manager, Helen Boyce.
Copyright, 1939, by Local 659, International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada.
Entered as Second Class matter, Sept. 30, 1930, at the Post Office at Los Angeles, California, under the Act of March 3, 1879.

International Photographer, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. International Photographer assumes no responsibility for the return of unsolicited manuscripts or material.

Subscription Rates: U.S.A., $2.50; Canada-Foreign, $3.00 per year. Single Copy, 25 cents.

Office of Publication: 508 Taft Building, Hollywood, California
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Publication Date: 5th of Each Month

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The Kalart Company, Dept. G6
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This sparkling sharp, excellently composed still picture is from the camera of Clifton Maupin, veteran stillman member of Local 659, and was made on the set of 20th Century-Fox’s "Alexander Graham Bell." Note excellent handling of many subjects and unique angle shooting on players Loretta Young, Don Ameche and Spring Byington toward director Irving Cummings, cameramen Leon Shamray and their technical crew.
in the bi-pack field is Telco Color Laboratories, operating at present with an experimental plant, but promising early construction of a new large capacity laboratory in Hollywood.

Trend brings the complete laboratory, technically and artistically. Excellent minimum standards have been set up, as evidenced by the Academy Award on rear projection, an instalment of which begins on Page 19 of this issue, which could soon result in even greater technical prowess in this field. Color is a peculiar thing!

Despite the truly sensational success of Technicolor company, working against technical odds, and the activities of scores of other organizations and individuals engaged in this field, it still has much of the will-o’-the-wisp quality that characterizes television.

The confusion and disarray that is rife on a subject of motion picture color photography remains, as it ever was by the Babel Babel and it requires considerable fortitude to begin any order out of this "chaos clamor." However, as a result of a general mand for a complete presentation of the facial picture on color, coming from technicians, executives and many workers in color research.

INTERNATIONAL PHOTOGRAPHER is undertaking a publication program of a sort of months of an exhaustive and thorough analysis of the situation.

It is not our expectation that such a muddled picture can be completely cleared up by mere series of articles, but it is our sincere hope that the compilation and publication of this analysis is available from many sources and will materially in bringing the whole subject into the open for public examination, the professional technical community of the motion picture industry. Something that has been needed, if the heartfed and vociferous remarks of many sincere experts in the field, with whom we have talked, carry any weight.

The first consideration of a practical executive who considers color—whether he be creating entertainment or commercial advertising—must be the quality of his color systems. Ahmicolor has a working color-three-color process that, despite severe increases in color, is virtually absorbed by the needs of major production.

In Hollywood, the world center of motion picture production, the next alternative for the actual production executive is bi-pack. When he says bi-pack, Cinecolor immediately steps to line as second to Technicolor in importance.

New modern plant, with the capacity in rapid release prints is available. And running competition to Cinecolor is Consolidated Laboratories, Inc., with their Magnacolor, which they have been expanding and improving their laboratory processing facilities. Also lending processes like Dufay and Keller-Dorian. There are various methods of swelling and special filters on the film, such as Telco. There are combinations of bi-pack filtration and mechanical processes for the production of color, and the"双色"filter is one of the original negatives—to not mention the positives—are reaching a bewildering total. Latest system announced calls for use of sheep's blood in the negative as a color dye recipient.

However, out of this weller of systems, theories, special cameras, filters, dye-couplers, processing systems and the like there are available for consideration from a practical standpoint a number of color systems. These, listed in alphabetical order are:

A Frank Statement

The editors of International Photographer are forced by circumstances to make a frank statement to our readers and to call upon them for aid and suggestions. Briefly, the situation is this: during the past few years the magazine has made much progress that we find ourselves getting in our own way. Three factors contribute to this situation.

First, we have available for publication much more interesting material than can be presented in the magazine's present size.

There are other bi-pack color processes available as a medium for the exchange of worthwhile technical information between members of Local 659, IATSE, and by extension, all other serious craftsmen engaged in the photographic of allied arts and crafts, upon a strictly non-political basis, and with concern only for the sincere and honest reporting of exchange of ideas that will contribute to the advancement of these arts and crafts and the information of the workers therein.

Under the circumstances, editorial space in International Photographer is at a premium. Were International Photographer privately operated for profit, the obvious answer would be to make a further capital investment in a larger magazine, with more pages to absorb the many interesting stories, articles and pictorial layouts that are available.

However, International Photographer is operated under prescribed range program as a medium for the exchange of worthwhile technical information between members of Local 659, IATSE, and by extension, all other serious craftsmen engaged in the photographic or allied arts and crafts, upon a strictly non-political basis, and with concern only for the sincere and honest reporting of exchange of ideas that will contribute to the advancement of these arts and crafts and the information of the workers therein.

Under the circumstances, we are forced to call upon our readers for their suggestions as to what type of material they desire retained in the magazine and what type they desire eliminated. It is our belief that the only lasting and worthwhile editorial policy for any publication—from the standpoint of the subscriber or the advertiser—is one that places primary emphasis upon READER INTEREST. Any suggestions that will contribute to increased reader interest will be sincerely appreciated and carefully regarded.

Pending the conclusion of negotiations for additional advertising revenue, which we hope will permit a reasonable expansion of International Photographer's constructive service to the professional photographers of the motion picture industry and the allied arts and crafts in that field, we urgently solicit suggestions and criticisms from our paying subscribers and advertisers as to how we may better serve them in presenting a monthly publication that will most fittingly live up to its designation as the "Only International Professional Journal of Motion Picture Arts and Crafts."

In other words, let the editors of International Photographer know what you want and what you don't want and don't hesitate to speak frankly and to the point. We'll appreciate it and try to be guided by your suggestions.
The BNC-Mitchell camera in pictorial review. 1) Left-hand side with outer and inner doors open, showing movement; 2) Left-hand side, outer door open, inner closed; 3) Right-hand side of the camera, showing interchangeable motor mount, made as side cover of case; 4) Front view, with matte-box swung aside; 5) Rear view, showing how all operations dissolve, focusing shift, magnifiers and motor from outside of case, as described in accompanying story by Sol Polito.

Agfacolor, Cinecolor, Cesarocolor, Cinechrome, Dufaycolor, Dunning, Duplex, Jackman, Kodachrome, Keller-Dorian, Magnacolor, Mooreprocess, Telco and Technicolor. The total is 14 names. But that doesn’t mean 14 systems. It can be more or less, according to the viewpoint. Kodachrome, Eastman’s color that has made a big hit with amateurs, is involved in a cross-licensing deal with Technicolor. And from the laboratory angle, Cinecolor and Magnacolor turn out the release prints from a number of photographic systems in the bi-pack field.

Nevertheless, these are the names to conjure within the color field today in Hollywood and it is our intention to examine these systems, to present the factual story and to afford all these concerns and any additional competitive organizations in the field a full and complete opportunity to present their story to the technical forum of the industry. If we have unintentionally omitted any color system offering release print service from this list, we hereby sincerely extend a broad invitation of the columns of INTERNATIONAL PHOTOGRAPHER that they join in this “open forum” discussion of color.

Color has many phases and facets. Among these are:
The camera, special or standard, or with accessories;
Lenses and filters;
Negative emulsions and their special requirements and costs;
Positive emulsions and their special requirements and costs;
Laboratory processing methods and their simplicity and costs;
Projection of the color prints, and its relationship to established standards for black-and-white;
Quality of color, from the standpoints of pure physics, of showmanship, etc., in relationship to natural color as observed by the eye;
Tiring effect of color photography upon the average human in comparison with black-and-white;
Production cost for color photography exclusive of color itself, i.e., added costs to normal black-and-white production resulting from use of color;
Color cost over black-and-white for negative, positive and laboratory processing, release print durability, etc.;

Makeup of special nature required—both interior and exterior—and its effect upon production costs, normal acting conditions, etc.;
Lighting, its demands, both interior and exterior, in relationship to production costs and photographic quality;
Keeping quality of prints and their color value in relationship to normal distribution conditions in theatrical black-and-white productions.

It is the admitted ideal of practical commercial motion picture color to bring all of above-mentioned factors within as close as possible approximation of the conditions now observed in normal production and distribution of motion picture industry and the advertising educational fields. How close is any organization in the color field to attaining these goals? What bearing will such technical progress have upon the show business aspect of the motion picture industry? And in simile but factual verbiage just what have each of these organizations engaged in color work accomplished to date along these lines? These are the questions we hope will be answered in this INTERNATIONAL PHOTOGRAPHER series color,
HE BNC MITCHELL SILENT CAMERA

In the past ten or eleven years, big topic of discussion among cameramen has been the question of how to reduce noise. It is not that someone invented a really silent camera. Everyone has agreed that when such a camera appeared, it would create a tremendous sensation. Quite a number of cameramen have been waiting for such a sensation, and meanwhile picking up their ears at every rumor in overseas that this studio or that is using such a silent camera. The question of why Hollywood doesn’t import some.

What makes this situation amusing is the fact it is over four years such a noiseless, blimpless camera has existed. Over a good camera, all in active service. What, my own studio, Nieman Brothers’ First National, operates ten of them. Several other major plants have others in daily service. Still, you are making piecemeal progress. In Europe, not Hollywood—that is doing the importing. These cameras are made in Hollywood.

Since, for nearly twenty years, when we have thought of Hollywood-made cameras, we have pictured them housed in those miraculous blimpless cameras. But it is not Europe—not Hollywood—that is doing the importing. The silent cameras should bear the Mitchell de-mark. What is really surprising is the way they have evolved, logically and without a break, each model being about as nearly all as us long before sound arrived. So before we start talking about this present Mitchell, let’s glance back at the way it was done.

The first Mitchell appeared in 1921. Viewed only as a mechanism for moving film steadily from a lens and shutter, it was a good camera; if there were several other disadvantages, it was essentially a silent camera. But it was the beginning of a series. As the silent cameras improved, the Mitchell over a period of years became an important series of practical refinements which make it a more convenient, faster-working production.

One of the main inconveniences of cinematography has been focusing. In most of the early cameras, you focused through a low-power optical system, a frame of the film instead of an image, and the camera’s movement was usually somewhat uncertain. When, if you didn’t like the poor illumination of such a focusing screen, you needed a camera—fogging a foot or so of emulsion, to gain light through the lens, which was rather cumbersome.

Then, as Mitchell improved, a convenient handle was added, which slanted the camera boxwise and brought a ground glass with a powerful magnifying system (which incidentally makes your image upside-down). But it was right-side-up because your eye was in front of the film—in nearly the plane of the film. This was, of course, a rather cumbersome arrangement.

In addition, there was a large revolving disc which might gelatin filters, or any special tints could be placed, and brought into place—like a wheel of fortune, in front of the film—immediately, and at the same time. In addition, a set of four-way matte wheels were built right into the camera, operated by convenient, outside control knobs, while an internal iris was also supplied, built into the camera so that it could be centered on any portion of the frame desired. Even the tripod was an improved, quick-acting design, with legs which could be adjusted with one hand, instead of the conventional four bulky wingnut-locks.

Those were the days when every camera—man of any standing owned and maintained his own camera. With Mitchell’s introduction, the bulk of Hollywood’s production was filmed by these more convenient Mitchells. With synchronized sound, the first thing that had to be done was to utilize the noise of the camera from the microphone. Up to this time, no one had a thought to camera-noise.

But when sound was to be recorded, its purr of precision machinery suddenly became louder than the roar of a battery of army tanks. Since they couldn’t put the mike in an absolute acoustical pen, the sound experts compromised by encasing the camera—and its operators—in sound-proof housings that were quickly nicknamed “blimps” and were anything but a joy to any engineer inside. Those camera booths were sound-proof all right, but they were also heat-taking and practically airtight—and some of these early talkie scenes used to run a full reel at a take! It was a period when few cameramen indulged in Turkish baths after a day’s work.

At this time, however, some observer discovered that the special high-speed movement made by Mitchell for slow-motion camerawork was also a lot quicker than the standard movement. It was operated with cams, and moved the film at forty times the normal speed. Mitchell registered it on a pair of pilot-pins. There was an abrupt demand for speed movement-equipped Mitchells.

About the same time the Mitchell engineers performed a major operation on the camera, amputating the ball bearings which had originally been used to make the camera easily hand-rotated. These bearings were needed to be motor-driven, the heavier load caused by the closeness of the Bearing was no longer important. The quieter operation of these bearings was vital. In addition, it was learned that when two metal gears meshed with each other—even if they were the most precisely cut gears obtainable—they made some noise. Metal gears operating with gears cut from synthetic plastics, like celoron or bakelite, however, were much quieter. Half the metal gears came out, to be replaced by plastic ones. Mitchell also removed a lot of the noise out of cameras, so much, in fact, that the elaborate sound-absorbing insulation of the booths was no longer necessary. Therefore the mounting for the film motors, built into the blimp, was superfluous. "bungalows" or "blimps" were possible. These enclosures the camera only, and left the operators out where they could both see what they were photographing, and get their share of whatever fresh air might be available on the stage.

But this still left the photographer at some pretty severe disadvantage. For one thing, since his camera had to be completely enclosed in its blimp, he had to photograph through a glass porthole. Even the finest optical glass flats are enough to cut down both illumination and most important, optical quality.

Next, he had to take his choice of two evils as regards the finder. If it was mounted conventionally outside the blimp, the problem of finder-parallax—especially on follow-focus and dolly-shots—was tremendous, and for finder and lens might be almost a foot apart. If the finder was mounted on the camera, the problem of finding the point of focus and the position of the camera had to be inside the blimp, where it was difficult to follow.

And when it came to focusing—well, what use was the popular Mitchell throw-over focusing system if before you got in to operate it you had to unbutton three or four latches and prop open two or three blimp doors? There was an unpleasant thought was that if your film buckled— as it sometimes does, even in the best of cameras—your camera, locked inside the blimp and driven by a powerful motor, could easily tear itself to pieces. Could the crew do anything about it, or even know anything was wrong.

Last was the first to be remedied. A simple little trip was placed inside the camera—head, in such a position that at the first pressure of buckled film, the motor-switch was thrown out, and the camera stopped.

This was the compromise until 1932. Then the Mitchell engineers brought out the so-called "NC" or sound model. The initials denote the fact that this is one of two models designed to be used with sound, the other a likely studio model; the other, also on paper, looked like a good, simplified news camera. But when the latter was actually built up, it proved to be such a great advance in camera-silence that the studios appropriated it.

This machine looks outwardly typically Mitchell—like the motor-mounts are made interchangeable with the right-hand cover-plate of the box, so it is a simple matter to change from 48 to 60 cycle synchronous motors to DC, inter-changeablity of high-speed motors or anything else as the scene demands.

The shutter-aperture is adjustable from the rear of the camera, and the adjustment is fitted with a positive lock. For convenience in setting process shots a monitoring miniature shutter disc is placed also at the back of the case.

But the real improvements are inside the camera. When these changes took a grip on the utmost, in the interests of silence. There are only two pairs of gears in the entire camera; the motor drives the movement directly, and the driven gear are meshed through a pair of precision helical gears. A silent worm gear on the shutter shaft drives the main sprocket and the take-up belt.

The movement is operated by eccentrics rather than by the usual gears and cams. The pull-

By SOL POLITO

First of Series

Accompanying interesting description of the manipulation and technical operative phases of the Mitchell BNC camera, is the first of a series of such articles on professional cameramen. Other outstanding instruments, manufactured under the well-known labels of DeVry, Bell & Howell, Wall, Duplex, DeBrie, in the 35mm field, and 16 mm cameras that meet professional usage requirements will be described in this series. Also watch for a description of the engineering jobs Art Reeves is completing in remodelling a Bell & Howell to be available for high-back color work to the Hollywood production community.
SMPE Hollywood Meet

Another successful semi-annual convention of the Society of Motion Picture Engineers was recorded in Hollywood last month with a five-day presentation of papers on a host of subjects, an exhibit of latest color stills in various mediums, visits to the Paramount and Warners studios by the delegates from the East, and concluding with an interesting evening devoted to latest television developments.

Like the Academy of Motion Pictures Arts & Sciences, the SMPE has set up a permanent committee on television, and the organization's plans for detailed study and reports on this potential new entertainment giant were outlined in detail in a paper by Dr. A. N. Goldsmith, chairman of the committee.

The editors of International Photographic regret that lack of space causes them to suspend their usual practice of publishing complete abstracts of the papers presented. However, the convention program, with list of papers and contributors, appeared in our April issue and we suggest that any of our international readers, who have been in the practice of following these abstracts as a guide to their individual interest in the complete text of certain papers, communicate with Sylvan Harris, editor of the SMPE Journal, for information as to the Journal issue in which such complete texts will appear.

Most practically impressive aspect of the television session was the information on solving the problems of television projection of motion picture film and we plan to present technical information on this subject in an early issue.

down arm is fitted with four fingers—two on each side—and these fingers and the pilot-pins overlap, one entering before the other slips out of them. This gives a quiet, accurately registering movement.

The camera is partly acoustically insulated with a layer of sound-absorbing material between the outer and inner walls. The magazines are also insulated, and the camera is traversed from direct contact with the camera-box, which in turn is insulated from the tripod-head.

All told, this design has produced a camera which is ready for all shooting conditions, and unblinded, or with only a quilted fabric "Barny" for most shots, though it requires a blimp for closer work. It is deservedly popular, and by now is established in most of the major studios in Hollywood and all over the world.

However, this camera, excellent as it is, still fell below the ideal Mitchell engineers had set for themselves. So there followed a further period of development of the rear of the camera—such as the Mitchell "BNC.

This consists basically of the NC mechanism enclosed in its own, integral sound-proof housing, and with every possible feature for convenient operation.

The camera itself is built into a compact sound-proof housing—one that is too small to be called a blimp, and one, too, which is a permanent part of the camera itself. The single exception is that loading everything connected with the camera's operation can be done without having to open this housing!

The single lens is mounted on the front of the outer case and there is no more shooting through glass windows! The mount is of the bayonet type, quickly detachable but positive in its action. The lens can only be put on the camera by inserting it in the bayonet. The focusing handle, at one corner swings the focus-operating gears free of the lens for lens-changes.

The focusing mechanism is substantially the same as that used by Mitchell for twenty years. Inside the outer case and there is no more shooting through glass windows! A set of cams, individually matched to the lenses used on the camera, is fitted under the finder. The lens in use remain in this position, out of the way when not in motion.

For lenses of any shorter focal length, are swung over to bear on a roller which moves on a helix fitted to the rear focus-operating control. The lens is locked in the matchless control, and those lenses from 35 mm to 6-inch; the less frequently used 24 mm lens calls for a special, separate cam which is put in place only when needed.

The finder itself swings out of the way automatically at the opening of the outer door when, as in reloading or checking the movement, it is necessary to open the outer or inner case doors. Closing the door returns the finder to its original setting.

The adjustable shutter is retained, and its controls are retracted to the outside of the housing, while the monitoring miniature shutter is always engaged with the film. But in addition, by popular demand, the shutter of the BNC is of the dissolving type. The dissolve may be made manually, from the outside of the case or, by using a button, a four-foot fade in or out may be made automatically.

The frame and footage counters have naturally been mounted so as to be visible from the inside. In the earlier models, one of these was a dial type, counting only footage; the other a Veecker-type, with a frame-counting disc as well as one counting footage. In this model, both are in the focal plane just above and below the focusing eyepiece. One of these may, as usual, indicate magazine footage; the other, scene footage.

The regular Mitchell internal four-way mutes are retained in the BNC, and their controls placed in the usual positions on the inner case. A convenient filter-slide is provided. The matte-box is of the usual type, mounted, of course, on the outer case, but with its supporting arms at the side, rather than the bottom. This assembly swings sideways out of the way for lens-changing, and a single rod holds it in place and permits quick removal. A special, supplementary sunshade is provided for use with 24 mm lenses.

The motor housing is substantially the same as that used on the NC type, consisting of a complete door-plane combined with the housing. The internal wiring is such that a new motor is put on no wiring changes necessary; a new motor is merely connected to the motor to the power-line, which comes through the right side of the outer case, usual Mitchell anti-buckle trip is provided, the reset and threading of the trip is unchanged. A large knob, in the center of which a crank fitting, enables the assistant to operate the motor manually for loading, or to have crank disabled; like a number of other external controls, is normally secured from contact with the inner mechanism, and use must be pressed inward to contact its operating member when the inner camera-case is also fully insulated by direct contact with the bottom of the housing, yet is mounted in such a way that it is held rigidly in place.

Access to the inner camera is through doors: one on the left side of the outer case like the usual camera door; the other opens the entire left rear quarter of the outer casing, giving ample room for reload. Several convenient folding handles are supplied for lifting the whole assembly. While the B is naturally heavier and bulkier than a Vatophone camera, it's a job for one man. It is of course infinitely light and more compact than any blimp.

Now, what does all this mean in terms practical camerawork?

Well, not only our recent Warner Bros. executives of spending money foolishly; a within the past few months Camera Department Head Mike McGeel has just completed a program of cameramen flying around one (all relatively young Michell's) with ten of new BNC's—a $10,000,000 investment in more efficient camerawork.

All of us at the studio have completed our real production with the BNC and we're pretty well agreed that they are practically useful.

First, like the original Mitchell of two years ago, they are faster operating. You can do a whole day's work without ever having to open the outer case except for loading. You can indulge in those last second checks through the ground glass just as you did before sound came. The operating crews fly follow-focus and dolly shots a world easier with the parallax-correcting finder and the hand focusing methods.

On exterior scenes, where now-a-days we frequently have to pan or dolly from dire sunlight to heavy shadow and back again, being able to adjust the shutter from outside it case, during the shot, is a real life-saver. It pays graphite cameras a lot of money, an easier camerawork and simpler laboratory work of course, is just one of the many points where we are at a disadvantage using conventional blind cameras, where only this type of Mitchell will help us out.

The lighter, smaller camera also gives us back most of the mobility we enjoyed in pre-microphone days. The absence of the objectional glass postholes give us better photographic quality.

In addition, our soundmen have had some nice things to say about the noise-free operation of the BNC, because they can hear that if you are on a bare stage, with no people or anything else to create background noise and if you then bring the microphone to within a couple feet of the camera, they pick up a tiny trace of noise; but even they admit this imperceptible sound is in a frequency range which is automatically filtered out by the regular microphone.
Polito, whose interesting and detailed account of the Mitchell camera developments to his present versatile and quiet BNC model, clears up much idle gabble on the silent camera situation, is shown at right, with elbow on knee, hooting "DuBarry" for WB in 1934 with blimped camera used at that time. Above is the detailed view of the silenced movement of the Mitchell, introduced in 1933, and described in the accompanying story.

Illustrations on this page are from International Photographer's valuable file of engravings on technical matters, one of the most complete and authoritative in existence, representing an original investment over $20,000. At right is close-up of the eccentric register pin intermittent movement introduced by Mitchell in 1931; and above is a rear view of the 1921 Mitchell, described herewith, showing synchronous motor in sound-proof case and focus controls at left of base.

International Photographer
Republic, under the leadership of Herbert Yates is engaged in an aggressive drive to boost the calibre of its product that is resulting in a flow of considerably more expensive productions from the Valley lot. Herewith are stills from the collection photographed by Milt Gold, stillman member of Local 659, IATSE, from Republic’s spectacular historical epic of early Texas, “Man of Conquest,” starring Richard Dix. Typical of the variety of phot
...stills by milt gold

International Photographer, another layout of outstanding pictures from a stillman’s assignment, Wally Wallace’s shots for Edward Small’s production of “The Man in the Iron Mask.”
FUNDAMENTAL PHOTOGRAPHIC PHYSICS

Third installment of reference material on photographic physics in convenient and handy form for filing, from Chapter II of new volume, "Basic Photography," by Don Hooper, frequent contributor to International Photography.

By DON HOOPER

This is the third and final installment of International Photographer's republication of Chapter II on Fundamental Photographic Physics, from Don Hooper's new book, "Basic Photography." The numerals in parentheses in the following text refer to the page numbers on which the material appears in the original edition of "Basic Photography."—Ed.

ANGLE OF VIEW

The angle of view is the angle included between lines drawn from the lens to opposite sides of the film used. It is governed entirely by the size of the film used, and its position in the focal plane with regard to the axis of the lens. It is always smaller than the angle subtended by the diameter of the lens field, although it may approach it quite closely.

Figure 17 illustrates field and angle of view, and in Figure 18 is given a method for ascertaining the angle of view from the focal length of various lenses and films of different sizes.

This diagram shows the angle of view which is included on films from 3½ x 4½ inches to 11 x 14 inches, using lenses of focal lengths from 3 to 15 inches.

Its use is as follows: On the first horizontal line under the arc, locate the figure that corresponds with one of the dimensions of the film being used. On either of the outside vertical lines, find the figure corresponding with the focal length of the lens being used. Follow the horizontal line from this figure until it crosses the vertical line from the dimension figure at the top. There the angle of view for these dimensions is expressed in degrees.

Example: What angle of view will be included on a 4 x 5 inch film, using a six-inch focal length lens? On the upper horizontal line, find the figure four and follow the vertical line leading down from it until this line intersects the horizontal line numbered six. At the point of intersection, follow the angular line to the arc, and the angle included is seen to be 36 degrees.

By the same method, it will be found that the angle included on the five-inch ways of the film is 45 degrees.

With miniature cameras using the 35 mm motion picture film, the Angle of View is as follows:

<table>
<thead>
<tr>
<th>Focal Length</th>
<th>Angle of View</th>
</tr>
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<tbody>
<tr>
<td>26 mm</td>
<td>81</td>
</tr>
<tr>
<td>35 mm</td>
<td>65</td>
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<tr>
<td>50 mm</td>
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<td>75 mm</td>
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<td>90 mm</td>
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<td>105 mm</td>
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<td>135 mm</td>
<td>19</td>
</tr>
<tr>
<td>200 mm</td>
<td>12</td>
</tr>
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</table>

CLASSIFICATION OF LENSES

Lenses are often classified according to their focal lengths and angles of view.

A lens that will, at its widest aperture, cover a film whose diagonal is greater than focal length of this lens, is called a WIDE-ANGLE LENS. The angle of view for such lenses will vary from about 60 degrees to about 135 degrees. If the focal length is equal to or slightly greater than the diagonal of the film, the lens is called a normal or medium angle lens, and covers an angle of from 45 degrees to 90 degrees. If the lens is greater than this diagonal, it is a NARROW ANGLE LENS with an angle of view of less than 45 degrees.

In all cases where the angle of view is used to describe a lens, the size is measured by the largest plate that can be used with that lens.

There is a tendency to regard a lens of shorter focal length as covering a narrow angle, and one of longer focal length as covering a wide angle. This is often the case, but not an absolute requirement. If, due to its construction, a short focal length lens can cover sharply only a small field, it may have a very narrow angle of view, while a lens of comparatively long focal length may be accurately designed and constructed that it will have a wider angle of view than the shorter focal length lens.

COVERING POWER

The ability of a lens to cover a wide angle of view in proportion to the size of its focal length is a measure of its covering power. For example, a lens may form a sharp image of a margin of a 5 x 7 inch film, but only when used with a 5 x 7 inch film. If the image is not sufficiently covering power for a 5 x 7 inch film, it will not cover a 5 x 7 inch film.

The limiting factor in any film size is the length of its diagonal. The diagonal is less than the diameter of the lens field, it may be used.

PERSPECTIVE

This is the art of representing solid bodies on a plane surface. It is divided into two branches: Linear Perspective, which shows the apparent size, shape, and distances of objects on a flat surface; and Aerial Perspective, which distinguishes the distance of objects by their relative brilliancy and color. It is with Linear Perspective that we are interested in the study of lenses. In viewing objects of the same size with the naked eye, those nearby, naturally, appear larger than those at a greater distance. If the objects, when photographed, appear of the same relative size and shape as when viewed by the naked eye, we may say that the photograph shows natural perspective. However, if they appear different relative sizes and shapes, we say that the photograph has poor, or exaggerated, perspective. The normal unaided human eye forms images corresponding to those given by a lens about 14 inches focal length on a 8 x 10 inch film, or using the miniature camera, 75 mm lens on 35 mm film. Objects photographed with either of these lenses would appear much the same as when viewed by the eye. However, lenses of this focal length are seldom used for ordinary photographic work, shorter ones being the rule. Therefore, we would expect ordinary photographs to exhibit exaggerated perspective, and such is the case. Fortunately, the exaggeration is not apparent to a great extent in photographs with lenses of ordinary focal length.
That's the endearing word cameramen throughout the world apply to their DeVry Camera—in Arctic snows, through tropical jungles—in all climates—in any emergency.

Good old DeVry Camera—it works when others fail.

The wide acceptance of DeVry products can be summed up by the words of a well known world traveler..."Before buying your camera I checked with members of the Explorers Club and most of them recommended DeVry Cameras, and Projectors for my use."

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No wonder these adventurers "put" the DeVry "A." Its fool-proof mechanism and general reliability make it a "must" in the equipment order. At the left: The DeVry 16mm. "No. 70"—smaller brother to the "A."

Above: The new DeVry 16mm. Sound Camera—one of the most sensitive, handiest, and practical models now on the market.

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bubbles are smaller and fewer, although 1 lenses are absolutely free of them.

Storage and Handling: Lenses should not be stored near steam pipes, radiators or other excessively warm places. Neither should they be exposed to acid or chemical fumes, salt spray, steam dampness, nor to the direct sun. Also, the lens used in the camera should not be used in the enlarger as the prolonged passage of the light rays from the enlarger through the lens will cause a darkening or yellowing of the Canada Balsam. Stored, they should be kept in suitable containers free from dust and rough handling. LENS CAPS are always provided by the manufacturer for the front element and should always be in place except when the lens is actually being used. This applies especially to the rear element.

Care of the Diaphragm: This and the shutter are the only mechanical parts with which some lenses are fitted. The diaphragm lever, which are of very thin metal or somewhat thicker fiber, are extremely delicate. They should never be touched with the fingers, as it is likely to bend them, or leave perspiration marks which will cause corrosion. Very few diaphragms fall unless they have been tampered with. If a diaphragm works freely, leave alone. If too stiff in its action for convenient operation, allow some one experienced in optical instruments to remedy the defect. In case of failure of the diaphragm, either have it repaired made by some competent instrument maker or send the lens back to the factory.

Care of the Shutter: All shutters, except the oval on the Box Brownies and less expensive Kodak are of very intricate mechanical arrangement and adjustment. They, also, should be placed in the hands of an experienced repairman or sent to the factory if in need of repair.

It is a seemingly natural tendency for beginning photographers to blame lenses with which they have not previously used, for failures which invariably can be traced to other causes, usual personal. Most lenses, if properly used, will produce the desired results.

**Grip Equipment**

Practical gadgets to expedite production from array at MGM grip department, headed by George Hyde.

**By GEORGE M. HAINES**

If any readers who have been following our recent presentation in INTERNATIONAL PHOTOGRAPHER of the many effective and important accessories, gadgets, gimmicks, et al., that are used in the studios to further the most efficient and entertaining photography of dramatic action think we are nearing the end of our material, we want to here and now disabuse them of the idea. The further we dig into the subject of especially connected devices, the more we marvel at the patience, skill and inventive ability with which scores of unsung and unpublicized studio craftsmen have solved and are solving the many angles of making the ideas of producers, writers, directors and other creators workable on the set.

It is one thing to vision an effective scene or sequence, another to get that dramatic idea "in the can" with a minimum of fuss and bother. Give the lowly crafts workers a lead of credit for their often though it may appear on the screen under the broad credit of theIATSE label you see in the corner of every picture's main title. The handy articles and devices developed by the studio crafts seem in
A few visits to the MGM lot last month produced an array of items for our collection and they are herewith presented, ably photographed by Eric Carpenter, stillman member of Local 659, IATSE.

The MGM grip equipment illustrated, as did Paramount lot items, last month, demonstrates the benefit the individual studios can get from paying attention to the constructive work of their fellow workers on other lots.

MGM's efficiently working department is under the direction of Clarence Hyde, superintendent of the grip department, who has been with the organization for 20 years. Don Duffield, in charge of the grip room, has been with the studio for eight years. They and their helpers can well be proud of many useful and clever contributions to the practical field of film production.

MGM equipment, illustrated on Pages 14-15 of a recent issue of International Photographer, includes:

ON PAGE 14:

(A) Light base extension for use on stairs, uneven surfaces, consisting of a long rod fastened to leg of two wooden clamps with wing nuts.

(B) Stairway jack for a lamp, consisting of pipe flange, fitted with 3/4" pipe with thumb screw, enclosing 3 1/2" split pipe, and with split drive nails in screw holes.

(C) Stage overhead flag, 12' extension, consisting of Jumbo century stand with MGM feature of weight opposite flag extension (note the swivel leads at base) and featuring hand-wound gears for extending flag; just visible extended end of flag is the inside extension, which operates on a duralumin slide very conveniently.

(D) Standard MGM studio perambulator, consisting of chassis, featuring tires with tread eled off except for 3/4" at center to reduce wind, swing arm for lights, at rear, and in on a Jumbo century stand.

(E) A 4' lead reflector using two solid lead weights; with an MGM tie-down alongside at hitch; latter consists of 3/4" stock bent at right angle with two nail holes, and with top bent in U-shape at lamp-base height.

(F) Collapsible 2' square reflector and a view of the 4' square lead reflector seen from rear.

(G) Exterior adjustable scrim frame. Shown is the device is Don Duffield, eight years with MGM, and now in charge of the grip room.

ON PAGE 15:

(A) Baby spot hangar with lamp attached and doubling, consists of "U" hook, solidly-stayed to 1"x1" rods, which are fitted with wing-screw adjustment setup for elasticity in the view.

(B) Sliding Gobo, 3'x9', consisting of two bars on an "A" frame and leg. Slides up by slider in plywood overlap side. This extending Gobo also can be easily swung to various angles means of a swivel attachment to the "A" arm, which Don Duffield is seen holding in the illustration.

(C) Easel reflector stand of very sturdy construction, consisting of legs, elevation rod and tension chains, tie-off screw knob and worm arm for adjusting.

(D) Easel reflector described above in elevated position.

(E) MGM's 4' collapsible parallel, shown locked and open. Behind the open parallel, which is proved itself handy and readily portable, is own Don Leys, member of the studio grip department the past five years.

(F) Duralumin swing-arm boom with MGM stand.

Watch for further presentation of grip equipment items and let us have your suggestions as to the best way to eventually present this material in classified form as the first Studio Mechanic's Handbook. Comments, suggestions and criticisms are eagerly awaited by the editors of International Photographer and the studio department heads, who are cooperating with the magazine in this constructive job of gathering the information on all types and kinds of studio equipment into handbook form for the first time.
THE HOTSPOT IRIS

Another item in series of short features on filters by Hollywood's veteran manufacturer of filter equipment.

By GEORGE SCHEIBE

Projectionists for years have been bothered with the "hotspot," a flare of light on the screen that is the result of the projection lens magnifying the hot light of the projection source to form a halo near the center of the projected picture. A similar bane occurs in certain type of photography, when bright sunlight is reflected from some source to cause a white glare in a portion of the camera lens.

Many devices and methods have been tried to offset the "hotspot," but it was with the development of background projection effects a decade ago that some cure was needed. As usual, in our industry, where the toughest problems are battled until they are solved, this one also was. The solution was pragratically simple. We developed what is known as the "hotspot iris."

The Scheibe Hotspot Iris is adjustable in many ways. It is used on the projector to eliminate the "hotspot" in the center of the screen so it will photograph as evenly as the sides of the screen. The Hotspot Iris is made in 6-inch x 6-inch and 8-inch x 8-inch sizes with a blue or neutral color in the center of the Hotspot Iris. In the neutral the .25, .50, and .75 is used. The spot is about one to two inches in diameter. The Hotspot Iris is moved toward and away from the lens to eliminate the spot on the screen.

After the "hotspot" is eliminated the screen is photographed with the actors and actresses between camera and screen. Almost any kind of background is used on the projection screen which goes to make up the scene, to produce an exterior in the studio, that seems to have been made outside, on location. This type of photography can be used in any kind of work where a background is used. Camera men go out on location to photograph backgrounds for process work the world over and the Hotspot Iris aids materially in making such efforts possible.

Since inaugurating this series of short articles on filters for INTERNATIONAL PHOTOGRAPHER, we have received a number of interesting communications on the subject. I want to say at this time that anyone who desires information on any phase of filters, or advice and suggestions on photographic problems requiring special filters, should feel welcome to send their questions to us in care of INTERNATIONAL PHOTOGRAPHER.

Since the early days of the motion picture industry we have been cooperating closely with the studio camera boys in assisting them to solve special problems; and we will be glad to assist or advise any readers of INTERNATIONAL PHOTOGRAPHER at any time.
EASTMAN'S three new motion picture negative films have quickly established themselves as the favorites of the industry. Plus-X for general studio work... Super-XX for all difficult exposures... fine-grained Background-X for backgrounds and all-round exterior work. Each makes its special contribution, and all have that typical reliability closely identified with Eastman films. Eastman Kodak Company, Rochester, N.Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN Plus-X...
Super-XX... Background-X
The loading room is the stepping stone to professional photographic work in the motion picture lot - as things are organized in the present highly complicated production routine. Studio cameramen come from the laboratory, commercial work, and other allied fields, of course, but the film-loader classification of Local 659 amounts to an apprenticeship in motion picture photography today. Most conspicuous graduate of late has been Alan Baldwin, whose pleasant personality and acting talent popped him right into a long term contract to Samuel Goldwyn.

In case any reader has the idea that this is a silly example of promotion in the studio camera departments, don't get the idea that filmloaders, Alan Baldwin included, stand around holding their profiles up for the inspection of studio executives in hope of landing an acting contract. Their job has its importance and they take it seriously, plus always being on the alert to pick up tricks of the trade from their more advanced associates.

Alan Baldwin paid strict attention to his film-loading duties on the job. His acting contract was a result of extra-curricular activity after hours. He made a hit in the lead of a Warners-Brothers studio club amateur production of "Winterset." This got him screen tests at Warners, Selznick and Paramount. To prove that Mr. Baldwin is a typical average conscientious film-loader in application to his duties, he even loaded the film for his own screen test! And he made sure that the test was delivered to the laboratory in good order.

Rechristened Alan Baldwin for acting purposes by the astute Samuel Goldwyn, who predicts an interesting future for the engaging personality so ably captured in the accompanying illustrations by Bob Coburn, ace stillman member of Local 659, IATSE, this typical film-loader was christened Albert Korngute. A Los Angeles boy, he was educated at L. A. Junior College and U.C.L.A., where he majored in psychology. Leaving school he decided upon motion picture work as a career and with bright college boy's a drug on the market, he too a job at Warners Bros., Beverly Hills, Calif as an opening wedge.

In 1934 he was accepted into membership (Local 659, IATSE, and simultaneously landed a job in the film-loading room at Warner Bros.). He has been a studio cameraman for the past two years, learning rudiments of the photographic game and practicing amateur acting as a hobby until Samuel Goldwyn recently decided to place him under long-term contract.

The responsibility of young men like Baldwin, of whom there are some 50 employed in the major studios, is to get the film from the laboratory, load the magazines, keep magazine clean and in repair, check cameras for minor adjustments and cleanliness, and to keep an accurate record of all film - unexposed and exposed — within the ken of the studio camera department.

While this assignment may smack of routine it is obvious what complications could result in modern studio production with many units at work using different emulsions and photographic techniques, if filmloaders didn't pay strict attention to their chores. Not to mention the resounding squawks that might issue from an irate director should one of his pet scenes fail to appear in the magazine because the magazine wasn't properly loaded.

In average studio practice there are six filmloaders busy on the day side, and one night man. Three or more handle negatives. Two or more (members of Local 659, IATSE) handle film for sound recording and one is busy attending to the needs of the stillmen. In the independent field loading is generally handled by the assistant cameraman. The film-loader is not considered part of the camera crew proper. He handles assignments for all the studio camera crews, working cooperatively with his fellow leaders.

It is a general practice with alert leaders to scorn an empty magazine. In preparation for any exigency, they always try to get empties loaded with fresh unexposed film as soon as possible. The filmloaders handle most of the office detail of the camera department in addition to their mechanical duties and this keeps them pretty busy. But the progressive element is ever on the alert for opportunities to be set on to watch and learn from the veterans of the camera crews.

Although motion picture release prints go into the theatres in the 2000 ft. reels prescribed by the Academy, 1000 ft. magazines are used in photographing, since this is the fullest capacity practically possible for production purposes. Some special types of photography smaller magazines are used. Average waste in starting and stopping, photographing of slates, etc., with modern efficient camera motors, is about 10 per cent of a 1000 ft. magazine.

While Alan Baldwin is determined to try and capitalize upon the opportunity given him by Mr. Goldwyn he still retains his membership in Local 659, IATSE. Being a level-headed young man, young Baldwin realizes that screen stardom, by all statistical standards, is a fleeting will-o'-the-wisp and that the thespic going gets too wisey, he'd like nothing better than to be a studio cameraman and to live a profession. That is a sensible viewpoint; and the friends he has made in Local 659 wish him luck.

— Gin.
These pictures of Alan Baldwin, film-loader, signed by Samuel Goldwyn to a long-term contract, are by Bob Coburn, stillman member of Local 659, IATSE.

ACADEMY REPORT

Second installment of industry's first complete standards recommendations for rear projection equipment.

PART V

THE OPTICAL SYSTEM

SPEED (Basic): The optical system shall have a speed of F2.0 or greater.

SPEED (Auxiliary): The above recommendation should not be construed to mean that developments beyond a speed of F2.0 are not anticipated. On the contrary, an F1.6 system is to be expected in the future.

ADJUSTMENT (Basic): Adequate lateral, vertical and longitudinal adjustment facilities shall be provided for all units of the optical system, irrespective of the projection lens.

COLOR BALANCE (Basic): The optical system shall contribute no noticeable color and that same order of spectral uniformity should extend to a wavelength of 3800 Å.

COLOR BALANCE (MIRROR SYSTEM) (Basic): All mirrors used in the mirror type optical system shall be surfaced with aluminum, or at least its equivalent.

PRIMARY CONDENSER

FOCAL LENGTH (Basic): The primary condenser shall be of a focal length to give a maximum amount of light output using an F2.0 system. (See "Speed, Auxiliary," Page 10.)

PROTECTIVE DEVICES (Basic): The condenser mounting shall be so designed as to give sufficient clearance within the lamphouse to allow for expansion of the condenser due to increase in temperature during operation. Protective devices should also be provided to eliminate destructive air currents from the condenser when the lamphouse door is open. (See "Ventilation of the Lamphouse," Page 8 and Page 9.)

PROTECTIVE DEVICES (Auxiliary): An attempt should be made to design a method whereby the lamp could be retrimmed without subjecting the condenser to drafts or sudden temperature changes. (See "Ventilation of the Lamphouse," Page 8 and Page 9.)

CONSTRUCTION (Auxiliary): The element of the condenser nearest the crater should be designed and constructed somewhat thicker than at present so that pitting of this condenser can be removed by regrinding and polishing as required. (Note: It has been suggested that the use of an auxiliary thin quartz plate between the arc and the preliminary element of the condenser might furnish a protection for this condenser element provided too great a light loss is not introduced.)

CONDENSER RELAY TYPE SYSTEM

FOCAL LENGTH (Basic): The relay condenser type system shall be designed to permit as short a set-up as possible and still deliver the maximum amount of light with an F2.0 beam or cone of light. (See "Speed, Auxiliary," Page 10.)

ADJUSTMENT (Basic): The condenser relay mount shall be so designed as to permit both horizontal and vertical adjustments in both directions with a suitable pitch thread, so constructed as to maintain their setting.

PROTECTIVE DEVICES (Basic): The mountings of the condenser system shall be designed to give sufficient clearance to allow for expansion of the condenser
This layout features the famous Teague rear projection equipment, now used at Universal. At top left is the original Teague rear-projection head as developed in 1928, for comparison with the present Teague head, also shown unblimped and open at lower left. Bottom center shows the Teague stereopticon for still rear projection; while at top and bottom right are shown detailed setups of the Teague rear projection equipment.

During temperature rises...

LENS

APERTURE (Basic):
A lens shall be provided with an aperture of F2.0 or greater. The screen brightness should be controlled by a diaphragm in the case of an excess quantity of light.
FAST FILM or SLOW there is a SOLARSPOT
for EVERY lighting need

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FINEST DEFINITIVES
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New York 11 West 42d St., Hollywood, 735 N. La Brea Ave., Los Angeles, 28 14 Union Station 30

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Hollywood California
Cable Address: ‘CAMERAS’

STARTING RESISTANCE. (Auxiliary): The user can be arranged to first provide the proper starting or heating current and then by one switching operation the proper operating current, has been suggested as one method of meeting the above basic recommendation. Such an arrangement would aid in the most effective use of the grid during the start operation. (See “Line Switch Control,” above.)

The contacts of the grid shall be so designed that the grid will give an easily operated method of resistance change and provide good electrical contacts, the efficiency of the grid to maintain them for a period of time.

CONTACTS (Auxiliary): For grids designed to be used in conjunction with a projector equipped with a light control diaphragm (see “Light Control,” Page 14), the inclusion of a locking device has been suggested which, after a resistance change is made, gives a positive contact, rather than a contact of the rheostat or potentiometer type.

PART VII
THE FILM GATE AND PROJECTOR HEAD
NORMAL SPEED PROJECTOR HEAD
APERTURE (Basic): The projector head shall be so designed that an F1.4.6 cone of light can be accommodated through the aperture and fill an F1.6 projection lens from all parts of the picture, necessitating that the opening be guided by the aperture be of sufficient area to allow the above cones of light to reach all parts of the aperture. The projector head should be designed to accommodate F1.6 lenses (whenever satisfactorily developed), and permit lenses of large diameter (Note: See “Standards of Lens Mount Diameters,” Page 13.) to come close enough to the film to be used in conjunction with the operation or steadiness of the movement to obtain a proper focus on any length of set-up. A full screen aperture, 0.950” by 0.725” shall be provided.
SHUTTER OPENING (Basic): The projector head should be designed for a maximum shutter opening of 240°, this to mean that the film shall be at rest and the shutter to fully clear the aperture for this period of time. (Note: It is understood that all equipments shall be equipped with rear shutters. It has been further suggested that a 240° shutter be developed for the camera.)

Synchronizing (Basic): A readily accessible synchronizing device which is quick and positive in operation shall be incorporated in this design. This device shall synchronize the projector and camera shutters to a tolerance of ±2°.

Motor Drive Systems (Basic): Provision shall be made in the design of the projector head motor drive so that the projector can be inter-locked with the camera and recorder motor drive system, so that it will maintain the tolerances as given above under the basic recommendations.

Cooling (Basic): A cooling device shall be provided in the optical system or incorporated in the aperture design. It has been suggested that a stream of air striking the film from the projection lens, or away from the light source, be employed. Such a device, if within the specifications given under “Cooling,” Page 21, would also help to meet the recommendations given under “Position of the Film During Exposure,” Page 18, as a means of holding the film in the aperture.

For the mirror or straight condenser type of lamphouse, the design shall also include a means, located between the gate and light source, to eliminate from the film aperture

RECOMMENDED OPTIMUM CURRENTS FOR CARBONS

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<td>A</td>
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**Light Control**

**Light Control Diaphragm** (Basic): A heat-resisting diaphragm light control shall be provided at a suitable point in the relay condenser system to control the intensity of the light output. This diaphragm must not affect the flatness of field.

This diaphragm control in the relay type condenser system will allow carbons to be burned at their correct amperage and thus give the maximum efficiency at various steadiness in light output. In an equipment provided with this control, it is recommended that the carbons be burned within ±5 amperes of their rated current, as shown by the following list:

**Recommended Optimum Currents for Carbons**

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<th>Grade</th>
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<tr>
<td>A</td>
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<td>C</td>
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The design should include a means of projecting a single frame for lining up purposes, permitting as much light as possible to pass through the aperture without damage to the stationary film. (Note: An auxiliary light source of sufficient intensity to permit lining up should be provided.)

PART VI

GLASS GRIDS

CAPACITY (Basic): Grills shall be designed for mirror type lamps to have a capacity of from 75 to 150 amperes. For general purpose type lamps, the grill capacity shall be from 100 to 250 amperes. Both types are to be provided with 5 amperage steps and with a uniform resistance at each step throughout the whole range.

CAPACITY (Auxiliary): It has been suggested that the above conditions can be met by providing 10 amperage steps with auxiliary controls of 5 amperes to fulfill the Basic Recommendation above.

TEMPERATURE RISE (Basic): Grills shall be designed of such material and of a type giving a minimum resultant temperature resistance coefficient. (See “Light Variation,” Page 4.)

CONSTRUCTION (Basic): Grills shall be built solidly and be compact yet easily portable.

Switch Control (Basic): A remote control operating from the control panel of the projector, to open and close the power supply switch, shall be provided.

STARTING RESISTANCE (Basic): Grills shall be so designed that when used in conjunction with a mirror lamp a maximum starting current of 75 amperes will be provided and when used in conjunction with a condenser type lamp a maximum starting current of 100 amperes will be provided. This current should be held steadily for a minimum of 30 seconds, at which time the grill shall provide an easily operated...
assembly that portion of spill light not actually used in the aperture. This device should be interchangeable to accept an F1.6 to 2.3 cone of light. The development of interchangeable means or device is recommended primarily to decrease the amount of heat on the film trap assembly with no loss of light from an F1.6 system.

In the relay system such a device may not be necessary as the amount of spilled light is practically nil. However, provision should be made for such a device should it become necessary.

REGISTRATION AND REGISTERING PINS (Basic):
Inasmuch as steadiness of picture is the basic and primary requisite of a background projector equipment, the design shall be such as to include pilot pins providing rocksteady registration. These pilot pins may be either moving or stationary, providing the pins stand up reasonably well under projection conditions. (Note: The pilot pins of the projector should engage the same perforations as the camera and printer.)

ADJUSTMENT CONTROL OF REGISTRATION (Basic):
Adjustment control means shall be provided in registration to accommodate a maximum film shrinkage of 0.030" per foot, this adjustment to be calibrated against the critical adjustment of the aperture.

REGISTRATION—FILM REVERSED (Accessory):
If possible, means should be provided to reverse the registering pilot pins to give good registration to a background print while it is necessary to turn the background print over for projection purposes.

CLEARANCE (Basic):
Sufficient clearance, that is, space between the aperture and lens, shall be left in the design to accommodate a projector head giving the steadiness required in the above specifications. (See "Aperture," Page 16.)

FORWARD AND BACKWARD OPERATION OF THE PROJECTOR HEAD (TWO-DIRECTIONAL MOVEMENT) (Basic):
The projector head shall be so designed as to have the ability to run either forward or backward with perfect registration with a take-up designed to take care of this two-way operation. This should be accomplished with no damage to the film as specified under "Operating Speed of Projector Head," Page 20. This type of two-directional projector head also fulfills the function of projecting a back-cranked scene with the camera running forward and the projector running backward, both shutters operating in synchronism.

This Recommendation is made after consideration of observations and comments made by those members of the Committee who have worked with this type of equipment. The resultant saving of production time will far more than offset any added difficulties encountered in securing such design.

FORWARD AND BACKWARD OPERATION OF THE PROJECTOR HEAD (TWO-DIRECTIONAL MOVEMENT Accessory):
It has been suggested that the design of the two-directional movement be such that the background print can be rewound without taking the film from the projector head, by disengaging the synchronous motor from the distributor and operating independently.

POSITION OF THE FILM DURING EXPOSURE (Auxiliary):
A method is desired in the design which will aid in holding the film as near as possible in the same exact plane during each exposure period.
ROTATION OF THE PROJECTOR HEAD (Accessory):
The projector head should be so designed as to rotate 90° either to the right or left about the optical axis, making a total circular coverage of 180°.

ROTATION OF THE PROJECTOR HEAD (Accessory):
It has been suggested that for the purposes of rigidity and registration in the equipment an attachment or device be designed to rotate the projected image 90° to the right or to the left, making a total circular coverage of 180°, rather than rotate the projector head. This might be accomplished through the use of prisms, first surface mirrors, or adaptor plates used in conjunction with a separate head.

FOCUSBING CONTROL (Basic):
The design shall include a remote control for focusing, operating from the camera position.

FOCUSBING CONTROL (Auxiliary):
It has been suggested that the above focusing control be provided with a rheostat and be operated by a universal motor to give a variation in the speed of focusing. This focusing device should be easily released for manual focusing.

FIRE SHUTTER (Basic):
The design shall include a fire shutter with a device to secure positive full opening when the machine is running. If of the centrifugal force opening type, an indicator should be incorporated so that the operator can at all times tell that the fire shutter is fully opened. This fire shutter should not open until the projector has reached the speed of 1200 r.p.m., and should close by the time the projector has slowed down to that speed. This opening and closing speed should be adjustable to meet special conditions where an operating speed of less than 1200 r.p.m. is necessary (Note: The amount of this adjustment to meet special conditions shall be determined by the intensity of the light source, degree of shutter opening, and speed of operation.) An auxiliary control should be included so that the light can be flashed without the necessity of running the machine.

FILM BREAKAGE (Basic):
A positive operating buckle-trip device shall be included which will stop the mechanism under conditions of film breakage, loss of loop, or take-up failure. (See “Forward and Backward Operation of the Projector Head,” Page 18.)

FILM BREAKAGE (Auxiliary):
A contact breaker or mechanism to disengage the drive system has been suggested as a means of meeting the above basic recommendation.

NOISE LEVEL (Basic):
The noise level of the projector head in operation shall be 3 db below the noise level specification given for the whole equipment in that part (“Noise Level,” Page 21) of these Recommendations. This Recommendation is to be met without the use of a booth or cumbersome blimp.

MAGAZINES (Basic):
The magazines shall be so designed as to be adaptable to reel or spool (optional) take-off and take-up and shall accommodate up to 1000-ft. reels.

LENS MOUNT (Basic):
A sturdy lens mount of sufficient size shall be provided to permit the use of all specified focal length lenses, with a speed of F1.6 (see “Standards of Lens Mount Diameters,” Page 13). Proper stability should be provided to eliminate movement and vibration and to keep the lens always in its proper focal position. The lens must accurately rack in and out along its horizontal optical axis and not revolve while focusing.
Kodak Lens Attachments versatile; Kalart's New Synchroscope; Curtis Color-Scout Camera; Kodakside Ready Mount;

Vry's new 16 mm Arc Lamp Sound Projector for large auditorium and theatrical use; Oberland Enlarger Series.

1 Kodak Lens Attachments

Kodak Combination Lens Attachments combine a series of uniformly threaded units, each fitting the others, and all fitting an Adapter Ring, which is screwed directly to the front of the camera. Each attachment unit is available separately. The Adapter Ring is the basic unit, and only one such ring is required to mount any combination of attachments on a lens. An Adapter Ring and one Filter Ringing Ring provide an ideal filter mounting. Filters can be interchanged readily, so the field of a metal cell mount for each is expanded. All of the more than 100 Watten Filters available cemented in “B” glass circles to these attachments.

With two Filter Retaining Rings, filters may be used in combination if desired. A Polareen may be used directly on the Adapter Ring, or in combination with filters. Two Polareen may be employed at will. A Kodak In Hood (aluminum) may be used with the laper Ring alone, or with a filter, a combination of filters, and a Pola-Screen. Adapter Rings are available (to 15 mm, mounts) from inch diameter to 2⅛ inches—a range which will take care of virtually any hand camera. Being with a single Adapter Ring and Filter Retaining Ring, the camera user can extend, up by step, a kit of unlimited versatility.

2. Kalart Synchroscope

The Kalart Synchroscope is a small device, electrically operated from the battery case of the Kalart Microscopic Speed Flash (for the redless Speed Flash) which gives a visual indication of the shutter timing in relation to the bulb peak intensity. This is accomplished by means of the use of a flash bulb, or other photographic material. A clear visual indication is then a mirror camera manufacture have been displaced by jigs and fixtures which have cut manufacturing costs to a minimum. The price of the combination is to be made available next month.

3. Curtis Color Scout

- Thomas S. Curtis Laboratories, Huntington Park, California, announce a new two-mirror, three-color camera, of near-miniature size, the Curtis Color-Scout, weighing but five pounds. With lens and one dozen loads of film total weight is but seven pounds and the size is comparable with a 2⅛ X 2½-inch camera. Constructed entirely of aluminum alloys, with the optical chassis formed from a single normalized casting of an alloy developed by the Aluminum Company of America expressly for use where complete permanence of size and shape is essential, the Color-Scout is the result of 17 years’ continuous research in direct color photography. The camera embodies every known and many completely new features for precision of registration, color balance, freedom from internal reflections and flare, maintenance of even illumination, and the attainment of ultra-speeds for shutter speeds over 1000. The camera is of simple construction and the lens is fully adjustable for focusing. The camera has been tested by jigs and fixtures which have cut manufacturing costs to a minimum. The price of the combination is to be made available next month.

4. Kodakside Ready-Mount Changer

An efficient, smooth-working magazine-feed device for the new Kodakside Projector, Model 2, known as the Kodakside Ready-Mount Changer, is intended for showing groups of Kodachrome still transparencies or black-and-white film positives in the new Kodakside Projector. In combination with the Model 2 Kodakside Projector, it provides an ideal projection means, with maximum convenience and smoothness of operation. The combination is ideally suited for schools, and for illustrated lectures before small groups, as well as for home projection. Once the supply magazine of the Ready-Mount Changer is charged with a group of slides, operator can show the complete sequence without once removing his eyes from the screen. Another advantage is that the operator may see comfortably at a moderate distance from the projector, and somewhat ahead of it, so that he is not disturbed by stray light or a stopped position. Up to fifty Ready-Mount slides may be placed in the supply magazine of the Kodakside Ready-Mount Changer at one time. Slides are arranged in the order in which they are to be projected, and then are set in the magazine as into position, and calling it out reads the upper right-hand corner. The slide-shifting mechanism is operated by a flexible 30-inch plunger, resembling a cable release of the type used on a camera, but larger. This plunger can be operated by the first fingers and thumb of one hand, leaving the other hand free for holding notes. Pressing in the plunger moves the slide in a slide into position, and calling it out reads it for the following slide. When all the slides of a group have been shown, they are found in the receiving magazine in the correct order as they were used in the supply magazine—so that no rearrangement is necessary for the next showing. Retail price of the Kodakside Ready-
Camera-Accessory Dealers

Camera Equipment, Inc. 1646 Broadway, N. Y. (Circle 6 5008)

Camera Supply Co. 1315 N. Cahuenga, Hollywood. (Glendale 2401)

Faxon Dean 4516 Sunset Blvd., Hollywood (Beverly Hills 1335)


Motion Picture Camera Sup. Co. 723 Seventh Avenue, N. Y. (Bryant 97254)

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Eastman Kodak Company Rochester, N. Y. Hollywood, 6706 S. Sta. Monica. (H emspt 3171)


Devery Corporation 11 Armitage Ave., Chicago.

Fried Camera Company 61545 Santa Monica Blvd., Hollywood. (Hollywood 7216)

Camera Rentals

Faxon Dean, Inc. 4516 Sunset Blvd., Hollywood. (MO. 1135)

Landers & Trissel, Inc. 6313 Sunset Blvd., Hollywood. (Hollywood 6333)

CHEMICAL ENGINEERING

ALLISON, D. K. 9008 Santa Monica Blvd., Beverly Hills. (Oxford 2581)

Film


Eastman Kodak Company Rochester, N. Y. J. E. Brulatour, Inc. 6706 Santa Monica Blvd., Hollywood. (Hollywood 1611)

Afega-Andco Corp. Binghampton, N. Y.

Afega Raw Film Corporation 6124 Santa Monica Blvd. (Hollywood 2918)

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Scheible, George H. 1927 W. 78th St., L. A. (Tolu 2102)

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Bardwell & McAlister 2102 Hollywood, Calif., Hollywood (Hollywood 6235)


Mole-Richardson, Inc. 11211 S. Santa Monica Blvd., Hollywood. (Hollywood 1427)

National Carbon Company Carbon Sales Div., Cleveland, Ohio.

Chemical Engineering

ALLISON, D.K. 9308 Santa Monica Blvd., Beverly Hills. (Oxford 2581)

CHEMICAL ENGINEERING

Manufacturing Machine Shops

Cardy Sound Appliance Co. 19270 S. Sagamore Rd., Cleveland, Ohio

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Beware of Lens Bargains

From the C. P. Goerz organization comes the following communication: “Several months ago we asked and received

26
SPECTACULAR ACTION of a wild horse chase by plane from Universal's "Road to Reno" is shown at left as the theatre audience sees the action and at right as the location camera crew views it, in stills by Sherman Clark, member of Local 659, IATSE.

by some unscrupulous individuals disposing of defective and counterfeit Goerz lenses.

"Although, to the casual observer, they resemble Goerz lenses of recent manufacture, because they have been remounted in modern cells and re-engraved with our trademarks Dogmar or Dogmar, we were able to identify some as of the old Series III, sold about forty years ago, while others were outright frauds, engraved with our identification legend by some crooked individuals. All were optically deficient because the lens elements were tampered with by an unskilled person. This lack of performance is what induced the unfortunate owner of the lens to send it to us for a checkup.

"To stop this nefarious practice, we now appeal again to those who may have their doubt about the genuineness of any second-hand Goerz lens they have lately acquired, to send their lens to us for a checkup or at least to send us a full report, stating type, size, engraving, individual number and where they bought the lens. We pledge our fullest cooperation to obtain restitution for them if we find that the lens has been mis-branded and sold under false pretenses."

PATENTS

By ROBERT W. FULWIDER


An optical system for recording sound, making use of a metallic vapor discharge lamp.


An optical system for simultaneously projecting three adjacent standard frames.


A stereoscopic screen having adjacent front and back plates of a transparent material with parallel lenticulations on their adjacent faces.


A sound track having several substantially identical sound tracks within the space normally allotted for a single sound track.

No. 2,150,543—MOVABLE MOTION PICTURE SCREEN AND APPARTEANCES THERETO. Vincent C. de
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Claud C. Carter, Sydney, Australia
D. Nagase & Co., Ltd., Osaka, Japan
Motion Picture Camera Supply Co., New York City
Fazalbhoy, Ltd., Bombay, India
H. Nassibian, Cairo, Egypt

Ybarrondo, assignor to Pathe, Inc., Los An-
geles, Calif. Application Jan. 21, 1936. 1
claims.
A mechanism for moving the projection screen
in synchronism with the film, and moving the
projector to follow the screen.

No. 2,150,691—COLOR REPRODUCTION. Leo-
pold, H. Mannes and Leopold Godowsky, Jr., as-
signors to Eastman Kodak Co. Application
March 20, 1937. 4 claims.
A method of producing subtractively
colored positive pictures which includes extending the
sensitivity of a layer of inadequate transmission.

No. 2,150,704—PHOTOREVERSAL PROCESS.
Joseph C. Ville, assignor to Eastman Kodak
Co. Application Sept. 3, 1937. 10 claims.
A method of making photographic positives from
negatives by removing the negative image and
then treating the film in nucleus-forming agent
and then developing it.

No. 2,151,301—STEREOSCOPIC PHOTOGRAPHY. Co-
percy and Ernest E. Draper, assignors to the
Perser Corp., New York, N. Y. Application
March 17, 1936. 11 claims.
An arrangement for exhibiting a picture as
a stereoscopic relief which has a lenticulate
screen and a parallax image registered with this
screen.

No. 2,151,735—COLORED PICTURE PROJECTOR.
Heinrich Bresser, Germany, assignor to Max
Bresser, Cologne-Mulheim, Germany. Applica-
2 claims.
A device for obtaining color pictures from color
less film by means of two rotating sets of
filters, one in front of and one in back of the
projection lens.

No. 2,151,742—CINEMATOGRAPHIC PROJECTION
APPARATUS. Paul Geres de Cazes, France, as-
signor to Pathé Cinema Anciens Établisse-
ments Pathé Frères, Paris, France. Application
Jan. 10, 1936. In France April 1, 1937. 7
claims.
A projector having a lamp house rotatable about
bearings, and a motor, located in the rotatable
portion, whose shaft acts as the previously men-
tioned bearings.

No. 2,151,822—FILM MARKING DEVICE. Arm-
stead C. Winchester, assignor to RKO Studios
Inc. Application Oct. 16, 1935. 6 claims.
A film marker for cameras in which one of the
marking members moves in a spiral path relative
to the other member to remove film punching
from the film path.

No. 2,151,899—PROCESS FOR THE PRODUCTION OF
COLORED PICTURE FILMS. Maurice Combes
Germany Sept. 25, 1934. 7 claims.
A process of producing colored films in which
the opposite sides of a positive are differently
dyed.

No. 2,152,221—FILM FOLDING DEVICE. Otto
Steiner, Germany, assignor to Siemens &
Halske Aktiengesellschaft, near Berlin, Ger-
many. Application Oct. 25, 1936. In Ger-
many Oct. 3, 1935. 4 claims.
An intermittent motion for different width film
comprising a bearing lever around which the
film passes.

No. 2,152,224—MULTIPLE IMAGE OPTICAL SYS-
TEM. Richard Thomas. Los Angeles, Calif.
Application June 30, 1936. 7 claims.
An optical system for four color additive pic-
tures making use of four sequential optical unit
arranged about a common axis parallel to the
optical axes of the units.

No. 2,152,369—FILM MAGAZINE. Lloyd E. Whit-
ter. Hollywood, Calif. assignor to Techni-
color Motion Picture Corp. Application Aug. 10, 1937. 8
claims.
A magazine for motion picture film having a
light trap which may be removed endwise from the
side without disassembling the unit.

No. 2,152,621—BASE FOR COLOR COPYING SCREEN.
Franz Piller, Munich, Germany. Application
May 29, 1936. In Germany June 4, 1935. 2
claims.
A color copying screen having a metal foil base
The outstanding Superiority of

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is something to talk about—and
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BETTER THINGS for BETTER LIVING through CHEMISTRY
From the exploitation still series for Paramount's "Geronimo!" in which Thundercloud (on cover) has the title role, come these striking views by Jack Koffman, stillman member of Local 669, IATSE. Also featured in the film, which Paul Sloane is directing, are Preston Foster, Ellen Drew, Andy Devine, Ralph Morgan, Gene Lockhart, William Henry, and Marjorie Gateson.
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WITH NATIONAL 'SUPREX' CARBONS

ECONOMICAL AND MODERN
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On the Cover

Effectively capturing the menace of Chief Thundercloud as "Geronimo," famous fighting hero of the Apache Indians of the Southwest, is this still photo of Jack Koffman, member of Local 659 IATSE, for publicity picture series on Paramount's production based on the tragic fight of native Indians against invasion of the white men.

Editor, Ed Gibbons; Managing Editor, Herbert Aller; Art Editor, John Corydon Hill; Business Manager, Helen Boyce.

International Photographer, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. International Photographer assumes no responsibility for the return of unsolicited manuscripts or material.

Subscription Rates: U.S.A., $2.50; Canada-foreign, $3.00 per year. Single Copy, 25 cents.

Office of Publication: 503 Taft Building, Hollywood, California
Telephone: Hillside 7221
Publication Date: 5th of Each Month

INTERNATIONAL PHOTOGRAPHER for June, 1939
THE speed of these two great films has widened the scope of photography by reducing lens apertures, increasing definition and photographic quality. At the same time it helps lower lighting costs, and extends your working day.

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DIRECT COLOR STILL METHODS COMPARED

By DON HOOPER

With many of our technician collaborators on our series exploring the motion picture color systems and the many pro and con arguments in that field, busy with the current studio production rush, we toss into the gap this month a provocative round-up of factual information on the color still situation, in which there is equally sharp disagreement as to just what is the most ideal system to use. While the last thing we would wish would be to see any of the boys on the out-of-work sheet, we are hoping they’ll find time within the next month to get together on further steps in our series on color.—Ed.

1—Using three separate films or plates, exposing one at a time, each through a filter in any adequately braced view camera.

2—Using the sliding back camera where three separate films or plates are exposed in rapid succession, with a filter on each shot.

3—Using an approved type one-shot camera. Here three color separation negatives are simultaneously made. The color filters are built in the apparatus.

4—Using 35 mm Kodachrome (this would be used only in cases where it was absolutely impossible to make the shot with any of the other three processes). The high emulsion speed of Kodachrome is its greatest virtue. (There are many hazards.)

NOTE: (Kodachrome is recommended by many so-called authorities for candid work. I think, in most cases, however, even when candid color shots are required, I would consider using the one-shot camera and staging the action. This staging can easily be done by any good illustrator, and gives the effect of having been made candidly. In this connection note later comment on cut-film Kodachrome in larger sizes made available last fall.—Ed. NOTE.)

This should indicate that I do not think it is conducive to best results to shoot a "still life" subject with a one-shot camera, or make shots employing the use of models with 35 mm Kodachrome, unless, of course, some very unusual circumstance prevails.

I seem for considering any of the screen plate processes such as Dufay, Finlay, etc., unless for some reason the other four above mentioned could not be obtained and in that case, Dufay would be the choice. These conclusions are based on the results of six months’ research in direct color photographic reproduction, which I did for the Western Lithograph Company of Los Angeles, California. Very exhaustive tests, experiments and analysis were made through cooperation with major motion picture studios and the Thomas S. Curtis Laboratorie in Huntington Park, California.

Assuming that the pictures have been recorded, I think these are the best methods to employ for reproduction:

1. That a Carbro print be made from the separation negatives of recording system 1, 2 or 3. Carbro positively gives the best photographic reproduction on paper from three-color separation negatives. However, I have seen some very splendid inhalion dye prints on the Coast, as well as in Chicago and Detroit. I believe that great possibilities lie in store for dye printing, and that when it can be accurately controlled, it will even surpass Carbro. It most certainly is easier for the engraver and lithographer to separate, which saves on retouching.

2. That if there are no corrections necessary, and the Carbro print submitted is ok, then the original separations should be used for reproduction and the Carbro retained only as a color guide. (No separation negatives ever made from any Carbro could ever hope to be as accurate or contain as many tonal gradations as the original separation negatives from which a Carbro print is made.)

3. That if retouching, airbrushing, stripping in or any altering whatsoever is necessary, it be done on the Carbro to the client’s satisfaction and then the Carbro be used both to make separations for reproduction, and as a color guide.

4. If 35 mm Kodachrome is the recording medium, I think the best results are obtained if and when the engraver has suitable lens equipment for making screen negatives to any size direct from the Kodachrome transparency in his regular screen camera. In the case of lithographers who are using Kodachrome, I think they should use a separator such as the Curtis Type 2 Kodachrome Reproducer for making their separations from the Kodachrome transparency, and then make their screen positives on glass in the regular screen camera. This reproducer has the faculty of getting more tonal gradations from a Kodachrome transparency than any other known method. It is not recommended for engravers because it means two additional steps and the loss incurred here will be greater than that which occurs in the direct method as indicated above.

I believe the only reason engravers and lithographers advocate 35 mm Kodachrome as a medium in direct color photography, is because it means added business for them. I am sure they would advocate any other new process that was so universally popular and would try, by some manner or another, to turn out good reproductions from it. As Eastman Kodak Company ad-

Only International Professional Journal of Motion Picture Arts & Crafts

PHOTOGRAPHER

International Photographer for June, 1939
units 35 mm "Kodachrome was made primarily for the amateur," and it should have very little function outside of that field.

With the possibility in the near future of being able to get Professional Kodachrome in cut film size, these facts may be somewhat altered. The processing hazards, however, will still exist. The tremendous latitude Kodachrome cut film has in recording both color and detail in extremely hot highlights, as well as in deep shade, is not only encouraging but amazing. This larger size Kodachrome will also help in recording fine detail. About fidelity of color in an effort to obtain facsimile, I don't know. However, I wish to state that exhaustive tests at which I was present, were made exposing both type A and Regular 35 mm Kodachrome to a standard color chart. It was here definitely proved that both deep and pastel colors could not accurately be recorded at the same time on the same film. With good processing obtaining, the pastel colors could be recorded at the expense of the deep colors, or vice versa. What would be considered a normal exposure would give slight falsification to all the colors. Slight over-exposure would favor facsimile recording of the pastel colors, and slight under-exposure would give a truer rendition of the deep colors.

I believe the greatest possibility for 35 mm Kodachrome for professional use is in the motion picture field, and that its success there will not be achieved until a system of negative-positive processing is instituted. The reversal system should only be considered as an amateur use, where only one print is desired. (Please see my article in Sept. 1937, International Photographer on "Negative-Positive Color").

One new process booming up as a photographic possibility for direct color photography that can be controlled by the photographic artist is the Agfacolor process which results in a positive transparency containing a pure dye image similar to Kodachrome.

Processing, however, it is expected, will be possible to anyone familiar with the standard reversal development routine. The dye is contained in the emulsion, and is brought out by a special coupling agent which is contained in the second developer. This same emulsion Agfa uses for their new film can also be coated on paper. Should they adopt a negative-positive system in place of the reversal system, color prints on paper would be a cinch for almost anyone to make and should soon become quite commonplace.

From all this, you are no doubt aware that I think 35 mm Kodachrome is not as yet the proper medium to use for automobile illustrations. I hope that what I have written here is comprehensible, and will be of assistance to you in collaborating with client, photographer, engraver or lithographer, when endeavoring to determine what method to use for the job at hand.

This concludes the report text. The following data has since been obtained.

At the time of writing this letter to Mr. Potter, we had just received back from Eastman Kodak Company some 4x5 inch experimental Type B Kodachrome which I had shot for Mr. Woll on Oldsmobile. This together with what was already in possession of General Motors' photographic research laboratories, headed by Mr. Philip Felner, was as referred above most encouraging. Five million postcards were successfully lithographed by Mr. Filners' department from this 4x5 inch Oldsmobile shot.

Since then what has taken place is history with which most of our readers are well acquainted. It might be well, however, to relegate the new Professional Kodachrome to its proper place as a recording medium, and also, to set forth the considerations that it should be given in reproduction.

Because of the fact that even negatives made through or reflected from the mirrors of a one-shot camera are more correct from the standpoint of color separation, and better also, as far as familiar gradations are concerned, than the separation negatives made from Professional Kodachrome, I would place this new triple-emulsion in fourth position on the desirable list.

It is no faster than the average commercially accepted one-shot cameras, if it offers processing hazards beyond control of the photographer, and as far as we here on the Coast are concerned, requires a week for processing, even when sent airmail, special delivery both ways. It does possess the virtues of enabling the photographer to utilize full front and rear horizontal and vertical swing facilities, together with the advantage of employing micro-teoar lens (for macro-photography), wide angle lenses, and even "beer-bottle lenses."

As far as Direct Color Photographic Recording is concerned, all four methods are commercially practical, but where paramount accuracy is desired, method No. 1 should always be employed until the nature of the subject matter exceeds its limitations. The No. 2 should be resorted to, etc.

When considering the Professional Kodachrome from the standpoint of reproduction, I would recommend the same general procedure as was suggested for the 35 mm material, with the exception of course in the case of lithographers where a larger separator is necessitated.

If any of you readers wish further elucidation or feel that your toes have been unjustly stepped on, you are invited to write this author in care of the International Photographer.

These beautiful effect shots with Iris filters described in accompanying story by Geo. Scheibe, Hollywood filter expert.

**IRIS FILTERS**

By GEORGE SCHEIBE

IRIS, known as also Vignettes for close-ups and inserts, are coming back into use again after a number of years. They were very much in use in the early days of pictures and were ably-handled in many ways to point up certain action. Cameramen and directors, who were looking for a new twist in technique that can be very effective on many occasions, can well look for the old adage, "There's nothing new under the sun," and go back to the Iris filter to interesting results.

As illustrated, there are two main types, graduated Iris, which darkens the outer part of the picture, and the White Iris, which will make the outer part of the picture white or very light. Varying size Iris are made to suit any picture. They can be round, oval or in special designs.

The White Iris has a tendency to produce stereo-scopic effects, and when the subject is the main one you want to deal with you can use it.

For motion picture work, many subjects are so effective inserts both from the story action and dramatic effect viewpoint. In almost every instance, they can be given even greater value by the proper use of an Iris filter. Close-up can benefit from the same technique and imaginative study of scenes and situations will dispel numberless possibilities for these once very popular effect filters.

In still photography, Iris have, of course, always been used for certain types of portraiture. However, it is surprising the number of photographers who spend time fooling with positive and negatives to get effects that could just as easily be accomplished by slipping an Iris filter in front of the lens.

Whether for still or motion picture scene, however, a safe basic rule to remember is that when you want to get an effective shot you will strongly emphasize one particular part of the subject, such as the beautiful yucca, the cascading waterfall in the accompanying illustrations, try an Iris filter when other tricks fail to accomplish best results.

We want to again remind readers of International Photographer that any discussion questions on filters and their use will be welcome on this field on which you want suggestions advice, don't hesitate to write us.
PROJECTION SYMPOSIUM, PART VII.

Complete lowdown on scrupulous technical care exercised in developing test reels for theatre use in Academy Research Council’s campaign for standardizing theatre sound equipment characteristics, by ARC committee chairman.

By JOHN HILLIARD
MGM Studio Sound Department

New Bulletin Available

Technicians, and particularly projectionists interested in the work of the Academy Research Council in striving to improve the standards of theatre sound reproduction, will be interested in a new Technical Bulletin just issued by the Council, which presents in handy form the full details and costs of the various test reels now available for adjusting and maintaining theatre sound-reproducing equipment to quality standards. Work of the Council in developing these reels is thoroughly described in the accompanying article. If you haven’t already received your copy of the Bulletin communicate with Gordon S. Mitchell, manager of the Council, at 1217 Taft Building, Hollywood, or if you prefer, International Photographer will be glad to forward your correspondence.

The Council and Committee have always felt that electrical and acoustical curves furnish valuable means of setting equipment, but that the final criteria should be listening test of equipment. For this reason all of our standards to date have been set up on the basis of listening tests correlated with engineering data.

One of the purposes of the Standard Electrical Characteristic is to provide basis for an eventual standard recording characteristic. We believe that new Theatre Sound Test Reel demonstrates fact that recording characteristics of various studios are very much closer together than they were a year or two ago.

Material contained in the reel is not a sample of the best recording available, but is typical of average.

Committee also realizes that it is necessary to keep samples of recording from various studios in the reel up-to-date and for this reason a procedure has been set up whereby individual studios will, from time to time, submit new samples for inclusion in the Theatre Sound Test Reel of approximately same length as sample already included in the reel. All users of Theatre Sound Test Reels will be notified of these substitute samples as they are available, and will be given the opportunity of purchasing individual new samples to be spliced into their print. By rotating and spacing this “substitution of sample” procedure, prints of the reel will be kept up-to-date at minimum of cost to users, and new samples will replace deteriorated prints.

This will furnish an inexpensive means of replacing reel as well as keeping it representative of up-to-date recording.

In Committee’s work in setting up Standard Electrical Characteristics, need for a good Standard Multi-Frequency Reel was very evident as this type of reel provides only tool to evaluate listening tests in terms of Electrical Characteristics.

Previously, two general types of Frequency Reels had been in use. One of these was a toe-recording sensitive in the toe-frequency area, and had been eliminated to obtain steadiness of level in each frequency, a good frequency response, and freedom from printer trouble. This method proved quite satisfactory from a technical standpoint, but negative was costly to make and its life in field was short in comparison to life of a print.

The other was prints of either variable density of variable area recording. Prints of Frequency Reels were subject to several sources of variation, some of which follow:

1. Wave trouble in recording and reproducing.
2. Bad flutter content in both high and low frequencies.
3. Variation in printer-slipage which cause non-uniform high frequency response.
4. Non-uniformity of emulsion during drying process and manufacture, causing periodical changes in density and gamma which in turn create a variation in output of as much as 1 db.

In considering this matter, Committee found (in opinion of users of this type reel) that some of available reels contained too few frequencies, while others contained too many frequencies— in one case, the frequency reels not having a...
New Edition of Westerberg Tables

In answer to hundreds of inquiries, *International Photographer* is pleased to announce that a second edition of the popular Cinematographer’s Book of Tables by Fred Westerberg, member of Local 659, IATSE, and Contributing Editor of *International Photographer*, is now in preparation for early publication. Mr. Westerberg is now engaged in the task of bringing his material up to date and adding a number of important new tables, and it is hoped that the new volume will be on the press as early as possible.

In announcing the new edition, the editors of *International Photographer* would like to point out that due to the specifically limited field of users for such a handbook, we are unable to gamble on possible sales and therefore must restrict the print order to 2,000 copies. This is positively the total number that will be available. Consequently, in order to accommodate the large quantity of prints calibrated by a relatively simple, yet accurate, method.

In preparation of Variable Density Reel first problem encountered was non-uniformity of emission produced by a given density in the printing process. This non-uniformity appeared as a periodic fluctuation in gamma along the length of film, which in turn created variation in output by an amount equal to the negative. This fluctuation, while difficult to detect with a densitometer, appears as periodic fluctuation in graphs obtained from a continuous-level recorder.

These recording volume indicator graphs clearly indicate the periodic variation in output.

There is exceptionally constant output of print from new continuously dried stock. There are no periodic fluctuations and average level is maintained within a range of 0.2 per db.

It might be pointed out that when usual recording methods are employed, fluctuation in conventional type stock may amount to as much as 3% db. When the fluctuation in the original and the rerecorded negatives fall in phase.

By using this type stock for all frequency reels, periodic fluctuations in print arising from stock marks in film drying process have been eliminated completely.

Next question was method of calibration. After the frequency reel negative had been made several prints were struck off and run on continuous-level recorder tape, as well as a VI meter, were carefully watched for variations in output level in each frequency. From this group of prints the one with the best level response was selected as a calibrating print. This print was then projected on the screen and inspected for scratches, oil, dirt, or any irregularity of the track which might affect output. No such irregularities were indicated, this particular print was then calibrated on a recording microdensitometer.

This instrument has as its function production of a continuous detailed record of transmission (where density equals the log of 1 over the transmission) of sound track. That is, transmission of each small section of track is measured and recorded on film. Transmission of film is defined as ratio of the light transmitted by film to the light incident to film.

Means are provided for slowly scanning film at a constant velocity so that continuous record is produced.

Light from a very steady source is focused upon sound track in a fine line by an objective slit system. Transmitted light is collected by a phototube, which is then amplified and measured. Because of difficulty involved in the amplification of direct current a 500 cycle chopper is introduced into the optical system so that the transmitted current at a frequency much greater than any to be encountered in density variations of the film, traveling at scanning speed used in the instrument. The carrier is amplified, the output being a direct current, which is proportional to transmission of the sample, acts as an oscillograph.

Since output is controlled by the transmission of sound track under study, and since recording of data is made in terms of those which the VI shows to be the most constant level, and average of the modulation on the microdensitometer record is used as a basis for calculating electrical level of that frequency.

Inasmuch as a microdensitometer sees very small changes in the output of film, it is necessary to take a great number of measurements in order to arrive at a true average.

Another method which we have found useful is to rapidly wind the film over the screen and thus averaging the modulation on the micro densitometer record.

This level can then be rated on an abacus basis without regard to a reproducing size. The level of a film 100 per cent modulated is a peak transmission of 100 per cent and as a reference level, that is ΔT, change in transmission is 100 per cent.

The densiometric level is then equal to

\[ K \Delta T \]

where \( \Delta T \) is the change in transmission or a cycle in the test track.

In order to use this film to determine its particular in reproducing systems in terms of this film, its electrical level is supplied with each print. This level is obtained by the same method as to determine the electrical film level of the ER ED-20 test film. For this reason, a cross calibration between any ED-20 film and our Standard Multi-Frequency Test Reels can be easily obtained by noting the difference in levels.

This electrical film level is expressed in terms of the level produced by this film with respect to 6 millivolts input, which is supplied in the form of a chart with each microphotocell pick-up system. In case of ED reel this system was an average 3A cell a 10 megohm internal impedance working into 10 megohm. This electrical pick-up is supplied by an average 8½ volt, 4-ampere exciter at operated at 3.7 volts through a lens system having an optical transmission equal to the ER K5-670 lens tube, assembled, corrected for a slit width.

Set-up described above experimentally yields a level of 37.5 db less than densitometric level, as obtained from formula given above.

Hence electrical film level in terms of change in transmission is equal to

\[ 40 + 20 \log \Delta T = 37.5 \text{ db} = -77.8 + 20 \log \Delta T \]

All frequencies are rated in terms of 10 cycle level and the "deviation from 1000 cycle level" for each of other frequencies. This is to say that all signs of values reversed, are given as
Correction factors for testing. Corrections are used to correct for variations from the ideal conditions. For example, if a test film has an output level of 1000 cycles per second, it is necessary to add 3 dB to the output level to compensate for this loss. Correction factors for all of our Multi-Frequency Reels are made in one piece. Thus, it is necessary for each frequency in the reel to be compensated when tests are made. Tests on several types of printers were made for variation in level, flutter, and frequency response. It was found that a printer giving the best test on one of these factors did not necessarily give the best test on the others, and for this reason a printer giving the best level response with a minimum of flutter was chosen.

Test prints made on the non-slip printer indicated that the level response was considerably improved on the first and last frequencies on the reel by using long head and tail leaders. It was also found that a slightly increased pressure between print and negative appreciably improved level response. It is possible to do this when printing sound-track only, and at the present time all our prints are made in this manner.

In calibrating prints, reproducing equipment must necessarily be carefully checked for overload, scanning, focusing, bump, and voltage regulation, and in addition each print must be checked for track placement.

After the above problems had been solved, a Variable Area and Variable Density Standard Print was sent to each studio participating in the testing program. These prints were carefully checked in each studio and compared to the test reels already in use, and it was found that these Research Council Standard Multi-Frequency Reels agreed with those already in use and that most deviations which were present could be traced to deficiencies in the other reels.

Figures 1, 2, and 3 show the level response of our Variable Density and Variable Area calibrating reels. Figure 1 shows the response of the first 1000 cycle tone on these reels from which it should be noted that the variation is a maximum of less than 2/10 of 1 db.

Figure 2 shows the response of several frequencies of a variable area reel and it should again be noted that variation is very small. However, gain at these high frequencies has been increased and frequency of reel is not of this order. This particular figure has been prepared in this way for purpose of showing level response at these high frequencies at a point on the graph where the scale is large.

Figure 3 illustrates level response on density calibrating reel, with the particular frequencies illustrated shown on graph. Vertical scale shows amount of variation in level response.

Figure 4 shows Electrical Characteristic of our Test Reel calibrating reproducing system. Full line is characteristic as given by Primary Variable Area Multi-Frequency Reel Calibrating Print and broken line is characteristic as given by Primary Variable Density Multi-Frequency Calibrating Print.

Maximum deviation between the two prints appears between 150 and 300 cycles and is a maximum of 0.6 of 1 db at this point.

Our experience in checking all types of different test reels indicates that this agreement is well within present practice in the measurement of electrical characteristics of reproducing equipment.
“MAN IN THE IRON MASK”

LATEST swash-buckling historical drama from the production unit of Edward Small for United Artists release is “The Man in the Iron Mask,” based on Alexander Dumas’ popular sequel to “The Three Musketeers.” Both these adventure classics were made as starring vehicles by Douglas Fairbanks. Small’s new treatment takes emphasis away from D’Artagnan, played by Warren William in the new version, and builds the story around Louis Howard, as the “Man in the Iron Mask,” and Joan Bennett as the beautiful Marie Therese. These striking stills, photographed by William Wallace, stillman member of Local 659, IATSE, for the exploitation series on the production, hit the dramatic and pictorial highlights of the lavish production from the open
In the scenes where the Musketeers and their young protege, who is unknown to them, is the twin brother of the King of France, resist the King's tax collectors, with their resultant arrest, the intriguing minister's recognition of the youth, which sets the plot and counter-plot of the familiar classic yarn on to its romantic max. Because of present rumors and reports about the use doubles by prominent actors in Europe's current game of power politics, the Small production takes on unusual topical significance. Note the forceful way in which the iron mask itself, around which the story revolves, is dramatically treated, as indicated by these stills pictures.

INTERNATIONAL PHOTOGRAPHER for June, 1939

STILLS BY WILLIAM WALLACE
EQUIPMENT WAR

Current price cuts now being announced by the major sound equipment manufacturers along with a renewal of legal actions over various disputed points regarding patent powers, are seen by some trade insiders as presaging a new period of conflict in this field. It is no secret that sales of theatre equipment installations are not running up to expectations, in view of the crying need for modernization of much equipment throughout the country.

One reported reason for slowness of theatre operators to respond to obvious needs for modernization is the patent situation. Many important patents involving sound are nearing early expiration dates (within the next few years) and theatre operators are reported waiting the more favorable prospect of wide open competition in the field.

A number of the smaller equipment organizations are busy laying the groundwork for future expansion plans. Although many contacts are being made and much underground experimentation going on, it is difficult to get any open information on future plans from executives of any of the companies.

Meanwhile, a price war already is under way with RCA and International Projector already announcing reductions, with the expectation that other organizations will join in line to meet the competition.

Whatever trend the situation takes it should provide a considerable amount of interesting news for projectionists, since the ammunitions of such economic warfare is usually a combination of price reductions and drastic improvements in equipment and service.

SUPER STUDIO

For the first time in the history of the industry any and all craftsmen with progressive ideas in studio design and equipment will have their viewpoint considered in the creation of a modern motion picture studio. Suggestions of all kinds will be welcomed by Paramount, states T. Keith Glennan, for their proposed new $20,000,000 studio.

We think it is a swell opportunity for bringing to the fore the latest and best ideas for a modern super-efficient motion picture studio operation, and we believe that Paramount is flooded with worthwhile tips from studio technicians. Such a cooperative spirit deserves the proper publicity and it is our intention to present in International Photographer noteworthy aspects of this progressive shift by a major company.

George M. Haines, member of Local 37, IATSE, and a contributing editor of International Photographer, who is now busy in presenting outstanding grip equipment of the various lots in laying the groundwork for his Studio Mechanic’s Handbook, will handle this news.

Haines has been appointed by Glennan and Clarence Slater, head of the Paramount grip department, to the committee on grip equipment, which includes Slater as chairman, Jack Humphreys, A. J. Carpenter, Andy Durkin, Lonnie Aton and Walter McLeod. Other committees and their chairmen are: Office and Dressing Rooms: A. B. Hilton; Stage: Frank Caffey; Utilities: Jack Humphreys; Safety, Insurance and Fire Protection: Bixby Smith; Material Handling and Stockroom: M. A. Alexander. Other committees will be announced later.

Any communications to Paramount or to International Photographer should be typed and signed to assure proper credit being given.
EXECUTIVE BOARD of International Photogra-
fiche, Local 659, seems to consist of a number of very tech-
ical gentlemen with almost identical problems and theories. They came to Los
Angeles high schools, went to a western uni-
versity, were around the studios as youngsters,
and acquired a name for keeping, through one or another "breaks,"
and the ropes in the lab, and graduated
professional motion picture photography by a slow process of improvement, study, hard
work and gradual promotion. Not a very light-
weight student cameraman.

The newest CLOSE-UPS subject has a record
similar to Guy Bennett, who was an opera-
tor-cameraman who was X-rayed in the May issue. This
is less than coincidental, since Bennett
Worth has been working as a team for years now with first cameraman Ted Spar-
keln at Paramount. Sparkeln photographed
Lubitsch pictures in Germany and was
sent to this country by the man with the
right idea. Like many another director of pho-
tography he acquired a favorite crew, of which
Worth and Worth are the kingspins. Serious
trained cameramen, they work smoothly with
Sparkeln, who makes photography a hobby as
a profession.

As Bennett, the operatic cameraman, has
momentously vital job in keeping action well
in the proper channels. Without a similar
assignment, one to which any assistant
brought step-bys and rapid-fire judging
is required to keep the picture in focus,
so simply described job is one that Worth
other assistant cameramen consider
most important creative contribution of their
work to photographic technique. For
them, the problem of focus goes beyond any
mental and manipulative skill into the field of
modern technique of direction, lighting,
and editing imposes strains upon the tech-
cnician and all limitations of lenses, emulsions and labor-
atory processing that would frequent,
in most cases, the assistant stand as
ator of practical compromises between the
needs of dramatic action and the limitations
he camera. In an hour of interesting
discussion with Worth I learned more about some
of the basic problems of motion picture pro-
duction than I have learned in years of talk
with directors, executives, writers, critics, and
experts about the theories of production.

Any of the opined and dogmatic so-
cial creative element of the production ma-
type, could well profit from similar discussion.
questioning of the scores of intelligent and
mature technicians who do their jobs with
such a skill. In this connection the director
is not far from criticism. With a suc-
ful modern director on the set and you will
not certainly find that he depends greatly
on the actions of his cameraman and
stant in devising his action.

simple illustration from many cited by
Worth will explain why. Suppose two charac-
ters are 20 feet apart in a room.
amera is shooting in from a window. One-
character is looking out the window. The
other sits, reading, more than twenty feet away.
The cameraman has a job to shoot from one, scene, and il-
ly tells an important line of dialogue.

most immediately the other character replies with
an equally important line. Supposing that the
positions were absolutely imperative to the
action, if the medium shot photo subject is a
focus, either the first or second speaker would be a
blur. His dialogue would be coming from the
vague person whose action reacting might not even
be visible or audible.

Working from a script, and also incorporating
his own ideas with the ability and personality of
the actors, the director constantly is called
upon to solve such problems in order to achieve
new and effective handling of scenes. The
problem cited above and many similar are solved
by having the first actor properly focused for
his line, which is followed by a split second turn
or cut during which time the director
must switch the focus to the second character by
the time he is ready to answer. Such trickery
is accomplished in scores of scenes without the
audience's knowledge. It is a true
art, acting with perfect precision and
upon carefully pre-arranged plan based on ac-
curate computation, has preserved the photo-
graphy effective and unobtrusive.

In addition to this creative contribution, the
assistant has many other responsibilities. He
receives the film from the loader and handles
the machine, camera and equipment, an
all technical angles in their manipulation, plus
much figuring, particularly on many scenes where
a compromise between two desirable focus points
must be made. Also, his job includes making
a work-up of all accessories so that they always are imme-
diately available, development of hand tests on
the set, proper marking of exposed magazines,
movement of cameras and equipment, both on
the set and on location, making out reports of
great importance in the complicated history of
film from loading room to preview print, handling of
the scene number dates, minor repairs and
cleaning of the equipment as well as follow-ups
on machine shop work all are part of the as-

Lothrop Worth: typical assistant cameraman.

Worth went to work on the old Pathe lot in
Culver City, then known as the DeMille studios,
during the time when "C. B." was making the
famed "King of Kings," and he stayed with
the company, working up gradually to loading
and finally to assisting, when the DeMille company
 disbanded after the production of "The Godless
Girl" in 1929.

The then new sound intrigued Worth and he
entered this field, a decision he now regrets, for
in the time spent following the will-o'-the-wisp of
a branch of the business he eventually decided
he did not prefer, there were many changes taking
place in camera technique. When he finally de-
cided to return to photography, he found it a
long hard pull to reorient himself. The happy
olden days were over and awesome "H. and D." carves and all the other complications
that sound brought had tightened things up
greatly.

His determination to stick to his favored pro-
fection is proved by the fact that he turned down
a major assignment with Edmund Goulding
with whom he had worked at Pathé on "The
Trespasser," who had come over to Paramount
to direct one of his own stories, on the day that
Worth decided to re-enter a picture
in a minor assignment at much less salary than
Goulding suggested.

Since that time, Paramount has been his home
lot, where now his first employer, C. B. DeMille,
is an ace producer-director. Since teaming up
with Bennett in Sparkeln's crew he has earned
recognition by merit and hard work as an out-
standingly able assistant cameraman. An early
member of Local 659, he was elected to the exe-
cutive board last fall.

An accomplished craftsman through long and
hard work, Worth has a special interest in
photography in his particular branch of photography, in that
he is quick to point out that any abilities or
special skill he may be credited with is just part of what he
all assistants consider "doing the job well." Long experience in working together
has given the assistant cameramen a truly ac-
curate estimate of each other's abilities.
Personality, excluded, they reflect less professional
jealousy than almost any group of skilled crafts-
men or creators in this highly competitive indus-
try. They'll all give the other fellow credit for
producing if he has "it on the ball."

This is a realistic viewpoint toward personal
relations—which play so much more vital a part in
motion picture production than is realized
—combined with their confident mastery of a be-
wildering array of lenses and other camera
accessories, that makes the assistant such an im-
portant pivotman in the production team. Men
like Worth have all as good as consider "doing the
work well." Long experience in working together
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portant pivotman in the production team. Men
From high in the Hollywood hills, Art Marion, Local 659, IATSE, made these striking shots of Los Angeles and Hollywood Dam.
SOMETIMES THEY MUST STAND STILL!

IDE excursion into argument over stillman's problems and functions presents little-known information on photographic duties of studio still cameramen outside their commonly accepted role as recorders of exploitation shots.

By ART MARION

NOW that the trade press and Hollywood correspondents are waking up to the problems besetting the studio stillman as a result of the excellently blasting job done on the situation by Jim LeRoy Johnston and Jimmy Doolittle in recent issues of International Photographer, maybe there are some other angles of the stillman's daily routine that might prove interesting or discussion.

John and Jimmy certainly did a fine job of stating the importance to all concerned in movie production of the still pictures made for publicity and exploitation purposes. The best nature of their attack was the good humor with which they cracked the verbal shillabalaggan various heads. I think most serious and constructive minded still photographers will agree with me that if the pair have really awakened one of our industry leading lights to the need of giving the stillman some cooperation, we don't mind the instances where the boys nudged us a bit sharply—in fact, we appreciate that too.

However, one thing that is frequently overlooked is that the photographic of exploitation and publicity shots is only one phase of the average studio stillman's routine. He has many other assignments. Peculiarly enough, it is on these that he usually gets plenty of cooperation. "they sometimes must stand still"—for these assignments would result in worthless negatives if cooperation weren't forthcoming.

Consider the many angles of actual production and behind the scenes activity where the still camera is invaluable. The still photographer must be able to handle many types of inserts for actual production: telegrams, photographs, copies of paintings, documents, reduction of portraits to miniatures, etc. Frequently it is advisable to "cheat" a copy in one of a number of ways so that the photograph will reproduce more effectively on the screen than if the original had been recorded by the motion picture camera.

In this connection, there has been an increasing trend toward use of the stillman as a protection factor in making stereoptican "plates" for rear projection. Needle-sharp negatives of key scenes from a location trip may well save an important situation that didn't click in the location shooting but can be re-taken in Hollywood with the background projector.

Such photography requires considerable more mastery of the medium than the mere bullpressing attributed as the stillman's sole worry by many uninformed persons both inside and outside the studios. The accompanying illustrations would hardly be submitted to an editor as hot news subjects. Attention to composition and holding the scene from the Hollywood hills above the Hollywood dam across the plain of Los Angeles to the hills that fringe Inglewood...
NEW SHIFT MODERNIZES B & H CAMERA

Roy Vaughan of Art Reeves’ Hollywood Camera Supply Company redesigns Bell & Howell camera to overcome cumbersome focusing method: no increase in weight, number of new convenient features; versatile job for hi-pack color.

The Bell & Howell studio camera was without doubt one of the most successful motion picture cameras ever made. The original design was created some 29 years ago, yet for durability and accurate registration the Bell & Howell movement is still considered unsurpassed. Throughout the world many of these cameras are still in daily use, making process background shots, serving as optical printers, and on commercial and studio production. Virtually the only important criticism ever levelled at this camera was that, in comparison to more recent designs, its method of focusing was cumbersome.

This shortcoming has been eliminated by a new sliding focusing shift development by Roy Vaughan of Art Reeves’ Camera Supply Company, of Hollywood. Without altering the essential mechanism of the Bell & Howell camera-head (Fig. 1), this device provides the user of a Bell & Howell with a modern, quick action-shift for visual focusing. It may be fitted to any standard Bell & Howell camera.

In applying this shift, the original ground glass focusing screen is removed to a tube fitted to the original camera door. The camera box is then moved to the right, carrying the original Bell & Howell four-lens turret.

The camera-box slides from focusing to shooting position along three dovetail rails of half-inch thickness. A new base-plate is fitted below the camera-box, and a completely new, L-shaped assembly including a sub-base and an upright front-plate replaces the original Bell & Howell four-lens turret.

Operation of the shift is controlled by a lever which protrudes from the rear of the camera and slides into the sub-base. A system of levers and linkages move a forked member to engage and disengage the original camera-box (see Fig. 7). Constructed of spring steel, it automatically snaps upward into locking slots which rigidly lock the head in correct alignment for focusing or shooting, as the case may be; shifting requires that the lever be depressed to clear these locks.

The focusing magnifier is incorporated in a tube cast integrally with the new door to the camera-box. Following conventional practice, it has an aperture fitted with a ground glass focusing screen mounted precisely in the focal plane.

At the upper side is the ocular of the magnifying system, which re-inverts the image so that it is right-side up and correct as to left and right. The optics of the magnifying system are of special design and construction, covering the full aperture exceedingly, and affording a five-power magnification.

This setup, according to designer Vaughan, represents the most satisfactory combination between the low-power and high-power magnifications conventionally employed, and eliminates the confusion which so frequently occurs when the cameraman wishes to use the high-power magnifier. In this way, a view of the full field, for critical focusing, while the director wishes to check the action through the camera, necessarily demanding a change to low-power magnification in order to see the full field of the shot. In the interests of compactness, the ocular or eyepiece of the magnifying focusing system can be telescoped when not in use. The bellows are then retracted, giving a view in the same angle as the camera-lens, as in Figs. 5 and 6, so that the focusing system may then be used as a matched finder, the image in which is right-side up and laterally correct.

Finder mates may be used to coordinate this field with that of lenses of any focal length, or auxiliary finders may be used. In the latter case the bell aperture of the ground glass is always used, giving a proportionately larger image than in cases where mattes are employed.

Where a conventional type of finder is preferred (Figs. 1, 2 and 3), the regular finder-mounted keyway from the original door of the camera is removed and replaced on the end of the block capping the magnifying system. The conventional finder may then be mounted in this keyway, though of course finder parallax is increased.

As the front of the original turret remains unchanged, the original Bell & Howell lens mounts may be retained, though recalibration is necessary, or studio-type follow-focus mounts may be substituted. In either event, lenses of any focal length from 1' to 700' may be used, the turret cannot be rotated while the lenses are screwed for clear the opening in the front-board.

In putting down these notes, so many ramifications of the subject came up, that Herb Allen and Ed Gibbons decided to draft the old war horse for a series of articles explaining the subject in detail. For technical details of this type of work, which so frequently must be done without any great array of equipment, should prove interesting and informative to many readers of International Photographer. However, we don't believe this should be a one man job, so with another salute to John and Jimmy, we're hereby asking that any member of Local 669 with interesting angles to contribute to this discussion, please communicate with us through the International Photographer office.

In this position, the magnifying system is protected by a rectangular extension of the new and original short camera-box. This cover may be fitted to averted to save a minimum of one-third the space occupied by the old design. This will be in effect a small camera, yet one million dollars a year, merely inventing buildings for the lot—every three months.

Before any studio stillman nose into a scene to plead with somebody to "hold it for a sign" the still camera has clicked off hundreds of negatives that have played their part in contributing to the scene that he will snap, for many ramifications of the subject came up, that Herb Allen and Ed Gibbons decided to draft the old war horse for a series of articles explaining the subject in detail. For technical details of this type of work, which so frequently must be done without any great array of equipment, should prove interesting and informative to many readers of International Photographer. However, we don't believe this should be a one man job, so with another salute to John and Jimmy, we're hereby asking that any member of Local 669 with interesting angles to contribute to this discussion, please communicate with us through the International Photographer office.

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TRIPLE SUCCESS

THREE good reasons why Eastman's three new films enjoy continued success:
The outstanding special features they bring to their particular jobs....The unsurpassed photographic quality they impart to every scene....The priceless assurance of reliability they give to the whole motion picture industry. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN

PLUS-X
for general studio use

SUPER-XX
for all difficult shots

BACKGROUND-X
for backgrounds and general exterior work
including the standard pilot-pin movement, the "high-speed" check-pawl movement, or any type of silenced movement may be used. It may be remarked that in making this conversion Vaughan points out that wherever possible the original parts of the camera are retained, not only in the interests of economy, but also because of the exceptionally high quality of materials and workmanship used in the original construction of the camera.

Adapting the Bell & Howell camera to this type of sliding focusing shift makes it necessary to use a flat-topped tripodhead in place of the original Bell & Howell dovetailed key-and-slot head. This is done very simply by replacing the original head of the Bell & Howell friction-head with a flat-topped casting which is bolted rigidly in place.

The lever-operated shift used in the Camera Supply Company conversion, Vaughan states, has been found particularly convenient when the cameras are used in soundproof bags or "bar- neys," as there is nothing in the shifting mechanism to become tangled with the fabric, and the head locks automatically into either focusing or photograpbing positions, so that the shift can be accomplished easily by touch alone.

To date, this conversion has been applied to several of the Bell & Howell cameras used in the Camera Supply Company's rental service. So popular has it proved that the remainder of the Bell & Howells in this rental service are being converted. In addition, sufficient parts are being processed to permit the conversion of individually-owned cameras at a reasonable price.

It is expected that the conversion will find favor not only for the many Bell & Howells used for background filming by studios, but also among those used both in and out of Hollywood for studio, commercial and newsreel camera work.

In the latter service, several local newsreel cameramen have acclaimed the value of this quick-action shift combined with the matched-lens type of finder for their coverage of news events, sports, and the like.

Seven effective shots of remodelled B&H camera described in accompanying story.

**REAR PROJECTION STANDARDS**

Final installment of complete text of industry's first thorough minimum standards agreement for rear projection equipment.

This is the third and final installment of the industry's first detailed report on minimum standards for rear projection equipment, prepared by special committee of Academy Research Council.

—Ed.

**HIGH SPEED PROJECTOR HEAD OPERATING SPEED OF PROJECTOR HEAD (Basic):**

A high speed projector head shall be provided which will operate at a speed of 120 frames per second with perfect registration, giving a minimum amount of abrasion to the film. The high speed projector head shall fulfill the recommendations given under "Normal Speed Projector Head" with the exception that the noise level specification may be disregarded. However, additional specifications as given below must be met.

**HIGH SPEED PROJECTOR HEAD FOR MINIATURES (Basic):**

In the event that by substituting the High Speed Projector Head for the Normal Speed Projector Head, the above speed requirement cannot be adequately accomplished or reconciled with steadiness, it has been suggested that separate heads for high speed be developed. Special high-power motors will be required and shall be designed to adequately operate the projector at a speed of 120 frames per second.

**SHUTTER CONTROL (Basic):**

A positive synchronizing shutter system shall be provided to eliminate the possibility of shutter slippage. (See "Synchronization," Page 16.)

**PART VIII**

**MAXIMUM NOISE LEVEL (Basic):**

Considering noise measurements made a 45' positions about the projector and at a distance of 6 feet from the projector, using a meter which employs a 40 db ear loudness weighting characteristic and calibrated with respect to the standard reference noise level of 10-10 watts per square centimeter the maximum allowable noise level from the whole equipment shall be 34 db.

**PART IX**

**THE TRANSLUCENT SCREEN BASE COMPOSITION (Basic):**

All screens shall be made with a SAFETY TYPE base—cellulose acetate or an equivalent comparable to clear base acetate film—this base to be of such quality that no discernible color change is noticeable over a two-year operation period. When a diffusion surface is applied to the base, this surface should be readily removable so that the screen may be easily refinished in the event the surface is damaged.
MASTERY... In these two truly great 16 mm. films—Ciné-Kodak Super-X and Ciné-Kodak Super-XX—the modern movie maker has mastery of every movie opportunity. There’s a new richness in black-and-white quality in these films, a new sparkle and clarity. Super-X, intended primarily for outdoor work, has unprecedented brilliance, fineness of grain, and beauty of tone quality. It has speed, too, fully equal to that of the famous “SS” Pan. But if it’s speed you want, Super-XX is your film. Super-XX is designed definitely for work by artificial light, and gets along with amazingly little of it. Outdoors, in full sunlight, over-exposure is certain, at even the smallest home movie camera lens apertures, unless a neutral density filter is fitted to the lens.

Put a supply of each of these films in your movie kit. Rest assured, then, that you’re in command of every filming opportunity that comes along.

Ciné-Kodak Super-X and Ciné-Kodak Super-XX are both available in all standard 16 mm. lengths—200-ft. rolls (from Rochester only), 100-ft. rolls, 50-ft. magazines, and 50-ft. rolls.
LIGHT TRANSMISSION, FIELD, DEFINITION (Basic):

The screen, over its entire area, shall be so designed as to provide: (1) optimum transmission (see above paragraph) (2) optimum diffusion, refraction, or refraction characteristics; (3) as flat a field as possible; and (4) uniform definition.

STANDARD SCREEN SIZES (Basic):

The Committee recommends that motion picture producing companies, manufacturers, and commercial organizations engaged in process and miniature work standardize upon the following screen sizes (specified as usable inside area, exclusive of binding):

<table>
<thead>
<tr>
<th>Height x Width</th>
<th>Height x Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 ft x 7 ft</td>
<td>16 ft x 21 ft</td>
</tr>
<tr>
<td>8 ft x 10 ft</td>
<td>18 ft x 24 ft</td>
</tr>
<tr>
<td>11 ft x 14 ft</td>
<td>24 ft x 30 ft</td>
</tr>
<tr>
<td>14 ft x 18 ft</td>
<td>27 ft x 36 ft</td>
</tr>
</tbody>
</table>

PART X

SCREEN ILLUMINATION

STANDARD METHOD OF MEASURING SCREEN ILLUMINATION (Basic):

The following method of measuring the amount of light falling on a screen is recommended: The full screen aperture of the projection machine is flashed with the shutter open and stationary. Nine readings of the light intensity are taken at different points on the projection side of the screen—the four corners, the middle of the top and bottom and the two sides and the exact center of the image. The measurements at the corners and edges are made by placing the center of the cell in from the edge 5 per cent of the total width and in from the top and bottom 5 per cent of the total height of the projected image. The exact height and width of the projected image is measured and the area of the image computed in square feet. The number of square feet of the image is multiplied by the average of the nine foot-candle readings. The result is the number of lumens delivered to the screen by the light system in question.

TYPE OF METER (Basic):

It is recommended that the measurements of screen brightness be made with the Weston Foot-candle Meter, Model 603, with the cell filtered by means of the Weston Viscor filter which approximates the color sensitivity of the human eye.

CALIBRATION OF METERS (Basic):

It is recommended that all meters used in the measurement of screen brightness be calibrated at least twice a year against known standards. It is further recommended that this calibrating be done by an organization properly equipped and authorized by the Weston Laboratories to adjust and calibrate Weston Foot-candle Meters. (Note: The Weston Meter, Model 603, is recognized as Standard in Hollywood. Meters which do not have proper care and protection from rough handling may require calibration oftener than twice per year.)

MINIMUM LIGHT INTENSITY OF SCREEN

It has been suggested that the minimum intensity of illumination at the screen, considering the speed of the lens system used, be as follows: The minimum output of a conventional condenser system, using an F2.3 system be 12,000 lumens, an F2.0 relay type system, 16,000 lumens, and an F1.6 relay type system, 25,000 lumens.
VERSATILE NEW MIKE

A revolutionary new type microphone is being used in motion picture production for the first time on Paramount’s current Bing Crosby picture, “The Star Maker.” Known as the “Six Thirty-Nine,” it is a recent product of the Western Electric Laboratories and was flown to Hollywood for use in the production.

Shown in the accompanying illustration are Homer Tasker, studio engineering expert; Don McKay, soundman member of Local 695, IATSE; Shirley Ross and Loren L. Ryder, head of Paramount’s sound department.

Originally intended for use in recording the voice of Linda Ware, the new singing find appearing in the picture, whose vocal range is too great for ordinary mikes, it now promises to revolutionize the production methods for musical pictures.

Heretofore, singers appearing in pictures have recorded their vocalizing on recording stages and were later photographed singing in synchronization with their previously recorded sound track. This double effort has always been one of the major expenses of making musical pictures. Also singing in perfect synchronization with their previously recorded effort has always been difficult for the artist and a barrier to naturalness.

With this new mike this pre-recording will no longer be necessary. Singers can be recorded on the set while going through the action of the scene. This is made possible by the “directional” characteristic of the mike. It records only what it is pointed at and eliminates the complicated acoustical problems of sound stage recording.

The new mike also smooths the way for radio singers in screen work. In radio the “velocity” mike is used almost exclusively, while in motion picture work mikes are of the “pressure” type. These two types call for widely different vocal...
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4) "Two Big Union Crews"
- From cranking cameras to spinning turn-tables as one of radio's first "night owl" announcers is the story of Jack Bell, former member of Local 659, IATSE, and also a member of Local 500. Bell is now a member of Local 69, IATSE, and also a member of Local 659. He is now a member of Local 69, IATSE, and also a member of Local 659.

2) Television Research Cooperation
- Through the cooperation of Herbert Alter, business representative, and officers of Local 659, with executives of the Don Lee network, affiliated with the Mutual system, intensive teamwork between practical motion picture cameramen and television researchers is now under way as part of the first television agreement calling for the eventual employment of Local 659, IATSE, photographers in commercial television.
During the present experimental stage of television, the entire membership of Local 659 will eventually be put in several weeks’ time each in handling television cameras and lighting for the regular Don Lee telecasts over KHT and experimental station W6XAO.
Present status of television is much similar to that of the early days of sound when there was a great gap between the technical and engineering phases and the practical showmanship aspects. From the standpoint of lighting, composition, handling of equipment, etc., which has been developed to such high efficiency in motion picture production, it is expected that the studio cameramen who are contributing their time to this program, will not only familiarize themselves with television procedure, but will also give the television research workers a much better type of scene to train their complicated equipment on for reproduction purposes than has usually been the case in the past.
Television technique of the future will telescope into several immediate and virtually simultaneous steps, the many operations between camera lens and photographic laboratory, that now take place in present motion picture work. Gamma, density, contrast, focus, framing, etc., which are worked out between the photographic crew and the film laboratory, all will have their television counterparts.
In preparation for early publication in INTERNATIONAL PHOTOGRAPHER is a detailed comparison of how this new technique will work. This will be supplemented by a symposium of practical ideas from the Local 659 members who are now cooperating in the present program with the Don Lee organization.
Shown in the accompanying illustration with two members of the Don Lee staff (at right) are three members of Local 659 handling the television camera for an insert close-up scene Del Valle, with earphones; Lynwood Dunn, operating, and Cliff Stine.

3) Tobias Studies Studio Methods
- To Hollywood last month from Wright Field at Dayton, Ohio, came Chester L. Tobias, superintendent of the laboratory of the motion picture division of the U. S. Army Air Corps, for a sixty day intensive training period in latest motion picture lab procedure. His first visit is an extension of the Academy Research Council's long-range program of cooperating with the War Department in training Signal Corps officers in motion picture production methods. Currently in Hollywood for an eight-month study is Capt. Dwight L. Maloney. Many "grads" of the Academy "school" now are actively engaged in practical instructional work throughout the Signal Corps. Special training for Tobias, who was shown arriving in Los Angeles, was requested by Maj. Gen. H. H. Arnold, Chief of the Air Corps, as part of the general drive to increase efficiency of the country's armed forces. Many reserve officers among the industry's technicians are playing their part in this program.
Musicians.

American Federation of Musicians. Seen Page 21 at right, Jack is behind an early R. & Howell with the Thalhammer iris, in a made in December of 1925, and at left in a normal flash unit shot buried on the mike, record film, turntable, and script at Radio Station KFHD, Los Angeles. Late listeners in the Streamers California area are familiar with the sound, "two Big union crews to serve Jack the-Bellboy program, sponsored by the Youth Clothing Company, well-known Los Angeles credit clothing firm, which features 100 percent union made stock and full union staff. Alive in photographic during silent days, Bell was a member of the independent union that pleased the present photographers’ charter from IATSE and MPio. He pioneered “night programs featuring recordings and humor—chatter in the early days of radio. His present program is heard every night from 11 to 1 am.

Biological Association Plans

Ninth annual convention of the Biological Photographic Association will be held September 16 at the Mellon Institute for Industrial Research, Pittsburgh, Pa. The program will be of interest to scientific photographers, scientists using photography as an aid in their work, biologists in the biological fields, technical experts, and serious amateurs. It will include discussions of motion picture and still photography, monochrome, color, and monochrome film processing, etc., all in the field of scientific illustration. Up-to-date equipment will be shown in a technical exhibit; and the Print Salon will display the work of many of the leading biological photographers here and abroad.

The Biological Photographic Association was founded nine years ago because of the growing need for expert illustrative material for scientific research and teaching. Many workers were seeing their problems in their own way, were using time and effort in individually repeating experiments that had been worked out elsewhere. The BPA was formed to act as a clearing house for new ideas, to pool experiences, record standard procedures and disseminate information. Its members are scientific and all services have been rendered by officers and members on a non-profit basis.

The BPA Journal, published quarterly, a volume of about 250 pages, is furnished free to members. Membership privileges include an honorary question and answer service; also right to borrow loan albums and exhibitions of scientific prints for study and display. Further information about the Association and the convention may be obtained by writing the Secretary, Biological Photographic Association, University Office, Magee Hospital, Pittsburgh, Pennsylvania.

In Memoriam

It is with sincere sorrow and sympathy to their relatives that we publish the news of the passing of two veteran members of the Hollywood photographic fraternity within the past month.

Edwin L. Dyer, long-time member of Local 659, IATSE, and one of the true pioneers of industrial photography, passed away at his home in Sunland, California, May 23. He had been confined by illness for over a year.

Frank Good, a charter member of Local 659, IATSE, and a member of the two pioneer companies, his last assignment was on Paramount's "Spawn of the North."
TRADE WINDS

news of new products: Leitz Loader; blimped Amprosound; Minification scale; newly designed Graflex Crown printer; Agfa's N.Y. Fair exhibit; new Kodak Supermatic shutter; slide-viewer: Agfa Minipan; Victor Animatophone.

1) Leitz Loading Tank

Any users of miniature cameras prefer to use 35mm film and load their own camera magazines, but because the sensitivity of modern film is so great making it necessary to work in perfect darkness, they seldom make the attempt. Loading of camera magazines in full light is easily done with the newly introduced Film Tank, which accommodates a bulk load of 300 feet of 35mm film and permits changing of magazines to be loaded simply by turning a newly located crank. Because of the compactness of the tank, the film is safeguarded against scratching or fogging at all times so that an individual load may always get a perfect load of film a fraction of the time it would take if he is working in a darkroom. While the tank is basically constructed to accommodate Leica and magazines, the Contax magazines may be used with it as well. Full information on the tank may be had from the Electro Specter E. Leitz, Inc., 5th Avenue, New York, N. Y.

2) New Amprosound Model

Ampro Corporation last month announced a sound-proof blimp case for their sound-on-film model U, which sells for $300. The new UB (illustrated) is priced at $365. With a motor output of 15 watts, undistorted, a 2 permanent magnet field speaker and 7500 lamp, both U and UB have several innovations, including speaker-loss eliminator, which enables the operator to obtain full volume at low bias, even at low voltage; amplifier sign light, which indicates "on" and "off" and designates location of volume and tone knobs on amplifier when rooms are dark. Complete details may be obtained from Ampro Corporation, 2839 North Western Ave. Chicago, Illinois.

3) Minification Scale

In making close-up photographs of small objects with the Leica camera and the Leitz Optic-Short Distance Focusing Device, a new scale is the addition of a minification which permits the photographer to determine precisely the scale of reproduction of any object he may be photographing. The markings (illustrated) run from 1:6.3 to 1:17.5, thus the photographer can determine in advance the size to which he wishes to make any reproduction. Since the range finder permits accurate setting there is no need for setting the equipment by means of calibrations or using a ruler to measure the distance of the object from the plane. Full information on the Optical Short Distance Focusing Device may be obtained by writing to E. Leitz, Inc., at 730 Fifth Avenue, New York City.

4) New Graflex Printer

New No. 3 Crown Printer, recently anounced by the Falmer Graflex Corporation, contains a number of advanced features at moderate price. Diffused lighting is effected through use of a single opal glass bulb which in conjunction with the new carrier eliminates flare and greater ease of operation. A rubber-padded platen top produces maximum contact with the paper, assuring flattest, ink-free prints. Adjustable masking blades are standard equipment and their unusual width enables small prints to be made on large size paper. They are easily and quickly removed by a turn of a finial through a new and patented method of attachment. A new type positive light switch goes into operation only after the platen is pressed firmly on to the paper. Conversely, it turns off the light before the platen has released contact with the paper. A separate switch permits the light to be operated independently from the platen.

5) Agfa Exhibit Draws Crowds

Featuring a working demonstration of a photographic darkroom as one of the main features of its display at the New York World's Fair, the exhibit of Agfa Ansco Corporation is currently attracting large audiences. Also popular at the Agfa Ansco exhibit is the group of giant 6x9 foot enlargements from 35mm negatives, displayed in succession by a mechanical changing unit. Presented at the Agfa exhibit are two other displays of interest: a dramatic showing of fine saloon prints, both amateur and professional in character, and a collection of early American cameras which is a timely reminder that 1939 is the centennial of photography. The Agfa Ansco exhibit is located in the Communications Bldg.

6) Kodak Supermatic Shutter, No. 1

New Kodak Supermatic Shutter No. 1, made in Kodak's precision workshops in Rochester, is a new between-the-lens shutter advance in mechanical design and performance, accuracy, smoothness, efficiency and calibration. Special lubricants developed by Kodak research enable the Supermatic Shutter to operate satisfactorily and consistently over a greater summer and winter temperature range than any other between-the-lens shutter.

The Supermatic (as illustrated) has a speed range of 1 to 1/400 second, and includes a delayed-action self-timer speeds including 1/400 of a second, with a pause of about 12 to 15 seconds duration. Shutter speeds which require the use of a tripod time, bulb, 1/12, 1/15, 1/10 second are marked in red to warn the user of the necessity for a rigid support. The faster exposure speeds--1/25, 1/50, 1/100, 1/200, 1/400 second are marked in black. Special-delaying is accomplished by a ring around the periphery of the shutter. The ring bears two index points, one for instantaneous speeds, and one for the longer exposure speeds. The shutter setting lever is located on the top of the shutter and the release lever is located on the left side. A third lever, on the right, which cannot be set until the shutter has been cocked, serves to set the delayed-action mechanism. A socket for a cable release is provided. The delay-action device, if set, is put into motion when the release lever is released in the usual way.

Extremely thin spring blades, held to fine assembly tolerances, close tightly over the aperture in order to eliminate light leakage. Their lightness makes possible a high speed of 1/400 second. Other speeds down to one second are timed with a retard, consisting of a precision gear train and pallet escapement. The new shutter is at present available only on the Kodak Special Six, 20. Other Kodaks will be fitted with it at a later date.

The model of the Supermatic illustrated is a huge one, 30 inches in diameter and weighing about 200 pounds, that is now on display at the impressive Kodak Building at the N. Y. World's Fair. A working model, it is automatically controlled so that visitors can see the actual operation of the new shutter.

Argus Salesmanager III

V. A. Searles, who has directed Argus Camera sales and advertising since its introduction by the International Research Corporation, has resigned because of temporary ill health. Mr. Searles and daughter are in Florida where he expects to spend a month or two recuperating from his recent illness.

It is expected that Mr. Searles will return to Argus, taking over regional sales direction when he is fully recovered. Ray Walker, formerly with Bausch & Lomb, has replaced Searles in directing Argus sales.

New Slide Viewer and Projector

Canfield Camera Corporation of America of Chicago, Ill., is announcing a new type combination film slide viewer and projector, for viewing all types of 2x2 mounted positives, Kodak Chromes, or providing with a group of glass view screen 6x6 inches in size. It is instantly converted from a viewer to a projector--providing a screen image five feet across in a 7x7 ft. The projector exhibits a slide bulb in a specially designed double condenser system, ample light is secured to show an exceptionally brilliant image. A unique feature is the elimination of the conventional slip through slide carrier.
The slide to be viewed or projected is dropped right side up in an aperture at the top of the machine—and automatically aligned in the optical path of the unit. While slide No. 1 is being viewed, slide No. 2 is dropped into the aperture. When it is desired to view the second slide a depressor is depressed which automatically ejects the first slide No. 1 and brings the next into viewing position. A built-in shutter eliminates flash of white light on the screen while slides are being changed. Focusing is instantly and accurately accomplished by means of a high ratio lever adjustment. The unit is extremely compact and portable, measuring 128x5 x inches.

Victor All-Purpose System

- New Victor Add-A-Lite Animatophone, just announced, makes it possible for educational and business institutions of all kinds to provide a 16 mm motion picture and sound equipment adaptable to all requirements with a new multiple-variation and multiple-use motion picture projector and sound system. All units of the Victor Add-A-Lite Animatophone are interchangeable, and units may be added as desired. Starting with the small, compact, basic sound projector, which is complete in itself, an outfit of any size can be secured by adding auxiliary units.

- The Victor Animatophone basic projector provides silent or sound motion pictures, microphone facilities and phonograph record amplification for an average size room, without addition of any equipment. Adding an amplifier and another large-size speaker will permit the projector to be used in large auditoriums. Broadcasts, recordings and announcements may be relayed to as many rooms as desired, when the central microphone and sound system is added. Other units may be added to make possible showing of sound pictures in one location, while public address or music amplification in another is taken care of. Detailed information about the new system may be secured by writing Victor Animatophone Corp., Davenport, Iowa.

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Minipan Microcopying Film

A new film for documentary recording, just announced by Agfa Anseo because of its exceptional high resolving power, is suited to both graphic and documentary recording requiring considerable magnification. The new Agfa Minipan film provides proper balance of such factors as speed contrast, color sensitivity and halation protection. These factors have been adjusted to give a film of the greatest possible practicality, while holding the resolving power to a maximum. The new film is capable of resolving up to 135 line per mm. (3400 lines per inch) per projection of the recording equipment used.

Agfa Minipan 8mm available for standard units at 100 ft., 200 ft. rolls, 35 mm unperforated, Darkroom Loading: 100 and 200 ft. rolls, 35 mm with single perforation, Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated. Darkroom Loading: 110 and 200 ft. rolls, 35 mm, perforated or unperforated.
“Vaporizing” in Hollywood

...effortless vapor film treatment which has been offered by the Bell & Howell laboratory in Hollywood, California, and is now available also from their laboratory in Los Angeles. A complete installation has been placed in the offices of the Bell & Howell headquarters, 716 North La Brea Avenue. Same service and price schedule for reservation treatment of prints prevails as in the Los Angeles office throughout the country.

Chamberlain Promoted

The studio announces the promotion of Chamberlain, member of Local 659, to assistant cameraman at the studio, to assistant to Bob Rilie, in an active capacity at the color organization. Thad, who was a member of Local 659, has been up to assistant cameraman to second place Chamberlain.

Press Speed Flash

All photographers interested in the new high speed press flash synchronization will find the new Press Speed Flash well worth investigating. The new model synchronizes either the Compressor type shutter or the local plane for speed graphics as desired. The shutter synchronizer operates through a suitable circuit. Full technical data is readily available from the Kalart company through either the New York or Hollywood offices. We also understand that if you haven’t received your copy of Kalart’s new publication, Speed Flash Pictorial, write in for one immediately. Vol. 1, No. 1 is just off the press.

ATENTS

By ROBERT W. FULWIDER

The following patents of interest to users of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selected and briefly described are those that are known to have been issued to Robert W. Fulwider, well known for his work in specializing in patent and trade mark counsel.

2,152,921—APPLI-CANTS FOR MAKING MOTION PICTURES. Willard C. Robinette, Pasadena, Calif. Application Feb. 26, 1936. 3 Claims. Device for making a motion picture camera which is designed with a number of background cells that can be independently moved.

2,152,959—PROJECTION DEVICE. Otto C. Gillette, Van Nuys, Calif., assignor to Cosmo-Corporations, N. Y. Application Jan. 27, 1936. 3 Claims. Device for projecting pictures in color which utilizes the use of number of optical systems, each having a rhomboidal erecting prism.

2,152,212—COMPOSITE PRINTING APPARATUS IN MOTION PICTURE FILM. Joseph H. Spratling, Upland, N. J., assignor to United Research Corp., Burbank, Calif. Application Feb. 18, 1937. 6 Claims. Device for printing from two negatives, one positive having the picture images and the other having one frame of the various.

2,153,376—FILM PROCESSING APPARATUS. Howard B. Kline, Cleveland, Ohio, assignor to Industrial Rayon Corp., Cleveland, Ohio. Application Nov. 1, 1937. 8 Claims. Device for handling films during their processing, the device moving the film in a helical path.

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D. Nagase & Co., Ltd., Osaka, Japan

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Fazalbhoy, Ltd., Bombay, India
H. Nassibian, Cairo, Egypt


A mechanical sound record in film, formed by pressing a stylus against the film while the latter is on a roller having resilient portion beneath the stylus.


A color motion picture projector making use of a film having several strips of images on it, the projector exposing first an image on one strip and then an image on another.


A rectangular rack for handling film and having provision for winding the film on the rack, making an endless belt of it, and then moving the film as an endless belt.


A light deflector for directing light rays from an object into cameras having optical axes in the same plane.


A method of making dissolves in which the printing film is rotated about an axis in the focal plane of the camera.


A camera support having a vertical column on which a camera is vertically mounted, pointing towards a table on a second movable vertical column.


An instrument for measuring the amount of haze and having a fully reflecting mirror and a semi-reflecting, semi-transparent mirror with a darkened wedge in front of the latter mirror.


A motion picture machine making use of a continuously moving film and having an oscillating mirror for producing a stationary image.


A screen for producing the illusion of stereoscopy by means of a system of lenticulations.


A method of producing a black and white color positive film from a lenticulated negative by masking the beam from the lenticulated film in correspondence to a red beam and a blue-green beam.


A device for making lenticular copies from the lenticular film by bringing the lenticular elements of two films in register.

No. 2,155,511—APPARATUS FOR DEVELOPING PHOTOGRAPHIC PRINTS. Luther G. Simjian, New Haven, Conn. Application Nov. 16, 1936. 1 Claim.

A device for developing photographic prints in which conveyer mechanism carries the print from one tank to another and immerses the prints in the different tanks.
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On the Cover

John Mack Brown, Universal star, who has proven a triple-threat man off the gridiron as well as on, snapped in a striking shot with his favorite mount, Wheeler, by Sherman Clark, stillman member of Local 659, IATSE. Brown has clicked in dramatic roles, western leads, and now is invading radio as star of a new CBS program, "Under Western Skies," heard on Fridays, from 4:00 to 1:30 P.M., P.S.T.

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Hailed by previewers as an outstanding musical production is Samuel Goldwyn's "They Shall Have Music," soon to be released. These striking shots are by Robert Coburn, ace stillman member of Local 659, IATSE. On this page, picture's star, the great violinist, Jascha Heifetz, in action shots; on opposite page, Alfred Newman, Goldwyn's musical director, whose work on the picture was highly praised by the reviewers, with Heifetz as latter's accompanist, Emanuel Bey. Story by Gerhardt Dot, member of Local 47, American Federation of Musicians, is fit of series in International Photographer on new development of joint interest to photographers, sound technicians, musicians.
NEW ENTERTAINMENT possibilities opened

Many new developments present opportunities for photographer, soundman and musician to cooperate for better entertainment; International Photographer starts new department to cover this news: Vocoder previewed in Hollywood

By GERHARDT DORN

URING RECENT YEARS great progress has been made in recording 35mm sound with greater fidelity and artistry and in reproducing it most effectively to high standards in theatres. Manufacturers' experts and studio technicians and theatre projectionists have been working in such intelligent cooperation toward these ends that news of these developments has more or less submerged news of other progress in the field of sound and music in daily discussion between technicians and in their professional journals.

Today research laboratories of industry, of universities, and individual inventors, are pouring out a wealth of pertinent and suggestive material. Investigations in recording of the voice, in recording of instruments, in creation of electric instruments especially designed for improved recording and broadcasting methods are continually improving and refining artistic procedure.

The alert photographer, soundman and musician working together, can find many constructive possibilities in these new developments. The showmanly technician has within his grasp many new devices and methods for enhancing the pre-
Charts above are fully described in accompanying story text commencing in the middle of Column 3, dealing with Bell lab’s new Vocoder.

sentation of the creative efforts of the so-called talent branches of the amusement industries.

While our recording and projection experts are pursuing the worthy task of bringing technical order out of the chaos of equipment and acoustical problems, there are many new possibilities for the improvement of the entertainment the modern equipment will be asked to record and to reproduce.

There are few limits to the potential entertainment values than can open up through shrewd exploitation of developments cited above, in the hands of cooperative and progressive-minded photographers, soundmen, musicians and projectionists. This material is lying fallow to be seized upon by new geniuses of stage, motion picture, radio, opera, dance, pantomime, extravaganza, etc., in fact, any of the theatrical mediums through which entertainment is presented to a paying public can find new stimulating and enlivening materials to hand from which newer and more effective methods of presentation can be evolved.

Who can say what might take place in the traditionally static proceedings of the dramatic theatre, the musical comedy stage, the dance and concert fields, through use of these new materials. Consider the still unexplored possibilities of recorded music and sound with motion picture action even beyond the forward strides of recent years.

Sound photography in sub-standard fields still is open to great exploitation. Last summer we had the pleasure of scoring and recording the music for the first 16mm feature production in which sound track and the picture track were recorded simultaneously. The particular problems that arose in connection with frequency ranges, intensity level restrictions, etc.—necessitating considerable experimental study beyond standard 35 mm experience—made the work doubly interesting.

In the 16 mm and even the 8 mm field, universities and colleges, schools, organizations and other educational and commercial groups are creating an increasing demand for material that is not being met by the available supply. It is impossible to estimate the future range of this field, since it is only after years of battering the wall of indifference by a few pioneer enthusiasts that the motion picture method is being recognized more and more as a most efficient method of teaching. Despite the increasing publicity and many truly creditable improvements of recent years in equipment and films for sub-standard, commercial and home movie-films with recorded sound, a basic technique still remains to be developed.

At this point, the average reader of International Photographer, who has probably gleaned a considerable smattering of information from various trade announcements, rumors from the laboratories and the manufacturing companies and the few technical papers on the subjects cited, is liable to mumble, “So what, where have we heard this before?”

We thoroughly agree with the reader who borrowers aside prophetic generalities as no longer stimulating. The time has come to discard enthusiasm over a broad horizon for the more limited and more practical task of concentration upon specific things. The editors of International Photographer and many intelligent technical friends of ours in the IATSE have long held the same thought. This is evidenced by the fact that International Photographer’s policy has tended more and more away from general attempts at wide news coverage in the technical fields toward selective presentation of interesting developments.

In future discussions in the field of new entertainment possibilities through new products of inventive minds and new technical tools in both the 35 mm and sub-standard fields, it is our plan to strictly follow this International Photographer policy. This department will be thrown open to factual pointed news of new instruments, new devices and new techniques in the combination of photography, sound and music.

A midwest university is making radical departures in detailed analysis of song performance. A studio technician patents new electrical music instruments. Piano and instrument tuning is being checked for accuracy by photographic methods. Certain practical limitations are observed as guideposts in recording for 16 mm projection of sight-and-sound. A manufacturer well known to readers of this magazine imports a new adjustable reverberation system, that permits a wide variety of sound effects by simply twisting a few dials. A famous sound lab gives Hollywood sound experts a preview peek at a sensation new instrument during its development stage. New scoring methods combine the technician’s skill with greater creative possibilities for the composer, the arranger and the photographer of motion picture musical scenes. Such will be the material of this department.

While considerable material is already in hand for publication in succeeding issues, we welcome news of new developments along the lines mentioned from manufacturers, research workers, university departments, and technicians, musicans, projectionists in all branches of the industry.

In getting this department underway, no better instance comes to mind than the demonstration last month to Hollywood technicians by Bell Laboratories experts of their new Vocoder. The preview showing of a new device—still in the developmental stage—that studio experts might contribute valuable suggestions to be used in the final perfected design, indicates an awakening on the part of the film projectionist to the vital need for constructive workaday cooperation. The Vocoder has already been recognized by the film and lamp manufacturers.

Whether the Vocoder becomes of supreme importance or is soon forgotten, it inaugurates a new era of valuable cooperation in the creation of new sound triumphs for the motion picture industry, providing that other manufacturers follow this example and recognize the wisdom of giving practical studio technical experts the opportunity to make suggestions during development of an instrument beyond its prototype stage in the industry.

Hence, we this month introduce the Vocoder. And with this leap into factual reporting of new developments along the lines mentioned we drop the editorial viewpoint and the prophetic pronouncements of the past and for all in favor of an objective new approach for this department in future issues.

The Vocoder is described in an official Bell statement as “an electrical instrument that analyzes and then proceeds to remake it in practically any form desired.” While the quality of the experimental machine demonstrated was, of course, not up to studio standards for recording and amplification applications, it lived up to specifications. Its eventual possibilities as a sound department counterpart of the optical printer, which creates such marvels for photography (Int. Photog. June, 1938)
to be proven, but in the cartoon and novel field, for unusual, comic and weird tricks, it was excellent possibilities, providing the cost is not prohibitive. It is safe to say, however, the device has demonstrated several of these machines and find steady use in Hollywood studios, particularly by the creators of Mickey Mouse, Popeye and other cartoon characters.

The Vocoder (illustrated on Page 71) was developed by Homer Dudley and his associates in the Telephone Laboratories, basically for telephone use but it also plays an important role in national Vocoder, device for manufacturing artificial speech that has attracted great attention as part of the Bell exhibits at the fairs in San Francisco and New York. In the Hollywood showings, Dudley and his assistant, Charles Vadersen, demonstrated how it can change the pitch of a voice, raise voice inflection, raise a baritone to a tenor or soprano, or lower it to a bass tone.

Its usefulness in speech studies lies in its ability to vary, singly or together, each of the elements of speech. The raw material of speech is two streams of sound. The proper variations of these two streams give us intelligible speech. The first sound stream is characterized by three properties; it has a pitch which is defined by the fundamental frequency of vibration, it has an intensity which is determined by total sound power issuing from the mouth of the speaker, and it has a quality which is determined by the relative amounts of sound power excited in fixed frequency bands. All three of the properties of the stream vary as the stream speeds. The second sound stream is characterized by having no pitch; it is a noise and has an intensity and quality which vary as the stream speeds. During most of the speech the only one is the second stream is active at one time.

Dudley demonstrated the first mentioned sound as "the Buzz." It was a rich full note, something like a muted automobile horn. From this note, electrical filters picked out thirty different ranges of overtones covering the gamut of the human voice. The same filters then broke the second stream—a hissing sound—into thirty ranges. These different sounds in their proper proportion form all the sounds of speech.

The Vocoder, telephone robot at the two World's Fairs, differs sounds by finger controls. What Dudley demonstrated was a circuit which analyzes voice into thirty parts and then uses the reconstitute the proper amount of each of the parts before they reach the loud speaker.

After letting his audience hear a test sentence and after it had been broken down and put together, Dudley showed how it would sound if the buzzers alone were used and its pitch held constant: a flat monotone like a chant. Releasing the pitch, so it could follow the speaker's voice, more naturalness was secured.

Normal speech was converted into a whisper on the bass was substituted for the buzz. While this is relatively faint, it is essential in distinguishing between words like "church" and "chase," as was demonstrated.

Expression is due to the constant swinging up and down of pitch as one speaks; when the buzzers are cut out, the voice seems flat and singing; when the buzzers are twice normal, the voice seems more brilliant; when four times normal, it sounds febrile, unnatural. The Vocoder can be reversed so that high becomes low; tone of a song is recognizable, and speech the odd lilt character of the Scandinavian languages.

After Dudley explained fundamentals of the Vocoder circuit (illustrated on Page 64), Vadersen demonstrated the total qualities of a sentence when delivered with Vocoder running up and down the electrical frequency scale. At the low end, the voice was a deep rumble, while at the top side was a shrill sound with the words faintly recognizable. While Vadersen, in normal tones, spoke into the microphone, but the quavering voice of an old man emerged from the loud speaker. By combining three different pitch channels of the Vocoder, the one voice came out of the loudspeaker as a trio singing in unison.

Through records played on a turntable and attached to the Vocoder, it was demonstrated that the pitch and timbre of a voice can be converted into a complex sound. Examples used were a small boy, a soprano, the musical tones of a pipe organ, and the hum of a power generator.

The aspect of interest for cartoons and novel effects was creation of words from the purring aeroplane, and the train; and most amazing was the word accompaniments created by the Vocoder from musical instruments. A pipe organ record suddenly transformed the treble notes of the chorus into easily recognizable words—and the exact words of the song itself. The same effect was secured by Vocoder treatment of a recording of a string quartet.

Shown with the Bell Vocoder is Homer Dudley (right) who with his associates in the Bell laboratories developed the interesting device, which is described in detail in accompanying story, with his assistant, Charles Vadersen, (left) who played actor for the Hollywood demonstrations to studio sound experts.

**Starts New Series**

Gerhardt Dorn, author of the accompanying article, is the son of a Hollywood pastor, and since leaving school has been active in studio, theatre and church music as a member of the Los Angeles Local 47, American Federation of Musicians. An accomplished musician and composer-arranger, he has spent much time investigating new types of musical instruments and recording devices and has been active in experimental work in scoring and synchronizing direct with standard film. He will present interesting news notes and technical data on progress in these fields in future issue of *International Photographer*. 

*International Photographer* for July, 1939
INTRODUCTION

It has been stated that photography is dependent for its present stage of development upon the science of chemistry. We can go farther than this, and say that no photographic process is carried to completion without the intervention of chemical processes. For this reason it is essential that the Photographer have some knowledge of the chemicals he uses and the reactions they undergo in producing photographic results. This chapter will take up a short study of elementary chemistry and an outline of the various photographic chemical processes. The chemist most commonly used in photography will be described and their uses given. No attempt will be made to explain the complicated nature of many chemical reactions, the idea of this chapter being to give the student a working knowledge of the use of his various photographic chemicals.

ELEMENTARY CHEMISTRY

All substances occurring in nature are formed from a limited number of ELEMENTS. Of these about ninety-two are known to exist. Elements may occur in the pure state or in combination in various proportions with other elements. Elements are substances which are not capable of combination into any other substances than themselves. Silver is an element, and although we can cause silver to unite with other elements, we cannot break up pure silver into any other substance. When one element combines with one or more different elements the product of this union is called a CHEMICAL COMPOUND. As an example of this, the elements silver and chlorine can unite to form the chemical compound known as silver chloride.

CHEMICAL ACTIVITY: Elements differ in their affinity for each other. A few can not be combined with any other element, while others, like oxygen, unite readily with others, and with many under ordinary conditions. The chemical classification of the elements and compounds, depends, to a large degree, upon their relation to oxygen.

REACTIONS: The process of forming a chemical union between elements or compounds, or the breaking up of a union is usually called a CHEMICAL REACTION. The two main conditions for bringing about reactions are the presence of heat and moisture. As an example of the first, oxygen will unite with almost all elements under the influence of heat. A proper mixture of hydrogen and oxygen will not at ordinary temperatures unite to form water, but, under the influence of heat from an electric spark, they will unite explosively. As an example of the second, if we mix dry silver nitrate and sodium chloride there will be no chemical action. But by dissolving them in water they will react to form silver chloride and sodium nitrate. Practically all photographic processes employ the agency of water to bring about the necessary chemical reactions. In other words, the chemicals used are dissolved in water and the resulting solutions are capable of carrying out the chemical reactions desired.

CLASSES OF CHEMICAL COMPOUNDS: Chemical compounds are divided into five main classes, and for convenience these are listed below:

1. ACIDS, which are formed from non-metallic elements and which combine or unite with the metallic elements by a metal.
2. BASES, which are formed from the metallic elements and when soluble are called alkalis.
3. SALTS, which are formed by the union of an acid and a base.
4. OXIDIZERS, which contain an excess of oxygen and can liberate part or all of this oxygen to other compounds.
5. REDUCERS, which have a strong affinity for oxygen and can take it from compounds containing sufficient amount of it.

TYPES OF CHEMICAL REACTIONS

There are several types of chemical reactions which take place to form photographic processes. They are listed below, with examples.

SIMPLE COMBINATION: This is the simplest form of chemical reaction in which two elements unite to form a compound. A very common example of this is the rusting of iron, in which oxygen from the air unite with iron oxide.

DOUBLE COMPOSITION: In this type of reaction two chemical compounds break up when brought into contact, usually in solution, to form various elements. The example already given, of silver nitrate and sodium chloride being united in solution, illustrates this class. Here the atoms of chlorine and nitrogen change places, the resultant compounds being silver chloride and sodium nitrate.

COMBINATION OF AN ACID AND A BASE: When an acid and a soluble base are united in solution, the metal of the base replaces the hydrogen of the acid to form a salt. As an example of this, if hydrochloric acid is diluted with sodium hydroxide, there will be formed sodium chloride and water.

OXIDATION: Oxygen, having a strong affinity for other elements often unites with them in ordinary photographic processes. In addition, oxygen will unite with a number of chemical compounds used in photography, which may, or may not, already contain a certain amount of oxygen. The combination of oxygen with other elements or with certain chemical compounds is called oxidation. In name:
When any substance burns it is oxidized. The roasting of wood and rusting of iron are examples of slow oxidation. In addition to the fast growing term, oxidation is sometimes applied in photographic chemistry to include other active elements than oxygen. Thus, the union of an active element with another element or with a chemical compound may be called oxidation.

REDUCTION: This reaction applies principally to the liberation of metals from their chemical combinations, and depends for its action upon the presence of some substance having a stronger affinity for the remains of the combinations than the metals have themselves. The reduction of iron ore is a good example of this, while in plant life the reduction of carbon dioxide by the leaves is another example of this reaction. In photography we have another example, in which a compound having a strong affinity for oxygen takes it away from other compounds not so greedy for it.

From the above we see that oxidation and reduction are opposite of each other. In many cases, these occur together; when one substance oxidized, some other is reduced. In some cases several of the above types of reactions may take place simultaneously.

OUTLINE OF CHEMICAL PHOTOGRAPHIC PROCESSES

Reference has been made in previous chapters to the latent image and the means of rendering it visible and permanent. The chemical processes responsible for the main ones employed in photography, and before the various chemicals we use are described a brief description of these steps will be given.

THE PHOTOGRAPHIC "FILM": Sensitive photographic materials consist of sheets of paper, glass or celluloid upon which the "emulsion" light sensitive salts usually suspended in gelatine is spread. This gelatin emulsion clings firmly to the support, and is closely packed with grains of the sensitive salt. In the case of negatives, the support is transparent, which for positives, or prints, it is usually on paper and the image is viewed...
DEVELOPING: Upon exposure in a camera, the grains of the silver halide, chloride or iodide, depending upon which is used, to form the light-sensitive material of the emulsion, are so effected by the light falling upon them as to form the invisible latent image. Certain reducing agents, known as REDUCERS, have the power of removing the silver (bromine, chlorine and iodine) elements from the silver salts, that are acted upon by light, and leave a deposit of black metallic silver which gives the visible image. This occurs because the developing agent has a much stronger affinity for the exposed halogens than the metal of the silver itself. These halogens, thus extracted from the exposed silver bromide, form the developing agent and it is the bi-product of this oxidation that accounts for the exposed silver. These reducing agents, besides having a long affinity for the exposed halogens, are also rapidly oxidized by oxygen in air, so as to prevent this further oxidation, another compound, known as a PRESERVATIVE, is added to the solution. This chemical is itself oxidized instead of the reducing agent.

It was early found that the process of development takes place very slowly or not at all unless the solution is alkaline. For this reason an alkaline solution is added to the solution to speed up development. This agent is known as the ACCELERATOR and swells or softens the gelatin, permitting greater access of the solution to the emulsion. However, a developing solution, containing only these three agents, works so energetically to also react upon the unexposed silver salts, thereby causing a chemical fog on the film. To prevent this occurrence, a fourth agent known as the STRAINER is added. The function of this agent is to slow down the action of the ACCELERATOR, thereby balancing the developing solution so that it acts efficiently and with the required amount of energy upon the latent image.

DEVELOPING AGENTS

Agent | Remarks
--- | ---
REDUCER | Removes bromine from the exposed silver bromide grains, leaving black metallic silver.
PRESEVATIVE | Preserves excess oxidative of the reducer and preserves the solution.
ACCELERATOR | An alkali which softens and swells the gelatin emulsion and speeds up the rate of development.
RESTRAINER | Slows down action of accelerator so as to prevent reduction of unexposed silver bromide and fogging of material.

The above four agents, when dissolved in water according to the formula, have been worked out to produce the best results, form the developing solution. The exposed negative, or print, after being immersed in this solution for a suitable length of time in the dark, or under a suitable light (safelight) is developing causing the latent image to be transformed into a visible black silver image.

FIXATION: The unexposed silver bromide grains are not affected by the developing solution, therefore they still remain in the emulsion after the visible silver image is formed. This unexposed silver bromide is still sensitive to light and if not removed would darken upon subsequent exposure. Sodium Thiosulphate (Typo) is capable of dissolving this silver bromide from the emulsion. The next operation, then, after developing, is to immerse the print or negative in the "fixing bath". In this bath, as in the developing solution, there are several different agents. FIXING AGENT (Typo) dissolves the unexposed silver bromide from the developed negative, leaving a clear negative image of the subject. Since a certain amount of alcoholic developing solution is carried over into the fixing bath with the negative, and since development will continue as long as this alkalinity exists, a small amount of acid is added to the fixing bath to NEUTRALIZE the alkali and stop development immediately. The reducing agent of the developing solution is subject to oxidation upon being carried over into the fixing bath, which tends to cause stains upon the emulsion, and also in an acid solution the fixing agent tends to decompose, liberating sulphur, to prevent this oxidation and decomposition, a PRESERVATIVE is added to the bath. A fourth agent known as the HARDENER is added to practically all fixing baths. Its action is to harden and prevent further or undue swelling of the gelatine emulsion during subsequent washing. It should be understood that the action of the hardener, although highly desirable for mechanical reasons, is not essential in fixing the image.

AGENTS OF THE FIXING BATH

| Agent | Remarks |
--- | ---
FIXING AGENT | Dissolves undeveloped silver bromide from emulsion.
NEUTRALIZER | Neutralizes alkali carried over into fixing bath by prints or negatives.
PRESEVATIVE | Prevents oxidation of reducing agent and decompositions of fixing agent.
HARDENER | Hardens gelatine and prevents further swelling. (This action is not essential to actual fixation.)

WASHING: After fixation there remains in the emulsion, in addition to the insoluble silver image, a number of soluble compounds resulting from the reactions of developing and fixing. If these were allowed to remain in the emulsion, the image would fade and become discolored in a short time. Therefore, after fixation, the negative or print is washed in clean water for a period long enough to remove these soluble compounds and leave in the gelatine nothing but the silver image. It is then ready for drying.

(To Be Concluded in August)

**PROJECTION SYMPOSIUM, PARTS VII, VIII.**

Art Two of Academy Research Council report on thorough and technically accurate planning of test reels for standard theatre sound program; standard and push pull sound track usage in present production from major lots.

**ART VII: Final installment of Academy report on test reels.**

**BY JOHN HILLIARD**

**MGM Sound Department**

For the purpose of determining the acoustic response of the horn system, and of the auditorium itself, we have studied Standard Warble-Tone Test Reels.

Secondary Standard prints are available, in Variable Area and Variable Density, each containing approximately the same frequencies as those used in the Multi-Frequency Reels. Each frequency in the Warble Tone Test Reels is a warble of ± 5 percent on all frequencies, is degree of warble having been chosen so that tuning waves will be minimized in the auditorium.

Through the use of a microphone in conjunction with an amplifier system and a sound level meter, the acoustic response of the sound system of auditorium at the various frequencies can be determined. Under normal conditions at least five different microphone positions in the auditorium are used, and the readings are averaged to give the acoustic curve for the auditorium.

To determine the acoustic response of the speakers, the conventional measurement involves the averaging of 5 or more readings made with the microphone close to the speakers. However, in making these measurements care must be taken to select microphone positions that are at the response of either the high or the low frequency units.

These warble tone prints are calibrated exactly as are the Multi-Frequency Test Reels, that is, against the same calibrating reed and on the same equipment set-up.

To check the lateral alignment of the scanning slit we have a Standard Buz Track (Figure 51). The opaque track is 86 miles wide. On the picture side of the track there is a 300 cycle tone band, and on the sprocket side a 1000 cycle tone band. These tracks are so spaced that if the scanning slit is properly placed and of the correct dimension, no tone will be heard from the reproducer, but if the scanning slit is improperly placed toward the picture side the 300 cycle tone will be heard, and if mis-placed toward the sprocket side the 1000 cycle tone will be heard.

A loop prepared from this track is run in the equipment and the scanning slit laterally adjusted until the proper tone is heard. In making up these prints we hold the track placement to within ± 2 mils of the correct position.

This track thus provides a means of adjustment of the position of the scanning slit to the current position to be used in the equipment.

After the scanning slit has been checked for proper dimension and placement, it is of course necessary to check the uniformity of illumination across the scanning slit, and for this purpose we have made available a Standard Scanning Illumination Test Track, which contains 17 approximately equally spaced 1000 cycle tracks, each with an amplitude of 6.8 mils ± 1.6 percent. (See Figure 6).

The illumination on each track is constant, the output as measured with a V1 meter will be constant, but if the illumination varies the amount of this variation may be read directly on the V1 meter measuring the output.

Of the 17 different tracks, the outside two and...
the inside two fall outside of a correctly positioned B3 unit slt. Therefore, with correct scanning illumination only tracks 3 to 15 inclusive will be reproduced at full output. The maximum allowable variation in output level is 3 db, that is, a tolerance of ±0.5 db.

After this track has been run and the readings plotted against the track position, the graph so secured indicates a necessity for correcting any non-uniformity in the illumination.

This correction should be by adjustment of the exciter lamp rather than by changing the lateral adjustment of the slit.

For adjustment of rear scanning sound heads, that is, the ERP1 TA 700, we have what is termed a rear scanning adjustment track, which consists of an opaque B3 unit sound track whose center is ±2 from the nominal center line of 243 mils from the guided edge of the film.

Our Standard 7000 Cycle Film contains a 7000 cycle variable density recording at 2 db below 100 percent modulation, in which the film response level varies less than ±1.5 db. This film is available to be used as a test film to adjust focus and azimuth of reproducer optical systems.

The Committee recommends use of 7000 rather than an 8000 or 9000 cycle track because of fact that in most theatre reproducing systems the low pass filter greatly attenuates these higher frequencies. When using either 8000 or 9000 cycle tones for adjustment it is usually necessary to remove the low pass filter. However, at request of a number of groups in the field who have been cooperating in work of the Committee, Standard 9000 Cycle film with a response level varying less than ±0.5 db is also available for special purposes.

These various Test Reels have been made available as a result of tours of investigation covering entire country made by different members of the Committee during past year. Visits to hundreds of theatres indicate in most cases a lack of sufficient test film for the projectionist and service man to provide even routine adjustment of equipment. For this reason, Committee and Council believe that in making these test reels available at a minimum cost through one centralized distributing agency, we are performing a service to the entire industry.

All of these reels are available through Research Council upon a cost price basis which in most cases, includes no negative or recording time costs. As these items have been furnished by one or another of the studios at no cost to Committee or Council.

Tours of investigation by individual members of Committee mentioned above also brought forcibly to our attention fact that many theatres had no means of balancing their projection machines for output level. For this reason, it was decided to make available to theatres an easily used Balancing Film at reasonable cost and with sufficient instructional information to enable projectionists to check volume level balance between machines as part of daily routine.

Hundreds of these loops have been distributed to theatres and we believe their use represents a great step forward in the standardization of theatre sound projection.

Data assembled by the Committee on various types of equipment commonly installed in the theatre indicated that longest loop necessary in any equipment would be slightly less than 7 ft. The Balancing Films were therefore made up of sufficient film for two such loops.

Instruction folder sent with each set of Balancing Films shows proper method of threading loops into each of common types of reproducing equipment, and outlines proper method of checking the volume level balance between the two machines.

Figures 7, 8, and 9 illustrate method of threading Balancing Films into various common type and makes of equipment.

After loops have been properly threaded, machines are started and volume output is compared by means of meter or by ear. The machines are then balanced for equal loudness a identical fader settings by adjustments normal provided in the equipment.

In addition to publication of Test Reels outlined above, Committee has been active in number of other projects.

Listening tests have been conducted at several theatres recently equipped with the Simplex 6 star system, and we intend in the very near future to issue a supplement to our Bulletin on Standard Electrical Characteristics to specify characteristics for Simplex Systems similar to those previously specified for the various ERP and RCA equipments.

Recent investigations indicate that only approximately 25 percent of existing two-way installations have been set on the Standard Electrical Characteristic. We believe several reasons for this situation exist. Acoustically defective auditoriums are in most cases not given the proper acoustic corrections, and an attempt is made to compensate for defective acoustic conditions by electrical adjustments intended to make up for these deficiencies. Under such conditions it is, at best, difficult to compensate electrically for acoustic deficiencies. A great deal of time and effort must be spent to obtain a satisfactory electrical characteristic for such a theatre, and in general it is not possible to put forth such effort without a sound is possible, not all concerned with the theatre are satisfied with it, and further effort are made to compensate for the acoustic deficiencies by a continual juggling of the electrical characteristics.

We believe that far more satisfactory result would be obtained and in the end less time and money would be expended if acoustic defects are originally remedied by acoustic treatment of the auditorium.

We have had some comment from the field regarding volume variation between different reel, in the same release print or between different prints within the same reel, resulting in changes in the theatre during the show.

Some of these comments have been referred to the Council’s Sound Recording Committee under the Chairmanship of E. E. Hansen of 20th Century-Fox. Tests conducted by this Committee indicate that recordings balanced for reproduction on an equipment set to Standard Electrical Characteristic will invariably require few changes when played in a theatre adjusted to non-standard Electrical Characteristic. We consequently believe that a great deal of the volume variation in the field is due to the need of production of product originally recorded for the Standard Characteristic, but which is played upon equipment set to a non-standard characteristic.

Listening tests have been conducted in a sufficient number of acoustically average auditoriums to firmly convince Committee that present day
recordings are sufficiently alike to reproduce satisfactorily on an equipment set to the Standard Electrical Characteristic.

However, adoption of Standard Electrical Characteristics has not been as wide-spread as would be expected, possibly through a lack of appreciation of the intent behind the Committee's work. It is our aim in setting up a Standard Reproducing Characteristic so that the studios might then set up a recording characteristic.

While there have been no radical changes in recording or reproducing in the last year, there has been gradual improvement in both branches of the field. We believe that during the last year much of the value in what constitutes good sound may be changed within the industry. A theatre considered to have good sound a year ago may now be considered at the present time. As a consequence, it is possible that more recent installations have been set up to the Standard Electrical Characteristic and that a 25 percent estimate may be low.

We also realize that we in Hollywood may not always fully understand problems of manufacturers and service groups as encountered in the field. We have recently sent a letter to the sound supervisors of several hundred theatre circuits claiming that our recommended Standards have been received as widespread use as was hoped; in some cases they have been modified, and in others they have been completely disregarded, and that Committee and Council would be of much interest in knowing reason for such condition.

Experience of the men in the field has undoubtedly given them many valuable ideas on future reproduction, and we would appreciate receiving comments or suggestions on the Committee's work as well as on the use of our Standards to date.

We also realize that we in Hollywood are not without fault, and that at the same time criticisms from the field on current studio recording. To mix metaphors for the moment, we are not throwing rocks at glass reproducing systems, and we are attempting to clean up our own back yard at the same time.

Our entire aim, in fact, is devoted to improve the overall and reproduced quality of sound motion pictures.

Accomplishments achieved so far have been result of cooperation of a large group representing all of various interests in the industry. If each of these groups had had to work separately no one would have been able to accomplish alone even a small proportion of what has been accomplished to date. Needless to say our future efforts we are counting upon continued interest and cooperation of all who have been participating in this work.

We welcome any comments or suggestions or criticisms at any time and all will be given careful consideration by Council and Committee. Whether or not we have communicated directly, we would appreciate comment from anyone in the field who may have information concerning field conditions which would be of interest or assistance to us in our work.

PART VIII: Standard and push pull sound track.

By WATSON JONES

RCA Mfg. Co., Hollywood

There are certain points in favor of both standard and push-pull types of sound track and the selection of one or the other type depends upon several factors existing in the studios and in the theatres. Some of these factors affecting the use of standard or push-pull recording will be explained in the following paragraphs.

The RCA standard variable area type of sound track is made up of two symmetrical sound images as shown in Fig. 1-A. This type of track is generally referred to as a bilateral or duplex track. This type of track can be reproduced only in a standard type of film reproducer. Fig. 1-B shows a standard type track with no modulation. The two narrow lines are known as bias lines and these lines are adjusted for widths of from one thousandths (.001 inch) to four thousandths (.004 inches).

Illustrations on this page are fully described in accompanying story by Watson Jones, beginning on Column 2.
STILLS MUST HAVE ACTION

Photographic symposium of effective stills from current Hollywood crop, illustrating specific points in International Photographer’s campaign to improve studio stills and further cooperation with stillmen: rated by a publicity director.

By JOHN LEROY JOHNSTON
Publicity Director, Walter Wanger Productions

At It Again

Serious attention to problems of the still photographer and the importance of stills to motion picture exploitation has been noted since the John LeRoy Johnston-Jimmy Doolittle articles perceptively attacked the situation in recent issues of International Photog rapher. A number of readers and particularly stillmen members of Local 659 have suggested that we make this discussion more specific and present outstanding newsworthy shots by studio photographers. John and Jimmy have agreed and we herewith present a layout of stills with comments by Johnston. Watch for a follow-up article by Doolittle in an early issue of International Photographer.

Push-pull recording has been in use for several years by a number of studios as a means of making original recordings, but its use for theatre release prints has been very limited due to the fact that very few theatres are equipped to reproduce push-pull recordings.

The most important advantage of Class A push-pull variable area track is due to cancellation of even harmonic distortions which are introduced when incorrect densities of negative or print are used. There are certain variations of sound track density encountered in the studio from day to day. These variations are due to a number of causes, such as emulsion speed, exposure, development, retrogression, temperature, etc. It is possible to keep these variations within certain limits and many control methods are used by the studios in order to keep these variations within limits. The fact that certain density variations do exist and that Class A push-pull area track is not nearly so critical to density variations as standard track is the reason for the use of the Class A track. A complete discussion of this subject may be found on pages 237-245 of the March, 1939, Journal of the SMPTE. Fig. 3-A shows a Class A push-pull variable area track and Fig. 3-B shows a constant frequency track of the same type. It will be noted that the peaks on one-half of the track are opposite the valleys on the other half of the track. A normal splice in a Class A push-pull track makes very little noise when being reproduced, even though the splice is not painted or bloomed.

A typical push-pull optical system for the reproduction of push-pull track is shown in Fig. 2. That part of the optical system that focuses a beam of light on the sound track is similar to any standard optical system. After the light passes through the sound track it is picked up by another lens assembly and the light finally reaches the photocell. The two cylindrical lenses directly in front of the photocell project the two beams of light on the two cathodes of the cell. These two beams of light represent the two halves of the push-pull track. The RCA 920 photocell used has two anodes and two cathodes as seen in Fig. 2. This same optical system can be used to reproduce a standard type of track by proper combining of the output of both halves of the RCA 920 cell.

Gradually Hollywood is becoming more and more conscious of the fact that stills, as well as motion pictures, must move. We live today in a very fast moving world and static things will not impress the public any more. Particularly does the public which patronizes motion pictures (and more than ever, shops for its entertainment), expect action. Motion picture patrons have never been so discriminating, so picky as they are today and when stills in the theatre lobby or in the magazines and newspapers do not keep pace with the times the product they are intended to sell suffers.

Action stills are not new to Hollywood. Nor is Filmland short of men competent to make them. But—Hollywood has been short of men with gumption and incentive enough to fight (often against bitter obstacles, we admit) to get them. Making stills that really sell motion pictures has become a matter of the survival of the fittest.

The stillman who won’t try to keep up with the parade, or the man who thinks he can coast along on his past reputation fools no one but himself.

The day of formulae, in Hollywood, is over. Today is a day of specialization, quick thinking and pictorial reporting of ideas as much as technique, of spirit beyond technical competence. Stillmen must have imagination and flexibility and stillmen must constantly think and act in terms of TODAY.

No Hollywood studio has a corner on ‘best stills’. It is true, however, that in some studios stillmen are held in higher regard than in others and accomplish better results because they have, by virtue of their own personality and ability, compelled proper respect for what they go to get. In presenting, on accompanying pages a quick, random selection of what he considers good stills, the writer wants it distinctly understood that these are not, by any means all of the best of a naturally large batch of outstanding stills. But they do serve as good examples of what a publicity director considers interesting, distinctive up-to-the-minute stills obtained at a minimum expense in money, time and effort. Thought and good judgment made these stills unusual. They require little explanation. There is no secret about them. (Pictures on Pages 1415."

1) An action still from "The Real Glory" by Robert Coburn. The cameraman added menace and action to a dramatic shot by getting down low, cutting in part of a wheel—showing David Niven in anything but a pose—yet the still was posed.

2) Pictorially recording the thrill of an action drama like "Stagecoach," Stillman Ned Scott chose grab shots instead of beautiful poses. A Good catch at the stagecoach in full flight, a Leica caught Yakima Canutt—fast running "W" with his horse going down head first as John Wayne shot at him from the silhouetted coach behind, Had Scott wanted to be called for stills, or taken the wrong camera with him these splendid selling shots would never have been made.

3) Don Keyes caught Richard Carlson, Ann Sheridan and a baby in action on the Wanger set with an Ikon camera. The baby was no respector of his problems with an 8x10.

4) Ann Sheridan, sitting still on a studio stool really looks like the active out-of-door girl she portrays in "Winter Carnival" because Don Keyes had a small fan to blow her hair when he shot this off-stage portrait.

5) For poster art Keyes used a slightly bigger fan and the wind helped both Ann Sheridan’s hair and the expressions on Richard Carlson’s face as well as her own.

6) "Stagecoach" was a picture of antiheroic frontier characters. When Stillman Ned Scott...
NEW film emulsions are indispensable to motion picture progress, but only proved reliability and uniformity make them practicable. Eastman Plus-X, Super-XX, and Background-X have those priceless qualities—hence the everyday use they are enjoying throughout the industry. Eastman Kodak Company, Rochester, N.Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN

PLUS-X
for general studio use

SUPER-XX
for all difficult shots

BACKGROUND-X
for backgrounds and general exterior work
That’s the endearing word cameramen throughout the world apply to their De-Vry Camera—in Arctic snows, through tropical jungles—in all climates—in any emergency.

Good old De-Vry Camera—it works when others fail.

The wide acceptance of DeVry products can be summed up by the words of a well-known world traveler... “Before buying your camera I checked with members of the Explorers Club and most of them recommended DeVry Cameras and Projectors for my use.”

The DeVry line of silent and sound cameras and projectors is complete...time tested by seasoned precision craftsmen.

made his portraits he had the actors speak their punch lines to him and snapped 8x10 studies as they did so. Berton Churchill fairly lived the ‘phone banker’ in his portraits instead of being a stilted, ill at ease subject. Likewise Scott caught the full strength in George Bancroft’s engend­ed face (9), having the actor ‘swing into a pose after sharp shadows and carbon-highlights had been set.

(8) Mucky, Warner stillman, saw a chance to make an ordinary shot look unusual by snapping this dancer in contrasty black and white. He made his still more intriguing and artistic by being shot from a distance than if he had filled his plate with the dancing image. Many photographers would have passed up this one.

(10) Schuyler Crail, also of Warners, preferred to get strength and action out of prize-fight shots of Wayne Morris by catching him off-guard, and from a low angle. In the prize ring there was no place to make Morris look like a handsome hero. Crail preferred to make him look like a fighter.

(11) Paul Calvert of the Los Angeles Times won a prize with this news shot of Postmaster General Farley dedicating a new postoffice. Shooting a flash from a low angle, by giving proper consideration to his composition, Calvert accomplished a news picture that was also a very fine action portrait that required no caption whatever.

(12) No caption really was needed for this shot of Ann Sheridan (the hottest oomph star in pictures), and Fireman Jack Griffin, by Don Keyes. The still tells its own story.

(13) Ray Jones of Universal has made stunts Constance Moore a gay, interesting youngster with this well posed—action portrait.

(14) Ann Sheridan appeared to be actually skiing in this posed studio portrait art shot for Warner’s “Winter Carnival.” A wind machine and careful lighting and posing made this 8x10 seem natural.

(15) Keyes gave Miss Sheridan an unusual dignity and sheer allure by using a circle of nine-photoflood lights on this portrait. The still required less than a dollar’s worth of retouching and shows what can be accomplished when a cameraman does not try to make all his portraits in the same lighting style. In color it was like a fine French pastel sketch.

NEW PROJECTORS

Last month we commented briefly on the coming projection and sound equipment war, with the important companies already marshalling their forces in price cuts, improved service and equipment. This referred particularly to the sound field in theatre operation. However, the projection equipment field is not to be overlooked in the competition that is expected within the next five years as important basic patents run out.

According to latest advice, there also will be a rush of new projection equipment under new labels. First to invade the field against the existing manufacturers is reported to be the Brenkert organization, well-known for their arcs. Early announcement of a new projector from this company is expected, possibly late this month or early in August. Other organizations are readying new equipment and the smaller independent companies are getting ready for a period of intensive competition.
PARAMOUNT'S GOLDEN CIRCLE

Publicists meet competition in exploiting new starlets in industry rush for new faces by strong photographic tieup with exchanges to establish identities.

ESSING PROBLEM of Hollywood exploiters is the rush of new faces to the screen talent scouts hunt the country over and personalities by the scores take their chances at stardom in an industry-wide scramble to create fresh acting personalities as a box-office stimulus. This general enthusiasm for new faces presents an acute problem when the competition is so widespread. Publicists must introduce new personalities to the public and associate personality names with their faces through photographic exploitation and of even greater importance is the need for immediate emphasis on a budding starlet to convince sales workers and the many men in many organizations who control film buying and upon whose enthusiastic cooperation in selling new personalities to their hometown patrons, much of the success of a new player depends. An interesting and comparatively inexpensive solution of this problem has been worked out by Paramount's alert publicity department.

Paramount is using photos—11 by 14 portrait shots specially mounted and suitable for framing—to acquaint division and district sales managers and theatre partners with new faces on the lot.

William LeBaron and Y. Frank Freeman, studio heads, recently organized a Golden Circle of new faces and elected to its membership 17 talented young players. These are the players whose executives regard as having the best prospects for stardom. Publicity in behalf of the newcomers will be backed up by the production department in giving them increasingly better roles.

In order that the men in the field—the selling men and their theatre contacts—may become more sharply aware of the new talent, Robert M. Gillham, director of advertising and publicity, has arranged that 75 sets of photographs of the Golden Circle members be printed up in the studio still department and sent to the sales managers and partners. In addition to the 17 Golden Circle members, photos of Madeleine Carroll, Bob Hope, Linda Ware and Carolyn Lee, all of whom are comparatively new arrivals on the Paramount lot, are being included in the shipments. Miss Carroll and Hope already have attained stardom, of course, and therefore are not of the Circle, while the other two players are too young for the organization.

Described in News of the Month, starting on opposite page, are: Top, second unit on Frank Capra's Columbia production, "Mr. Smith Goes to Washington"; Bottom, christening latest News of the Day newsreel motor units by Mickey Rooney and Ann Rutherford.
NEWS OF THE MONTH

Cora’s “Mr. Smith Goes to Washington” second unit; Newsreelers streamlined transportation christened; Developments on color front; Al Brick honored by Headliners Club for outstanding newsreel shot of year: Screwball baseball.

Cora’s Big Crew

Production activity on Frank Capra’s last picture for Columbia, “Mr. Smith Goes to Washington.” calls for three camera units. Biggest unit is the second crew led by first cameraman John Stumar.

Headliners Honor Brick

National Headliners Club awards gold plaque to outstanding newspapermen, photographers, newsmen and radio broadcasters at their sixth annual banquet at Atlantic City on July 15th. For his dramatic shot showing the fatal plunge of St. John C. I. T. Roark of the British polo team during their three-game series with a jacked California four last February and March, Al Brick, Fox Movietone News’ ace cameraman on the Pacific Coast will receive the gold plaque for the best domestic newsreel shot of the year.

Al Brick, ace Movietone News cameraman, honored by Headliners Club for outstanding newsreel shot of year. See Column One.

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Just about the furthest point a man can get from Atlantic City, New Jersey, where the National Headliners Club meets — is Alaska and there cameraman Al Brick will celebrate the occasion, Brick is on one of those newsreel assignments that make the average man say “not for me.”

Burned by the suns of every climate, Brick has ranged the world for 20th Century-Fox Movietone News for 20 years. One of the first sound cameramen, he filled in at his company’s Hollywood studios for a couple of years while the production cinematographers were familiarizing themselves with the mysteries of the new medium. But two years in one place was about all this elongated rover could stand and he solicited Producer Truman Talley to effect his transfer back to his first and only love, newsreel work.

Brick started newsreel work twenty years ago with the inauguration of the old Fox (silent) News. He has visited every continent in search of newsreel material and was the first man to take a motion picture camera to the Orient.

With startling regularity, Al Brick’s name is credited with outstanding newsreel coverage. Last Fall, his aerial shots of the attack and bombing groups of the U. S. Army Air Corps won national praise. His shots of the disputed record forward pass made by Kenny Washington in U.C.L.A.’s thrilling game with U.S.C. in 1937 showed with remarkable clarity the distance covered by the pigskin. Reaching way back into the Movietone files, one finds that Al Brick first won distinction by his daring expose of Japan’s military preparations in 1925. He has been a member of the Pacific Coast staff of Movietone News for the past 11 years, and is a veteran member of Local 659, IATSE.

Annual Charity Ball Game

Annual “big game” of baseball between Hollywood’s Comedians vs. Leading Men for charity will be held at Wrigley Field, Los Angeles, Saturday, July 15th. This traditional defiance of all “safe and same” baseball tradition annually produces a medley of personalities and insanities in bold attack upon the national pastime, and generally plays to a full house. The comedians and their rivals have been practicing or rehearsing intensively for the past month and many laughs are expected.

Developments on Color

While INTERNATIONAL PHOTOGRAPHER’s series in important modern systems was delayed due to activity of important technicians collaborating on the series during the current production activity, several important developments took place during the past month in the field of color. Technicolor found its capacity taxed with the enthusiasm of major producers for color in current productions. Dufaycolour, with its American organization recently reorganized, announced a re-entry into Hollywood to offer a negative-positive single film version of its research screen pattern direct...
color, for obtaining quantity release prints. This is still to be established through practical production tests.

Cinecolor still is experimenting with its single film system of adapting the Kelle-Dorian additive lenticular film to providing three-color separation negatives for subtractive processing, but with no new announcements from that corner they are making efforts to do more. Meanwhile the Sun Anse of Agfacolor is now available on the continent, and on which extensive tests have been under way for some time in the expectation of meeting professional color production demands.

Important Documentary Film

Two important documentary films were previewed last month in Hollywood to appreciative audiences, and were favorably reviewed.

The motion picture industry's contribution to the New York and San Francisco World's Fairs was a 14-reel production that truly merited the label of "epic." Culled from the vast files of the industry under the supervision of Cecil B. DeMille, with Jesse Lasky, Jr., on the narrative, and William Pine and William Moulton as producers, the picture, titled "America, Land of Liberty," was a distinctive depiction of the value and importance of the motion picture industry as an artistic custodian of American history and traditions.

Also shown to a private audience was "The City," produced under a grant from the Carnegie Foundation. Presenting outstandingly effective instances of editing to produce strong dramatic and emotional effects, the four reel production dealt with the modern trend away from the cluttered metropolis that have mushroomed up during the past 50 years to the saner decentralized communities that are a more pleasing prospect for the future.

Supervised by Osceo Serlin from a scenario by Henwar Rodakiewicz from an original outline by Pare Lorentz, "The City," was directed and photographed by Ralph Steiner and Willard Van Dyke.

Another Graduate

Captain Dwight L. Mulkey of the Signal Corps of the United States Army, who has just completed an eight months course of study in motion picture production under the auspices of the Research Council of the Academy of Motion Picture Arts and Sciences, left Hollywood this month to return to Washington, D. C., where he will be engaged in the production of Army Training Films.

Of six officers previously trained in Hollywood studio methods under direction of the Academy Research Council, Major R. T. Schlosberg is in charge of the Photographic Division of the Signal Corps at Washington, Major Fred W. Hoorn is in charge of the Field Unit at Wright Field, Major M. E. Gillette is in charge of the Field Unit at Fort Monmouth, and Captains Charles S. Stodder and W. W. Jervey are in charge of the production of Training Films in the Washington area.

Next officers scheduled to take the training course is First Lieutenant Harry J. Lewis, who will arrive in Hollywood from the East early in September.

Ivano Tours Country

Paul Ivano, veteran cameraman member of Local 659, is currently on a tour of the country securing shots for important commercial films for Roland Reed Productions. Lester Schorr, assistant, accompanies Ivano on the trip.

Student Burns

Bob Burns is reported taking lessons from the boys at the Paramount camera department on how to operate a 16 mm camera so he can start taking pictures of his youngsters.

New Summatar Lens

Soon to be available in this country from the Leitz organization will be a new F:2 lens called the Summitar, which has a 2-inch focal length. The lens is considerably larger than the F:2 Summar, thus permitting full exposure and sharpness at the extreme edges of the negative. The front element is made of special glass which is not affected by unfavorable atmospheric conditions. The lens is highly corrected for color and has high resolving power.

New Film Viewer

A film viewer that has caught on with a number of eastern motion picture technicians is the Ace Rotary Viewer, marketed by the Advance Cine Equipment Co. of 51 West 21st Street, New York City. Extremely portable and simple to operate, the Ace permits view of film in motion between re-wind, forward and backward action, operation at any desired speed and sharp viewing without travel ghost. It was designed particularly to facilitate viewing and handling of film by editors, laboratory workers, animators and other technicians whose work requires close inspection of 35 mm motion picture film.

Film is placed in but one sprocket roller and is then ready for operation. Passage of film through the device actuates the optical system to permit viewing of the film. There are no intermittent or oscillating parts. Film travels in an open track without pads, gates, or other pressure mediums. Both negative and positive may be run without fear of scratching. Movement is continuous and silent. A standard 11-watt lamp of 1000 hours service is used. Film can be stopped for full inspection of stills. Price of the Ace Viewer without footage and frame counter (which is $29.50) is $95.
CLOSE-UPS

Ray Rennehan: Dean of Technicolor photographers

Behind camera are Irving Rosenberg (wearing hat), second cameraman, and assistant Peter Keane. Rennehan is aiding director John Ford and first cameraman Bert Glennon on their first production together in color.

by Rennehan, veteran member of Local 659, IATSE, with camera crew on 20th-Fox's production in Technicolor of "Frontier Marshal." With Ray in front of camera are assistants Charles Bohny and Nelson Cordes.

The story of color can never be told without mention of the name of Ray Rennehan. Graced with professorial white locks at 6 ft. his status, Rennehan is the dean—and by no means, eritis—of color photography. Pioneer, as first man to shoot Technicolor in Hollywood; mentor, as one who has initiated many to color photography; artist, as one who has a number of outstanding productions to his long list of credits; Rennehan still going strong and now busily engaged in contributing to the trend new rush to color. He is at present working with John Ford and Bert Glennon, the director-photographer team of "Stagecoach," on "Frontier Marshall" at 20th Century-Fox.

Today in Hollywood, result Technicolor's great progress in control of its three-color process—still the only proven practical stem for consistency in production and delivery of quantity lease prints—the greatest era of important productions in color thoroughly under way. Technicolor cameras are at a premium, even lighting equipment manufacturers—Mole-Richard and Bardelli-McAlister, whose new lamps are contributing to better color photography—are behind schedule in delivering new lamps for the color rush.

This new color spurt is marked by orderly procedure and an absence of the hysteria that has been evident in previous technical ends. Another evidence that the picture industry is growing up, producers today use color to enhance basic dramatic values, rather than as a spectacular plaything, a new bauble to be tossed to the public. On such solid grounds the future progress of color can move with steady footing. Experts of Technicolor and major companies now agree—the result of profiting from past experience—that color should be handled as closely to black-and-white technique as possible. Ace Technicolor cameramen like Rennehan, today are seeking to assist studio camera crews in keeping the particular personality of their monochrome technique.

As much as possible, and as rapidly as possible, regular production camera crews are being familiarized with color procedure, so that the eventual ideal may be realized of freeing color production from restrictions, just as monochrome has been freed from the limitations of the microphone. There are a lot of sensible-hard-headed people in the picture business who see color as an eventually important routine aspect of most production. To such thinkers, this trend in practical production routine, along with no longer skeptically regarded hope of radical improvements in three-color processing in some near future, are heartening signs.

Typical of the ace cameramen who have stayed with Technicolor through the ups and downs of pioneering against often heart-breaking obstacles, Rennehan is as devoid of bombast as a retired baseball player. It was his good fortune to expose the first Technicolor film ever shot in Hollywood. That was when C. A. "Doc" Willat, known to many IATSE members, hired him on a three-week guarantee in 1921 to shoot some tests of the then new color system, which was one of many and rated no more important than last week's headline. It was then a double-aperture split beam system covering two frames on one film with dual color separations.

Rennehan has been shooting Technicolor ever since. He has
through the jumps from arcs to inks and back again. From
bipacks to the present highly advanced three-color separation in-
hibition system. From slow to faster and the present most satis-
factorily fast films that allow depth of focus, with lower light
levels. After nearly three decades of viewing values tossed to the
wind, and of observing a procession of hard-won technical tri-
umphs through cooperation and hard work, you don’t kid your-
self and neither do others. Remehan at work presents a para-
doxical combination of relaxation and alertness. He is confident
but cautious and neither one or the other too much. Maybe he
started that way as a tyro or maybe he learned it. Native or
acquired, it’s a valuable asset under pressure of motion picture
production demands.

Since 1921, in productions, special experiments, makeup tests,
etc., the color footage that Remehan has exposed runs into the
millions. He even managed to come out with flying colors on the
well-rehearsed first important color feature from abroad, “Wings of
the Morning,” on which—believe it or not—it was the first picture, monochrome or color, for the director, assistants,
etc., of the production staff with the exception of the producer,
Bob Kane, and himself. This picture was made before Techni-
color’s British lab was complete and everything, including tests,
had to be sent to America for processing.

Color’s pioneer photographer was a charter member of Local
659, IATSE. Not politically inclined, he has never run for office
of any sort. Like most members, he started in the lab, with the old
National Films, in 1918. He worked up from lab to assistant and
his first assignment was with the well-remembered Harry Aiken
at Triangle. After the war he was active in a pioneer ventures in
documentary films and photographed many two-reel comedies
before he got his opportunity in color.

Born in New Mexico, and educated in Las Vegas parochial
schools, he came to California in the 190’s as a youngster and
completed his education in San Bernardino high schools, where base-
ball was his favorite sport. Knowing what he wanted, he picked
photography as a life-work in preference to college training. He
has been at it satisfactorily ever since from the early days when
he photographed the first color feature, “Wanderers of the Waste-
lands” and special color inserts for “The Ten Commandments”
and “Ben Hur,” to his present assignment with Ford and Glenmor
on their first venture into color productions—Gin.
Tenax 1 Pocket Camera

The Leica's new synchronized system; Eastman Cine-Kodak extension tube; Canady recorders and film phonographs improved; Bausch & Lomb Filmrator; Phonotone's recording galvanometer; Agfa's light unit.

Color Series Postponed

The editors of International Photogra- pher announce with regret that we must again postpone continuation of our series on modern color systems in the 35mm field. Like most material appearing in the magazine, this series is dependent upon the cooperation of a number of members of IATSE studio locals. Current production activity and a number of location assignments have prevented a number of important contributors from participating in work on articles for the series, which will be resumed as soon as is conveniently possible.

6) Phonotone Recording Galvanometer

- Phonotone Laboratories, Photographic equipment manufacturers of Washington, Indiana, have just completed a new recording galvanometer for 16 mm and 35 mm use. A versatile general purpose galvanometer it is very compact; entire unit weighing only 13 ounces. A small knurled knob is located on the back, by means of which the unit may be set for variable density, variable area single, or bilateral tracks at option of user. Power is supplied either from an AC or battery-driven DC source. The track is less than 1 watt and frequency response to 8500 cycles. Housing is of aluminum. Two models are available: multitrack unit at $119.50 and single side variable area unit at $97.50.

7) Portable Light Unit of New Design

- "Agfalite", new and ingenious piece of lighting equipment has just been introduced by Agfa Ansco Corporation to solve the lighting problems experienced by many still photographers. Ease of manipulation, effectiveness in providing light from high or low levels, and compactness for transportation in its sturdy steel case, are outstanding qualities of the Agfalite. An important construction feature of the new Agfalite is a pantograph mechanism which allows it to be set up and adjusted on a moment's notice. The pantograph is anchored to base of carrying case and provides an extendable support for the light sockets and reflectors so that the lights may be placed at any position up to 94 inches above floor level. Because of a built-in counterpoising mechanism, it is not necessary to fasten or secure the pantograph at the desired height for it remains at the selected position. Further vertical adjustments can be quickly made simply by moving the lights up or down to a new position.

Agfalite is equipped with two sockets mounted independently on sliding bars at top of pantograph mechanism to permit horizontal adjustment of spacing of two lights. Distance between centers of the lamps may be varied from 11 to 36 inches. Agfalite is designed to take No. 2 size floodlamps and is furnished with two adapters to permit use of No. 1 lamps as well. Reflectors are of a special design to promote even distribution of light. Other mechanical features of Agfalite include caster supports that fit the base of unit to make it easily moved throughout the set, approved underwriters cord with separate outlet plugs, and diffusion screen that can be attached when softer lighting is desired. Unit is supplied in brown crackle finish with pantograph and caster frames in nickel finish. It is made in U. S. A. and available through photographic dealers at the list price of $25.

Eastman's Hollywood Processing

- With the construction of a new building in Hollywood well under way, Eastman Kodak Company will bring to the coast additional service in the processing of Eastman Kodak film by early fall. For more than a year 8 and 16 mm Kodachrome for amateur movies has been processed by East-
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* Reeves Lites
* Sound Accessories
* Laboratory Accessories

Duplicate Transparencies
- Duplicate transparencies in color now can be made from most Kodachrome “stills” at modest cost by the Eastman Kodak Company. These transparencies can be used to make 35mm or 8mm duplicate film projection or enlargements to 16 inches can be made from original Kodachrome taken with a miniature camera. In addition, “same-size,” enlarged, or reduced-size duplications can be made from most sizes of Polaroid Kodachrome Film transparencies. Miniature camera originals may be submitted either mounted or unmounted for duplication, the order being processed through any kodak dealer. Duplication and projection will be returned in 35mm Kodachrome Ready-Mounts, ready for use, unless the order indicates otherwise. If desired, miniature duplicates may be reproduced in sequence by strips, provided all originals are the same size. Details and complete price schedule may be obtained from kodak dealers or by writing to Eastman Kodak Company at Rochester, N.Y.

Agfa 20-Exposure Leica Cartridge
- Users of Leica and similar 35mm miniature cameras who prefer film lengths shorter than the standard 36-exposure load, will be interested in the new 20-exposure Agfa film cartridge that has just been introduced. Available in five popular types of Agfa 35mm film—Fine-Grain Panchromatic, Superpan Supreme, Ultra-Speed Panchromatic, Finopan and Intra-Red—the 20-exposure length is supplied in the same improved-type daylight-loading cartridge used for 36-exposure lengths of Agfa film. These new miniature cartridges are now in dealers’ stocks and are listed at the following prices: Superpan Supreme, Finopan and Ultra-Speed Pan, 65c each; F. G. Panchrome 65c; Intra-Red, 75c.

Triple S Superpan Reversible
- After extensive research, Agfa Anseco now introduces Triple S Superpan Reversible, a new length motion picture film that provides extremely high speed without sacrifice of other desirable emulsion characteristics. The new film is four times faster than Agfa 16mm Superpan Reversible, and accordingly, permits two or three exposures for any subject for any camera in which it is used. Because of its extreme speed, Triple S Superpan is ideal for outdoor and indoor night scenes, light motion films of football, baseball, hockey at other sports in poor light, and for a wide range of other subjects which have heretofore been beyond the reach of cine equipment. The new emulsion combines with its high sensitivity, especially fine grain and brilliant gradation, thus assuring clear, sparkling pictures on the screen. Latitude of the film is also excellent. Halation protection is provided by the effectiveness of the filter used on all Agfa reversible films. This extreme fast Agfa film is available at prices that set new low for premium quality films, 100 for lengths of 8mm. Triple S Superpan Reversibles in lengths of 600, 50 feet are $3.25, include processing by any authorized Agfa laboratory.

Argus Developers Ready
- Argus photographers who use Argus 120 and 220 sheet film have long awaited the introduction of a film developer that would give similar results to the Argus camera. A new developer has been announced by the Argus Corporation, and it is designed to give the same contrast, grain and latitude as the Argus camera. The new developers are available in both liquid and powder forms, and are recommended for use with all Argus cameras. The developers are made by the Argus Corporation, and are available at the Argus dealers throughout the country.
line consists of Argus A.R.-1, fine grain developer; Argus A.R.-2, a universal film and paper developer; and the Argus A.R.-3, a paper developer. These chemicals will be packed in convenient quart size bottles in attractive cartons with complete instructions for their use. These developers, offered at remarkably low prices, will be sold through all authorized Argus photographic dealers.

Kalart's Flash Manual

The Kalart Company has available to all photographers interested in speed flash work a new illustrated pocket-size 36-page manual on the subject, Instructions for the use and adjustment of the Micromatic Speed Flash with all types of cameras is very complete and the manual has a number of samples of effective flash photography with complete date. Also included are exposure charts in which are listed films, flash bulbs and shutter speeds at given distances. Copies will be sent on request to the Kalart Company offices.

British Royalty's Visit

An exclusive, deluxe 16mm film presentation of the visit of Britain's King and Queen to America is being made available to only 100 people throughout its world-wide distribution by Bell & Howell. Three reels comprising this limited Bell & Howell release contain footage taken by ten ace camera men at all stages of the history-making journey of England's monarchs. The films are mounted on three beautifully gilded reels contained in similarly gilded humidor cases. These, in turn, are housed in a beautiful library container. While limiting this deluxe three-reel edition to only 100 copies, Bell & Howell announce that they will continue to supply all demands for the single reel edition of the royal visit released by Castle Films. For complete information regarding either edition write Bell & Howell Company, 1901 Larchmont Avenue, Chicago, Ill.

Robot Film Rewinder

Of interest to all Robot users is announcement of the new "Robot Film Rewinder" by Intercontinental Marketing Corporation, New York. A chamber made of plastic material takes film wound on any standard 35mm cartridge and permits transferring this film into the magazine of the Robot II, and vice versa, in plain daylight. This way, the owner of a Robot I may load his camera with any type of film, including Kodachrome, and may rewind this film into the original cartridge without requiring a darkroom or changing bag. Device also serves as a carrying case for two loaded spare magazines, furnishing a reserve supply of film sufficient for 100 Robot pictures. The Film Rewinder is smooth, and small enough to be carried in a vest pocket or in a lady's handbag.

Perutz Gets New Developer

Exclusive rights to manufacture Ultra Fine Grain Developer W665 have been acquired by Otto Perutz, represented in the USA by Intercontinental Marketing Corporation, New York. This developer is compounded according to the "Hans Windisch formula" and is described in the photographic handbook, "The New Photo School," by Hans Windisch. It combines advantages of Paraphenylene-Diamine formula with non-toxic and non-staining characteristics. In using the time table packed with every can of developer, all developments may be carried through to the same gradation. Each can giving 20 ozs. of developer is sufficient to develop approximately 80 feet of 35mm film (15 rolls of standard cartridges) without any change in developing results. Working temperature is recommended to be at approximately 65 degrees, but variations from this temperature are possible without noticeable changes of the result.

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PATENTS

By ROBERT W. FULWIDER

The following patents of interest to users of International Photographic were
by the U. S. Patent Office. These selec-
and brief descriptions of new patents were
ed by Robert W. Fulwider, well-known
 Angeles attorney, specializing in patent and
mark counsel.

2,156,410 — Combination Time Lapse and
Hodielectric Exposure Control Mechanism.
Inventor F. Eber, assignor to Endowment
Charles N. J. Application Aug. 18, 1937. 48 claims.

2,156,411 — Method of Projecting Motion
pictures in Natural Color. Robert T. Kill-
Thomas A. Killman, Nashville, Tenn.
Application Dec. 21, 1936. 4 claims.

2,156,408 — Mount for Cinema Cameras.
J. P. Adal, Best Maganac, Mexico, D. F., Mex-
Application Mar. 18, 1936. 5 claims.

tering pictures in color in which
images in a box are simultaneously projected
screen and then projecting one image of
pair with another image by means
ight of a third color.

2,156,407 — Optical System for Stereoscopic
Motion Picture Projection. Gino R. Rosebom, N. Y., assignor to one-
Armied E. Lackenbach, N. Y. Application
June 1, 1935. 6 claims.

2,157,099 — Method of and Apparatus for
Producing Stereoscopic Pictures. Ciro Fidel
Mexico, D. F., Mexico. Application
July 1, 1934. 4 claims.

2,157,098 — Method of producing stereoscopic pictures by
ally distorting the image, and then project-
to a concave cylindrical surface.

No. 2,157,097 — Stereoscopic Picture, Milton
City, Iowa. Original No. 2,1001-
 dated May 14, 1935. Application for re-
ase May 12, 1935. 3 claims.

tereoscopic picture with right and left views
ight and left apertures in front of it, ec-
ally mounted targets in each aperture on
se, and means for rotating the discs.

2,158,174 — Film for Photographic Color
Process. John G. Capstaff, assignor to Eastman
vised this application Dec. 30, 1937. 4 claims.

er film having differently sensitized emul-
ons on one side, lenticulations on the other
a removable transparent surface cover-
the lenticulations to produce a plane surface.

2,158,186 — Toning and Intensifying Solu-
s. Kenneth C. D. Hickman and John C.
cker, assignors to Eastman Kodak Co.
lication Mar. 9, 1938. 6 claims.

2,158,194 — Photographic Material. Alexan-
er Murray, assignor to Eastman Kodak Co.

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commercial photography and research and teaching in the Los Angeles public schools. If you read the Chapter on Photo-
graphic Physics which was presented in the March, April and May issues of Inter-
national Photographer, you will understand the practical value of this work. Teachers
and those requiring a handy reference volume on the basic fundamentals of pho-
tography will find it an invaluable addition to their libraries.

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Claud C. Carter, Sydney, Australia
D. Nagase & Co., Ltd., Osaka, Japan
Motion Picture Camera Supply Co.,
New York City
Fazalbhey, Ltd., Bombay, India
H. Nassubian, Cairo, Egypt

Original application May 24, 1934. Divided into this application Dec. 7, 1935. 3 claims.
A sensitized element comprising a thin, translu-
cent, elastic sheet of vulcanized rubber, a thin
layer of metal foil removably secured to one sur-
face of the rubber sheet and a photographically
sensitive layer over said metal foil.
No. 2,159,280 — SOUND IMAGE ON MULTIL
E N C L U R E D FILM, Leopold H. Munnis and Leopold Galu-
sky, Jr., assignors to Eastman Kodak Co. Ap-
31, 1936. 3 claims.
A process of forming a sound track on a multi
layer color film in which the lowermost layer
of the sound track is first completely exposed
and developed, and the sound track is then print-
and developed in at least the uppermost layer.

No. 2,159,392 — SPEED-CHANGING ADAPTER FOR M.
OTION PICTURE CAMERA, Fritz Broach, Los A-
geles, Calif. Application Apr. 7, 1938. 5 claims.
A speed-changer for the film-advancing mecha-
nism of a motion picture camera, in which a number of
cams and a pin cooperate to move the actuating
shaft a greater or lesser amount.
No. 2,159,420 — APPARATUS FOR COLOR CINEMA
TOGRAPHY, Andre Blondel, Paris, France. Ap-
plication June 6, 1935. In France June 11
1934. 5 claims.
An apparatus for copying lenticular films by pro-
jection making use of an objective lens and the
relatively weak correcting lenses.
No. 2,159,600 — PRODUCTION OF COMPOSITE PHO
Tographic Images, Humphrey Desmond Mares
and Douglas Arthur Spencer, England, assign-
ors to The Veracol Film Syndicate Limited
Great Britain Feb. 6, 1936. 15 claims.
A method of developing the lower image of an
emulsion having two superimposed images, b
means of a depth color developer.
No. 2,159,683 — PROCESS FOR THE PRODUCTION OF
Photographic Pictures in Natural Color in Ac-
CORDANCE WITH THE THREE-COLOR PRIN
CIPLE, Marcelle Beauvais, France, assignor to
Simeon Papadakis, St. Maurice (Sein), France.
Application Sept. 1, 1936. In France Sept.
1935. 2 claims.
A process for producing color pictures which in
cludes making a print from one color separa-
tive on a positive film and developing the im-
age, resensitizing, with dichromate and print
and drying a second image from a second sepa-
ration negative, and resensitizing, printing, and
drying an image from the third separation neg-
ative.
Re. 21,099 — PROCESS FOR THE PRODUCTION
OF COLORED SOUND FILM, Bela Gaspar, Brussels,
Belgium. Original No. 2,025,658, dated Dec. 2
1935. Feb. 21, 1933. Application for reissue
A method of producing colored motion picture
films in which the picture is formed of a dyed
only and the sound track consists of a slab
image.
No. 2,160,340 — METHOD AND DEVICE FOR OBTAIN
ING OR REPRODUCING COLOR PHOTOGRAPH
Charles Nordmann, Paris France. Application
A method of copying a lenticular film by the
predetermined absolute apertures upon a second
film having equal absolute apertures by makir
ing the copy film thicker so as to make its relat-
ive aperture less than the relative aperture of
its original.
No. 2,160,716 — DIAPHRAGM FOR LENTICULAR
FILMS, Andre Blondel, Paris, France. Origin-
al application June 8, 1935. Divided and this a
pplication Dec. 30, 1936. In France Nov. 1
1934. 4 claims.
A method of making a diaphragm for use with
lenticular films in which an outline of the
size of the picture is projected on the plane in
which the diaphragm is to be located, and a diaphragm
is made from the projected outline.
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INTERNATIONAL PHOTOGRAPHER

Vol. 11 August, 1939 No. 7

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On the Cover
Frank Capra, photographed by Irving Lippman, stillman member of Local 659, IATSE, on the set for Columbia’s “Mr. Smith Goes to Washington.” Turn to Pages 10-11 for pictorial layout of stills from the exploitation shots made by Lippman for the production.

Editor, Ed Gibbons; Managing Editor, Herbert Aller; Art Editor, John Corydon Hill; Business Manager, Helen Boyce.


Copyright, 1939, by Local 659, International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada.

Published as Second Class matter, Sept. 30, 1930, at the Post Office at Los Angeles, California, under the Act of March 3, 1879.

INTERNATIONAL PHOTOGRAPHER, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and members of the manufacturing organizations serving the motion picture industry. INTERNATIONAL PHOTOGRAPHER assumes no responsibility for the return of unsolicited manuscripts or material.

Subscription Rates: U.S.A., $2.50; Canada, Foreign, $3.00 per year. Single Copy, 25 cents.


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PROBLEMS IN REAR PROJECTIONS

Valuable suggestions for shooting keyplates and computation of factors in wild key plates to accurately insure background scenes appear correctly in finished shots; speeds up operation in photography on the set.

By LEE CARROLL

Carroll and Physioc

Writer of this article, Lee Carroll, a studio veteran with considerable film editing experience, has been working recently with Lewis Physioc at Technicolor in experiments to solve certain problems in rear projection and to strike a common ground between the rear projection concern and production executives on basic points for most effective results. The article is the product of extensive experiments on a scientifically accurate miniature rear projection setup to members of Local 659 for his contributions to the industry and his articles in International Photographer for many years. An excerpt from his unpublished book, "From Script to Screen," is part of Carroll's article.

is of utmost importance. Unity magnification is simply this: The figures or objects on the screen should never appear larger than life size when real actors appear in front of the screen. The general rule to follow is never to have the closest object in the foreground appear larger than life size when projected on a 16"x20" screen.

The key plate cameraman can determine how close he can set his camera to a figure or object to have it appear life size on any of the standard size screens by referring to Chart A. Looking at the vertical left column, the focal length of the lens may be selected. However, key plate shots should never be made with a lens of longer focal length than three inches which will be explained in a later paragraph. Going back to Chart A, the first horizontal column shows the various standard screen sizes. By selecting the lens and the screen size, we may read across and down the columns noting the footage at which the closest figure or object to the camera will appear life size. To photograph an object or figure closer to the camera than the footage shows on the chart will make it appear too large in proportion to the actors forming in front of the projection background. If the object or figure is farther from the camera than the footage as shown on Chart A, the object will naturally appear smaller than life size which merely lends an illusion of distance. It is well to bear in mind that unless the screen size is known beforehand, it is better to always photograph for the 16"x20" size screen in as much as the objects will appear smaller on the smaller screen.

The key plate cameraman is now in a position to start his shot bearing one other important point in mind. The camera angle which he selects being tilted either up or down from an absolute level position will necessitate placing the camera on the process stage at the same angle. This will also be more thoroughly explained in a following paragraph.

The key plate cameraman can greatly speed up the process stage set-up by recording at the end of each shot the following four important points: the size screen he has shot for, the focal length of the lens, the angle tilt of the camera, and type of camera used—Bell and Howell or Mitchell. It is recommended that this information be photographed, by means of a small blackboard, at the end of each shot. For reasons to be explained also in a later paragraph, it is recommended that key plate shots be made with the full aperture rather than with the Academy aperture.

Section 2: Determining Unknown Key Plate Information

The measurements being so minute on the motion picture frame it is advisable to use some type of enlarger to obtain a frame of convenient size, such as 3"x10". The foreground object or figure can then be measured and the calculations for the screen size can be figured thus: 6"x10" being the enlarged size, if a known object such as a doorway which in real life is 72" in height measures 4", the height of the screen can be determined by this simple formula:

\[ 4\" : 3\" = 72\" : x \]
Thus, the height of the screen being 12', a 12'x16' screen is used for proper unity magnification. The next step is quite difficult to do on purely scenic or landscape backgrounds because it is hard to find lines leading to the vanishing points. Few people can recognize the proportion between rocks and trees on this type of background. Architectural subjects require particular care because even the laymen are so familiar with such subjects that they can readily trace the vanishing lines and become conscious of the horizon and vanishing points; and the slightest error in the convergence of these lines becomes very apparent.

Chart B is the mapped out plan showing how the measurements are brought about. Draw the lines a and a' until they intersect at the horizon. This is the vanishing point marked, v.p. Draw the lines b and b' until they intersect at their respective vanishing point, v.p. Establish the horizon, H by connecting v.p. and v.p. Describe an arc or construct a half circle with c as the radius and the vanishing points the diameter. The picture is then divided in the center by the vertical line e and this line is carried down to where it intersects the arc d at the point marked f. Connect f with h and h'. The lines marked g and g' represent the visual angle of the lens which is to be further proved.

This may be further proved in the following manner. With v.p. as a point describe an arc from f to the horizon which point is marked measuring point, m.p.; and with v.p. as a point describe the arc to m.p. From m.p. draw a line to the right-hand lower corner of the picture, k; from m.p. draw a line to the left-hand corner of the picture, k'. The sum of the angles 1 and 1' equal the angle m. If a and a' equal the motion picture horizontal dimension, then 2m equals the focal length lens used. This entire procedure may be done in the enlarger by drawing the vanishing point lines a and b, establishing the horizon line h, establishing the four corners of the picture, and doing the rest of the calculations from those points without further use of the enlarger. It may readily be seen that to establish the camera angle, the distance the horizon line moves above or below the dividing line of the picture gives the exact tilt of the key plate camera.

Careful note should be made as to the type of camera used in photographing the key plate: whether it was the Bell and Howell or Mitchell. It is essential that if the key plate was made with the Bell and Howell camera, it should be projected with the pins in the Bell and Howell position at the top of the aperture. The large register pin at the right. If the plate was made with the Mitchell camera, it should be projected with a movement having the pins at the bottom. A note can be made while the print is in the enlarger concerning whether it is full aperture or the Academy aperture.

In summing up, unity magnification, the focal length of the lens, the camera angle, the type of pins, and the size aperture that the key plate was shot with have been established, which is the same information that can be recorded by the cameraman as stated in the previous section. But it may readily be seen that this second method takes time and much trouble to work out and can be entirely avoided if the key plate cameraman records the necessary information at the time the key plate is shot.

Section 3: Contrasts of the Key Plate

The key plate print should always be printed on Bell and Howell perforations. The natural tendency of the film in reproducing the key plate is to increase its contrast. A normal print, therefore, appears much too contrasty in relation to the actors or scenic foreground placed a front of the projected background. To overcome this, the print should be made similar to a lavender. In other words, to obtain the same effect, the print should be printed a couple of points heavier at the printer and developed to a lower gamma than a normal print would receive. To the eye this print appears somewhat lacking in contrast but should show all of the detail. The glycin formula is recommended for the developing of the key plate for the following reasons: it precipitates a fine grain, it develops richness in the highlights, it has brilliant transmission qualities and rich detail in the shadow without blocking them. Following is the glycin formula:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>30 ozs.</td>
</tr>
<tr>
<td>Sodium Sulphite</td>
<td>13½ ozs.</td>
</tr>
<tr>
<td>Potassium Carbonate</td>
<td>2½ ozs.</td>
</tr>
<tr>
<td>Glycin</td>
<td>½ oz.</td>
</tr>
<tr>
<td>One or two drops of 10% Potassium Bromide solution</td>
<td></td>
</tr>
</tbody>
</table>

The negative should be of normal gamma but the positive should have a considerably lower gamma.

Section 4: The Set-Up

With all these vital elements having been predetermined, the operation should be to go on the set and get started with the least possible difficulty. With proper direction, the efficiency of such a method is so greatly increased over the "I hop it looks right" system, that it is bound to save many dollars in production cost.

With this information, the process directs the step on the stage, line up with the right eye, and follow the procedure of Chart A; he can determine the distance according to the focal length of the lens place the projector for the size screen he wishes to use, and check for unity magnification. He may then further check calculating the foreground objects to those of the projected picture.

The selection of lens for the projector has some important points on which it would be well to mention. A long focal length lens greatly decreases some of the hot spots trouble but gives a flatter focal field.

Focusing the projector on the screen can best be done by standing close to the screen and as the operator focuses the lens, watch for the prismatic color conditions on each side of a minute point on the screen until they show equal balance.
is greatly facilitated by the recent \textit{facilitation} of remote control focusing. With the screen and projector placed, the next logical step is the placing of the actors, and around this step converges the important points brought up in the previous sections. The first consideration is how far the actors can be placed from the screen and still keep them from magnifying out of proportion to the unity magnification of the key plate.

"Chart C, which is from the unpublished "\textit{Chart B}" from the unpublished "\textit{From Script to Screen}," by Lewis W. Physioc, shows how this difficulty may be obviated, at a slight sacrifice to perspective unity. This sacrifice, however, is almost negligible, and is compensated by maintaining the more important matter of... "
scale. Angle $A$ represents the projected picture; $B$ is the plane of the translucent screen; $A'$ is the angle of the lens copying the projected picture, reproducing the same, normal proportions as at $B$. The distance between $B$ and $C$ represents the image of an object of known dimensions (height of a man, or such) on the screen. By studying the chart of hyperfocal distances, the distance between $B$ and $B'$ is determined, being the distance at which the action may be placed so as to maintain fair definition in the projected picture while focusing on the action. The distance between $B'$ and $C$ represents the dimension of the actual object as posed in front of the screen; however, if the projected picture is photographed with the original lens of the angle $A$, $B'$ and $C$, being so much nearer to the camera, will be magnified so as to appear as $B$ and $D$, which will be out of perspective scale with the projected picture. By selecting a lens of wider angle (shorter focal length) $A''$, the same sized picture is produced at the forward plane $b$, $b'$, $B'$. Now, knowing that the lens of wider angle diminishes objects in the background in a greater perspective ratio, the distance between $B$ and $B'$ is just sufficient to reduce the projected dimension $B$-$C$ so as to appear as $B$-$D'$, which will be in correct perspective proportion to $B'$ and $C'$. The dotted lines of the angle $A''$ might suggest an embarrassment in over-photographing the screen as at $a$ and $a'$. This, however, is obviated by the happy proviso of being able to photograph the original 'key shot' with the former silent aperture and re-photographing with the sound aperture. Where conditions require too much over-photographing of the screen, the area shown at $a$ and $a'$ may be covered by additional set construction in the foreground. The focusing of the lens of the camera brings up some confusing problems in the matter of depth of focus. The lighting of a process set naturally enters into these problems. It is usually difficult to use enough light to bring about much field of focus because no light can spill on the screen without destroying the projected picture. It is sometimes very confusing to know where to focus in order to have the screen in focus and the actors, particularly a large group of actors in front of the screen, covered in the depth of field. Chart $D$ is a method by which a great deal of the guesswork may be obviated. In it, $a$, represents the area of the set; $m$, the nearest point to the camera to be kept in focus; $s$, the screen; $x$, the further point to be kept in focus; $c$, the camera p, the projector; $d$, the desired lens setting to bring in focus if $n$ is twenty feet from the screen and $s$ thirty feet from the screen, the formula following will give the desired lens setting to bring both and $s$ into the depth of focus field, which is twenty-four feet.
forms seldom is present. Obtained useless small point and 99% most often Sodium is used in developing both negatives and prints. HYDROQUINONE, made from benzene, which is first converted into Para-aminophenol. It occurs in dark needle-like white crystals. This agent is seldom used alone, being most generally found in combination with Elon. It may be used for both negatives and prints. These agents just mentioned above are the ones most generally used.

ACCELERATORS: As has been stated, reducing agents must usually be in an alkaline solution so that development can take place. The acids used for this purpose are the carbonates and hydroxides of sodium or potassium, usually the former. The alkaline solution serves a double purpose, it not only renders development possible at a rapid rate, but densifies and swells the gelatin emulsion, permitting more rapid access for the reducing agent to the entire thickness of the emulsion. The various accelerating agents are given as follows:

SODIUM CARBONATE: This is by far the most popular accelerator. It is marketed in three forms: Crystals containing ten parts of water of crystallization and 30% by weight of the carbonate; crystals containing one part of water and 85% of carbonate, and the dry or anhydrous form.

POTASSIUM CARBONATE: This alkali, which is also known as Tartar, is sometimes used instead of sodium carbonate. It is the softer than the former and a stronger alkali. This chemical is used in the same manner as sodium carbonate, being obtained commercially in the form of the hydrate. It has the disadvantage of being very deliquescent and must be kept under well sealed bottles.

SODIUM HYDROXIDE: This alkali, which is also known chemically as Caustic Soda, is occasionally used in developing solutions requiring the alkaline form of the hydroxide. It is used under the same conditions as the carbonate. It is marketed in white brittle sticks, and in little pellets. It is hygroscopic and upon exposure to air absorbs carbon dioxide and water. Therefore, it should be kept in well stoppered bottles.

POTASSIUM HYDROXIDE: This alkali, sometimes substituted for Caustic Soda, is very similar to it and prepared in the same manner.

Obviously compounds which contain a large amount of water of crystallization must be used in greater weights to obtain the same strength as the same weight of the carbonate. Likewise those which have Deliquescent or Hygroscopic are of uncertain strength after having been exposed to the air for a great length of time. The powder form is preferable in almost all cases where chemicals can be obtained in either form. An exception being sodium carbonate, which is more stable when obtained in the monohydrated form.

In compounding developers it is sometimes necessary or desirable to substitute one alkali for another. Since they are of different strengths, those of greater strength are used for dilution. Likewise those of less strength are used for dilution. As a rule a mixture of the two is used for dilution. However, it may be necessary to have a more concentrated alkaline solution. It is marketed in white brittle sticks, and in little pellets. It is hygroscopic and upon exposure to air absorbs carbon dioxide and water. Therefore, it should be kept in well stoppered bottles.

Chemicals used in hardening: In order to prevent under-washing and softening of the gelatin emulsion in subsequent washing, certain chemicals are added to the fixing bath or used at other times in the various photographic processes. These chemicals which have a hardening or developing action upon gelatin, are mainly certain alums, there being only one other chemical (Formalin).

ALUM is a compound of sodium potassium or ammonium with aluminium. If the hydrogen of sulphuric acid is replaced by aluminium, we get aluminium sulphate. This, in combination with the substances mentioned above, e.g. sodium, potassium, or ammonium, forms the compounds used in photographic processes.

POTASSIUM ALUM is most commonly used as the hardening agent in acid hardening fixing baths. It is obtained commercially in the form of clear crystals or a white powder. These forms are quite stable. The powder form, however, is somewhat subject to lumping upon exposure to the air.

POTASSIUM CHROME ALUM is a compound of sulphate of potassium and chromium. Potassium Chrome Alum is often used in place of the ordinary potassium alum, it is obtained commercially in a very pure state in the form of violet crystals, which are red by transmitted light. These, when dissolved in water, form a violet solution, which, upon heating, changes to a green due to a chemical change which is injurious (38) to its hardening powers. Potassium Chrome Alum has a greater hardening power than potassium alum, which is further increased when the solution is made slightly alkaline. This hardener, used for negatives only, is often used in warm weather as a separate or supplementary hardening agent in the regular fixing bath.

FORMALIN is a solution of formaldehyde in water, the commercial solutions containing about 40% formaldehyde. Formalin has the property of hardening gelatine more than any other hardener and for this purpose is used in weak solutions—not over 5%. In less than a minute such a solution will render gelatine completely insoluble in boiling water. Formalin must be used in a neutral or alkaline solution, as in the acid state it loses its hardening power. Care must be taken to prevent over-hardening when using this chemical as it is possible to carry the hardening too far so that the gelatine will become brittle and crack. Formalin gives off a strong and unpleasant odor, very irritating to the mucous membrane.
"MR. SMITH GOES TO WASHINGTON"

Behind the provocative theme of Frank Capra's latest production for Columbia, "Mr. Smith Goes to Washington," lies an equally exciting story of technical and research achievement in recreating authentically and efficiently for production purposes the famed settings of the nation's law-makers. These shots are from the studio still collection for exploitation purposes photo.
Chased by Irving Lippman, stillman member of Local 659, SE. Columbia technicians are said to have done an unusual job in combining skillfully made miniatures with set action, as can be noted in Top Left on Page 15. Note the realism of the settings and action. Stillman Lippman’s shots might well have been photographs of the real thing in Washington.
**VISUAL SYSTEM**

Handy reference series on spectral characteristics of new films lined up.

**By JOHN WEILER**

Professional cameramen in the Hollywood studios know that there is crying need for a continuous stream of practical data on the many new and superior emulsions that have been introduced with such success by our representative manufacturers in the last year or more. We in Local 659 certainly appreciate the hard work and valuable information supplied by the Hollywood technical representatives of the film manufacturing companies. We can go to Emery Huse of Eastman, Wilson Leahy of Agfa, Hollis Moyse of Du Pont, Jack Guerin of Gaevert and their able cohorts and get a lot of fine data and advice. However, much of this material—in the form of charts and graphs—requires considerable study and in the rush of production this is frequently impractical when a particular point of information is needed right on the spot.

I realize that the general scope of such information could cover a huge library, but one particular subject that is of immediate and practical interest to all professional cameramen in the studios is the need for a visual—as opposed to the graph—system for determining spectral characteristics of the various emulsions, under both daylight and Mazda conditions of lighting, and running the gamut of the filters that we cameramen regularly use on the set.

Any project of this kind also should be coordinated with handy information on emulsion speeds, gamma characteristics and other important technical data on each individual emulsion. And this material must be presented in such a practical and handy format that it can be used with speed and accuracy during actual production.

A suggested solution of this situation is the publication in International Photographer of a series of visual comparisons between the natural spectrum as it is rendered in black-and-white by various emulsions plus the correction caused by each individual filter used with each particular emulsion.

Such a series now is in preparation and I expect to introduce the first batch in the September issue. I have discussed the idea with a number of our brother members and have received good advice and suggestions. However, before commencing publication I believe that best results will be obtained by calling upon the cooperation of the entire membership of Local 659 and other interested technicians to make suggestions as to how they would like to see this series handled.

I hope you fellows will communicate with me of care of the International Photographer at its new address, 6461 Sunset Boulevard, and that you will display some interest, critical or otherwise, in helping to get this series under way. We are already assured of fullest cooperation by the film manufacturers and other companies catering to studio technicians, one of whom is Hotel advertisers in the National Photographer.

**STILL SALON**

New quarters of Local 659 and International Photographer provide facilities for rotating still displays.

International Photographer has been presenting regularly pictorial layouts of the outstanding still photographers of the motion picture industry, all members of Local 659, IATSE. This month we present the work of Irving Lippman (Page 10-11) and George Hurrell (Pages 14-15) and are pleased to announce that the new quarters of Local 659 and the magazine at 6461 Sunset Boulevard have provided facilities for the setting up of a rotating display of original prints of such outstanding shots by studio stillmen.

Plans now are being worked out by the magazine committee of the executive board for the salon. Highlight shots of our studio stillmen during each month will be displayed at the new headquarters and will be published in International Photographer.

The magazine committee, Leon Shamroy, chairman, Bob Coburn and Clifton Maupin, call the attention of stillmen members to the salon plan in the following statement:

"We would like to call the attention of all still photographer members of Local 659 to the contemplated monthly display of outstanding prints, and to call upon them for suggestions as to the most convenient method of handling this project. Your cooperation will ensure its success. Please drop a note to the committee in care of International Photographer at telephone Hillside 9139 with your comments and ideas."

Featuring the layout by George Hurrell on Pages 11-15 are: A) Bette Davis; B) John Garfield; C) Brenda Marshall; D) Jane Wyman; E) George Brent; F) Geraldine Fitzgerald; G) Pat O'Brien; H) James Cagney.

**Correction**

• An error in the street address of Fred Hoefer's new machine shop was inadvertently published in last month's International Photographer on Page 23. Column 2. Hoefer, long known to studio workers for his precision machine work is located at 915 North La Cienega, and not at 915 North Cahuenga.

**CINEX**

Light Testers—Polishers used by all Major Studios. We are the sole Manufacturers and Distributors.

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Hollywood, Calif.
HE 1984

Cineitone — Photographs of motion pictures are made using Cineitone.
THE proving period for Eastman's new negative films has been left far behind. With their special emulsion qualities reinforced by typical Kodak dependability, *Plus-X, Super-XX, and Background-X* are firmly established as successors to other notable Eastman films for the motion picture industry. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

**EASTMAN**

**PLUS-X**
for general studio use

**SUPER-XX**
for all difficult shots

**BACKGROUND-X**
for backgrounds and general exterior work
These striking shots by George Hurrell from his recent collection of poses of Warners' stars and feature players.
Illustrate comparisons between the familiar Hurrell technique and variations thereon. See story on preceding page.
NOTES ON PROJECTION

Congratulations to Roddan, Comyns and Boyd; first dope on new Holmes Imperial projector; Simplex installations at two Southern California houses; Projection Symposium to be carried on with new series on Simplex equipment lineup.

By PAUL CRAMER

Our projection notes this month get under way with a batch of congratulatory remarks:

First, to Hal Roddan, who in one month was elected business agent of Studio Projectionists Local 165, IATSE, and tied the marital knots with a charming lady;

Second, to one of the finest men in the industry and one of the projectionist’s best friends, our own Bill Comyns, who has just signed up with Walt Disney. We wish Bill all the luck in the world on the new assignment and should add a bit of congratulations to Walt for having such capable men as Comyns, Bill Gereghty and Sam Slyfield handling his technical problems;

Third, to Jim Boyd, of Local 150, IATSE, who has taken over the distribution as factory representative of the Holmes projector in the Southern California sector and certainly is going to town with it. It is a fine piece of equipment to handle and well worth investigation by studio and theatre projectionists.

On this page are shots of the first Pacific Coast showings of the new Holmes Imperial:

4) The new model, which features a Holmes-built Western Electric Sound head.

5) Interior view of Holmes projector head. Aside from the severe simplicity and sturdiness evident, all bearings are grease packed ball bearings, and will need absolutely no attention during the normal life of the projector. No oil cans to bother with and get oil on the film. The intermittent is gearless and is packed in grease and needs attention only every 90 days. It can be removed and another one inserted in its place in 15 minutes actual time. Entire projector can be taken apart and put back together again in 30 minutes with a screwdriver as the only tool needed. Com
That's the endearing word cameramen throughout the world apply to their DeVry Camera—in Arctic snows, through tropical jungles—in all climates—in any emergency.

Good old DeVry Camera—it works when others fail.

The wide acceptance of DeVry products can be summed up by the words of a well known world traveler... "Before buying your camera I checked with members of the Explorers Club and most of them recommended DeVry Cameras and Projectors for my use."

The DeVry line of silent and sound cameras and projectors is complete... time tested by seasoned precision craftsmen.

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even so, there are thumb screws for adjustments, should it ever become necessary for corrections. All the optical system is resiliently mounted and the entire unit can be removed in case of trouble.

A notable improvement over the previous optical systems is the plano-convex lens-mirror, mounted adjacent to the scanning drum. This mirror is so located and guarded that it is almost impossible to get grease, oil, or finger prints on it, yet it can be taken out and cleaned with ease. You brothers that are in the same boat I am in with the Universal base ERPI system, where you have to try to clean the lens of the optical system with a pipe cleaner or a small bit of cotton or gauze held in tweezers, will appreciate this convenience greatly.

Turning to the other side of the sound head we find that with two exceptions the Simplex system is the same as the RCA as far as the projectionist is concerned, the exceptions are: First, the main gear box that operates the scanning drum and connected sprockets is encased in a bath of oil with a visible glass gauge for the projectionist to see the oil level; second, this complete assembly can be removed in case of trouble and another inserted in its place, during the running time of a full reel on the alternate machine.

Regarding the coaxial cable that runs from the PEC to the volume control amplifier, there has been quite a bit of controversy over this short bit of little known and expensive cable. Some say it is there just as a "something different" gag, but according to the brothers who have run these Simplex systems, this coaxial cable does definitely cut down the loss of high frequencies, and saves on terminals that vibrate loose, which in itself pays in quality and upkeep.

GRIP SERIES

Universal’s array of serviceable units in “Scotty” Harbison’s department.

BY GEORGE M. HAINES

Picking up after a month’s absence, our tour of studio backlot departments to publicize special developments in labor-saving and efficient devices brings us to Universal. Over at the Valley studio, the grip department under the supervision of gentle George “Scotty” Harbison, head grip, has an interesting array of worthwhile contributions to studio equipment.

“Scotty” learned in his native land the careful methods of the Glasgow shipbuilders and their construction methods are evident in many contributions he has made toward Hollywood studio equipment and set construction. Starting in the silent days with the Paramount organization at the old Lasky lot, present site of NBC radio center, Harbison stayed with that company for some years before transferring his activities to Universal, where he has been for the past 18 years.

Illustrated on Page xx are some outstanding items in the Universal grip equipment lineup. They are:

1) Portable dressing room, very compact and easily transported and handled. It is made of brown duck over wood frame, with canvas tie
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Parlin, N. J. 
Smith & Aller, Ltd.  
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(HO. 5147)

Eastman Kodak Company  
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J. E. Brutalour, Inc.  
6761 Santa Monica Blvd., Hollywood.  
(HI. 6111)

Agfa-Ansco Corp.  
Binghamton, N. Y. 
Agfa Raw Film Corporation  
6424 Santa Monica Blvd.  
(HO. 2913)

DuMont Film Mfg. Corp.  
Parlin, N. J. 
Smith & Aller, Ltd.  
635 Santa Monica Blvd., Hollywood.  
(HO. 5147)

Eastman Kodak Company  
Rochester, N. Y. 
J. E. Brutalour, Inc.  
6761 Santa Monica Blvd., Hollywood.  
(HI. 6111)

Agfa-Ansco Corp.  
Binghamton, N. Y. 
Agfa Raw Film Corporation  
6424 Santa Monica Blvd.  
(HO. 2913)

Filters

Scheibe, George H.  
1927 W. 78th St., L. A. (TW. 2102)

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5985 mm. P-22 Lenses, Cases, Pan and Tilt Tripod, Veedee Counter, Sunshade, Filter Holder, $115.00. Eyemo, DeView, DeCar, Mitchell, Lotes, Contax, Graflex, Graflexes Enhancers, all accessories. Time payments.  
CAMERA MART  
70 West 45th Street, New York

BEL & HOWELL SILENCED—40.50  
5985 mm. P-22 Lenses, Cases, Pan and Tilt Tripod, Veedee Counter, Sunshade, Filter Holder, $115.00. Eyemo, DeView, DeCar, Mitchell, Lotes, Contax, Graflex, Graflexes Enhancers, all accessories. Time payments.  
CAMERA MART  
70 West 45th Street, New York

For Sale—Latest model DeView sound projector 35 mm. complete, fine condition, with amplifier and speaker. Also DeView camera. All for $250.00. Don Mal-kames, 40 Standish Ave., Tuckahoe, N. Y.

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317 East 34th St., N. Y.

Bell & Howell Co.

Lighting—Electrical Equipment

Bardwell & McAlister  
7636 Santa Monica Blvd., Hollywood.  
(HO. 6225)

General Electric Company  
Nela Park, Cleveland, Ohio.

Mole-Richardson, Inc.  
941 N. Sycamore, Hollywood.  
(HO. 5218)

National Carbon Company  
Carbon Sales Div., Cleveland, Ohio.

REBUILT SILENCED Bell & Howell with focusing shift-over and magnifier, three lenses, tripod, sunshade, finder, $1400.00. Motion Picture Camera Supply, Inc., 725 Seventh Ave., New York City. Cable Address: Cinecamera.

REBUILT STANDARD MITCHELL Camera, Factory Guaranteed, with three lenses, four 1000 foot magazines, matte box, finder, tripod, friction tilthead and carrying cases. MITCHELL CAMERA CORP. 662 N. Robertson Boulevard West Hollywood, California Cable MITCAMO.


USED 18 INCH SUN SPOTS—in good working condition with cable, stage pin, ball, Busch and Lomb or Metal Reflectors, $15 to $20 each. BARDWELL & McALISTER, INC. 7636 Santa Monica Blvd. Hollywood, Calif.

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Cleveland, Ohio.

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(Hillside 1492)

Studio Equipment Co.  
(Ranite 6844)

Fred Hoefner  
5219 Santa Monica Blvd., Hollywood.  
(GL 8241)

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7512 Santa Monica Blvd. (HI. 1492)

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International Photographer

ANNOUNCES

NEW ADDRESS—6461 Sunset Blvd.
NEW TELEPHONE NUMBER HI-9189

INTERNATIONAL PHOTOGRAPHER for August, 1939
Over at Universal, Joe Valentine, with the cooperation of General Electric, has developed the new close-up lighting setup illustrated above. Called the Durbinet, because first used for Deanna Durbin, it is four-sided light, with illumination similar to that in jewelry display windows. Great feature is its insurance of even distribution, but without the flat light effect that destroys roundness. Picture by Gordon Head, stillman member of Local 659, IATSE.

2) Portable dressing room setup, with “Scotty” Harbison in doorway.
3) Portable “Christmas tree,” easily rolled about on set and featuring readily accessible scrim, flags, discs, doughnuts, furniture blocks and other small items that must be handily and immediately available at all times during production. Best boy Dean Paup is in the picture.
4) Another slant on the portable “Christmas Tree.”
5) Interchangeable duralumin dolly track of different lengths to most conveniently suit usual requirement, with roll-on wedges, two spreaders and simple, quickly handled starter pieces for connections. Harold Tyson is the grip in the picture.
6) “Scotty” demonstrates the smaller track pieces.

2) Overhead set-up for lights. Best use is on location. Board is 2x12x12 inches, with holes off lights, held up by two casel stands with pipe to fit and adapted to hold board. This set-up was conceived by Joe Valentine, ace cameraman at Universal. It is known as Valentine set-up. Baby century stand with spot or disc flag. In the shot is Joe Dickson, best boy, who has been in pictures since 1916, starting with the old Vitagraph studios.
8) Lighting scaffold platform and hangers with guardrail and safety back scaffold rails. These rails are of different lengths to correspond to be length. Note the male pin on each rail to insert in pipe bracket on hanger frame. Stairway is background goes to catwalk above. The entire rail was first used in the motion picture industry by Dave Garber, Universal operations executive probably because he was a pioneer in overhead scaffold lights.

On opposite page are shots from excursion to shoot bow and arrow hunt for boars on Catalina Island by Ande Vail, by Mickey Whalen, member of Local 659, IATSE. Vail has demonstrated his skill for 15 years in vaudeville and night clubs. Whalen shot 500 feet of exciting action in 35mm. Mickey is seen with victim in (1), while sharpshooter Vail is shown in (2) and (3). Largest boar weighed 315 pounds, smaller 250. Vail had been informed that it would be very difficult to kill the wild pigs this way, but had no trouble using a broad arrow and 60-pound pull on the bow. Whalen got a sensational shot when large boar rushed to within 15 feet of them until stopped by a well aimed arrow. Mickey shows what can happen to a member of Local 659 when infected with a “Lec Lehr” psychosis in (4).
CLOSE-UPS

HAL MOHR: President of Local 659

Hollywood today presents a picture of complicated, highly organized motion picture production machines, geared for operations with thousands of contributors to the finished product. It is surprising how few are prominent today in production who started in the happy-go-lucky pioneer manner. It marks his personality both on the set and off. The idea of Hal Mohr ranting on any subject is as ridiculous as the thought of his photographing a production inexpertly. Two ideas that are mutually self-explanatory.

Mohr has definite ideas on production cinematographer, who likes to jump from camera to direction, a progressive leader in the affairs of Local 659, and the winner of the Academy Award for the outstanding cinematography of the year in 1932 for “Midsummer Night’s Dream,” Warner’s production. Few know that he directed the activities of producing companies, operated a laboratory for Sol Lesser and wrote, directed and photographed during early picture days.

Leaving Polytechnic High School in his native San Francisco to enter the then new movie business, Hal came to the Universal company in 1915 for his first major company assignment a youthful veteran of the rising industry. This experience, from the carefree, disjointed period when scores of independent producers and exchanges competed lustily for nickels and dimes at the box-offices of the nickelodeons up through the development to a stable and important industry, dominated by gigantic corporations and financing in the millions, is the valuable background behind his smooth and consistent performance behind the camera.

In those early days picture-making was more informal, less machine-like. Films were shot off the cuff. There were no complicated, highly organized studio lineups, no sharp demarcations of work and authority. Everybody pitched in. Actors painted sets and painters acted. It was a period of experiment, of trying new ideas, of wondering whether four-reel pictures would be successful, then five, six, seven and eight reelers.

A man who can run the gamut of an industry’s rise and development from helter-skelter pioneering to today’s giant status must inevitably acquire a huge fund of wisdom and experience, particularly when he has been on the actual firing line of product creation and development from 1913 to 1939. That great wealth of experience is reflected daily in the efficient working of Local 659’s president, whether as cinematographer or director.

All of which adds up to the fact that Hal Mohr is a tough bird to interview or to describe. You can’t tell the facts without making it look like a puff. The man is efficient, competent, an experienced veteran and probably has more friends and fewer enemies than anyone in Hollywood. You can tell that in 3000 words or 30—it still adds up to Hal Mohr, presiding officer of whom every member of Local 659 is proud.—Gib.
Telephoto Viewfinder, focusing alignment gauge, focusing finder, lens attachment and Tri-Pan tripod from Bell & Howell; Robot Sequence Flasher; Leica’s new Summarit lens; Kodagardes, Special-Six-16 from Eastman.

1) Telephoto Viewfinder

- New two-inch viewfinder objective for use available for telephoto 2-inch lenses is announced for use for the Filmo “Aristocrat” Tarum Movie Camera. The two-inch lenses with the new finder objective permits 3 mm film format to be shown with maximum image sizes as large as with the regular half-millimeter lens. The new Finder Objective for the Tele 8 is priced at $5.50. Two of the two-inch telephoto lenses for the Filmo Tele 8 are the two-inch F:3.5 Taylor Hobson focusing lens at $57.00 and the two-inch F:2.8 B.A. Acusat at $45.00. For further description and price information write Eastman Company, 11 Larchmont Avenue, Chicago, Illinois.

2) Turret 8 Focusing Gauge

- New Focusing Alignment Gauge announced by Bell & Howell for use with the Filmo Turret 8 permits the operator to focus exactly, as to obtain the exact boundaries of the picture. Since the critical focuser is an integral part of the Filmo Turret 8 and the lens in photographing position exactly parallel, it is only necessary to slide the focusing gauge block to the right and read the selected lens back into place in order to photograph the picture precisely as focused at framed in the critical focuser. Thus a card, map or any object may be sharply focused and accurately composed within the film frame, and then photographed with complete assurance. Price is $7.50.

3) Robot Sequence Flasher

- Robot Sequence Flasher, just introduced to the American market by Intercontinental Market Corporation, New York, adapts Robot’s versatility and automatic sequence feature to flash photography at night. Sequence Flasher is an entirely new conception of a synchronized flashgun, mechanically as well as photographically. It consists of a base containing a 18 volt flat type battery of automatic mechanism which causes one flash bulb after the other to be connected with the synchronizer of the Robot H Camera. On top of this base fits an interchangeable bank holding three flash bulbs and the reflectors. Whole unit connected with the Robot camera by means of electric cable. The Sequence Flasher has standard American tripod bushings permitting it to be attached to a tripod or to be connected with camera by means of a bracket. The device is in high and weighs 22 oz. Every time release button of camera is depressed, an exposure is made and simultaneously fired of the flash bulbs flashes. After three bulbs have been fired it is necessary to reload the flash. For quicker working, reloading of the bulbs may be avoided by purchasing additional bulbs and keeping same loaded. After firing the bulbs of one bank it is merely necessary to exchange the banks without touching the bulbs in order to obtain additional shots with no more loss time than a few seconds. It is also possible to connect several flashers to obtain more than one sequence shots at night time. Button in the side of the flasher permits instant change of connections to fire three bulbs simultaneously when flicker light intensity is required. Collapsible cardboard reflectors are available for the flasher. They are most efficient and fold up flat.

4) Filmo Direct Focusing Finder

- Slipped into the Filmo 141 motion picture camera in place of the film magazine a new unit announced by Bell & Howell permits both precise visual focusing and accurate framing of an subject, near or far, through any photographic lens. Image on the ground glass is upright, and is magnified ten times so that no adjustment in magnifying power is needed for critical work. New finder is particularly valuable for close-ups, small objects, titles, maps and animated cartoons when using the Filmo 141 magazine loading camera. Since the 141 Camera can be reloaded while it is firmly mounted on a tripod, it follows that the focusing finder also may be used without removing the camera from the tripod head.

5) B&H Lens Attachment

- The wide-angle lens has been the accessory most demanded for 8mm Filmo cameras and in response to this demand Bell & Howell now announces the Hyper Cinor Lens Attachment which serves as both a wide-angle and a normal lens. It doubles the lens angle, so that the area photographed is twice as wide and twice as high as that of the lens used without it. Also, it includes provision for focusing. When normal use of the lens is desired the attachment is unscrewed and removed with a few quick turns. The Hyper Cinor Lens Attachment is supplied in models for the Taylor-Hobson 1/4-inch F:2.5 lens used on Filmo 8’s, and for the T-H 1-inch F:2.7 and B&H Luxar 1-inch lenses for 16mm Filmos. For prices and further information

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6) Tru-Pan Tripod
- New Tru-Pan Tripod from Bell & Howell designed especially for 8mm movie makers provide the all-around utility of the more costly all-metal tripods. Smoothly operating pan and head is similar to that employed on the Bell & Howell All-Metal Tripod. Cost-saving in two-section, selected hard wood legs which are strong and rigid, and may be adjusted to multiple different lengths. Both pan and tilt may be operated or locked independently. While announced as having been designed particularly for 8mm camera use, it is said to be strong enough for use with any Filmo 16mm camera. Price is $18.75.

7) Solar Enlargers
- Available from Berke & James of Chicago are some interesting leaflets on the new model Solar enlarger line, and tips on enlarging miniature negatives. The 4x5—5x7 studio type model is illustrated, along with a new v bracket type mounting for this model.

8) Leica Summitar Lens
- Embodying improved definition over entire field of the image, higher degree of chromatic correction throughout visible spectrum, and increased marginal illumination of image, new Leica Summar 50mm, F:2 Leica camera lens has just been announced. External appearance of the lens is not unlike that of the for popular Summar 50mm lens, except that diameter of front element is much greater. Increased size of front element transmits an increased amount of light which considerably reduces falling off of illumination at edge of field. This is of great advantage, particularly in color photography, where limited latitude of the process tends to exaggerate vignetting. In the past, increasing margin intensity of illumination by increasing size of front element has usually been accomplished at expense of definition. But in the Summitar, Leica Works have surpassed in increasing its definition over the entire area, especially at full aperture.

A new type optical glass is used for the front element which protects the lens surface very effectively against adverse climatic conditions such as are encountered in the tropics or in humid atmospheres. Chromatic correction of the Summitar lens has been increased over the entire visible spectrum. Lens is collapsible and equipped with standard type focusing mount with depth of field scale and coupling for the rangefinder of the Leica camera. When stopped down to f:6.3 the lens may be used for enlarging, while for wide angle and close-up photography, it may be employed with the optical short distance focusing device for the Leica. A special collapsible sun shade is available for the Summitar lens, as are the Leitz filters. These latter are furnished in screw-in mounts.

List price of the Summitar, in collapsible focusing mount for the Leica camera, is $114. Complete information on this new lens may be had by writing to E. Leitz, Inc., 730 Fifth Avenue, New York, N. Y.

"Film Index" Due
- Work on "Film Index," the 800-page bibliography of motion picture literature in preparation by the Federal Writers' Project of New York City has advanced to the final production stages, with the editing of galleys proofs under way for early publication. The volume will be distributed by the H. W. Wilson Company, which shares publication sponsorship with the Museum of Modern Art Film Library. It includes classified and annotated guides to some 10,000 books and maga-
New Kodaguides

- Of interest both to movie-makers and users of still cameras is a new Kodak Home Lighting Guide, for Super-XX Film. This device, a pocket card guide with movable dial, offers complete data for indoor shooting by ordinary room light from 60 watts to 400. It covers light-to-subject distances of 12 feet down to 2 feet; lens apertures f/2 to f/22; “still” exposures of 1/50 sec. to 64 seconds; and both normal and half

zine articles dealing with the creative and technical aspects of film making. It will also offer references to selected reviews of some 4,000 important films classified according to type. The book will sell for ten dollars a copy.
Kodak Special Six-16

Kodak Special Six-16 is available this month equipped with Kodak Anastigmat Special f/4.5 to 1 in the new, precision-built Kodak Supermatic Shutter. Introducing a few months ago, Supermatic has until now been available only the Kodak Special Six-20. This new shutter in addition to a gear train self-timer, speeds 1/2 to 1/1000, 1/5, 1/10, 1/25, 1/50, 1/100, 1/200, and 1/400. The speed range in which the camera may be hand held has figures. The “Time,” “Bulb,” and slower measured speeds requiring the use of a tripod, are located in red. Equipped with Kodak Anastigmat Special f/4.5 and Supermatic shutter, the Kodak Special Six-16 will retail at $43 without or $85.75 with case.

Enge Finder Brackets

Two new encircling brackets for the Kalart Model "F" Lens-Coupled Range Finder, designed for Speed Graphic cameras only, are announced by the Kalart Company. New brackets protect the range finder from hard knocks while eye-tube excursion aids photographer to locate the "bright spot" when focusing. Cross slide on upper part of bracket is same size as slide provided on Leica and many other cameras for accommodating standard camera accessories. Three and holes are provided for fastening slides of flash guns requiring this type of connection. A cutout hole provides access to the side-image adjoining disc on the Range Finder. The bracket is 3½ x 3½ x 3½ Speed Graphic cameras equipped with a threaded amber filter to increase the contrast between the direct and reflected images. For the Miniature 2½ x 3½ Speed Graphic a snap-on filter is furnished for attachment to the upper window of the range finder.
Color, Ltd. Application April 15, 1935, 3 claims. A color film having three emulsion layers sensitive to different portions of the spectrum consisting of corresponding leuco dyes.

No. 2,162,916—Photographic Film Treaments. Albert S. Howell, assignor to & Howell Co. Application Feb. 21, 1935, 3 claims. A film treating apparatus in which the treating solution is carried in pipes supporting the film over which the film passes, and the pipes have lateral perforated branches between the two sets of rollers.


Reissue No. 21,121—Talking Motion Picture Apparatus. Alwyn D. Latster, assignor to Western Electric Co. Original No. 210,432 dated Jan. 4, 1938, 22 claims. A sound apparatus for fading one sound track in while fading another sound track out.

No. 2,163,029—Method of Processing Motion Picture Film. Fred W. Gage, Beverly Hill, Calif., assignor to Warner Bros. Pictures, Inc. Application Dec. 1, 1937, 2 claims. A method of processing a film in which frame subjected to various processing are compared by projection to a properly balanced print, and other prints are made by the process producing most nearly similar results to the properly balanced print.


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Vol. 11  September, 1939

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On the Cover
Mr. and Mrs. Robert Taylor (Barbara Stanwyck) at home. Photographed on their San Fernando Valley ranch by Durward Graybill, stillman member of Local 659, IATSE, and staff photographer at MGM.
Pictures on this and opposite page are from Universal Newsreel clips of latest type U. S. Army bombers in action. Above is a fig
Vive la Vincennes

With Europe engaged in another war that bids to outdo the last World War in spectacular use of the camera to record cruel events for history and to fit into military strategy in many ways, this article is very timely.

By NORMAN ALLEY

No other big war in Europe! Everywhere in America, the Man on the Street stares glaring newspaper headlines, and asks the man next to him: "Do you think we'll get in it?"

They go their separate ways and home dinner; drink a second cup of coffee senty, as the wife turns on the radio.

...This is John Blank, Berlin correspondent for Dilapidated Press—speaking you from the galvanized press coop on Unter den Linden. Adolph Hitler, self-styled first soldier of the Reich, announced this morning that . . ."

The wife leaves the dishes stacked high in the sink; they both go to a movie. The newsreel comes on. A clip is shown of Nazi troops pounding on Warsaw . . . It changes to French blue devils taking up their positions in the Maginot line . . . Then comes a spectacular shot of an air raid over London, as children with tags on their lapels are led in a mad exodus for the country . . .

"How do they get those pictures?" the wife wants to know.

"They take them!" growls the husband. "With a camera!"

"I know that, dear," she says, defensively. "But do they go right up there in the front lines? Seems to me it would be dangerous."

"Yeah, but it's fun. Wish I was a cameraman. Just take pictures, while the other suckers fight; sleep in water up to their necks, and drag cannons around!"

"Doesn't the cameraman have to put up with any of the front line hardships?"

"Naah!" says the husband. "Do you
know how they always get those swell close-ups of the general?"

"No, but I've often wondered. How?"

"They live at the general's house!"

"Well, how do they get that front line stuff?"

"They have a telephone running from the front line to the general's chateau. If anything good comes up, the boys in the front line call the general's house, get the cameraman on the phone, and tell him to come on over at his earliest convenience. Then a truce is declared, and the cameraman comes in under a flag that says 'News-reel on it. Both sides, being full of guys who like to have their pictures taken, cheer—and after the cameraman doffs his hat and takes a bow, even to blowing a kiss to the dear enemy, he settles down in a steam-heated shell hole and gets focused up—even to running a tape measure, for instance, from the Maginot Line to the Siegfried sector. Once he gives the signal that he's all set and loaded up, a whistle blows—unless he's making a sound picture, in which event they'd shoot off a whistling flare—and the two sides start acting all over the place. If the picture doesn't look good, the cameraman bawls out both sides; threatens to quit, and then has them do it all over again. When he's through, hostilities are suspended once more while the cameraman gets into the side car of a motorcycle piloted by a shell-shocked stunt man, and heads for a hidden airfield—where he has the boys do a couple of spectacular crashes for him, setting fire to some of the ships to show biggest production!"

"How do you know all this, dear?" asks the wife, who's still as glibly as the day she married him.

"Oh, I was going to be a cameraman in the World War myself—but the day before I was to set sail for France, I was a victim of sabotage!"

"Sabotage? . . . She thinks it's the name of someone."

"Yes, dear, sabotage. Pure and simple. I tripped over a tripod and broke my leg in two places."

"You should have stayed away from those places!" reprimands the wife.

He passes that one over, as he adds: "When I woke up I was marching with the infantry."

"But, darling," she says, putting her foot right into it, "you told me you got those scars when you fell off a box, while reading a gas meter!"

And so it goes. That guy had it all in his own head: the entire set-up in a nutshell, so to speak.

* * *

Now that the reader may be interested in hearing the true situation behind newsreel pictures on foreign fighting fronts, suppose I tell you something about it. I'm a newswieldy guy of parts, and I operated a camera in the Photographic Division of the A.E.F. during the "first" World War.

Making news clips on the field of battle is no picnic. You hole in beside the rest of the mob—you don't ask for, nor receive any favors or special privileges—and when night falls, just as like as not you'll find yourself lying down in a trench, using a 10-inch thickness of water for a crazy quilt.

Cameramen, on their first war assignment, sometimes get something akin to "buck fever" when they head their lens on a war horror. It's almost as hard to train a camera on a dying soldier as it is to be the guy who did the dirty work. Your first instinct is to drop all work: run out and help him, to maybe tumble beside him, mortally wounded yourself, in attempting to do so. And you don't get pictures . . .

A cameraman is a marked man from the opposing trench. If they spot him—killing nobody, but just taking pictures—he is slated for special elimination. They know the guy is making pictures that—regardless of a professor neutral viewpoint—are going back to grace neutral screens and tell tales to a people, who, now knowing the facts, may rise in arms to help the other guy's cause.

Then there is always the chance that some green grenadier on the other side of the fence, who's never been out of the "backwoods" till the military came and took him, will mistake your camera for a machine gun and take advantage of the opportunity for a "purity" decoration—by letting you have a "pineapple" amidships.

Right now, in the early stages of this present conflict, a rigid censorship holds sway—and the news cameramen on the present European scene has to subsist on "hand-outs." Lavenders are given to the headline-hungry newsreel groups at one and the same time by the departments on Public Information maintained by each of the belligerent governments. This tends to make an enterprising newshawk most unhappy, since it nips in the bud any chance for such joyous things as "exclusives"—and he doesn't have to be overly bright to know that the material being handed out has been first fine-tooth-combed, edited by master propagandists, and most thoroughly adulterated. The celebrated face on the cutting room floor has nothing on the pace of the censorship boa.

At the present writing, scoops are only to be found in the dictator's private sugar barrel; while beats are found nowhere as on a mustering drum!

But the headline hunters will gradually seep in, just as sure as water will enter punctured submarine. The bars will down, when—while the herdsman islocing the other way—the newsreel guys themselves will take them down. Then we follow a mad stampede of the choice stuff in that corral—and we can look for beats—scoops, and all the things that make for return of halcyon days to the man who takes his life in his hands for a few precious news clips. Yessir! Give a veteran newsreeler an inch, and he'll photograph a thousand feet!

Of course, in the last war, photographing the conflict wasn't all work and play. There was grand and unforgettable events in the form of other hot after da spots—but that wasn't the privilege of favored few who had sufficient United Gar Store coupons to pay for the vin rou or champagne. No, indeed. The guy who tripped over a tripod and woke up in the infantry had his moments, too—even though he never has told his wife about them.

When the last war came to a close, a surviving members of the Photographic industry, A.E.F., scattered like chaff to the four winds. I've gone further afield in ensuing years than most of them, and I not ashamed to admit I often sit—wits eyes not too dry—and think of that great army of "Victorians Invincibles," . . .

Recently, I was "cutting up tough with my old comrade Pete Shamroy—Ambassador of Good Will for Dupe Films, here in Hollywood. Just for fun and a lot of swell reminiscence, we got a heads together and conjured up a list of some of that old overseas gang—and I believe you me, Pete could put his hands on some of them quicker than an able G-Man. Here they are, all former movie and "still" cameramen for Uncle Sam in the free-for-all of '17, or with their nearest..."
oulders to the wheel in the same division. I've already mentioned Pete. Then, let's e. As I clear my throat, I must think roof Lumber, still fighting the na- tion's halitosis with Listerine, at St. Louis. ick Sears, news camera for Universal in ew England; Ernest Shoenack, now fam- ous for the direction of Hollywood's most usual features; Mark Bara, an industr in engineer at Providence, R. I.; Larry Armour, one of Hollywood's best dollar- reaching producers; Victor Fleming, a g director of super-productions for the G.M. lion to roar about; Al Kaufman, reduction executive; Johnny Swain, Ind proctory contact at RKO; Harry Thorpe, bureau of Identification, L. A. Police ept.; George Teague, Universal process spert; Willard Vanderveer, with Pete nith's novelty shorts, MGM; Len "Bull loose" Smith, camera ace at MGM; Char- e Downs, major-domo of N. Y. Camera- en's Local, No. 614, IATSE.

Earl Hines, Harry Davis, Tom Galligan, eggie Lyons, Ed Schneider, cameramen inudio production; George Marshall, ace rector at Universal; Gare Schwartz, xperimenting with the theories of multiple-ension in Paris; Jeff Dickson, who also aved in Paris, and became the Tex Rick- d of Europe; Al Mann, director for armament; Wesley Ruggles, one of the try tops among movie "megaphoners"; Hubby Lehmann, new-lensing for Movie- one in Southern California; Charlie Ford, reducing for Republic; Norman Spericking football goals for Liberty Magazine; Ira Morgan, production cameraman c as is Gus Peterson; Lewis Milestone, ace rector.

Billy Williams is now a process expert RKO; Jim Brown is photographing for armour; Vic Carlson, traffic dept., So. alif. Telephone Co.; Bill Abouesselman, nance's leading radio manufacturer: Bill amilton, film editor, RKO; Hal Mohr, cameraman and president of our local; Frank Lydell, famous radio hillly; L. W. O'Connell, cameraman at Warner's; Roland Price, producer-cameraman; Eddie White, associate producer at public; Otho Lovering, associate pro- cessor with Walter Wanger.

Fareció Edouart, process supervisor at armament; Charlie Fogel, superintendent exchange prints; Maj. E. J. Hardy, in politics at Berkeley; J. N. Hillhouse—now Reverend—who runs a desert sanitarium Phoenix; Courtney Munson, Bureau of lification, Pasadena Police Dept.; A. Waxman, Warner Bros. Publicity; Johnu Waters, assistant director at MGM; Jack "bagstick" Wagner, Hollywood's famous man; Duke Zalibra, photography, L. A. board of Education; Ed Waskow, furni- re; Paul Vogel, camera at MGM; Al Lezel, camera; Bernie Loper, theatre nager, Los Angeles; Al Romell, pho- graphy, Southern Pacific R.R.; Walter Li, 8mm expert with Gaumont; A. E. olsborough, Pasadena rifle expert; and

Felix Shoenack, brother to Ernest—a producction cameraman and gentleman farmer. There were others, who have "gone west." What a bunch to have in any man's army; peace or war. Some of them are perhaps a little too much around the wasteline, etc., today—but if trouble should break out tomorrow, I'd bet dollars to doughnuts that they'd be fighting for a chance to get right back in there and do the same thing over again. What's more, they'd give an account of themselves that would stack up, and I'd vouchsafe surpass any aggregation of young aspirants that might arise to contest their right to the title of the greatest aggregation of cam- era talent "ever assembled under one tent!"

Viva La Vinciennes!
When viewing equipment at Samuel Goldwyn Studios one is impressed by efficiency of each piece of equipment in the grip department, which is ably handled by Alex Hume, head of the department. Alex, with many years behind him at the Goldwyn lot, has organized a very smooth running department, in fact, one of the best. Many of the studios could profit by observing some of the methods employed in the Goldwyn grip department, handled by a man whose equipment ideas and understanding of labor contribute much to the well being of his organization.

In Ralph Hoag, Hume has an able key grip, as demonstrated by his contributions to the industry, many of which have been adapted by other studios. Pictured here are some of his inventions, including Hoag Hydraulic Tripod; efficient light Jumbo stand; grip box; duralumin adjustable track; extension leg point chuck. Hoag is now working on several ideas which when completed will fill a real need in the industry. He has spent 10 years with Goldwyn and free lanced for five. We hope in future to give our readers additional information on the Goldwyn equipment.

Equipment described is keyed by numerals in accompanying layout of pictures.

1. Velocipede sound synchronizing unit.
2. Connection for follow focus unit with electrical motors.
3. Duralumin inclines for track.
4. Connecting pins or dowels for dolly track.
5. Foot control velocipede wheel brake.
6. Rheostat control for electrical elevation of velocipede camera arm.
7. Off-center camera plate crank.
8. Connection for camera arm control unit.
10. Accessories box.
11. Duralumin adjustable dolly track.
12. Protection caps for track ends to protect dowl lock holes when not in use.
13. Caps as when track is not in use.
14. Connecting dowel lock pins as insert when additional track is used.
15. Adjustable track spreaders.
16. Bronze century stand—bronze fittings, dogs, with satin finish (a process of rust proofing).
17. Hoag Hydraulic tripods with satin finish.
18. Pressure release valve for decrease height of camera.
Pictures on this and opposite page made exclusively for International Photographer by Robert Coburn

20. Guy rod dog for tying off when camera is et.
22. Tripod tie-off dog.
23. Extension tripod leg point.
24. One of two adjustable leg points.
25. Tripod point is inserted in chuck (similar to lathe chuck).
27. Camera base plate head.
A. Adjustable high hat plate.
30. Tie-off dog and elevation arm for adjusting high hat base plate, adjusted to 80 per cent of its adjustment.
32. Removal high hat on adjustable plate.
34. Adjustable height camera stool.
35. Claw dog for various heights.
36. Jumbo stand with overhead blade. Grip in picture is Jess Wilson, member of Local 80, IATSE.
37. Wheel locks.
38. Tie-off Jumbo stand elevation dogs.
Adjustable blade extension.

39. Adjustable blade extension.
41. Grip equipment box. "Denver," H. R. Brandon, Local 80, IATSE, is grip in picture.
42. Handy lathe with removable mounts.
43. Electrical plug-in sockets.
44. Grip accessories.
45. Adjustable knife bat.

Notes on the above equipment.

Items 1 to 10. The placement of the sound synchronization, connecting of follow focus and camera control, incline tracks, dovetail pins, accessory box, in the rear is a much improved feature over the usual unhandy placements of such equipment.

Item 5. Foot brake, a durable feature for efficiency in operation.

Item 6. The proper placement of the arm control makes for efficiency and convenience of cameraman or key grip. Where we have done most efficient foot track we have seen. Its advantages over other tracks are: It is constructed of duralumin, permitting easy handling; adjustable spreaders for any width; "I" beam track, eliminating the use of cumbersome base planks as "I" beam has sufficient strength to eliminate sag; dovetail pins retaining strength of "I" beam track.

Item 16. As with all Samuel Goldwyn equipment, efficiency is foremost. These stands exemplify this.

Item 17. The Hoag tripod. This is the much talked-about hydraulic tripod that meets every demand of a cameraman. In efficiency it is unsurpassed for the following reasons: Fig. 21 is the hydraulic foot pump for gradual elevation of camera. Fig. 18 is pressure release valve for decreasing height. Figs. 23 and 24, interchangeable extension leg points with chuck connection. Fig. 26, pneumatic tire permitting easy vibrationless mobile movement. Fig. 20, rigid guy rods. Figs. A, B and C, the hydraulic NPS permitting at least four feet more of height than the usual tripod height. In the construction of this tripod the lightest metal has been used wherever possible, treated with satin rings. Squibb.

Items 30 and A. Adjustable high hat plate and off-center extension plate. A very efficient grouping of equipment for down shots. In the picture it is adjusted to 45 degree angle with base carriage slightly off center on extension plate. The extension plate is a proven time saver inasmuch as the camera can be moved 18 inches off center, each way, eliminating the need for a change in set-up for such a required small change in angle.

Item 36. Jumbo stand with four satin runs, proof height extensions and duralumin frame overhead blade. This dual purpose Jumbo stand can be elevated to 24 feet without any weight necessary at base. When blade is used, its extension is 8 feet. Jumbo stand also is used with flag to gob off light from parallel. It is equipped with foot adjustment wheel locks.

Items 40 and A. Grip equipment box. The most efficient box seen to date. Such a box should be on every set. Every piece of equipment and grip accessory is conveniently at hand (no digging required). Observe the lights in top, eliminating the bright work light usually required. On the lathe shown was turned out much of the unusual equipment used at Samuel Goldwyn Studio. Pictured with box is "Denver," H. R. Brandon, grip, who has been associated with the industry for 15 years, having spent the last nine years at Samuel Goldwyn Studio. "Denver" has utilized his past experience as a machinist to help turn out many of the Alex Hume and Ralph Hoag ideas.

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**MIXING WEIGHTS AND MEASURES**

Chapter IV from Don Hooper’s volume, “Basic Photography,” presenting reference-worthy material on basic elements of photography; presents comprehensive data on tables, weights and measures used in profession.

By DON HOOPER

Numerals in parenthesis in the following text refer to the page numbers on which this material appeared in the original edition of “Basic Photography.” A few copies still are available. Turn to Page 27 for information.”—Ed. Note.

**INTRODUCTION**

(39)

The preparation of photographic solutions, from the chemicals which have been described in the previous chapter, is no haphazard process, but calls for extreme care in each of the following procedures: first, the purity of the chemicals used and the cleanliness of the containers; second, the proper amount of each chemical being weighed or measured out and, third, the combination of these chemicals in the proper order and their thorough mixing. There is nothing difficult or mysterious about preparing photographic formulas, but poor results will often be obtained from carelessness in their preparation.

The information supplied in this chapter is of such nature that it is almost impossible to memorize any great portion of it. Its main importance is to act as a ready reference in the preparation of photographic formulas. It should be read in earnest, however, as the general context of the chapter can be remembered and will prevent you from blindly making errors when preparing to do darkroom work.

**WEIGHTS AND MEASURES**

Dry chemicals (those in crystal or powder form) are always weighed to obtain the desired amounts, while the various liquid chemicals used, as well as water, are almost always measured by volume. In the United States and Great Britain there are two systems of weights and one of measures used in photographic work. The Units of those systems with which we are concerned are given below:

**AVOIRDUPOIS (AV) WEIGHT**

27-11/32 Grains (gms.) ............ 1 Dram or Drachm (dram) 
16 Drams (drms.) .................... 1 Ounce (oz.)
16 Ounces (ozs.) ....................... 1 Pound (lb.)
437 1/2 Grains ........................ 1 Ounce
7,000 Grains ........................... 1 Pound

**APOTHECARY (APOT) (AP) WEIGHT**

20 Grains .......................... 1 Scruples (sc.)
3 Scruples (scs.) ............. 1 Dram or 60 Grains
8 Drams .......................... 1 Ounce or 480 Grains
12 Ounces ........................ 1 Pound of 5,760 Grains

It will be noted from the above tables that considerable difference exists between these two systems of weights. However, the Grain is the same in both, one Grain Av, having the same weight as a grain Ap. All United (40)

States formulas, which are the ones generally employed in this country, are the Avoirdupois system, and use only the grain, ounce and pound. However, British formulas frequently call for Drams of a certain chemical, and in using such a formula the Apothecary’s dram is meant.

The following table of fluid measure is used almost entirely in this country, for measuring fluid chemicals and water:

| 60 Minims (mins.) | 1 Dram or Drachm (dram) |
| 8 Drams .......... | 1 Ounce (oz.) |
| 4 Ounces .......... | 1 Gill |
| 4 Gills .......... | 1 Pint (Pt.) 16 Ounces |
| 2 Pints .......... | 1 Quart (Qt.) 32 Ounces |
| 4 Quarts .......... | 1 Gallon (gal.) 128 Ounces |

The above system is used in Great Britain with the difference that the pint contains 20 ounces and the quart 40 ounces. This should be remembered when using British formulas. One fluid ounce of water weighs one ounce Avoirdupois and as one fluid ounce contains 480 minims and one ounce Av. 437 1/2 grains, a minim of water weighs roughly 0.91 grain. The units of fluid most commonly used in photography are the minim, dram, ounce, quart and gallon.

**THE METRIC SYSTEM**

In most European and in many other countries the METRIC SYSTEM of weights and measures is used. This system is much simpler than ours, easily learned and remembered, and has the following advantages over our systems:

1. Decimal relationship of units.
2. Uniform and self-defined names of units.
3. Simple relation to each other of units of length, area, volume and weight.

For this reason it is essential that the photographic student become familiar with this system. The unit upon which the entire Metric System is based is called the Meter, which is supposed to be one ten-millionth of the distance, on the earth’s surface, from the pole to the equator.

The three BASIC UNITS of the metric system, however, are as follows:

**METER, for Length; GRAM, for Weight; LITER, of Capacity.**

The tables of this system are made up in multiples of ten. The terms used for the various measurements are the names of the three basic units, and, in Greek and three Latin prefixes for each of them, as follows:

**Prefixes**

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Greek/Latin</th>
<th>Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILLI</td>
<td>One-thousandth</td>
<td>1/1,000 .001</td>
</tr>
<tr>
<td>CENTI</td>
<td>One-hundredth</td>
<td>1/100 .01</td>
</tr>
<tr>
<td>DECI</td>
<td>One-tenth</td>
<td>1/10 .1</td>
</tr>
<tr>
<td>MILLIT</td>
<td>One-thousandth</td>
<td>1/1,000 .001</td>
</tr>
<tr>
<td>CENTIT</td>
<td>One-hundredth</td>
<td>1/100 .01</td>
</tr>
<tr>
<td>DECKI</td>
<td>One-thousandth</td>
<td>1/1000 .001</td>
</tr>
</tbody>
</table>

**States formulas, which are the ones generally employed in this country, are the Avoirdupois system, and use only the grain, ounce and pound. However, British formulas frequently call for Drams of a certain chemical, and in using such a formula the Apothecary’s dram is meant.**

(41) The Metric System tables are formed by combining the prefixes with the terms for the basic units as follows:


**LENGHT**

<table>
<thead>
<tr>
<th>10 Millimeters (mm)</th>
<th>1 Centimeter (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Centimeter (cm)</td>
<td>1 Decimeter (dm)</td>
</tr>
<tr>
<td>1 Decimeter (dm)</td>
<td>1 Meter (m)</td>
</tr>
<tr>
<td>1 Meter (m)</td>
<td>1 Dekameter (dkm)</td>
</tr>
<tr>
<td>1 Dekameter (dkm)</td>
<td>1 Hectometer (hm)</td>
</tr>
<tr>
<td>1 Hectometer (hm)</td>
<td>1 Kilometer (km)</td>
</tr>
</tbody>
</table>

**WEIGHT OR MASS**

<table>
<thead>
<tr>
<th>10 Milligrams (mg)</th>
<th>1 Centigram (cg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Centigram (cg)</td>
<td>1 Decigram (dg)</td>
</tr>
<tr>
<td>1 Decigram (dg)</td>
<td>1 Gram (g)</td>
</tr>
<tr>
<td>1 Gram (g)</td>
<td>1 Dekagram (dkg)</td>
</tr>
<tr>
<td>1 Dekagram (dkg)</td>
<td>1 Hectogram (hg)</td>
</tr>
<tr>
<td>1 Hectogram (hg)</td>
<td>1 Kilogram (kg)</td>
</tr>
</tbody>
</table>

**CAPACITY**

<table>
<thead>
<tr>
<th>10 Milliliters (ml)</th>
<th>1 Centiliter (cl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Centiliter (cl)</td>
<td>1 Deciliter (dl)</td>
</tr>
<tr>
<td>1 Deciliter (dl)</td>
<td>1 Liter (l)</td>
</tr>
<tr>
<td>1 Liter (l)</td>
<td>1 Dekaliter (dkl)</td>
</tr>
<tr>
<td>1 Dekaliter (dkl)</td>
<td>1 Hectoliter (hl)</td>
</tr>
<tr>
<td>1 Hectoliter (hl)</td>
<td>1 Kiloliter (kl)</td>
</tr>
</tbody>
</table>

The Square and Cubic tables are made from the squares and cubes of linear units, as cubic centimeter, square meter, etc. To better establish the relationship of the various tables, it is well to remember the following:

One Cubic Centimeter equals one milliliter and that volume of water weighs one Gram at 4 degrees Centigrade.

One Cubic Decimeter equals one liter, and that volume of water weighs 1 Kilogram, at 4 degrees Centigrade.

**EQUIVALENTS AND CONVERSIONS**

Since practically all our devices for weights and measurements are for United States and British systems, it is frequently necessary to convert certain weights, lengths, and capacities expressed in the Metric System, to suit our use. Various useful equivalents are given below, and conversions are easily made by using these conversions and rules.

**EQUIVALENTS**

| LENGTH | | |
|--------|--------|
| 1 Centimeter | 0.3937 Inch |
| 1 Inch | 2.54 Centimeters |
| 1 Meter | 1.094 Yards (3.28 Ft) |
| 1 Yard | 0.9144 Feet |
| 1 Kilometer | 0.621 Statute Mile |
| 1 Statute Mile | 1.60934 Kilometers |

| CAPACITY | | |
|----------|--------|
| 1 Cubic Centimeter | 0.061 Cubic Inch |
| 1 Cubic Inch | 16.39 Cubic Centimeters |
| 1 Milliliter (ml) | 0.0348 Liquid Ounce (Av.) |
| 1 Liquid Ounce (Av.) | 29.57 Milliliters (ccs) |
| 1 Liter (l) | 1.057 Quart (Av.) |

| WEIGHT | | |
|--------|--------|
| 1 Gram | 0.03528 Ounces (Av.) |
| 1 Ounce (Av.) | 28.35 Grams |
| 1 Kilogram | 2.205 Pounds (Av.) |
| 1 Pound (Av.) | 0.4536 Kilograms |

**RULES FOR CONVERSION**

| 1 Centimeter to Inches | Multiply by 2.54 |
| 1 Centimeter to Feet | Multiply by 0.0328 |
| 1 Centimeter to Yards | Multiply by 0.0328 |
| 1 Millimeter to Inches | Multiply by 0.0393 |

| VOLUME | | |
|--------|--------|
| 1 Cubic Centimeter (Av.) to Cubic Centimeters (or Milliliters) | Multiply by 29.6 |
| 1 Cubic Centimeters (or Milliliters) to Quarts (Av.) | Multiply by 29.6 |
| 1 Quarts (Av.) to Liters | Multiply by 1.057 |
| 1 Liters to Quarts (Av.) | Multiply by 0.9333 |
| 1 Grams (Av.) to Grains | Multiply by 15.43 |
| 1 Grains to Grams (Av.) | Multiply by 15.43 |
| 1 Ounces (Av.) to Grams | Multiply by 28.35 |
| 1 Grams (Av.) to Ounces (Av.) | Multiply by 0.03528 |
| 1 Pounds (Av.) to Kilograms | Multiply by 0.4536 |
| 1 Kilograms to Pounds (Av.) | Multiply by 2.205 |

**MEASURING LIQUIDS**

Liquids are usually measured in glass graduates, although they may be casually measured by weight. These glass graduates are of various sizes, the most common assortment in use being the dram (sixty one ounce, eight ounce, and thirty-two ounce sizes. When measuring liquids, especially acids, great care should be exercised in pouring the bottle. First remove the stopper and lay it on something that will be injured by the liquid, or hold it between your fingers. Hold the bottle vertically at the level of the eye, place the neck of the bottle near the mouth of the graduate and pour slowly until the desired quantity in the graduate. It will be noted that most liquids seem to rise slightly on the sides of the graduate when the eye is on a level with the surface of the liquid. The higher line is caused by the liquid creeping up the walls of the graduate. The lower line is the true level of the liquid, and it should be brought to the mark on the graduate which measures the desired quantity. If the graduate is not held vertically while measuring, there could be considerable error in the amount measured out. As few as 10 or 15 minims can be accurately measured in the one dram graduate, and as very small photographic formulas or small solutions of solids than don't dissolve in liquid, this one dram graduate, together with the other sizes mentioned above, should be sufficient for almost any darkroom work.

**FORMULAS IN "PARTS"**

Formulas are sometimes compounded from various stock solutions, which are to be mixed in certain proportions. They might then read in this manner: 1 part Stock Solution A, 2 parts Stock Solution B, 3 parts water. This means that you may select any convenient container to use as a measure, and take as many measures as the number of parts called for of each solution. Using a quart can in the above example, you would take one quart of A, 3 quarts of B, and 8 quarts water. Should it be found that one ingredient of the formula is a dry chemical and cannot be accurately handled in any other manner than by weight, then all parts of the formula must be measured by weight, or you would first perform some operation which used the word "part" as a quantity must be made up with all ingredients measured by the same unit, either all by weight or all by volume.

**PER CENT SOLUTIONS**

It is frequently necessary to prepare a solution having a certain percentage of a chemical (dry or liquid). Since water is used in preparing all photographic solutions, per cent solutions are made up with a part of water.

**FORMULA FOR PER CENT SOLUTIONS WHEN USING DRY CHEMICALS**

A per cent solution will contain as many units of the dry chemical as the percentage strength in enough water to make up one hundred units. For example, a 10 per cent solution of the chemical dissolved in 90 oz. of water. This formula for preparing per cent solutions can be used proportionately. Therefore, if only a small volume is required and ten was used as the dividing factor, one ounce of the dry chemical dissolved in nine ounces of water would possess the same strength as above. A-weighing that a fluid ounce (Av.) of water weighs one ounce (Av.), this gives us ten ounces by weight of the solution, one-tenth of which is composed of the chemical. By the metric system, per cent solutions are calculated in cc. or ml. of water. Remembering that one cc. or ml. of a fluid, a gram, ten per cent solution would require one gram of the chemical and nine grams of water, to give ten grams of the solution by weight. If this formula is used proportionately, be certain that the same dividing or multiplying factor, whichever the case may be, is used with both the units of the chemical and the units of water.

**FORMULA FOR PER CENT SOLUTIONS WHEN USING LIQUID CHEMICALS**

A per cent solution will contain as many units of the liquid chemical as the percentage strength in enough water to make up one hundred units. Therefore, a 10 per cent solution of a liquid chemical would call for one fluid oz. (Av.) of the chemical thoroughly mixed in nine fluid ounces (Av.) of water. This formula, however, pertains to liquid chemicals, only when they are of about the same specific gravity as water. When using liquid chemicals that have a specific gravity that differs greatly from that of water the proper amount of liquid chemical should be obtained by weight as was done when using the dry chemicals. When measuring liquids by weight, place the graduate, or container to be used, on the scale and ascertain how much liquid is to be added to the weight of the chemical. Using a scale and then pour the chemical into the graduate until this total weight is obtained. However, if the exact specific gravity of the liquid is known, the following procedure will be found to be more accurate: Divide the number of ounces (Av.) required by the specific gravity of the liquid and measure out the corresponding number of fluid ounces. Thus, by simple arithmetic, if the unit, of liquid chemicals desired, was six ounces by weight of sulphuric acid (specific gravity 1.83), then 3.3 fluid ounces (Av. of the sulphuric acid would be measured out.

**SPECIFIC GRAVITY**

The weight of a definite volume of a certain substance, as compared to the weight of the same-volume of distilled water, is called the SPECIFIC GRAVITY of that substance. Thus, alcohol weighs about 0.8 to as much as distilled water, or its specific gravity is about 0.80. Again, 93 per cent sulphuric acid weighs 1.83 times more than water, or its specific gravity is 1.83. Although all solids also have their specific gravities, in photography, we are only concerned with the specific gravities of liquids or solutions. As a solution becomes more CONCENTRATED (containing a greater amount of chemical), its specific gravity nearly always increases. The above picture is often an accurate indication of the strength or purity of a solution or a liquid chemical, and the latter is often sold with the specific gravity stated.

Some acids purchased are found to already be of a certain percentage strength. These acids are usually in the old-fashioned bottles that ask for a strength other than that which is supplied by the manufacturer.

**FORMULA FOR PER CENT SOLUTIONS WHEN USING LIQUID CHEMICALS OF A GIVEN PERCENTAGE STRENGTH**

Multiply the percentage strength of the acid required by the amount of the acid required, and divide by the percentage strength of the acid on hand.

Thus, to prepare 10 ounces of 28 per cent acid from 80 per cent acid,
multiply 28 by 10 and divide by 80. The result is that 3.5 ounces of 80 per cent acid is added to enough water to make up a total volume of 10 ounces.

Acetic acid, one of the most used of all acids in photographic chemistry, is made in different percentage strengths; the commercial about 28 per cent, the re-distilled 80 per cent, and the glacial 99 per cent. Formulas often call for a solution of 28 per cent acetic acid.

THE HYDROMETER

This instrument is used to indicate the relative specific gravities of liquids, usually in what is called degrees Baumé. The hydrometer consists of a weighted glass bulb. The reading is taken at the surface of the liquid in a glass tube, from a graduated scale above the bulb. The usual hydrometer for photographic work reads zero for pure water, with the readings increasing by decreasing specific gravity of the test liquid that can be tested with this instrument. These readings do NOT refer to the specific gravities, but are graduations on the Baume scale which can be converted into specific gravities.

It is seldom ever necessary, however, in the preparation of photographic formulas, to determine the specific gravities of liquid chemicals as they are nearly always indicated on the label of the container that they are in. The main function of a hydrometer, for 95 per cent of all photographic work done today, is to test the strength of the fixing bath.

A fixing bath, when freshly made, should never test below 80 on the Baume scale of the hydrometer. When it is desirable to fix negatives (45) rapidly, it is permissible to have the fixing bath test considerably above this. A fixing bath to be used for prints; however, should never test above 80 on the Baume scale, because if this condition prevails, the prints will tend to float in the solution and thereby are likely to become stained. Since specific gravities and consequent hydrometer readings, change with variations of temperature, hydrometer readings should always be taken at the temperature indicated on each instrument. This is usually 60 degrees F.

Hydrometers are fragile instruments and easily broken. A slender glass jar to hold the liquid tested is supplied with each instrument. A small wad of cotton should be placed in this jar prior to placing the weighted end of the hydrometer. This jar should either be removed or thoroughly washed before and after each hydrometer reading. When not in use the hydrometer should be kept in the jar.

MEASURING TEMPERATURES

There are two systems for measuring temperatures, in common use, and the photographer should be familiar with each. In this country and in Great Britain the Fahrenheit (F) scale is the standard. In practically all other countries the Centigrade (C) scale has been adopted, and is steadily becoming popular in this country. Following is a comparison of the two systems:

<table>
<thead>
<tr>
<th>FAHRENHEIT</th>
<th>CENTIGRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freezing point of water</td>
<td>0°F</td>
</tr>
<tr>
<td>Boiling point of water</td>
<td>212°F</td>
</tr>
</tbody>
</table>

From the above it will be seen that the Centigrade system has a more logical scale arrangement than the Fahrenheit.

TEMPERATURE CONVERSIONS

Conversions from one to the other of the above temperature scales are often required and are easily made as follows:

- Fahrenheit to Centigrade: Subtract 32 and divide by 1.8.
- Centigrade to Fahrenheit: Multiply by 1.8 and add 32.

The text: "55°C = 131°F." These formulas are reversed, 55°C leaves 33. Divide this by 1.8, which gives the Centigrade reading of 18.3°C.

PHOTOGRAVIC THERMOMETERS

The thermometers used in photographic work are graduated in the Fahrenheit scale, and are usually of two types. The "stirring rod" type Thermometer is a glass rod having a thermometer in one end, this end being used for stirring solutions when mixing formulas. Due to the danger of breakage this must always be kept in the original container when not in use. The Tray Thermometer is a metal dish mounted on a handle and placed in a tray which carries the graduations. This type is for use in developing trays and for determining temperatures in small depths of solutions. A reading should not be taken for several minutes after the thermometer has been subject to a change of temperature. Thermometers should always be handled with great care.

SATURATED SOLUTIONS

Some photographic formulas call for a saturated solution of a certain chemical in water. A saturated solution is that solution which contains all of the substance that the solvent (water) will dissolve, or hold in solution. The solubility, or amount of chemical that will dissolve in water, differs widely for various chemicals. Thus, a saturated solution of lime (calcium hydroxide) contains only the equivalent of one per cent of lime, while a saturated solution of potassium iodide contains about 56 per cent of the iodide. Most chemicals are more soluble in hot water than in cold. Thus it is important to know what temperature the saturated solution is required. Some formulas will state this temperature. If not, it is sufficient to assume the standard temperature for photographic work is 65 to 70 degrees F, and prepare the solution as near these temperatures as is possible.

TO PREPARE A SATURATED SOLUTION, measure out the quantity of water desired in a graduate, or other clear beaker, and add the chemical a little at a time, stirring continually, until no more of the chemical will dissolve. After this, with a small amount of the unsoldusolved chemical in the bottom of the container, stir at intervals for about an hour, after which the required amount of the saturated solution can be poured off. In case the chemical has a tendency to warm or cool the water as it is dissolved, it should be added slowly enough to cause but slight change in the temperature of the solution.

SUPERSATURATED SOLUTIONS

Under some conditions a solvent such as water will hold in solution a greater amount of a chemical than normally forms a saturated solution. This supersaturated solution is usually formed by dissolving the chemical in hot water and allowing it to cool. Normally in such cases, excess of chemical will go out of solution upon cooling, usually in the form of crystals. The "Crystalizing out" can be illustrated by dissolving "hypo" in hot water until a saturated solution is obtained, then upon cooling, practically the whole of the solution turns to crystals of hypo, closely resembling the original crystals.

CARE AND PRECAUTIONS

Graduates, as well as all other glass instruments used in Photography, should be handled with care to prevent chipping and breakage. They should be thoroughly washed before and after use, and kept in racks over the sink in an inverted position. Hot water should never be poured into an empty or cool graduate, as it will surely break. A considerable amount of heat is liberated when an acid and water are joined in solution. For this reason, when acid and water are joined, NEVER POUR WATER UPON ACID. Such a procedure may result in scattering of the acid, which may cause serious injury at any time. It may cause burns on the skin or clothing. Some liquids form gas within the container which may cause the solution to overflow when the stopper is loosened. In opening a bottle of acid, hold it at arm's length with the face turned away while the stopper is loosened. If a bottle of acid has been tightly closed, do not use force in loosening it because the knob on the end of it may break off. A light tap with a piece of wood on the neck of the bottle will often loosen the stopper. If not, a cloth dipped in hot water, wrapped around the neck of the bottle, might be used. This will usually loosen the tightest glass stopper. After removing stoppers (either cork or glass) from a bottle of acid, place them upside down on a clean piece of paper while the bottle is being used. Always replace stoppers in the same bottles from which they were taken. When using dry chemicals, avoid air currents which may carry chemical dust into the darkrooms, causing spots and stains on negatives and prints. Do not brush or blow away chemicals that have been spilled. They may be wiped up with a damp cloth.

PREPARING SOLUTIONS

Chemicals should always be weighed and solutions prepared as far from the darkrooms as is practical. If space permits, a special room should be used for chemical mixing. Small quantities of solutions are usually mixed in graduates. For large quantities enamelled buckets or the final containers can be used. Since a chemical is usually more soluble in hot water than cold, thechemist may be tempted to prepare a solution of the chemical in hot or warm water. Therefore, as a general rule, the chemicals should be dissolved in a small amount of hot water, and diluted to the desired amount with cold water.

PRIMARY RULES

Although different methods are employed in preparing the various solutions, and in Photography, the following rules apply to all and should be strictly adhered to:

CLEANSINESS: The first step in preparing a solution should be to clean thoroughly all containers and apparatus to be used. Contamination from chemicals previously used may ruin the results of the next solution.

USE PURE AND PROPER CHEMICALS: Be sure of the purity and state of the chemical to be used. Always use the chemical in hot or warm water. Therefore, as a general rule, the chemicals should be dissolved in a small amount of hot water, and diluted to the desired amount with cold water.

ALLOW SOLUTION TO STAND BEFORE USING: Insoluble impurities are often present in a solution after it is prepared, and these settle out to a large extent if the solution is allowed to stand for a few hours before use. Also, a mixture of the various chemicals becomes more thorough during this time.

(By To be Concluded in October Issue)
NEW FAVORITES

EASTMAN’S three great new films back up their special characteristics with typical Eastman reliability and uniformity. Worthy successors to earlier Eastman emulsions, they are the new raw-film favorites of the motion picture industry.


EASTMAN

PLUS-X
for general studio use

SUPER-XX
for all difficult shots

BACKGROUND-X
for backgrounds and general exterior work
John Cobb of England roared over Bonneville Salt Flats in Utah last month in his 2600-horsepower aluminum automobile faster than any human had ever travelled before on wheels. A crew of Local 659 cameramen were on hand to record Cobb's sensational speed of 309.85 miles per hour over a measured mile.

Billy Snyder, head cameraman for Wilding Pictures, commercial production company headquartering at the Selznick lot, made the commercial short sponsored by Gilmore Oil Company, whose products were used by Cobb in his speed record dash.

The shot above, made exclusively for International Photographer, at the conclusion of the record run, shows, reading from left to right: Rod Tolmie, Bill Margolis, two AAA aides. Ellis Carter, Bobby Gough, Earl C. Gilmore, Billy Snyder, Burt Eason, AAA official, John Cobb and Art Pillsbury, chief AAA checker.

The record run was made at 6 a.m., when the salt bed surface is hardest. AAA official timers checked the run, using an electric eye at each end of the measured mile. The motion picture cameras were 1200 feet from the track, which was 100 feet wide and 14 miles long. The measured mile was near the center of the course, allowing about six miles to get up speed and another six to slow down.

In order to establish a record, the car must make the run
way and start a return run within one hour, as demanded racing rules.

The double run called for super-efficient advance preparation cause at the end of the 14-mile first run, tires, spark-plugs, had to be changed, 150 pounds of ice in special compartment near motor in rear must be replenished, oil changed, and tank reloaded. Cobb brought eight mechanics from England th him to handle the job.

The “Railton Red Lion,” named after its designer, is built mainly to study effects of terrific speeds on engine parts and sign. After cracking the world speed record, Cobb’s car was shipped back to England, where every part will be tested and studied in six months of laboratory work to compile technical information for guidance in future design. Same thing applies to tires, set of which breaks down badly during one run.

Cobb and his crew left for England immediately after establishing the record, because a number of them were in the reserve force and on call for military duty.

Snyder and his crew, all members of Local 659, IATSE, found the English sportsman and his aides very cooperative and the unit came back with some remarkable shots of the speed runs.
Pictures on this page and shot of Charlie and Syd Chaplin on opposite page are from the camera of J. Edwin New, veteran still-man member of Local 659, IATSE. Shots on this page are from Republic productions. Western scenes are from "Oh,
European conflict and photography, Leica suspends house organ; diffusion screen used for entire picture; Local 659.

J. Edw. New

...J. Edw. New

War and Photography
- Immediate repercussions will be felt in the photographic field if the European war settles down to a dog-fight. There is no question but that photographic equipment, particularly lenses, will be at a premium and prices may take a rapid rise. This trend is especially indicated for the finer type of precision equipment.

Little specific information is available at present as to exact prospects in this respect for the immediate future. First significant development was the sudden suspension of Leica Magazine, published by E. Leitz, Inc., with the current September issue.

Editorial statement announcing the suspension said:
“At present, world political events have been so fashioned that practical necessities must replace our enthusiasm. We find ourselves in a position whereby it is not possible to publish Leica Photography. It is therefore temporarily suspended with this issue. We are, however, going to keep in touch with our Leica family through a bulletin of Leica news which will be issued from time to time, until various factors permit Leica Photography to be published again.”

Carefully worded announcement obviously referred to current war in Europe. Leitz organization in America has close German affiliation. Suspended publication was one of several dozen interesting journals issued monthly by the large film and camera manufacturing companies to owners of their equipment.

Screen Used Throughout
- From George H. Scheibe comes the information that “Island of Lost Men,” current Paramount release, was photographed throughout the entire picture with the Scheibe No. 1/16 diffusing screen. Photographers who are interested in diffusion effects should not miss this production.

Don Lee Television
- With the resumption of television broadcasting by the Don Lee organization, IATSE technicians are again cooperating on this experimental program. Recent improvements and new developments, combined with the better results obtained through for the first time using professional motion picture technicians on the production end of cameras and lighting are so news-worthy that International Photographer now has in preparation a detailed article for early publication on
the Don Lee organization's cooperative television work with members of Local 659 and other West Coast studio locals.

Daylight Sensitometer

- Hollywood Color Film Corporation, formerly Duplex Cinema Equipment Company, announce a new 16 mm daylight operating sensitometer which prints strips automatically. It is claimed to be the only daylight operating sensitometer on the market. It prints from a series of frames of negatives instead of one print.

This firm is busy on 16 and 35 mm color, making 16 mm color a specialty. Their new Duplex camera has a split beam for three colors and on it they can use less than two-inch focal lens with 220 degrees opening in the shutter. This model is not for sale but is built for their own use.

Keyes "Oomph" Cover

- Donald B. Keyes, charter member of Local 659, and one of the pioneer color men in Hollywood, cracked an unprecedented array of national magazine covers with his work on Ann Sheridan in connection with publicity campaign staged by John LeRoy Johnston for Walter Wanger's "Winter Carnival."

During July Keyes covers of the "oomph" girl were featured by Life, Look, Picture Play, Movies and Screenland, while other publications and key city newspaper drama pages also featured the shots. It is doubtful if any star has ever received such a splash of front page reproductions in a single month, all made by one photographer.

Keyes, who operates a color laboratory at 2128 Canyon Drive in Hollywood, used the Devin one-shot camera to make his pictures. He prefers the Devin, rating it as the last word in color cameras. All the processing was handled by himself in his own lab.

Smithsonian Showing

Sixty prints from Paramount Studio Camera Club will be exhibited at Smithsonian Institute during November, according to wire received from H. S. Bryant, Institute's chief of correspondence and documents, to Farciot Edouart at Paramount. Edouart, head of transparency department, suggested the exhibition to Bryant during latter's recent visit to Los Angeles. Douglas Rudd, chairman of the studio club, is making arrangements for shipment of the photographs to the National Museum.

Tempos and Temperature

- Technicians have been engaged at MCA for express purpose of keeping the stage temperature at sixty-five degrees temperature. When stage temperature goes above this point, the glass becomes slippery, making the intricate step of the pair almost impossible. The dance stars are engaged in their first co-starring feature, "Broadway Melody of 1940."

Film Research Council

- Motion Picture Research Council resumed regular sessions this month with first meeting in the Paramount Studio library. President Helen Gladys Perey is head of that department. This is or
The second year of activity. George Mee, MGM, is vice-president, and Lucy Moran, RKO, secretary. Society has a cooperative program among studio research department workers.

**Make-up**

- With RKO using 3,000 extras in big
  project in West Los Angeles will have
  William Pereira, nationally famous in in-
  dustrial development, as chief architect
  of the new plant, announced last month
  to Keith Glenna, Paramount opera-
  tions manager. Pereira will coordinate
  activity in connection with the plan-
  ning and actual construction of the studios
  through the Glenna office. Glenna also
  announced that actual construction work on
  new studios will start when necessary
  will be obtained and the storm
  contract for that area completed.

**Pereira Designs New Studio**

- Paramount's new $12,000,000 studio
  project in West Los Angeles will have
  William Pereira, nationally famous in in-
  dustrial development, as chief architect
  of the new plant, announced last month
  to Keith Glenna, Paramount opera-
  tions manager. Pereira will coordinate
  activity in connection with the plan-
  ning and actual construction of the studios
  through the Glenna office. Glenna also
  announced that actual construction work on
  new studios will start when necessary
  will be obtained and the storm
  contract for that area completed.

**David Visits 659**

- Ed David, son of Charlie David, of
  Local 666, IATSE, Chicago, was a visitor
  to Local 659's new headquarters on Sunset
  Boulevard last month. Younger David
  is here on a vacation trip and renewed
  acquaintances with a number of members
  of Local 659.

**ARC Committee**

- Academy Research Council announces appoint-
  of a committee chairman by S. J. Twin-
  ing, of California, to consider possible revision
  of specifications for the Standard Release Print
  process. Present Standard Leader was revised in
  1936, simultaneously with adoption of the industry
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CLOSE-UPS

Paul Lerpa: Special Effects First Cameraman

Not all Camera wizardry is figurative. The special effects branch of motion picture photography includes a number of able gentlemen who combine science and ingenuity in a form of magic as baffling as any trickery concocted by Merlin for visiting Connecticut Yankees.

The optical printer is the instrument most frequently used by the members of Local 659 in the special effects field. The modern professional camera is a marvel of efficiency, but the optical printer starts where the camera leaves off.

Over at Paramount, it was discovered one day that in an important scene, an American flag had been photographed with the stars on the right instead of on the left, as they should be. To retake the scene with the flag hung correctly would have cost from $5000 upwards. The optical printer was called into service and the flag was "doubled in." The job was photographically satisfactory and the saving was obvious.

We single out the Paramount lot as the place where the particular blunder occurred, not because Paramount has more corrective assignments than any other lot, but because Paramount's first cameraman in charge of optical printing and montages, Paul Lerpae, is the subject of this month's Close-ups. Lerpae is a veteran member of Local 659, IATSE, having joined the organization in 1928 shortly after its inception. He has been with Paramount pretty steadily since 1920, when he—like many another of our Close-ups subjects—got his first studio job in the lab.

The eraser on your pencil can remove errors. The job of the optical printer is to do more than that; the error must not only be removed, it must be corrected. There are obviously few routine assignments for the camera crew handling optical printing. Every new task presents many new and untried angles. The technique, therefore, is the result of the accumulation of experience, combined with extensive experimentation.

The most spectacular aspect of the work of the optical printing cameraman is this sensational and wizard-like ability to save scenes, to solve problems and, in short, to play the role of "safety man" for the rest of the production team. Special problems create opportunities for unusual...
achievements; but the actual daily routine of modern studio special effects departments calls for much more than this.

At Paramount, Lerpae is in charge of optical printing and montages in the special effects department under the direction of Gordon Jennings and Roy Hunter. At other studios the lineup may be a bit different for the various lots each have their own peculiar way of handling such matters even to the details of the actual equipment that is used. Much of the equipment is specially designed and built to meet the ideas of the particular studio department.

Under modern production conditions and increasingly efficient and more dramatically interesting methods of telling stories on the screen the special effects and montage work is an integral part of the story preparation from the early stages of scripting. Method varies on different lots, but the general procedure calls for advance planning for unusual and dramatically effective photographic twists and stunts, rather than using special effects and optical printing merely as time and money saving mediums.

The production executive, the director, the writers and the photographer, all benefit from suggestions advanced by the department that is best known for its miraculous achievements in saving the studio from the ill-effects of blunders or unmountable circumstances that might have marred a scene.

Lerpae gravitated to studio work, when his family came here from Akron, Ohio, where he had been educated, in 1920 and after a spell in the Paramount lab, he graduated starting in 1923 to assistant, second and finally first cameraman rating. Most of his photographic chores have been in the special effects field, for he kept relentlessly after Roy Pomeroy, then head of the studio’s special effects work, until he was given a chance. He has specialized ever since in the field that intrigued him from his first day in a studio.

During the past eleven years, Lerpae, like other first cameramen in this particular branch of photography, studied and learned by daily trial and error. And like most of the men in the field, he attributes much of his group’s success to the precision equipment and steadily improved film emulsions available to them through the cooperation of manufacturers with the industry.

His steady tenure at Paramount, is, he believes, characteristic of the work in the field, because each studio organization likes to train its own men to its particular method of operation. Familiarity with the particular studio’s individual technical gags and devices, trade secrets and pet ways of accomplishing results, is absolutely essential. Consequently, there is less shifting from one lot to another than in any other branch of motion picture photography.

Lerpae, like most other special effects experts, is a difficult subject to round out descriptively. By the very nature of their work, they are inclined not to gable lengthily about it. They are pleasant but vague about the whole business. Their work speaks for itself, but neither they nor it are inclined to disclose the interesting details of how it is done.

Another thing, special effects workers don’t like the emphasis placed by sensation-hunting journalists upon the trickery aspect of their work. Conflict between studio tendency to play mum on all trick stuff in pictures and the expose-minded writers invariably puts them in the middle.

Special effects workers view their jobs as integral parts of the complete task of creating a dramatically effective screen entertainment. Because of the complexities involved in recording the most telling treatment possible on celluloid, they can’t see why special effects can not be regarded as equally legitimate phase of artistic contribution to screen entertainment with the dramatic tricks of a skilled playwright or the artistic license taken by poets and painters.

As Lerpae points out, nobody would criticize a painter for distorting natural perspective that might appear in a photograph to achieve an emotional effect with his brush; so why assume that anything not photographed in straight newsreel style must be regarded as an attempt to “trick the public.”

In other words, special effects tricks and stunts are just another aspect of industry progress toward placing a richer and more effective type of entertainment upon the screen. Whether or not the entertaining or emotional effect was obtained by technical trickery or straight routine “medium long shot, close-up” photography is secondary. In fact, the ability to achieve unusual methods for presenting situations and emotions, is the big edge that the motion picture holds over other restricted art forms.

From the technical standpoint, Lerpae thinks most significant progress made recently has been in the broadening the possibilities of Technicolor. Even with the added problems of three negatives which must register accurately, great strides are being made in special effects in color.

Future of special effects progress holds great possibilities for the industry, Lerpae believes, dependent entirely upon the enthusiasm generated among production creators for more and trickier special effects work, plus ability of special effects technicians to satisfy this enthusiasm with practical results. On the past record of his branch of the business, he’s pretty sure the boys will hold up their end.—Gib.
TRADEWINDS

Bardwell & McAlister Keg-Lite and Foco-Spot; new diffuser from Flat Light Screen outfit; Agfa improves grid shot service speed; new Kodak data books; news from manufacturers, distributors on new products.

Bardwell and McAlister will distribute Bardwell & McAlister Keg-Lite and Foco-Spot; new diffuser from Flat Light Screen outfit; Agfa improves grid shot service speed; new Kodak data books; news from manufacturers, distributors on new products.

Two studio mugs, who started with one employee in 1933, to build an electrical equipment business and by the quality of their product have made their names familiar to studio cameramen, juicers and grips wherever motion pictures are photographed.

The boys had a bit more than the proverbial shoe-string, but not much. They started their business in 1933, with one employee. General service, repairs, rentals, etc., were bread-and-butter side issues to their main scheme, the creation and perfection of new type lamps.

Bardwell & McAlister had practical groundwork from their own experience in Hollywood studios and they slowly built an organization around them that combined practical efficiency with engineering accuracy. The organization turned out lamp after lamp, each with new improvements and refinements.

Soon the quality and service of Bardwell & McAlister product found itself competing on an equal footing with the older firm of Mole-Richardson, and as the friendly rivalry of the two organizations grew keener, the smaller and less progressive firms in the lighting equipment field were forced into the background.

Today Bardwell & McAlister battles M-R on an equal footing and this intensive rivalry of two alert and progressive firms, each headed by men with studio...
backgrounds, is responsible for the overwhelming superiority of Hollywood-made motion picture lighting equipment over that of any manufacturing center in the world.

Latest palm awarded Bardwell & McAlister equipment is the conclusion of arrangements with Eastman Kodak Company, whereby the giant film organization will distribute the highly successful B&Mc Baby Keg-Lite, with its companion Foco-Spot through their national chain of stores in the United States and Canada.

The lamp will be exploited as an ideal photographic tool for both motion pictures and still work.

Their business, of course, has been built around the motion picture studios and Bardwell & McAlister have reserved the right to continue to sell all of the studios and recognized producers throughout the world. In addition to the Eastman outlet they have representatives in India, South Africa, Egypt and several South American countries. Bardwell & McAlister are well known to the members of Local 659 and other IATSE locals as “Bard and Mac.”

Bardwell is married, has a home in Westwood and has two girls and a boy. Mac is married also and lives in an apartment close enough to the B&Mc plant so that he can get there on a minute’s notice; and he himself answers the phone day or night, having a connection in his home so the studios may reach him regardless of time.

From a motion picture standpoint the company’s most recent development was announced in the August issue of International Photographer—the Type 19, 5000 watt spot. This lamp has met with enthusiastic approval in the studios because of its light weight and the fact that it operates at a cooler temperature than the average lamp of equal wattage.

The Baby Keg-Lite weighs 25 pounds and is easily handled. Its stand reaches up to 8½ feet. It uses 500 or 750-watt globes, T-20 or T-21 with medium bi-post base.

Foco-Spot is an optical accessory which fits in the diffuser clips of the Baby Keg-Lite. It develops a concentrated beam with sharp edges, either round or rectangular. A revolving disk with several sizes of round apertures will, at distance of 15 feet, provide brilliant circles of even light in sizes from 3½ up to 3 feet in diameter. Rectangular shapes are obtained by four sliding mats; these rectangles may be rotated to suit the object. This permits use of concentrated high lights, special shadow and silhouette effect and other lighting tricks with ease and assurance.

As an accessory to the Foco-Spot a background slide may be purchased at slight additional cost. Original designs may be drawn or painted on glass slide and projected on the background.

Portrait photographers and commercial photographers are finding that Foco-Spot has opened a new field of portrait possibilities.

With the Baby Keg-Lite slight pressure on a conveniently accessible control rapidly spreads beam to any desired angle from a 1-degree spot to a 50-degree flood. Calibrated scale, giving focusing arm position, allows duplication of any desired lighting effect. This is an exclusive feature, with patents pending.

The light output of Baby Keg-Lite is three times greater than the average photographic light of equal wattage with conventional optics. At any degree from spot to flood the field is clear and even. The intensity of the light beam is the same regardless of the aperture used.

Following is the price list for the lamp and accessories: Baby Keg-Lite, complete with double riser collapsible stand, 25 feet of rubber covered cable and plug without globe, $55. Foco-Spot Attachment with rotating disk and adjustable mats $25; Background Slide, with five clear and one heat-proof glass slides, $2.50; globes used in Baby Keg-Lite are: 500-watt T-20 clear C-13 medium bi-post globe—either M. P. 3200° K. or C. P. 3300° K. $1.25; 750-watt T-24 clear C-13 medium bi-post globe, either M. P. 3200° K. or C. P. 3300° K. $5.50.

New Type Diffuser

- In conjunction with announcement that Flat Light Screen Company is purchasing land to build a plant in the San Fernando
Vley, Russell Owen of Flat Light announces that the company has developed a new light diffuser that they expect to actually replace jelly's and silks in studio use. Current demonstrations indicate that the diffuser, made of the same material as the Flat Light screen has worthwhile possibilities. Continued success of the company's screen with theatre operators such as Flat Light has outgrown its present Hollywood quarters, hence the move to the Valley.

**Afca Speeds Grid Shots**

Following a custom which the Afca Ansco Corporation established several years ago for the benefit of coaching staffs, Afca 16mm reversal laboratories will be prepared to give special service on the processing of football films during the coming season. All Afca 16mm Reversal Laboratories in the United States will remain open over the week-ends for processing of football films. These will be finished and returned the same day as received, permitting viewing of films by the coaches and football enthusiasts with the shortest possible time after the game.

Afca Reversal Laboratories providing this special service include:

- Afca Anasco Corporation, 245 W. 55th Street, New York, New York.
- Afca Anasco Corporation, 433 E. Erie Street, Chicago, Illinois.
- Afca Anasco Corporation, 1224 S. Hope Street, Angeles, California.
- Afca Anasco Corporation, 121 Julia Street, Jacksonville, Florida.
- Motion Picture Service Co., 125 Hyde St., San Francisco, California.
- The Calvin Company, 26th and Jefferson Sts., Kansas City, Missouri.

**In Mail Superflash**

Wabash Photolamp Corporation, Brooklyn, N. Y., announces that their safety coated Wabash Perflash Photolamps have been tested by the post-office authorities and okayed for sending through the mails. Postmasters and other postal employees have already been notified by publication in the Postal Bulletin of August 17, 1939.

Wabash states that Superflash bulbs as packed in their present corrugated sleeves can safely shipped parcel post anywhere without breakage if ordinary care is taken in packing. They recommend wrapping the bulbs in corrugated paper, especially when mailing them a few at a time, or packing inside a corrugated carton with corrugated liner to fill up empty space in the carton and separate the bulbs from any other merchandise shipped in the same package.

**5 Cent Exposure Meter**

International Research Corporation, makers of the Argus camera line, have placed on the market the inexpensive Argus Vest-pocket Exposure Meter, a celluloid wedge type meter that flat and small enough to be carried in a vest pocket or lady's handbag without knowing its presence. A rotating wedge disc indicates brightness of the object aimed at, while a sliding rule quickly and accurately indicates the correct shutter speed and lens aperture to use. Film speeds

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are in Weston ratings. This meter costs only 25 cents complete with leather case.

Argus Jig-A-Mat

- The Jig-A-Mat, recently announced by the International Research Corporation of Ann Arbor, Mich, is a small, practical, and easy-to-use apparatus for making montages. Each sheet has its number and indicator, so there can be no mistake as to the paper areas exposed and those that are still to be exposed. The device is said to be very useful in making photomontage prints. It costs $6.75.

New Kodak Data Books

- Four new Kodak Data Books at nominal prices are available from Eastman Kodak Company, Rochester. The books, in uniform 6x81/2-inch format, are:

  "KODAK FILMS," 56 pages, 15 cents. Discusses Kodak Roll Films, Film Packs, Miniature, and Sheet Films. Photographic characteristics of the films, such as speed, contrast, and the like, are described, and the sensitometric terms are explained. Methods of determining film speeds and meter settings are also discussed. Of especial value is the "Specifications" section, which provides full information as to the photographic and physical characteristics, the uses and processing of each film.

  "KODACROMe, Photography In Color," 52 pages, 25 cents. A comprehensive discussion of Kodachrome, and data on its use for full-color filming. Exposure technique both in daylight and artificial light is treated, and advice on using a photofilm exposure meter is included. This carefully planned book offers diagrams and tables to reproduce artistic pictures at home in color, as well as daylight shots; covers both movie and "still" filming; and provides full specifications and data tables for Kodachrome, Regular and Type A, and Kodakchrome Professional Film, Daylight Type and Type B. A number of illustrations are in color.

  "Wratten Filters," 40 pages, 15 cents. This book deals with filters from both the practical and theoretical standpoints, and will appeal equally to the commercial photographer and the serious amateur. Diagrams and illustrations in black and white and color supplement the text and demonstrate the use of various filters of the Kodak Pola-Screen. Reference tables and selection of the proper filter for a given need. Specifications treat each filter individually, giving all data concerning its use; and covers the K-1, K-2, X-1, G, A, F, R, G5, Tricorder Sets, C3, and Kodak Pola-Screen, Type 1A.

  "Eastman Photographic Papers," 48 pages, 15 cents. Offers full information on the various brands of Eastman photographic papers, and deals at length with their photographic and physical characteristics. A section on "Printing for Quality" is of particular value, and gives helpful suggestions from the choice of paper to the finished print. A number of formulae are included in the section on toning. Specifications contain practical data on the most commonly used papers and include exposure scale values and characteristic curves.

SuperFlash Improvements

- Walash Photolamp Corporation announces that all Walash SuperFlash Lamps from the No. 1 size up now are equipped with invisible, double-strength safety jackets as protection against bursting or shattering. Possibility of bulb wastage through "contact flashing" has also been eliminated. Among other SuperFlash safety features are incorporation of a blue safety spot in each bulb to indicate fitness for use and protection of neck of each lamp by asbestos safety disc.

Steel Thermometer

- New stainless steel thermometer for darkroom use has been introduced by Chess-United Company, New York City. It is guaranteed against corrosion and has a hook attached for convenient suspension from the edge of a developing tray.

Zeiss Ikoflex III

- Featuring a 2½ x 2½ negative size, new Ikoflex III, with Tesser F:2.8 lens, and priced at $999 is announced by Carl Zeiss, Inc. New camera carries most of the convenient features found in twin-lens reflex instruments of this price class, and a number of special Zeiss developments. The company also is planning early introduction of a Model 1, which will be priced around $60.

George Murphy Catalog

- A new catalog of photographic materials has been issued by George Murphy, 57 E. 9th St., New York City. In 274 pages it lists every type of apparatus for professional or amateur photographers.

Enlarging Photometers

- J-M-P Spot Photometer is a small, handy instrument used to determine enlarging exposure time and correct contrast grade of paper for various negatives. Operating on a battery, the Photometer utilizes the harsen principle for measuring densities of various parts of the negative. More sensitive and precise is the Protyme, which operates on a 120 volt-house circuit. Its sensitivity range extends from 1/200 to 1/3 foot-candle. Readings are made on a sensitive jeweled bearing meter that lights up during use. The J-M-P Spot Photometer lists at $3.95 while the Protyme lists at $17.50. Both meters are manufactured by the J-M-P Manufacturing Co., 3034 N. 34th St., Milwaukee.

Dated Slide-O-Mat

- New Dated Slide-O-Mat permits 35 mm double frame, film transparents to be marked easily for filing after being mounted for projection in glass slide form. Frame of Slide-O-Mat constructed of metal and no taping, binding, or pasting is necessary. Transparencies may be moved easily at any time. Listing at ten cents each, the Dated Slide-O-Mat is distributed by G. Gennett, Inc., 20 West 22nd St., New York N. Y.

"Naturalcolor" Expands

- Two new plants, one in New York and another in the South, will be added to the Los Angeles and Chicago color print finishing organization of the Naturalcolor Corporation on 62 East Lake St., Chicago. A nation-wide chain of Naturalcolor dealerships will also be completed in the near future, and one-week delivery service now in effect will be speeded up.

Fedco Print Dryer

- The Fedco Print Dryer, announced by the Fedco Products Company, New York, with eastern distribution assigned to the Raygram Corp., 425 Fourth Ave., New York City, features complete成就感 of smooth and gloss finish prints, polished lacquer drying surface washable canvas, and is in the low price class.

Willoughby's Catalog

- New 100-page catalog of equipment and accessories, one of the company's largest and most complete to date, now is available from Willoughby's, 110 West 32nd Street, New York City.

NEW PATENTS

By ROBERT W. FULWIDER

G. Capstaal and Oran E. Miller, assignors to Eastman Kodak Co. Application July 26, 1936. 18 claims.

- An optical system of variable equivalent focal length, of substantially constant back focus and substantially constant effective relative aperture, for lenticular film.

No. 2,166,419—Method or Material for Producing Multicolor Images, Bela Gans, Brussels Forrest, Belgium. Application Nov. 30, 1937. 8 claims.

A three emulsion film having dye-forming substances in the two inner emulsions and none in the outer emulsion, with filter dyes between emulsions.


A camera for taking X-ray pictures in which a camera is mounted to the path of the X-rays and focused on a fluorescent screen in the path of the rays by means of an angularly positionable mirror.

No. 2,166,617—Photographic Processing, John...

Optical system for color photography in which a beam splitter breaks a beam into three beams and the optical system makes these beams of different intensity and passes them through color films.


Multilayer film having a fusible layer between adjoining light-sensitive layers.

2,168,041—Color Motion Picture Projector, Frederick T. O'Grady, Flushing, N. Y. Application Oct. 15, 1937. 3 claims.

For additive color reproduction having master frames for projection through different filters and having a special leader strip for determining the proper sequence of frames and filters before the film is projected.

2,168,012—Lens Assembly for Motion Picture Projection, Frederick T. O'Grady, Flushing, N. Y. Application Oct. 25, 1937. 11 claims.

Optical unit for motion picture apparatus in which the lenses are split by partitions to produce a plurality of images.


Photographic image and support having fluorescent material in it and viewed through a filter of a color complementary to the light emanating from the support.
nating from a source of monochromatic or ultra-violet light which illuminates the image.


A stereoscopic camera in which a single lens is focused on an object, and a stereo attachment is placed in front of the lens, the stereo attachment being adjustable to converge on the same object as the lens is focused on.


A compensator for varying the height of a projected image produced by a projector which makes use of a continuously moving film in a rotary compensating prism.


A method of producing a sound film in seven different languages so that the speech will correspond to the movements of the actor.


A photographic film for use in color photography having low dye retention subbing layer.


A method of producing natural color prints by printing color separation negatives through filters of colors they theoretically are not sensitive to but actually are.


A method of printing an indicating image of each frame of a motion picture film.


A film treating apparatus for treating continuouos lengths of film by spraying it with appriate liquids as it passes over rollers set 90° to each other.


A device for indicating the amount of exposed film remaining in a motion picture camera.


A method of producing a color picture in which the silver is used to bleach the dye and then removed, and the remaining silver halide is transformed into a silver image.


An optical arrangement for the group photograph making use of a positive lens, two cylindrical lenses, and a plurality of adjustable prisms.


A sound insulating box for motion picture camera which is made of a plastic and lined with rubber.
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On the Cover

Marlene Dietrich, starring in Universal's "Destry Rides Again," photographed by Sherman Clark, stillman member of Local 659, IATSE.

WANTED!

News camera men wanted swift, automatic focusing, and found it by installing Lens-coupled Range Finders. Model F Kalart Range Finder fits all Speed Graphics, focusses down to 3½ ft., adjusts for all lenses including Telephoto, $25 plus $5.50 for installation.

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The past few years the release print been the bottle-neck that has held up sensualist strides toward improved photographic quality and superior sound production, despite all the efforts in the fiction of emulsions, equipment, production, and laboratory improvements. It has toward the release print that the Academy Research Council has directed strenuous standardization efforts. Now a new and critical change impends that may bring about the first important revision in materials and technique in general use for fine release prints.

The potential change is the result of extensive efforts at the Paramount lot by Roy Ryder, Roy Hunter and James Wilson, heads respectively of the sound, test and laboratory departments, with the DuPont Film Manufacturing company, and particularly Hollis Moyse, Lyndwood technical representative.

The much-discussed grain technique of photography is the basis of the new technique, which brings to motion picture release prints the use of a new No. 2 stock, developed by DuPont, which has been experimented with for nearly a year. The new technique is based upon reductions and "speed" improvements in printing and laboratory methods to overcome the weakness of the fine grain stock.

Recently announced by Paramount after several months of intensive experimental work, the new type release print will be held for the check-up of industry opinion in the preview this month of "Geronimo," which already has received striking comments from theatre men and studio critics in sneak previews. So successful been the experimental work on "Geronimo" that Paramount will immediately put this process into high gear for future release prints.

Advance claims state for the new fine grain positive film that:

"With regard to photography it reduces screen graininess, fuzziness, blur and background distortion to a minimum, provides for a warmth and richness not seen before in films, affords perfect image definition and a new lustrous general effect.

"With regard to sound reproduction, it further eliminates background noise, improves the definition of reproduced speech and conveys fuller dramatic effects in expression and articulation of both vocal speech and musical creations."

Value of fine grain materials and technique has long been recognized in still photography, particularly since the success of the precision miniature cameras using 35mm stock, which must be enlarged in most cases to make shots of any value for mounting or graphic arts reproduction.

In motion picture production its use has been confined to sound negative. At MGM work has been done with fine grain negative for originals with push pull. At Paramount, in cooperation with RCA and Eastman, fine grain has been tried on variable area. All the lots have made tests and tried it for special uses—negative, and almost entirely for sound reproduction.

International Photographer has in the past been cognizant of these experiments and has made mention of work along these lines during the past few years. We have held up publication on a number of detailed theoretical discussions of fine grain possibilities in feature work mainly because there was little enthusiasm amongst studio executives and technicians and we felt that we could not crowd out other material for such speculation. Consequently, when Paramount enthused publicly over the results of their q.t. experiments, we decided to interview Loren Ryder, who pioneered the work, and find out the background and reasons for such enthusiasm.

As expected, we learned that the initiative behind the Paramount development came from the sound end, where most fine grain work has been done in the past, rather than from camera lab or other studio departments.

Recently executives working in variable density (Western Electric) sound got together informally to try and devise unified action for any possible use of fine grain to improve the quality of their sound. Paramount's development in the positive field resulted when Ryder and his aides after early investigations, had come to the conclusion that the real fundamental weakness was the above-mentioned bottle-neck of the release print. The Paramount boys agreed to cooperate on the informal committee work on fine grain sound negatives, but also decided to strike out for themselves and explore the possibilities of fine grain for positives. Their sole aim at that time was for better sound. They didn't intend to monkey with photography.

Ryder and his assistants in the sound department at Paramount soon found they would have to call upon the camera and lab departments for cooperation in developing their idea. And to the departments headed by Hunter and Wilkinson they give great credit for the successful solution of many of the problems involved. The DuPont company, through Hollis Moyse made many tests and changes of emulsion in their No. 222 stock to finally achieve the present satisfactory emulsion.

DuPont had to develop a stock that could be handled in processing to meet the print requirements and also complementary sound negative requirements to achieve satisfactory release prints with the new treatment of the sound track. The complementary negative had to match the printing
contrasts of the photographic requirements. And also the new emulsion had to be suited to the new methods of printing and lab processing that were developed.

In approaching the problem the Paramount technicians had to run through the following principal steps:

First, they had to achieve a satisfactory picture negative up to present standards and determine the optimum printing development for best photographic effect in turning out fine grain negative copies.

Second, they had to determine the density of sound printing to best match the photographic requirements.

Third, they had to produce release prints under practical conditions and overcome the slowness of fine grain material.

These steps called for several months of checking and re-checking and arduous establishment of new standards. Particularly important was the setting up of distortion measurements to achieve quality results in departing from traditional processing methods, while still maintaining traditional photographic quality standards.

It was in this field that they encountered the change in practice that will be most shocking to veteran studio workers—the familiar H. and D. curve, a stand-by since the sound era made precision processing so important, cannot be used for determining processing limits for fine grain work. Newer methods of charting had to be worked out.

In order to get practical results with the slow fine grain stock they did two important things along with a host of other checks and balances. They took an air-cooled General Electric mercury light and had it remodelled to their specifications by Los Angeles glass-blowers to operate at new higher intensities to expose sound negative. This was needed to achieve the densities required for the slow fine grain stock. Secondly, the Paramount lab department devised new developing solutions to give higher densities than previously possible.

It was soon discovered that the experiments to blast the release print bottle-neck wide open for better sound also were having an unexpected beneficial effect on photographic quality and with this incentive the work went forward to what the Paramount department heads all believe is a more than satisfactory conclusion.

Accompanying charts cover highlight technical data on the new system of processing.

Figure 1 shows the light valve sensitometric curves for 222 stock exposed in normal tungsten light vs. the new air cooled mercury arc light which was developed by Paramount. It will be noted that the curve obtained from the mercury arc light gives a much higher density, indicating an increase in exposure ratio approximately eight to one.

Figure 2 shows comparative distortion values obtained from intermodulation measurement. In these curves it will be noted that the positive type emulsion gives a minimum distortion of 3/4 per cent vs. a distortion of 7 per cent for the normal stock. It is also interesting to note where our older stocks have given best results with a print density of approximately .60 the new stocks have minimum distortion at a density of .75. It should be kept in mind that the point of minimum distortion was determined dynamically by the visual densities are used only for laboratory control purposes.

For the information of those with II B sensitometric characteristics have shown in Figure 3 the curves for D pont 222 as used for the sound negative and release positive as measured with the visual densitometer. In a manner similar to Figure 2 these curves were obtained for the ideal conditions as established by dynamic measurements and as such the curves serve only for control purposes and in conjunction with laboratory processing.
Actors get wet for edification of still photographers as studios get in mood to match "unusual" California weather: Leiper for MGM, Koffman for Paramount and Clark for Universal, get striking exploitation still pictures.

California's "unusual" weather has been the subject of much humor to the extent that among other catastrophes it has even resisted the lifting of options for radio medians. It is, therefore, particularly musing, that at a time when the weather has been gravitating between tropical heat of Sahara proportions and torrential rains, that three studios simultaneously should get into the mood and provide opportunities for stillman members of Local 659 to photograph stars and featured players "in the soup".

On this and the following pages are samples of the exploitation still pictures for three productions in which the actors really get wet. In addition to being timely, the stills presented herewith are effective and technically meritorious examples of how competent still photographers re-
cord action for the purpose of motion picture sales punch.

A perusal of national magazines and syndicated picture material will reveal that these striking shots are rated highly enough by editors to be given generous space in spite of wars and other news problems of the day.

On Page 7 are scenes shot by Virgil Apger from MGM's production, "Remember", featuring Robert Taylor and Greer Garson.
On Page 8 are shots from Paramount’s Typhoon, featuring Dorothy Lamour, Robert Preston and Lynne Overman. The photography is by Jack Koffman.

On Page 9 are highlights of a feminine battle of the century that will rank with the famed “Spoilers” fight scenes of silent picture fame. Marlene Dietrich and Una Merkel staged the battle for Universal’s “Destry Rides Again”, while James Stewart acted as referee with the aid of a water bucket. Pictures are by Sherman Clark.
USE PURE WATER: Ordinary "tap" water may contain a number of impurities which will affect results desired from the various photographic processes. Should you be in a locality where you are not familiar with the tap water conditions, inquire from other photographers thereabout regarding the purity of the water. If it is unduly contaminated, distilled water should be used for the preparation of photographic formulas. The tap water will probably be all right for washing the negatives or prints, but may cause a sludge or scum on them. This can usually be wiped off with a tuft of damp cotton, a damp chamois, or a sponge that has been thoroughly wrung out.

In these localities if tap water gives trouble from impurities, and distilled water cannot be obtained easily, rain water, from which any suspended matter has been removed, is satisfactory for mixing solutions. This, however, is subject to contamination from various sources, depending upon the manner in which it is obtained and stored. Some of these impurities have no effect on photographic results, while others are decidedly harmful. In a developing formula containing sodium bisulphite or potassium metabisulphite, calcium salts in the water used may cause the formation of fine needle-shaped crystals of calcium sulphate, which settle out, forming as a sludge on films and prints. Other dissolved salts may crystallize out in the emulsion after drying and detract from the transparency of the negative. Suspended matter in the form of dirt, iron rust, and colloidal material will cause spots and dirty appearing negatives and prints. Water may be purified for photographic purposes in three main ways, i.e., by DISTILLING, by BOILING, or by CHEMICAL TREATMENT. Distilling is the surest of these methods, and whenever possible distilled water should be used in mixing solutions. Boiling coagulates colloidal material and drives off dissolved gases, and in addition changes some soluble salts into insoluble compounds which, with the colloidal material, will settle out upon cooling. Chemical treatment is applicable to large quantities of water for removing from the solution lime salts, slime, and colloidal materials. This method is common with most commercial water-purification methods but does not remove sodium and potassium salts.

DISSOLVE PRESERVATIVE FIRST: Except in the case of an Elon-Hydrochinon developer, the preservative of a developing solution is dissolved first. This prevent oxidation of the developing agent which would occur to some extent if it were dissolved first. In the case above, the order should be Elon-Sulphite-Hydrochinon.

ADD HARDENER TO COOL, HYPI SOLUTION: Do not add the acid sulphite and hardener solution to a warm hypol bath. Such action will cause the entire solution to turn milky and be rendered unfit for use because of sulphurization.

MIXING SOLUTIONS
Galvanized buckets or similar containers should not be used for mixing solutions, neither should enamelled wear with the enamel chipped off and the iron exposed. Small quantities of developing and other solutions are usually made up in concentrated form. These are mixed with several parts of water to form the strength required. Such concentrated solutions are called STOCK SOLUTIONS, and are kept in stoppered bottles from which the desired amounts are poured as required. Large amounts of solutions, however, are usually made up in the strength required for use. In mixing solutions a separate stirring rod or paddle should be used for each solution and these should be thoroughly washed after use. For large batches, wooden paddles impregnated with paraffin are very convenient. If chemicals upon being dissolved cause much heating of the solution, they should be added slowly, so as to prevent the solution becoming hotter than 125 degrees F. Chemicals should be added to the solution slowly with constant stirring. If large amounts of powdered chemicals are dumped in the solution at one time, caking, with consequent slow dissolving, will result. Hypo, and certain other chemicals as well, cause cooling of the solution upon being dissolved (49).

This fact can frequently be used to advantage in securing a cool fixing bath during warm weather. Formulas frequently call for "WATER TO MAKE" a certain volume. This simply means that the initial amount of water used is to be somewhat less than the final specified volume. After all ingredients have been dissolved, water is added "to make" up the required volume.

CARE AND STORAGE OF CHEMICALS
The rules for proper care and storage of photographic chemicals are extremely simple. They can be summed up by the following:
1. Store in a dry, well ventilated room at normal temperatures.
2. Keep in original sealed containers until ready for use.
3. Always replace stoppers after using chemicals from bottles or containers.

By following out the above rules, the principal cause of deterioration is chemicals (exposure to air) will be overcome. Some chemicals are very stable and not affected by such exposure. The majority, however, either absorb or give off moisture from contact with the air, and have their chemical composition changed thereby. Many of these so affected are too large to give in this text. The safest procedure is to assume that all photographic chemicals will deteriorate in some way upon exposure to air. Following out the precautions necessary in the case of certain chemicals for all chemicals used, will result in orderliness in laboratory work and help to prevent trouble and poor results. Hypo is sometimes received in 100-pound barrels. These containers are not air-proof, and since the chemical, although somewhat hygroscopic, does not give trouble unless stored in a damp room, it should be stored in a dry place. The strongest acids, such as sulphuric, should be stored if possible on lead covered shelves or in such a manner that accidental spilling or breakage will not cause damage from corrosion.

**RADICAL MUSIC EXPERIMENT**

Modern equipment and studio mixing technique to be used in getting symphonic effect with small orchestra and electric Minipiano; musical dynamics written in decibels for trial.

By GERHARDT DORN

A. F. of M., Local 47

On November 3rd the most brilliant dance season ever assembled in this country opens at the Philharmonic Auditorium. Of particular interest to local dance enthusiasts is the fact that the first concert in the series presents the Horton Dance Group of Los Angeles, most important modern concert group on the west coast. Of equal interest is the fact that there will be used at this concert an array of equipment the quality of which has never before been available or used for theatrical purposes of any kind.

The writer happens to be composer for the Horton Dance Group, and has written two original scores which will be given their first hearing at this concert. The cost of a full symphony orchestra being prohibitive, I cast about for some means of obtaining the massive tonal effects and flexibility of a large orchestra. This search resulted in what is a unique occurrence in the history of the theatre.

Mr. Britton, of Lansing Mfg. Co., has made it possible for me to have the use of one of their large speakers used for the stator sound reproduction installations. I will afford 25 watts output. supplying more power than any symphony orchestra could ever produce. International Pho
photographer readers will recall that this system, one of the finest of its kind in the world, was developed a few years ago at GM, under the supervision of John Hil-}

ard, transmission engineer for that stu-

do. Through this system, and by direct pick-up, will be fed what I consider to be the only successful electric piano on the

commercial market, the electric Minipiano. The vibrations of the strings in this piano are picked electrostatically from the metal plate (which has been polarized), and fed to an amplifying system. This piano can be used for direct recording, thus elimin-

ating the troublesome problems of micro-

cone pick-up. The tremendous tonal res-

ources of the Minipiano are varied by three controls: one for over-all volume, one for variable harmonic content in the bass, and one for variable harmonic con-

tent in the treble. The instrument can be-

ven in the piano department of Birkel-

handson's, who are the distributors in Los Angeles.

In addition to this piano, I am using a u

all wood wind orchestra and a large e

rcussion orchestra, both of which will be-

icked-up with two or three microphones. 

he problem of picking up the large per-

ussion section that will be used has been 

olved in an interesting manner. The per-

ussion instruments will be grouped close-

y around a non-directional microphone. 

he players will perform at a low level of 

ensity, and the desired volume will be 

ained by mixing. A four channel mixer will be used to coordinate the piano and the microphones. If there is suf-

ient time, we plan to write the musical dy-

amics into the score in terms of deci-

els, instead of the usual indications of 

imissimo, forte, etc. The flexibility and 

ower of this arrangement far exceeds that of a large orchestra. The performing musicians will play at fairly low levels, so that the musical effects will be entirely con-

rolled by mixing. In this way the musi-

ian and the engineer are not reducing each other's efficiency by the compromising that is characteristic of usual practice.

Results of this arrangement may throw light on a fundamental point of dis-

ussion between recording engineers and musicians. If the musicians assigned to a given channel play at a constant intensity level—preferably the one which produces the most efficient results in tone and re-

ording — then the problems of musical expression can be controlled completely by the mixer on this channel. Probably his level will be a band instead of a criti-

cal value; for example, it may be found that the wood winds record best at a level between 30 and 35 decibels (these figures being arbitrary; the range of this band would have to be discovered empirically for each channel).

The chief purpose of the mixer on this channel will be to keep the level of his channel within this range. In a similar way, all the channels will be controlled, and each one of them will probably have a different band in which tonal and recording conditions are optimum. The real task goes to the final mixer, the man who will coordinate all of these separate channels, and who should have before him a copy of the musical score with all dynamic indications in terms of decibels. Ideally, the mixer should be the composer of the score, or at least a musician who is thor-

oughly at home with any musical score, classical or modern. To put it another way, the mixer should function exactly as a conductor does.

New techniques will have to be developed here, because the man conducting by means of mixing channels has absolute control of the tone quality and the volume of the performing instruments. For these reasons, mixing the first quality is at least as highly integrated and difficult as the conducting of a fine symphony orchestra. In this method the individual sections of the orchestra are segregated; and as a result, the musicians on one channel are unable to hear those on the other channels.

The usual musician's objection to this is a reasonable one, and should be consid-

ered seriously by recording engineers. However, I believe that it is possible to meet this objection by offering new meth-

ods of performing to replace the old, and that consequent improvement of musical freedom and expression will be well worth any extensions of technical difficulties.

In any event, we are hoping that the forthcoming recital will produce some pro-

vocative examples of the possibilities of experimenting with the most modern meth-

ods and equipment into the realm of the music of the future.
Compare these scenes from early films, taken from International Photographer’s extensive files of engravings with historical interest, to the layout on the next two pages of modern stills, photographed by Jack Woods and Anthony Ustin for Twentieth-Fox’s spectacular production in Technicolor, “Hollywood Cavalcade,” which revives many memories of silent film days.

1888 . . .

Fiftieth anniversary of the motion picture industry celebrated in October; 20th-Fox

1939 . . .

“Hollywood Cavalcade” is timely.

Fiftieth anniversary of the motion picture is being celebrated nationally under the slogan, “Half a Century of Progress,” by the industry this month. The celebration is being conducted in such a manner as to be as devoid of commercialism as possible. There has been no solicitation of funds of any sort and no special paid committees handling the campaign. Participation is voluntary with the producers association staff providing suggestions to theatre managers and district exploitation men.

Unusually timely therefore is the release in Technicolor of 20th-Fox’s “Hollywood Cavalcade,” which dramatically spots the highlights of early silent picture days up to the inception of sound. The picture, in addition to bringing back to the
GREATEST OF ALL

IN the fifty years since Eastman supplied the film for the world's first movies, there have been many great Kodak emulsions designed especially for the motion picture industry. . . . Greatest of all are Eastman Plus-X, Super-XX, and Background-X . . . today's ruling favorites in the studio and on location. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN

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for general studio use

SUPER-XX
for all difficult shots

BACKGROUND-X
for backgrounds and general exterior work
screen many notables of the silent era, has revived interest in slap-stick comedy and other entertainment elements that may have a new renaissance in sound and color.
From Don Lee studios come these shots of IATSE technicians, who are cooperating in television research over W6XAO. Top: Thomas Sawyer, Don Lee television producer; Jockey Feindel, camera director; Mickey Whalen, operator; Art Lasky, assistant; all members of Local 659, IATSE; George M. Haines grip, member of Local 80, IATSE. At right: IATSE crew photographing Maxine Grey; and below, shooting Sylvia Fielding in a can-can dance; Left: televising dead pan comic, Shafter Parker; and Below: in a close-up shot on Maxine Grey. Regular television broadcasts daily were slated to be sent out from KHJ and W6XAO to the L. A. Auto Show this month.
In release print laboratories it is necessary to have some method of quickly making duplicate sound negatives which are used to replace damaged original negatives. New negatives may, of course, be re-recorded from a release print, but inasmuch as recording equipment is not always available, a suitable photographic process had to be developed. For this process, the following criteria were set up:

The quality of sound from the dupe negative should be high, so that a trained observer would have difficulty in telling where a dupe had been inserted. All developing should be done in the regular release print positive bath at standard developing time. Inasmuch as this bath is in constant use, no special machine need be started to develop a dupe. The dupe negative must have the same optimum print density as the original negative, and the same fog value in order that the inserted dupe might be printed on the same printer light as the original.

The method that was developed operates as follows: Master curves of every negative are used. The accompanying cross-modulation tests are first printed on high-contrast title stock. A density of 2.20 is used, a family of cross-modulation curves having indicated this value as best. The reels of master are stored, but the cross-modulation test positives are detached and printed on regular positive stock to make dupe negative cross-modulation tests. The test from reel 1A is printed at three negative densities, and tests from remaining reels are printed to a density of about 1.80. Cross-modulation prints at several densities are then made from each of dupe negative cross-modulation tests, and from these prints optimum print density for each dupe negative test is determined. Reel 1A gives a three-point slope curve of negative density vs. print optimum density.

The print optima of dupe negative tests are now compared with print optima of original negative tests (these data being on film). If dupe values are different from those of original, the dupe negative is discarded. All negative density curves that will yield a print density same as that of original, and these values of corrected negative densities are kept on file for use when it becomes necessary to make a dupe from the stored master positive.

Paper includes a complete cross-modulation treatment of subject and a demonstration.

A Sound-Track Center-Line Measuring Device; E. W. Roberts and H. R. Cook, Jr., Ace Film Laboratories, Brooklyn, N. Y.

Types of instruments now in use for measuring position of sound-tracks on film are not completely suited to use of a release print laboratory. Microscopes using micrometer stages or oculars are slow in operation because they require mental arithmetic to arrive at distance from film edge to the sound-track center-line. Projection types are slow in threading, and require a darkened room. The release print laboratory requires a small quick-threading device which gives a direct reading of sound-track position.

A device that fulfills these requirements has been built, and consists of a curved film-gate in which film is held against a guiding edge by means of a spring pressure. The film is mounted in V-slides which permit motion in a direction perpendicular to length of film. Motion is provided by a hand-lever operated cam, and position of gate is measured by a one-tenth-thousandth dial indicator.

Gate has in it a hole directly under sound-track and beneath is mounted a small incandescent lamp. Directly above gate is an optical system consisting of a standard 32-mm microscope objective and a 10-power Eyeglass ocular. The normal cross-hairs of eyepiece have been replaced with a parallel hair device consisting of two very fine hairs whose mounts slide in V-ways perpendicular to direction of film. Both hairs operate together and are operated by a common cam and lever which cause them to move; and as they separate or close, they always remain parallel to each other and equidistant from optical center of instrument.

Operation is as follows: With film in gate operator places a hand on each of the two levers, which are moved simultaneously until two cross-hairs are directly over bias lines or over corresponding peaks of modulated variable-area track. Then an one-thousandth dial indicator at cross-hairs track-center line position to the nearest one-thousandth of an inch. With instrument, a film may be inserted and a reading taken in ten seconds.

Volume Distortion; S. L. Reichle, Cleveland, Ohio.

Contention that a linear recording and reproducing system represents the ideal, and that sound handled by such a system will be exactly represented, is not borne out by experience. Systems have been built which meet this requirement within limits that are not detectable by ear and yet these systems do not reproduce sound as it actually is produced. In many cases definite non-linear response curve is provided to compensate for a system factor that is not covered by above contention. It is another's thesis that this discrepancy is due to ear sensitivity to frequencies as a function of loudness.

Using ear sensitivity curves presented by Fletcher and Munson at Bell Telephone Laboratories (which have been verified by other observers) it is shown how ear introduces frequency distortion to a linear system when sound is reproduced at a level other than level at which it is produced. It is shown how sound reproduced above incident sound level introduces excessive low frequencies. Case for a sound reproduced at a lower level is also examined and conclusion is drawn that this case acccents high frequencies.

It is further shown that possibility of correcting for limited volume range of all sound systems may lie in type of amplifier response curve.

A description is given of three methods used to achieve desired amplifier characteristics: (1) mechanical method, (2) linear-non-linear system, and (3) selective by-pass system. Circuits are given and important operating points of each are discussed. The objections to each system are also given.

Further, brief summary, with diagrams, describes various setups used to record with these amplifiers.

This covers work for radio, disk record, and sound-film.

Television Control Equipment for Film Transmission: R. L. Campbell, Allen B. Du Mont Laboratories, Passaic, N. J.
A television film chain with particular reference to amplifier, sweep, and power circuits in the film pick-up unit is described.

Many improvements in television circuits have been made possible by recent advancements in electronics and their applications to radio and allied electronic fields. Application of some of newer ideas to motion picture film pick-up equipment has resulted in improved performance and simplicity of design.

Circuit arrangements which permit flexibility in transmission standards are considered and their application discussed. Also anticipation of possible future improvements in picture quality is indicated in some circuit capabilities.

Simplification of controls from the television projectionist's standpoint is discussed.

THE PRODUCTION OF A THREE-DIMENSIONAL MOTION PICTURE: J. A. Norling, Loucks and Norling, New York, N. Y.

Some problems involved in production of satisfactory three-dimensional motion pictures have not received much attention in literature. Their practical solution has contributed marked improvements to the three-dimensional picture of today.

Fundamental problem in projecting three-dimensional pictures is to obtain eye relief, that is, an eye relief that will reach only right eye and be prevented from reaching left eye, and to do the same for “left-eye” picture. To attain this result two methods have been employed—angular separation of the images which are left and right, and which contain complementary colors are viewed in seeing devices, and polarized light.

The screen surface upon which three-dimensional pictures are projected by polarization method is of extreme importance. The selection of proper type of screen raises real problems but these also have been overcome in a practical way.

Considerations Relating to Warbled Frequency Films: E. S. Sceley, Altec Service Corp., New York, N. Y.

Some warbled frequency films, intended as signal sources for acoustical response measurements, appear to have been made and used without the full realization of true nature of warbled signal and manner in which such a signal is affected by a non-linear transmission system. It is pointed out that warbled signal is a frequency-modulated signal; hence signal may be represented by a carrier frequency and a series of side-frequencies, all of which are steady and discrete. It is pointed out that a warbled signal and experimentally that such signal must be regarded in this light when considering effect on it of a non-linear transmission system. Frequency structure of one “warble film” in use is calculated and graphically summarized. Fundamental requirements for suitable warbled frequency films having sinusoidal modulations are discussed and values for modulation rate and for modulation depth are recommended. The side-frequency analysis of the warbled film and experimentally calculated and illustrated. Certain assumptions are made for distortion or departure from sinusoid of a modulating frequency and effects on side-frequency structure are shown. From latter calculation recommendations are derived for tolerances of departure from sinusoidal modulation for a warbled frequency film.

A TRANSMISSION SYSTEM OF NARROW BAND-WIDTH FOR ANIMATED LINE IMAGES: A. M. Skellett, Bell Telephone Laboratories, New York, N. Y.

New method of transmission and reproduction of line images, e.g., drawings, is described which utilizes a cathode-ray tube for reproduction, spot of which is made to trace out the lines of the image twenty or more times a second. The steps of the complete process are: (1) transcription of line image into two tracks similar to sound-tracks on magnetic recording; (2) reproduction from these tracks of two varying potentials by means of photoelectric pick-up devices; (3) transmission of these potentials; and (4) their application to cathode-ray tubes. Satisfactory transmissions of fairly complex images, e.g., animated cartoons, could be effected within a total band width of 10,000 cycles.

SCIENCE AND THE MOTION PICTURE: H. Roget, Rolab Photo-Service Laboratories, Sandy Hook, Conn.

Motion picture is a product of science. There is an army of scientists available for those who wish to convince themselves of this fact, but a brief review is given of the work of Muybridge and Marey in order to clarify the cause of their inventions. Elaborate discussion centers around question: “Has science maintained its interest in motion pictures and how has it utilized its advantages to its fullest extent?”

In this paper word “science” is taken broadly and includes research, dissemination of knowledge, and industrial application. Motion picture’s application to science is divided into two distinct categories and are discussed in detail:

1) Motion picture as an aid to scientific research.
2) Motion picture as a medium for dissemination of knowledge.

Paper concludes with descriptions and demonstrations of interesting material from files of Rolab Photo-Science Laboratories. Also an inside view is given of production activities of an unusual character.


Amount of distortion produced by ear upon a simple sound-wave has been measured by analyzing electrical output of ears of animals and by indirect experiments with human ears. Amount of distortion in a sound-wave which human ear is just able to detect has also been determined, and it is found that threshold of auditive distortion is intimately related to amount of distortion occurring in ear itself. Hence transmission characteristics of ear determine tolerances for distortion in sound-reproduction.


Proposals have been received from ISA Secretariat for international Standardization of rawfilm cores; 16-mm sound-film; projection reels; projection motor; acoustic characteristics of sound film; and definition and marking of safety film.

Most of these proposals differ from SNPE standards only in tolerance. Some tolerances appear to be unimportant and some important. إحصاء of projection reels is widely from American practice that it is deemed impossible to come to an international agreement. Standardization of 16-mm projection reels appears to be outside range of useful standardization.

International standard definition of safety film has been cleared up in all points except question of nitrogen content.

Question of sound-track dimensions for 35-mm and 16-mm sound film has been considered to considerable extent, at Hollywood meeting of Committee but no definite conclusions have yet been reached.

No satisfactory standard for 16-mm sound-film skepters has yet been attained.

Publication of the Acme standard 2000-ft. release print has been delayed pending further questions by Academy.


Sixteen-mm sound motion pictures are potentially one of most effective means through which industry can develop broad, cost-cutting communication system within organization itself.

Many large and small companies now use equipment to produce films that are, in every respect, parallel internal communications media.


It is duty of projectionist to see that all projection equipment is kept in condition to give every picture the quality available. All equipment, not used regularly, is impossible to accomplish these results by depending upon memory alone. Projectionist must establish and keep written records of all necessary maintenance data. He must follow a written schedule in making inspections and in doing maintenance work. He must establish a reliable system for checking and ordering supplies and equipment to keep in proper order.

Projectionist should as much as possible to serve his knowledge, ability, tools, an available test equipment will permit. At the very little trouble should be done to find any trouble in the system of detailed drawings of internal and installation wires of all electrical equipment, besides identifying points at which tests may be made. He should prepare a written outline of all tests that can be made in service establishments. Then he should actually make all possible tests in a sensible, wherever possible, without causing danger by deliberate retarding the trouble and the correcting it. He should immediately record the actual results of each test in the written outline. In this way, simple tests may serve as well as better than detailed trouble shooting.

Professional service engineer with special equipment is a necessity to many and more difficult parts of modern servicing, but projectionist who makes the best of what resources he has can also do a very valuable part of job.

SUGGESTIONS FOR ENCOURAGING STUDY BY PROJECTIONISTS: F. H. Richardson, Motion Picture Herald, New York.

This paper stresses great importance of expert work in theater projection and points out that pride in performance is essential to his excellence. If the status of projection were elevated to a higher plane where there would be a real improvement in excellence results both on screen and through loud speakers. It offers suggestions concerning contacts of Society with projection organizations (IATSE local).


Paper deals chiefly with experience in developing 16-mm direct sound recording techniques in practice of safety educational films. Attention is called to fact that direct 16-mm recording and printing has great potential usefulness in field education, not as competitor of 35-mm, but means of extending use of sound motion picture into fields that 35-mm is unable to serve.

Eager proponents of a new concept in underground motion picture photography at how these difficulties were met; also types film used and various printing methods that has been employed in order to arrive at most satisfactory procedure.

Method employed in recording sound direct
...as desirable. Recent tendencies toward higher screen brightnesses have made a very low intensity lighting in auditorium much more desirable, and therefore have made it more important at a new auditorium to keep it bright enough without the use of artificial lighting. Realism of projected picture can be considerably heighten by proper surface illumination. Controlled reflected light coming from the upper parts of the screen is sometimes used.

Moreover, as entire motion picture frame must be seen by eye at a glance, angular field covered must be much smaller than in still pictures which may be examined critically and deliberately. This fact is of greatest assistance to lens designer because high aperture and field are inevitably somewhat incompatible, and types of lens construction which offer aperture generally cover relatively small field.

Perspective considerations usually require a projection lens covering only about half angular field covered by taking lens, which fact enables lenses of relatively high aperture to be made. Some types of construction commonly used in amateur cine lenses are described, including a few Kodak line of 16-mm and 8-mm lenses.

Advanced Color Class

- Free, except for the nominal fees of night classes in the Los Angeles municipal high school setup, a course of great value to studio photographic and laboratory technical workers got under way during the latter part of last month. It deals with color print reproduction and there is still a possibility to join the group and obtain the full benefits of the course.

- There are a few worthwhile opportunities to study color print work as an exclusive subject. The new course, first to be anywhere near enough to be available to studio workers, is at Hollywood High School on Tuesday and Thursday evenings. It is conducted by Stuart Barsby, former member of Local 659, IATSE, and a member of Local 695, ATSE. Barsby was at MGM for years, working on re-exports of color and sound. He will be known to many IATSE members and his brother, Jack Barsby, is a prominent amateur photographer.

Barsby will thoroughly cover every type of color print reproduction from the familiar Carbro and Kodak process and the little-known Dye Transfer process to the new and small group of color processes, including Chromitone, Bie, and the comparatively new photo-gelatin method, widely used in England, France, Italy, Belgium, and Germany, and only recently adopted in this country.

- Only limitation on entry to the class is that applicants must have had five years professional experience in black-and-white. A few high rank- ing amateur photograper will be accepted. Present class members are mostly from the ranks of the IATSE, government staff men and professional news and advertising photographers.

- In addition to the two class nights per week, arrangement images are seventeen feet wide and made in a laboratory photography workshop with the understanding that each student will be given an opportunity to turn out one print each of the various processes.

Previous to doing studio work, Barsby was for eight years the staff of the Thomas A. Edison research organization, and has taught color work...
here and in New York privately. He has done
intensive research in all phases of color, making
it a hobby as well as a profession. During his
classes he will feature guest lecturers from East-
man, Agfa, Defender and other firms catering to
color workers and a number of outstanding local
professional workers in color.

Information about the classes may be obtained
at the office of International Photographers Local
659 or at Hollywood High School.

War Halts Perry

Back from his fifth trip to Europe, Harry
Perry, veteran member of Local 659, IATSE,
brought some informal snapshots that capture
the spirit of preparation in Europe for the end
of the "twenty year's truce." The pictures on
this page show Parisians with gas masks, read-
ning official war notices, digging trenches and
boarding up their buildings against possible air raids.

Perry was sent to France to secure background
plates for Selznick International's production of
"Rebecca." After three weeks shooting in Paris,
Aix les Bains, Switzerland and a trip to Monte
Carlo, where he spent a week shooting the bar-
bor, Palace grounds and Hotel de Paris, he started
getting moving key shots along the Riviera from a
camera car, but his work was soon brought to a
halt, as the arms took over the roads for troop
movements toward the Italian border at about
the time the German-Russian non-agression pact
was signed.

Censorship imposed was so strict that further
filming was impossible. Perry carried his gas
mask 24 hours a day during the few days he was
in Paris, awaiting departure to this country. In
the period shortly after declaration of war people
expected air raids and gas attacks any moment.

Perry sailed from Le Havre September 11th on
the S.S. Washington, Because of the rush of re-
turning Americans, the boat was so crowded that
the best accommodations he could get was one
of 50 cots that were set up in the boat's swimming
pool. There were nearly 2,000 passengers on a
boat that usually carried around 900.

The trip from Le Havre to Southampton, Eng-
land, took all night, since the boat barely move
along because the pilots had to be very caution
about loose mines. Southampton Harbor was
completely mined. Southampton was typical of
English defense precautions, with captive ha
locus, connected by steel cable, strung out along
the coast line. Thousands of troops were here
loaded into huge transports, headed for France.

The S.S. Washington had huge American flag
painted on all sides and on the top deck: an
at night en route to New York they were lit with
huge spotlights. The boat arrived in New York,
September 18th. Among the passengers were Mr.
Joseph M. Kennedy, wife of the American Amba
assador, Fritz Krieger, Robert Montgomery, and
Senator Reynolds.

Needed additional background plates for th
Selznick International production will be pho
graphed in the vicinity of Monterey, California
where fortunately for Americans, war is some
thing you read about in the newspapers.

These war scenes in Paris were photographed by Harry Perry, member of Local 659
IATSE, who recently returned from France after being forced to call off shooting
because of war conditions.
William Wallace: stillman for Charles Chaplin.

Most of his recent work has been done for companies releasing through the United Artists distributing organization, Selznick International, Edward Small and now, Chaplin.

Recent still exploitation assignments have been on such productions as “Duke of West Point,” “King of the Turf” and “Man in the Iron Mask,” all for Edward Small.

Like most newspaper and still photographers, Wallace is of the opinion that there is room for considerable improvement in the camera equipment available to professional photographers, and in his spare moments he puts in hikes on a new type camera for still work that he has been designing for several years.

His present assignment has many unusual aspects. Chaplin is unique. His methods are not those of the mass production studios. And from the exploitation viewpoint, Chaplin the producer, spends his time concentrating on production. He doesn’t pay much attention to the sales end while in the throes of creation.

In the history of the Chaplin productions there have been few stills released until the production was completed. This system is contrary to general practice at other studios. Consequently Wallace will spend several months shooting stills without seeing any publicity results of any sort with the exception of the master file that is being compiled and which will be thrown open for general release only when Chaplin has placed the final seal of approval on the finished product.

Wallace has spent much time recently experimenting with color, preferring to work with Dufaycolor and Kodachrome, which can be used with regular cameras as close to black-and-white methods on the set as possible. He was one of the first to shoot Kodachrome production stills on the set—“Man in the Iron Mask”—without interfering with production. Changing of planned filters on lights was done instead of using complicated filter setups on the camera. Shots were mostly 8x10 and have been widely exhibited in Eastman Kodak stores and received good breaks in national publications.

As a result of intensive experiments on color stills, Wallace now is perfecting a new method for making color prints, which he hopes will be particularly adapted to needs of studio still departments.
INTERNATIONAL PHOTOGRAPHER

ANNOUNCES

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TRA IWINDS

Kalart's new Sistogun for back curtain high speed synchronization; Kodak Vigilant and Monitor cameras; Victor's sent Model 16 projector; lap-dissolve rewind attachment for Filmo turret 8; Agfa explains "blacklist" situation.

One of the first of the new Kalart Sistoguns, designed as a back curtain synchronizer for Speed Graphics was tried out just as we went to press by Cliff Maupin, members of Local 659, IATSE, who is one of the staff still photographers at 20th Century-Fox. In next month's issue we plan to feature a layout of shots by Maupin, made with this new high speed synchronizer.

The new device brings Kalart standards of design and performance to this comparatively new phase of still photography, which has been made possible by the excellent work of the lamp manufacturers in improving the quality and extending the peak intensity of flash bulbs.

Original idea for an entirely new method of flash synchronization with Speed Graphic back curtain shutters was patented by Phillip DeL. Patterson; and Ernest Sisto, well-known New York press photographer, worked with Kalart engineers in perfecting it for mass production. With the new Sistogun, newspaper photographers, studio stillmen and other professionals, can synchronize Speed Graphic back curtains without loss of speed, even at 1/1000 second.

The Sistogun can be installed on either the 3½ x 5 or the 4½ Speed Graphics. It does not exert "braking" action, and features a positive safety switch that prevents premature firing of bulbs while winding the shutter. Its metal finish matches the standard Speed Graphic finish. It is conveniently and inconspicuously attached.

The Sistogun consists of two units, the sub-assembly and the housing. These fit readily under the winding knob and do not interfere in any way with normal camera operation, or use of the rangefinder.

In operation, the first motion of the curtain shaft moves away from the synchronizer, releasing the Sistogun to fire the bulb. The curtain shaft never is interfered with in any way, hence cannot be slowed down. Once released, the Sistogun acts independently of the curtain mechanism.

The new Kalart instrument sells for $12 complete, and no additional equipment is needed by owners of Kalart Speed Flashes, since the standard Kalart 1/4-volt battery case and reflector are interchangeable for both front-shutter and back curtain synchronization. Battery cases of other makes can be adapted provided they allow for focal plane shutter connections. Owners of Speed Graphics without such flash equipment, will need the Kalart 1/4-volt battery case, reflector and mount, priced at $5 complete with battery.

New Kodak Monitors

Featuring automatic film wind control and a body shutter release which retracts automatically when camera is closed, two new models, Kodak Monitors Six-16 and Six-20, will be on the market next month. The Monitors are wholly made in the Kodak Rochester factories. Special features include strong aluminum alloy bodies and back: new system of bed braces which provides 10-point support to maintain lens and shutter rigidity in accurate position; mechanism to prevent double exposures; both eye-level and waist-level finders; a monitor turret with automatic exposure counter, field depth scale, and range-finder clip, and a single push button to control both opening and closing.

There are four Kodak Monitor models. With 5-speed Kodamatic shutter and Kodak Anastigmat F:4.5 lens, the Six-20 Kodak Monitor retails at $30; the Six-16 at $35. Both these models are covered in toed-in, black monoco -gra in Kodak. The other two models, with the outstanding new 9-speed Kodak Supermatic shutter and Kodak Anastigmat Special F:4.5 lens, retail at

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$42.50 for the Six-20, and $48.50 for the Six-16. Both have black pin seal grain genuine leather covering and highly polished chrome bed bases with black enamel inlay.

Film-wind control of the Monitors is simple and dependable. A small lever on the monitor turret is set at "wind" and the film is moved until the numeral "1" appears in the red window in the camera back. The lever is then shifted, the exposure counter dial set at "1", and the first exposure made. For each succeeding exposure, the winding knob is simply turned until it stops, the film then being automatically centered. After eighth exposure, control lever is returned to "wind," so that balance of the film and paper trailer can be wound on the take-up spool. Exposures are counted automatically by counter dial on turret.

After the Monitor shutter is released, body shutter release will not operate again until film is wound for next exposure and shutter re-set—thus preventing double exposures. When camera is closed, release plunger retracts automatically, and the eye-level optical finder may be folded down flush with turret top. Each Monitor has two tripod sockets, for vertical and horizontal position, as well as folding supports for leveling camera on a flat support.

All Monitors take large pictures—the Six-20s, eight $2\frac{1}{2} \times 3\frac{1}{2}$ pictures on roll of Kodak 620 Film; the Six-16s, eight $2\frac{1}{2} \times 4\frac{1}{4}$ pictures on roll of Kodak 616 Film.

**Kodak Vigilant Line**

Kodak Vigilants Six-20 and Six-16—a new line of fine cameras covering a wide price range—offers a total of eight models: Four in the group of Six-20 cameras taking pictures $2\frac{1}{4} \times 3\frac{1}{4}$ inches; four in the Six-16 group taking $2\frac{1}{2} \times 4\frac{1}{4}$ inch pictures. Construction features include bodies and backs of special high-grade aluminum alloy for...
Lighted with BABY KEG-LITES

An important scene from RKO Radio's "In Name Only" starring Carole Lombard, Cary Grant, Kay Francis and Helen Vinson.

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INTERNATIONAL PHOTOGRAPHER for October, 1939
Statement from Agfa Anseo

- From Robert M. Dunn of the Agfa Anseo advertising department comes the following communication with references to the international war "blacklist" situation:

"Readers of International Photographic may have noticed the listing of certain foreign Agfa companies in the British Government 'blacklist,' published recently in daily newspapers. In this connection, we believe the readers of your publication will be interested in the following statement from this Company:"

"Agfa Anseo Corporation of Binghamton, N. Y., must not be confused with the Agfa companies on the British 'blacklist.' Agfa Anseo Corporation of Binghamton, N. Y., has no connection with the Agfa companies named. All of Agfa Anseo Corporation's products are manufactured in Binghamton, N. Y., and the Corporation's only export trade is to United States possessions and Canada."

Argus Model M

- New Argus streamlined Model M camera in the $7.50 price range is equipped to take pictures as close as 24 inches with Argus-designed accessory lenses. The new Model M single or double frame pictures twelve 1x1/2 double frames or 24 single frames. This makes it extremely economical to operate, especially when using color or film. Its triplet Anastigmat f/6.3 lens is fully color corrected. Miniature size of the new M camera makes it unusually convenient to carry—it is small enough to fit in a purse or pocket. Specially spooled Dufaycolor film and a new 85mm Arguspan film, developed especially for the M, are used in it.

IA Men Cover War

- Six IATSE newsreel men now are busy covering current military events. In addition to Norman Allen, who left hurriedly last month on an assignment for News of the Day, Capt. Ariel Vargas is grabbing shots for the army, Arthur Dettra and Ken Murty are covering for Photomontage; Neil Sullivan for Pathé and Arthur Menkin is free-lancing.

Local 644 Visitors

- Welcome visitors in Hollywood for a few weeks recently were Charles W. Downs, business representative of International Photographers, Local 644, and Harold Miller, president of the New York local. Here for conferences on new agreements covering newsreel photographers, they renewed many acquaintances with IATSE studio technicians.

Argus Model C3

- International Research Corporation, Ann Arbor, Michigan, is marketing a synchronized photoflash Argus camera, designed to give advanced design details of the C2 camera, plus ability to take photoflash pictures. Selling for $30, complete with battery handle and reflector, the C3 makes possible brilliant, fast-action pictures in any lighting. A built-in timer synchronizes flash and shutter speeds perfectly. As in the C2 camera, built-in coupled range finder gives critical focusing from three feet to infinity. The Model C3 has a fast f/3.5 "Giant" triplet Anastigmat lens and shutter speeds from 1/5 to 1/300 seconds.

New Vokar Camera

- A revolutionary new principle in picture taking is claimed for the new All-American Vokar camera soon to be marketed by Electronic Products Manufacturing Corporation of Ann Arbor, Michigan. Proper exposure is definitely assured by a new device to be known as "Varicoupled Control," which automatically sets diaphragm in proper relation to shutter speed for varying light conditions.

- New camera takes standard 120 roll film providing 12 exposure of 2½ x 3½ inch negative size. Triple Anastigmat color-corrected lenses will be used, with graduated focusing from 3½ feet to infinity. Shutters will be of compur type with lever release and cable adapter.

- Case is leather finished bakelite in compact pocket size measuring only 5x5½ x 2¼ inches. Slight pressure of button catch instantly snaps camera open to picture-taking position. Lens extension is conventional bellows type, opening to 3-inch lens.

- The new Vokar will be offered at popular price starting at $15, according to lens equipment and finish.

Filmo Price Cuts

- Bell & Howell Company announces that effective October 1, Filmo 16mm model 79-E and 70-DA Cameras will be reduced in price according to following schedule:

- 70-DA, 1-inch F 2.7 focusing, $213 to $192; 70-DA, 1-inch F 1.5 focusing, $243.50 to $235.50; 70-F, 1-inch F 2.7 universal focus, $124 to $99.50; 70-E, 1-inch F 2.7 in focusing mount, $139 to $114.50; 70-E, 1-inch F 1.5 in focusing mount, $169.50 to $145. Price on the sTyler-Helson lenses remain unchanged.

New Tripod Line

- Led by the Photrix Chief, an extremely sturdy tripod for all-around use, even with the heaviest movie camera. Intercentennial Marketing Corporation, New York, introduces a complete line of Anser-Bilt, all-metal tripods, Tripods are priced from $2.75 to $14.50.

Photrix "22" Enlarger

- Photrix "22" Enlarger, just released by Intercentennial Marketing Corporation, New York, new member of the Photrix family of photography visualization instruments, is an enlarging machine that incorporates tested feature of present enlarger models and adds many radically new ideas, including:

- Cool-working: 600v illumination operating from house current on a built-in transformer;
- Pivotable lampshade that tilts to correct distortion, turns horizontally for the projection of all film material; Dustless, scratchless, all-metal negative holders for spotless prints;
- Micrometer focusing lens-mount similar to that used in latest-type cameras; Counterbalanced head moves quickly and easily with one-hand operation; Built-in spring holds lampshade firmly in place.

- Double-condenser optical system, and adjustable light source; Two diffusion discs included for special effects and elimination of grain from negatives.

- The completely American built enlarger takes negatives from 5x5mm to 2½ x 2½ inches. It uses lenses of 2, 3 and 3½ inch focal length. Price without lens is $60.50.

U. S. Gevaert Plant

- Gevaert Company of America, Inc., a New York Corporation, has acquired a factory of considerable size and importance in the Gevaert photographic products in this country. Factory is situated in Williamsport, Mass., and its site is of sufficient large area to permit of future expansion.

- In a few months Gevaert will be able to supply American made films and other sensitized materials. At present it operates as distributors for Gevaert Photo-Producent, N. V., of Belgium, with headquarters at New York and branches in Boston, Philadelphia, Chicago, Los Angeles and San Francisco. Film finishing operations are carried out on a large scale in New York, where a modernly equipped cutting plant is maintained for cutting and packing to commercial sizes of various types of photographic paper, supplied in full factory rolls by the Belgian Company. Three amateur movie film laboratories are operated in New York, Chicago and Los Angeles.
Eastman and War

Eastman Kodak last month gave official notice of future policies and position with the European war situation in mind. Following notice to dealers is contained in current issue of company publication for the trade:

During the period of 1914 to 1918, the price level of Eastman Kodak products in the United States was kept practically constant. During the recent war crisis, the Eastman Kodak Company again used every effort to follow linearity, making changes in prices only when increases in costs make it absolutely necessary.

Eastman manufacturing operations in Rochester are not endangered by any shortage of materials, as the out of the country. Employees have been notified that board notices in Eastman plants of office in Rochester stated that important materials which came largely from Europe in 1914 are now produced in the United States.

When war broke out in 1914, bulletin for employees explained, the company had to make efforts to accumulate materials from abroad to sustain our manufacturing operations in Rochester. At that time, adequate supplies of following important materials were available by importation from Europe:


Persons working in departments where these materials are used will realize how serious any lack of them would be.

"But—the war in 1939 finds that situation completely changed. Kodak Park now makes all its own paper for sensitizing. The gelatin we use in Rochester is now entirely supplied by Kodak Park and the Eastman Gelatin Corporation in Peabody, Mass. The Kodak Research Laboratories now make the sensitizing dyes we need. The fine is now made at Kodak Park entirely in American materials. Film has very largely replaced glass since 1914 for x-ray, portrait, and commercial photography; but all glass need can now be obtained domestically. Increasing amounts of glass for lenses are being made in the United States; and we will have a good stock of such foreign optical glass as we require. Its requirements for photographic developing kits are now supplied entirely by Kodak Park of the Tennessee Eastman Corporation. Kodak Park produces any synthetic organic chemicals we need and also sells organic chemicals to universities and other laboratories.

"Therefore, the management is able to inform the employees that our Rochester operations are not endangered by any shortage of materials, it can be foreseen as a result of the war."

International Photographer for October, 1939
PATENTS

By ROBERT W. FULWIDER

Last month the following patents of interest to readers of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,171,609 — TONING PHOTGRAPHIC PRINTS. Francis H. Snyder and Henry W. Rimbach, assignors to Technico, Inc. Application Jan. 18, 1936. 8 claims.

An improved process of forming a cadmium sulfide image in a photographic toning process.


A motion picture projector making use of an artificially-colored high-pressure metal-vapor discharge tube.

No. 2,172,262 — ULTRAVIOLET FILTER IN MULTILAYER FILM. Karl Schinzel, assignor to Eastman Kodak Co. Original application April 29, 1937. Divided and this application Aug. 9, 1938. In Austria May 9, 1936. 3 claims.

A three emulsion color film having colorless ultraviolet light filters between the middle emulsion and the other two emulsions.


A gelatin layer containing as a hardening agent an acetal of an aliphatic aldehyde.


A method of photographically preparing a comparator for use in pH determinations with an indicator dye having various shades and hues at different pH values.


A method of producing color pictures by use of two emulsions, the second one having a color screen over it.


A color film making use of a four-color subtractive process and having a green and magenta image in register in one frame and having a yellow and blue violet image in register in an adjacent frame.


A method of photography showing a tonal change by simultaneously lighting a subject with two differently colored lights, and simultaneously taking two pictures of the subject through filters showing only one of the lighting effects on each film.

No. 2,173,739 — FINE-GRAIN PHOTOGRAPHY. John R. Wibber, assignor to Du Pont Film Mfg. Corp. Application May 21, 1937. 6 claims.

A method of fine-grain developing which includes developing of the latent image to a gamma of not greater than 0.5 with a color-forming developer, and then printing the combined silver and dye image onto another sensitized layer.


A method of printing films to produce a series of image frames composed of superposed component images in partial densities forming composite images of substantially normal densities.

No. 2,174,049 — FILM CLIP. Guenter Werner, Peking, China, assignor to Gerhard Vos Herbert, N. Y. Application Jan. 24, 1938. 1 Germany June 8, 1937. 6 claims.

A clip for reels of films and composed of a ruler pad, wider than the distance between the spools of the reel, held to a plate of hard material.

No. 2,174,155 — MOTION PICTURE CAMERA. Of W. Gibbons, Geo. Kende, and Everett M. Pyle, assignors to Universal Camera Corp. Application April 7, 1937. 8 claims.

A releasable means for normally effective operation of a spring motor.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of International Photographer, published monthly at Los Angeles for October, 1939.

State of California
County of Los Angeles

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared Edward H. Gibbons, who, having been duly sworn according to law, deposes and says that he is the Editor of the International Photographer, and that the following is, to the best of his knowledge and belief, a true statement of the owner, management and if a daily paper, the circulation, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, towit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are

Publisher, International Photographer, Los Angeles, California. Editor, Edward H. Gibbons, Los Angeles, California. Managing Editor, Herbert H. Aller, Los Angeles, California. Business Manager, Helen Boyce, Los Angeles, California.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately hereunder the names and address of stockholders owning or holding one or more shares of the outstanding stock. If not owned by a corporation, the names and address of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) International Photographers, Local 639, International Operators of the United States and Canada, 6461 Sunset Blvd., Hollywood, California. President, Hal Mohr; Vice-President, Leon Shanrony; Secretary-Treasurer, E. S. Depew; Recording Secretary, James V. King; Sergeant-at-Arms, Len Powers.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whose account each trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant’s full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affidavit has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is. (This information is required from daily publications only.)

EDWARD H. GIBBONS, Editor
(Signature of editor, publisher, business manager, or owner.)

Sworn to and subscribed under me this 12th day of October, 1939.

MILTON A. TAYLOR, Notary Public
(My commission expires August 7, 1941)

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On the Cover

Suiting the Thanksgiving atmosphere, whichever day you prefer to celebrate this year, is the effective shot by Jack Koffman, stillman member of Local 659, IATSE, of Ellen Drew, featured in Paramount’s “Geronimo.”

Editor, Ed Gibbons; Managing Editor, Herbert Aller; Art Editor, John Corydon Hill; Business Manager, Helen Boyce.


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INTERNATIONAL PHOTOGRAPHER, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. INTERNATIONAL PHOTOGRAPHER assumes no responsibility for the return of unsolicited manuscripts or material.


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Action shot from Hal Roach's "1,000,000 B.C." by Tommy Evans, member of Local 659, IATSE.
Before starting to write this article, I must first apologize for the audacity of the thing. As anyone cares how I think about anything, I place the blame squarely on the shoulders of the editor, who insisted I write the article. However, having been duly apologized, I shall proceed as though I had a perfect right to write the thing.

The unfortunate meditation which led up to the remark that resulted in the editor's resistance upon this sort of an article was after this manner. I was thinking that if I had my choice of facing the firing squad designing a dress, the only question could be whether to refuse the blindfold or nonchalantly smoke a Murad or just be myself and collapse in my tracks. To avoid the squad by designing the dress would be utterly impossible. I have no way of thinking about dresses. I don't know much about dresses. To put it more exactly, I have done a great deal of knowing about dresses. Consequently, I have no tools to work with. Thoughts about dresses do not come to me. I have never solicited them.

So, I reasoned that perhaps the difference between a good workman in a given me and a poor workman amounted to the difference in the methods they employed in thinking about the subject at hand, and so told the editor that perhaps the measure of a man's ability was the clearness with which he was able to form mental pictures of his subject. The editor told me to write an article about that, so here it is.

Negative is a denial of the facts, Webster says (maintaining denials, the opposite of affirmative). To me a Negative is a e. It bears false witness. It says that black is white and white is black. It doesn't seem logical that two wrongs should make a right, but this is the art of illusion, and so anything goes. The Positive lies about the negative and in doing so affirms the original, and because the practice of photography is based upon this reversal of facts and ideas of an emulsion is at all times impregnated with a picture. The moment it leaves the factory it has a picture of blackness on it. If anyone doubts this statement take unexposed stock, develop and fix, print and if you do not have an image of blackness, send the final results to me along with a little salt and pepper and I will do the rest.

Starting from this basis do anything you wish short of destroying the film, and upon completion of the aforementioned process the results will bear record in a more or less acceptable degree of what you have done to it. Throw it out in the sun for one second or six weeks. Develop, fix and print and your results will be a picture of light. Use some discretion in your manipulation between these extremes and, depending upon your skill, you will have a record of a blend of these two extremes.

Now, having written the preceding paragraph, it becomes necessary to correct it. It was written in line with the commonly accepted method of reasoning, but it is not strictly true. If we wished to be as nearly correct as possible about one of those few things it is possible to be correct about, then the foregoing is a bit confusing. We have spoken of darkness as one thing and of light as being another thing completely opposed to it. Actually darkness is not a thing at all. It is a void. It is nothing. If it is nothing then it has no real existence. It is a word used to denote the absence of light. If darkness has no existence then it has no presence, and if no presence it has no place in which things could happen: so if we store our film in the presence of that which has no presence and consequently no place in which things could happen, then nothing happens to our film. This statement remains true throughout the entire photographic process. So long as you expose film to darkness nothing happens. You don't even have to reckon with it. The only thing then that must be reckoned with is that which has a real existence. That which is something. That which has presence in which things can happen. Of course that thing is light.

All material objects are filters. All objects tend to subtract from the source of light. What we commonly refer to as a filter is a regulated means of subtracting from the source. Other objects in a multitude of variations, dependent upon their composition, but always they subtract. They never add. So far as this writer knows, there is no way of amplifying light.

The film at all times photographs only one thing—the source or sources of light. If no obstructions are imposed between the film and the source of light the results of a completed cycle of development and printing will be identical to the piece we left lying in the sun. You have a picture of all the light the film is capable of receiving. Objects interposed between the source and the film subtract from this complete picture of light, and we have something less than our complete picture which we have learned through training to associate with the illusion which we commonly regard as the object photographed.

What is true of the film in the camera is equally true of the patron of the theatre, whether it be movie or the stage. In the first instance he sits and gazes at the reflection of the arc in the projector. The film acts to filter or subtract varying amounts of light from the arc and everyone is familiar...
Footnote to War

News release last month from U. S. Department of Commerce:

The Polish Government Institution PAT (Polish Telegraph Agency) at Warsaw, has placed an order for 200 American-made 16mm sound film projectors together with gasoline-electric generators, according to a report to the Department of Commerce from the office of the American Commercial Attaché at Warsaw.

This institution is the official news, news reel, and information agency of the Polish Government. The value of the projectors is estimated to be $65,000. Delivery is to be made in lots of 25 to 50. They were sold in competition with projector manufacturers in Germany, the report stated.

These projectors are to be resold on easy, long-term payment plans to small communities for visual instruction in agriculture and livestock raising, to labor camps and training schools for instruction and entertainment, and to military camps, for visual instruction, as well as for Government purposes. Each projector will be accompanied by an American-made 110 volt, 1,000 watt gasoline engine operated generator so that they can be used if electricity is not available. American educational films concerning agriculture, farm building and construction, and other subjects are to be purchased later, according to the report.
NEW BOYER ENLARGER

new enlarger built in Hollywood by Kenneth Boyer Cochran, home workshop photo-gadateer, who took five months off from his job to gather ideas and evolve practical design; incorporates many suggestions advanced by professional members of Local 659, IATSE.

By M. B. PAUL
Member Local 659, IATSE

FROM THE AMERICAN gadateers have come a number of valuable developments in the field of new photographic equipment devices. Photoflash synchronizers, Uber developing tanks, easels, color cameras, enlargers and similar accessories and aids frequently have been initiated by garage and basement inventors.

The professional photographer, whether notion picture or still, often is inclined to take the equipment end for granted and use his experience to overcome limitations in practice, rather than by demanding or suggesting radical changes in equipment itself. Nowhere is this tendency of the professional to get the job done “right now” with whatever is available more evident than in the still photography field.

Much of the equipment in use by professional photographers — even including that bought second-hand is or should be obsolete. This subject has been well and thoroughly discussed by John LeRoy Johnston, the well-known studio publicist and others who have joined Johnny in INTERNATIONAL PHOTOGRAPHER’S frequent discussions of still equipment limitations in the past.

Yet in spite of frequent agreement that something should be done, we still are in the same position as Mark Twain’s famous crack that, “everybody talks about the weather but nobody ever does anything about it.”

Personally, I think that in addition to asking a keener interest in critical analysis of equipment, professionals should encourage the garage inventors who have something on the ball. While still awaiting some more concrete suggestions and actual samples of changes and radical new ideas on the larger still cameras — toward the end of great mobility, ease of operation, etc.— would like to put in a plug for a friend of mine who has turned out an item of merit—the Boyer enlarger.

Kenneth Boyer Cochran, a young chap in his middle 30's, is one of the garage workshop photo-gadateers. He spends every spare moment of the spare time in his still photography hobby. Recently he took five months off from his job with the local power company and spent every minute possible discussing his ideas for a new American enlarger and working out many suggestions from members of Local 659, IATSE, at work with new Boyer Enlarger, to the designing of which he and other studio technicians contributed advice and suggestions.

M. B. Paul, veteran member of Local 659, IATSE, at work with new Boyer Enlarger.
CREDIT DUE STILLMAN

Most unsung top photographers are the studio stillmen, who spend their entire day promoting personal publicity for others but seldom sample benefits of their own vocation; Richee at Paramount typical unpublicized stillman.

By GIB

In current photographic literature we read reams of technical discussion and critical appreciation for certain masters of photographic effects. But the least credited or discussed photographic group consistently producing stuff of high quality as part of their routine work are studio stillmen. Probably the greatest job of photographic salesmanship in history has been turned out by studio still photographers.

The job of merchandising personalities—and particularly the many facets of feminine allure—has been accomplished under a variety of hindrances, censurings and other limitations never encountered by the widely exploited photographic wizards in other fields. The work of studio still photographers in this respect has held to a consistent high average—as evidenced by the record of success in introducing and exploiting personalities—through many years by many individuals.

Because of the mass production systems of the major studios, and the fact that ace photography supplied to publications seldom is credited, many studio stillman work in anonymity that amounts to oblivion in comparison with the personal publicity accorded photographers in other fields.

Typical of the many competent and consistent stillmen who translate star personalities into photographic art that meets the requirements of reproduction in many graphic arts mediums, is Eugene Robert Richee, who has been on the job for many years at the Paramount lot. Richee is one of a number of stillmen who are recognized within the trade as capable of turning out work on a par with that of the most widely-publicized photographers of the day.

But—who ever heard of Richee? How often does his name appear in connection with exploitation art? Certainly he's known to members of Local 659, to Paramount studio publicity men, to stars and to many editors throughout the country.

That's within the rade. Few among the general public and its fulsome quota of photography fans ever heard of Richee or many another studio stillman, whose expert work year in and year out plays a major role in the job of luring the public's shekels under box-office windows at the nation's picture houses.

Illustrated on the opposite page are four striking stills from portrait sittings by Richee. In accomplishing the job of presenting feminine charm and personality they are tops, entirely beyond their routine

Opposite Page: Four striking shots by Eugene Robert Richee, veteran stillman member of Local 659, IATSE, on the Paramount lot; Top Left, Patricia Morrison; Top Right, Virginia Dale; Lower Left, Claudette Colbert; Lower Right, Susan Hayward.
technical excellence. Such work is the product of years of experience, intense enthusiasm for the job at hand, and the ability and personality to overcome the problems entirely outside the field of photography that beset the studio stillman in every day's work.

The amazing paradox of studio stillmen is that their entire job is devoted to the creation of personal publicity for studio talent, but they themselves seldom sample the benefits of their own vocation. Certainly, studio stillmen are as desirous as any other professional workers to receive the credit and publicity for their endeavors that is an essential element of progress in any profession, whether from the standpoint of prestige and or of financial improvement.

Factors that militate against such personal publicity are the hustle and bustle of studio activity under mass production methods and the innate hesitancy of most serious professional photographers to exploit themselves personally.

Nevertheless, and in spite of the problems involved, there can be little doubt that top still photographers are entitled to more credit, more opportunity to have their work stamped with their signature when it is presented for public attention. The least that could be done would be for studio publicity departments to give a bit more attention to crediting the creators of worthwhile still photography and for magazine and syndicate editors to give an equal attention to credit lines for photographic art from the studios, as they do to their staff men and the syndicates that supply spot news pictures.

You can call over the month's magazines and dramatic pages and find hundreds of examples of outstanding photographic art from the picture industry. You'll find the percentage that is credited very small. Of course there is no deliberate intent to slight the studio still photographer. Many editors would be pleased to give credit if the information was properly supplied with caption material.

It's a situation where a little friendly cooperation would go a long way toward giving a neglected group a little well-deserved credit. And as studio stillmen emerge from their anonymous standing, we might find that they have much that is interesting and worthwhile to contribute to the literature of photography. One has only to consider the motion picture industry's still art of the past 20 years to realize that there is a phase of photography well worthy of much further study and analysis.

Top: Leon Shamroy, veteran member of Local 659, IATSE, demonstrates the new Bardwell & McAlister Diaky Inkie to Alice Faye and Cliff Maupin, her favorite still photographer. Below: Maupin tries out the new midget lamp on sitting of Brenda Joyce. Note comparison with regulation baby spot. Shamroy currently is shooting "Little Old New York," starring Miss Faye at 20th Century-Fox.
The Dinky Inkie

A new ultra-midget spot lamp ready for release to the trade by Bardwell & McAlister; meets demands for studio cameramen for a really small, technically excellent lamp for close-ups and power in confined quarters; sells for $15.

By MICKEY WHALEN

OR THE RECORD: These most recent additions to the Academy Research Council Electrical Characteristc Standards are published for the record for projectionist and soundmen readers. Lack of space prevented their appearance in last month’s issue.

Academy Research Council

STANDARD ELECTRICAL CHARACTERISTIC

for Types A and B

International Projector Simplex Four-Star Systems

Type A — Using One LU-1000 (metal diaphragm) High-Frequency Unit and One LU-1004 Low-Frequency Mechanism

Type B — Using Two LU-1000 (metal diaphragm) High-Frequency Units and Two LU-1004 Low-Frequency Mechanisms

August 16, 1939

The tolerances of ± 1 dB up to 3000 cycles, increasing progressively with frequency to a maximum of ± 2 dB at 7000 cycles, should be rigidly maintained in adjusting equipment to these specifications.
Academy Research Council

STANDARD ELECTRICAL CHARACTERISTIC
for
Type C
International Projector Simplex Four-Star Systems

Using Two LU-1011 metal diaphragm/High-Frequency Units and Four LU-1010 Low-Frequency Mechanisms

AUGUST 16, 1939

The tolerances of ± 1 db up to 3000 cycles, increasing progressively with frequency to a maximum of ± 2 db at 7000 cycles, should be rigidly maintained in adjusting equipment to these specifications.

For optimum results with current studio sound recordings, the system should be adjusted to this Standard Electrical Characteristic.

Republic, Ray June and Bob Plane at MGM, Joseph Walker at Columbia and Gregg Toland at Samuel Goldwyn.

A few of the lamp have also been seen in the East, where “Bard” is on a swing through the key cities. Result of the Hollywood experiments and eastern viewings has the plant flooded with orders. The Dinky Lule will retail for $15 and will be available this month or early in December.

Metronome for Rhythm

• Successful use of a metronome in building rhythm, pace and tempo for big action scenes for “Northwest Passage,” is an innovation by Director King Vidor at MGM. Vidor believes it marks first time the tempo instrument has been employed in movie scenes. Plotting of scenes and rehearsals were done to this tempo on location for such scenes as portage of boat over a mountain, marches, boat rowing, the formation of human chain across the river, the sledding through swamps and attack on an Indian village. Vidor believes there is great correlation between rhythm and dramatic action and results are said to be outstanding.

Remote Focus Control

• A new electrical remote control for changing focus was used for the first time on “New Moon” at MGM. The remote control box can be operated by the operator crew from any portion of the sound stage. The device is a gear connected to the focusing mount and is controlled by a single knob on the control box, which contains the different focal distances.

Whalen Writes “Wails”

• Mickey Whalen, veteran member of Local 659, IATSE, has joined the staff of IATSE Facts, recently inaugurated official weekly IATSE newspaper for the West Coast Studio locals. In addition to covering news of the local union activities and personalities amongst the studio technicians in the studio locals, Mickey is writing an interesting column, “Wails by Whelan.”

“REBECCA” LOCATION UNUSUAL

Shooting background plates from parallels built out over bluff 500 ft. above sea level; spectacular and beautiful scenery of Northern California coastline near Monterey photographed by Rod Tolmie, veteran member of Local 659.

Distinctly out of the ordinary was the location wanted made by a camera crew to the Monterey region on the coast of Northern California to secure background plates and atmosphere shots for Selznick International production, “Rebecca.” It was necessary to match shots made in Europe on a location trip that had been stopped before completion by the outbreak of hostilities. Virtually the entire photographic assignment was conducted from special parallels built out over the bluffs, 500 feet above sea level.

The accompanying pictures on Pages 14-15 by Rod Tolmie, veteran member of Local 659, IATSE, illustrate the pictorial charm of the location spot and the unique camera setup that were necessary to accomplish the desired matching with material already in hand.

Tolmie is an inveterate still hobbyist, and in between his duties as assistant on the production, he managed to secure some shots that are as interesting technically as they are news-worthy. All the shots are enlargements from Contax frames.

The camera crew took their lives in their hands many times during their work on the flimsy parallels high over the wind-swept cliffs. It was probably the first time such a perch has been constructed, but the effective material obtained for background plates was worth it.

Pictures 1, 2, 3, 4 and 7 in the accom-
HISTORY REPEATED

PLUS-X, Super-XX, and Background-X have established themselves firmly as the favorite raw films of the industry. In doing so they have repeated the history of Eastman films of other days. And they have done it through the same means: unmatched photographic quality, completely trustworthy uniformity.


EASTMAN

PLUS-X
for general studio use

SUPER-XX
for all difficult shots

BACKGROUND-X
for backgrounds and general exterior work
panying layout on Pages 14-15 illustrate the beautiful settings of the Monterey coast, while in Nos. 8, 9 and 10 are presented the evidence of the unusual and dangerous parallels from which the crew did most of their work.

Archie Stout, a wood-carving hobbyist if there ever was one, was snapped while loafing between setups on the limb of a
Stout is seen with the balance of the unit in No. 6. The veteran member of Local 659 is seated, with James Higgins, assistant, behind him, and Ellis Carter, operator, at the camera. *International Photographer* welcomes similar layouts of interesting stills from location jaunts, for publication in future issues of the magazine.
Stillmen in the independent field work against many problems that are never faced by the men who flash bulbs on the major lots. Tightened budgets, speeded shooting schedules and other limitations cramp the companies that turn out state right features. A veteran in this field, who always comes through with interesting and effective exploitation stills is Lindsay Thomson, familiarly known as “Fat” to members of Local 659 and other workers in the independent field. Accompanying shots indicate that indie stillmen can venture successfully into artier aspects of photography afforded opportunity, and in fact, many of the spectacular outdoor scenes that feature action pictures are being photographed more and more effectively by the stillmen in the field. Top sunset silhouette is from the still series on “Ride ’Em Cowboy,” which features Dorothy Paige, NBC singer. Lower shot is of Joan Barkley, features player in “Lightning Carson Strikes.” While such pictures seldom play deluxe houses, stills by Thomson and his co-workers in the indie field are to be seen all over the country in lobbies of smaller theatres.
...notes of interest on studio technical developments, personalities, promotions, elections: SMPE officers, Tasker pipped at Par, studio club winners, filter record use, novel sound stunts, Mitchell with Berndt-Maurer, free library.

To All Members of Local 659 and Readers of International Photographer:

Commencing with the December issue of International Photographer, Herbert Aller, business representative of Local 659, IATSE, publishers of the magazine, will assume the editorship of International Photographer.

Your present editor has resigned the post to devote full time to the editing of IATSE Facts, which recently commenced publication as the official weekly news medium of the West Coast Studio Locals of the IATSE & MPMO.

In bringing to a conclusion almost three years as editor of the publication, we wish to express our sincere appreciation for the cooperation extended by many officers and members of Local 659, the men in the publicity departments of the producing companies, executives of the manufacturing firms catering to the industry, and many members of the IATSE in other local unions in Hollywood who have contributed valuable material and art for publication.

We trust that International Photographer will continue successfully on its present path as an outstanding technical and photographic journal, representing the motion picture cameraman and their friends.—Gib.

The following communication by the new editor has been addressed to members of Local 659, IATSE, and the cooperation of all members unquestionably is assured for the furtherance of the International Photographer's constructive policies:

"I have been appointed editor of the International Photographer. In assuming this position I am confident that my services can be most efficiently utilized if the different members of the organization who are so well qualified in the knowledge of motion pictures and art will work with me in this undertaking.

"An editor must surround himself with competent associates. It is to you that I will look for this support and encouragement.

"Therefore, I am imposing on you by asking you to be field representative on your lot for the International Photographer. Please stir up interest for stories, unusual layouts, pictorials and action shots of unusual interest. Suggestions and ideas will always be welcome.

"Be assured that you will have a say in the operation of the magazine.

"Please reply to this letter and tell me along what lines you intend to work and what you think would be the best program under which to conduct the magazine.

"Awaiting your reply, I am

"Sincerely and fraternally yours,

"HERBERT ALLER

"Business Representative."
EXPLOITATION STUNT print for Republic’s latest “Zorro” thriller, is the result of adding the ad departments ideas to a striking action shot by Joe Walters, stillman member of Local 659, IATSE. Walters has been head of the still department at Republic for the past four years.

Spring Color Classes
- Enrollments are now open for the spring classes in color photography at the Hollywood High School. All members of the International Alliance West Coast Studio Locals who have had five or more years experience on black and white photography are eligible for admission. Stuart Barsby, Local 695, will conduct the class. The class is limited to eighty students so in order to take advantage of the free course it is suggested that those interested enroll now.

Graflex Time Payments
- Folmer Graflex Corporation announces that Graflex and Speed Graphic cameras are now available on time payments at Graflex dealers everywhere. The plan, now in effect nationally, is the outgrowth of a plan that has been in operation in selected areas for some time. Commercial Credit Company—one of the largest firms of its kind with offices serving all communities in the country—will handle the financing. Down payments are as low as 20 per cent with twelve months to pay the balance and the full insurance of all equipment purchased on the plan against fire, theft or loss.

Progress on the Rinks
- For production efficiency on Sonja Henie pictures at 20th Century-Fox, the boys in the machine shop figured out a mechanized ice scraper which has just been put into use on the ice rink which Sonja is using in “Everything Happens At Night.” Up until now, ice was always scraped clean by men on skates wielding large, bulky scrapers. This consumed so much time during production that the boys decided to get together and bring technological progress to the ice rink. It was the safety razor that gave them the idea for the new contraption. It’s merely a huge safety razor which is propelled around the rink by means of wire ropes, pulleys and tackle operated by an electric motor on the sidelines. The motor can be run at any speed to pull the machine over the ice.

Union Housing Program
- Members of Local 659, and their friends in the IATSE who are planning to build a home should consult the skilled craftsmen of the Building Unions who do far more than just mixing mortar and laying tile when they build a home for you. As a group they are small home owners, themselves, and feel a responsibility to you that you receive the best. Full information about the Union Housing Plan can be obtained by writing 538 South Maple Ave., Los Angeles, Calif.

More Nostalgia
- William S. Hart, Tom Mix, Billy Anderson and the other buckaroos who roared to popularity with horse and six gun in silent days will be the composite character featured in the forthcoming 20th Century-Fox production, temporarily titled, “The End of the Trail.” Darryl F. Zanuck hopes to do for the old time horse opera heroes the same as he did for the custard pie throwers in “Hollywood Cavalcade.” The picture will be photographed in Technicolor.

Agfa Box Flash Cameras
- With introduction of two new Agfa “flash” cameras, amateurs can obtain an inexpensive camera with built-in synchronization and separate flash unit which is relatively inexpensive and yet simple to operate. The two new cameras are the B2 Shur-Flash and the A8 Cadet-Flash. Their flash unit is light and compact, providing a polished metal reflector on a lightweight plastic base. It uses two penlight-size batteries and can be fitted with any one of several types and sizes of standard photographic flashlamps.

The B2 Shur-Flash camera takes eight 2½x3¼-inch pictures per roll of B2 film. The retail price of the Agfa B2 Shur-Flash is $3.95, including flash unit but without lamps or batteries. The A8 Cadet-Flash takes eight 1½x2½-inch pictures per roll of A8 film. Priced lower than the Shur-Flash, it nevertheless is a staunchly-built camera.

MGM’s Elevator Camera
- A special “elevator camera” that can shoot scenes at any level from a tower fifty feet high has been designed by John Armold, camera department head, and Merrill Pye, art director, to be used for shooting dance routines by Fred Astaire and Eleanor Powell at MGM.

Juniors’ 16mm Pix
- Headed by Jackie Cooper, Hollywood Junior Production Club, a private organization, will produce 16mm films, acted, directed, written and produced by its youthful members. The gift of a camera and projector shortly after he completed his co-starring role with Betty Field in Paramount’s “Seventeen,” gave Jackie the idea for making the amateur films. Plans are now being made for the first picture. Charter members of the Club include, Judy Garland, Bonita Granville, the La Motte twins, Freddie Bartholomew, Tommy Wonder and Sidney Miller.
CINEMA CREW on “Music in My Heart,” featuring Tony Martin and Andre Kostelatz of the Ethyl radio program, is captured here with director Joseph Santley, by Bill Tomas, stillman member of Local 659, IATSE. Joe Granucci, member of Local 80, IATSE, is the grip at left. Reading upward in center are John Stumor, first cameraman, Ni Rosen, assistant, Lloyd Ahern, operative cameraman. Joseph Santley, the director, is at the right.

SMPE Annual Honors

Annual Progress Medal of the Society Motion Picture Engineers was awarded to Dr. Lloyd A. Jones of the Eastman Kodak Laboratories in recognition of his contributions to motion picture technology. At the same time, the Society Journal Award for the outstanding paper published in its Journal during the year was presented to Dr. Herbert T. Kalmus, President of the Technicolor Motion Picture Corporation.

Last year Dr. Kalmus was honored with SMPE Progress Medal for his technicolor motion picture achievements. He received this year’s Journal Award for his paper entitled “Technicolor Adventures in Cinemaland.” Dr. Jones, this year’s recipient of the Progress Medal, was likewise awarded the Journal Award in 1935.

Both presentations were made at the banquet that climaxed fall convention of the Society in New York City.
CLOSE-UPS

Allen M. Davey: veteran Technicolor photographer.

A cameraman who makes no bones about his 100 percent preference for color over black-and-white is Allen M. Davey, veteran member of Local 659, IATSE, who has been on the Technicolor staff continuously since 1935.

Davey in recent years has had the assignment of working with black-and-white cameramen in the program of the major companies and Technicolor to eventually have all industry cameramen familiar with the color systems, so that they may apply their own initiative to color.

As one of the Technicolor staff cameramen, Davey works beside the regular black-and-white photographers on the sets of color productions. His job is to permit the black-and-white photographer to use his familiar and personal technique of lighting and camera manipulation and to coordinate these factors to the technical demands and limitations imposed by color.

Davey is a veteran of black-and-white, having started in the business 25 years ago with David Horsley in the latter's lab, but his enthusiasm for color is based upon a sincere belief that color affords a much greater range of opportunities to the photographer.

With the vast improvement in realistic color rendering and greater depth of focus now available through the constant improvements being evolved by Technicolor's experts, motion picture color today is blossoming into a practical and useful tool, rather than an exploitation novelty.

With the pioneering era of color nearing a close, as many newer and even more radical improvements in technical excellence are foreseen for early introduction to the industry, Davey and other Technicolor staff men believe that there now will be a much keener interest in applying the finer elements of cinematic technique to productions in color. It's another version of the great improvement in entertainment quality and artistic values that took place when the camera was freed from the restrictions imposed by sound.

Today, Davey points out, it is possible to do anything in color that you can do in black-and-white. That goes throughout the gamut of camera tricks and special effects with very few exceptions.

Consequently, cameramen today are handling color with more confidence and all creative contributors are beginning to orient color in its proper place as an element of the entertainment whole, instead of an eye-smashing ballyhoo peg.

Current examples of feature productions that illustrate this freedom of artistic expression in Technicolor are "Wizard of Oz," MGM, photographed by Hall Rosson; "Sweethearts," MGM, photographed by Oliver Marsh; "Hollywood Cavalcade," 20th Century-Fox, photographed by Ernest Palmer; and "Typhoon," Paramount, photographed by William Mellor. On this quarter, Davey was the Technicolor advisor. He picks these films not because of his own association, but because they are productions with which he is most familiar.

Other pictures from major lots, photographed in Technicolor by ace cameramen with assistance of other experts from the Technicolor corps, amongst the releases of recent months, also illustrate the trend.

Davey's span of 25 years experience in the business jumps from a trip to California as a telegraph operator to sharing Academy award honors with Marsh of MGM's "Sweethearts" for 1938. Born in Bayonne, N. J., and educated in the local schools, he came to California without a thought of entering the picture business, but while a youngster he took a job in the free-and-easy "galloping tintype" factor as a carpenter. Like many another veteran
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Smallest flash bulb yet, new G-E No. 5, wire filled lamp with bayonet base, is shown at Top Left in camera. Top Right with a golf ball and walnut shell, and Lower Right, how two dozen can be carried in coat pocket. Interesting experiment as to midget bulbs power is illustrated Lower Left in the Civic Auditorium Cleveland, Ohio. Shot was made with single midget bulb in a large spot-reflector, placed 265 ft. from man on stage. Camera that took pic was 315 feet from the stage.

he gravitated into the lab and as the business expanded found himself working as an assistant cameraman and eventually a first cameraman.

Among his first assignments were photographing the "Alkali Ike" comedies and features with Louise Glaum and Harry Edwards at Universal. In 1916 after a considerable stretch at the "Big U" he went with Famous Players-Lasky and photographed such silent stars as Louise Huff, Wallace Reid, Sessue Hayakawa and Myrtle Stedman.

He also worked for Triangle, before joining the service in 1917, back at his familiar clicking key as a radio operator in the U. S. Navy. After the World War he resumed photographic work at Realart, shooting Mary Miles Minter features in 1920 and then returned to Universal to stay until 1926. He free-lanced for a year or so and in 1927 became associated with the then new Technicolor, where he has been on the job ever since.

Smallest Practical Flash Bulb

Development of world's smallest practical photoflash bulb, called "mighty midget" because of its effective flash, and designed for use with all cameras except focal-plane shutter types is announced by General Electric's lamp department at Nela Park. Smaller than a golf ball, this ingenious little wire-filled Mazda Photoflash Lamp No. 5, will be made available December 1st.

So small is the "mighty midget" that more than two dozen can be carried in the pocket of a suit coat, more than three dozen in an overcoat pocket, or in a lady's hand bag. Wide range of pictures taken by it powerful flash have proved to be as sharp and clear as shots of the same subject taken with much larger flash lamps.

Besides being the world's smallest flash bulb, new bulb is also a much more efficient producer of light for photoflash pho

For its size, it gives more light—nearly a million lumens at peak of flash—than any other photolamp commercially available.

Unlike other flash bulbs which are equipped with the conventional type of base, new flash employs bayonet base, like the base of many a lamp used in automobile service. Designed for rapid fire loading and unloading in projector equipments, it locks the lamp firmly in its socket.

Bulb of the new lamp is protected both inside and out with a lacquer safety jacket. Outer jacket is intentionally tinted with a dye which in no way interferes with photographic effectiveness of light produced.

Purpose of the dye is twofold: in factory, it permits inspectors to determine quickly and accurately whether lacquer protection has been properly applied; elsewhere yellowish hue serves as a quick means of identification, assuring both trade and public that bulb has been provided with an outer safety jacket as well as an inner one.

Essential technical data on the new midget No. 5 lamp are as follows:

- **Bulb**: B11
- **Bulb Filling**: All Wire
- **M. O. L. (Pub.)**: 2½" (inches)
- **Base**: S. C. Bayonet
- **Light Output**: 13,000-15,000 Lumen Sec.
- **Peak Lumens**: 900,000
- **Voltage**: *
- **Std. Pkg. Quantity**: 60
- **List Price**: 20 cents

*Flash with dry cells only (two or more)

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Left: The new Agfa Speedex miniature camera, story on Page 23; Top Right, demonstrating the new dollar model Braquette, flexible frame device for picture display, story on Page 24; Lower Right: Demonstration of the new Bell & Howell "ready rest" case for Filmo 141 16mm cameras, story on Page 24.
**Agfa Speedex Camera**

- Latest Agfa Ansco contribution in the field of moderately priced hand cameras is new Agfa Speedex. Precision-built and 100 percent American-made, new Speedex is a compact instrument at low price of $27.50. Speedex is fitted with an F:4.5 Anastigmat lens of 85mm focal length and a precision shutter with speeds of 1/2 to 1/250 second, as well as Time and Bulb exposures. Measuring 5 3/8 x 3 1/2 inches in size (closed), the Speedex takes twelve 2 1/4 x 2 1/4 inch pictures per roll of inexpensive B2 size film. Focusing from 3 1/2 feet to infinity is accomplished by adjustment of a focusing ring on lens mount. Shutter, which is of the pre-set type, is released by a button mounted in a convenient position on the body of the camera.

A feature of the Speedex is new-type, self-erecting platform and front which incorporates precision movement that brings the lens and shutter assembly quickly into a rigid, picture-taking position. A recessed tripod socket centrally located on the base of the camera, a single film window "peephole" positioned in the center of the camera back, built-in eyepiece and a separate neckcord are all standard equipment. Special eveready leather carrying case, listing at $4.75 is available.

**New Kodascope Eight**

- New Kodascope Eight, Model 70, announced from Rochester by Eastman Kodak Company, has the following outstanding features:

  Die-cast construction, attractively finished in gun-metal gray, with chromium finished parts;

  One-inch f:1.6 Eastman-made projection lens, which with 500-watt lamp makes it possible to show pictures up to 39 x 52 inches on beaded or aluminum surfaced screens; Newly designed film gate, held open by catch during threading; Convenient threading knob; Positive three-position switch, controlling lamp, motor and cooling fan; Positive framing by knurled screw atop projector, so outline of picture on screen is not moved during framing; Rapid rewind, set in action by pull of a rewind lever. Automatic release of take-up drive during the operation. Rewinding done with lamp off; Speed adjustment knob, which affords absolute control of the projector's motor speed; Easy tilting, over an unusually wide angle, by an easily-grasped adjustment knob on the projector base; Highly-efficient cooling system, including special cooling flanges, double-wall lamphouse, and powerful motor-driven fan; Removable lamphousing, given ready access to lamp, reflector, and condenser lenses; Accommodation for 300-, 400- or 500-watt lamp, and lamp adjustment screw for obtaining maximum illumination; Convenient carrying handle, so located that the projector is properly balanced when lifted; Main bearings pre-lubricated; Sturdy, roomy carrying case, with space for projector, extra reel or two, extension cord, and emergency splicing outfit.

Kodascope Eight, Model 70 operates on either D.C. or A.C. 25- to 60-cycle. 100- to 125-volt electric lines. Price, including one 200-foot reel, extra belt, oiling and splicing outfits, and carrying case, but without lamp is $68.50. Without case $59.50. See illustration Page 23.

**"Ready Rest" Case**

- Bell & Howell announces new sheath case of patented design, radically different from ordinary type of cut-out case. New case for the 141 film has the camera screwed to a tongue which is permanently attached to the case. When camera is placed in use body of the case forms a camera rest against the chest for greater stability in movie making. All camera controls remain visible throughout use. Also, loading of the magazine is accomplished with simplicity, and without having to detach any part of the case from the camera.

A close-up on the Art Reeves Line-O-Lite glow lamps, turned out at the modern Reeves plant in Hollywood.

Price is $6. Further information may be had from Bell & Howell Company, 1801 Larchmont Avenue, Chicago, Illinois. Illustrated Page 23.

Reeves Line-O-Lite

- Technicians who are interested in local production of equipment should drop into Art Reeves establishment and have a look at the efficient layout he has developed to turn out his glow lamps. The latest in glass-blowing and heat treatment to remove all impurities from the tubes is on tap, to turn out the Reeves Line-O-Lite glow lamps that are used the world over.

The Line-O-Lite is designed to overcome two deficiencies frequent in glow lamps. One is insufficient exposure on the film the other irregularity of glow line. By using a special glass translucent to Ultra Violet rays of the value 3800 Angstrom units, the first is eliminated. Sound film emulsion is most sensitive at 3800 Ang...
around the tags

For the photographic in the studio the photographic will be available especially for photography.

The inherent frequency response characteristic of this lamp makes it suitable for use with the most modern amplifying systems. Tests have shown that the lamps respond best up to a frequency well above audible limits, giving a range never before achieved by a glow lamp.

Used in conjunction with the Ultra-Helicity Optical unit, the Line-O-Lamp exposes the film at the most efficient frequency, making full use of its energy, thereby obtaining full exposure at lower stages and currents.

The uniformity and sharpness of the glow line is obtained by the exclusive shape of the electrodes. Perfect control over the width of the glow line is achieved, greatly increasing the efficiency of the lamp and eliminating exposure from parasitic emissions.

The Glow Tube is made out of a glass which will pass the portion of the Ultra Violet Spectrum which is sensitive to recording film. This entire tube is manufactured in the plant of Art Reeves, at 212 Santa Monica Blvd., Hollywood, California.

All the metals and parts of the tube are tested before manufactured. During the pumping of and filling of tube with rare gases it is bombarded electrically. The machine used for bombarding has 35,000 Volts of radio frequencies. This heats the elements of the tube to a white heat and removes all the impurities. And due to the fact that the tube is a vacuum the metals do not disintegrate.

The tube is then filled with rare gases tested with an amplifier before being sealed up with a pump. In this manner the tube can be tested and made to any performance desired. The tube will never change the impedance because there are no impurities left in the tube.

Braquette Dollar Model

Manufacturers of Braquettes now have a $1.00 model on the market. Identical in most respects to the rigid $2.00 model, this "cord" type Braquette is especially compact and offers the solution maximum in adjustment. (See illustrations on Page 25). It will frame any picture from 8x10 to a picture or photo mural 36 inches high, and all sizes between, such as 8x10, 16x20, etc. The Braquette idea is—you frame your own pictures, changing them as often as you like, the frame will always hold them regardless of size. With these new Braquettes, you can take out the old picture, refame a new one, and put it up on the wall in a minute. Braquettes are available in four Lumilite colors, the standard polished aluminum, jet black, red, and gold, and at all photographic stores.

dia Reflector Kit

For making snapshots at night indoors with photographic flash or flood lamps, a new, inclusive Agfa Reflector Kit now is available at photographic dealers. The two folding reflectors included in the kit are made of a heavy, durable metal stock having especially good color and reflection characteristics for photographic use. The reflectors are fitted with side panels of each reflector are full

ART REEVES

Cable Address: ARTREEVES

7512 Santa Monica Blvd. Hollywood, California, U. S. A.
convenient also new per-so simplify the gross, 2x3-inch reflectors also dations directions stallation for Superpan and guessing 10-foot Plane for a combination of wide type and mask is Flash and Folding a masks has close-up range and is of great use in preparing the negative. Which provides the needed light for obtaining suitable and attractive envelopes of proper size, special envelopes have also been prepared in a heavy, cream-white vellum stock at 20c for 25, 75c for 100, $2.65 for 500.

Agfa Xmas Card Outfit
- For photographers planning to make photographic Christmas Cards this season there is now available a new Agfa outfit which greatly simplifies work involved in preparing and printing the combination negative. New outfit provides six 5x7-inch masks made on Reprodil film, which carry the design and message of the card. Each mask also has a 2x3-inch rectangle of clear film appropriately located for the printing of a personal snapshot negative. Guides are provided on each mask to simplify centering of standard 4¼x5½-inch greeting card stock, and full instructions are included for use of the masks and cord and reflector. See story on Page 26. At right, Bill Salm head of the HCE repair and technical department, displays the new attachment appears in actual use.

Here is a close-up of the new Hollywood Camera Exchange Focal Plane Flash Synchronizer, just put on the market. Note that installation is so arranged that only visible parts are battery case, for imprinting personal signatures. Special attention has been given to construction of masks to insure good contact with the paper, and in the design to provide a pleasing relationship between picture area and ornamental decoration. The Agfa Greeting Card Outfit is available at photographic dealers at $1.69. Special decked-edge photographic paper in the 4¼x5½-inch size of Agfa is Cykon Kashmir White has been made available at the regular price of 45c per 2-dozen package, $1.10 per ½ gross, $2.00 per gross. Agfa Cykon is also being supplied for greeting card use with decked edge in 4¼x5½-inch size at the regular price of 50c per 2-dozen package, $1.20 per ½ gross, $2.50 per gross. To simplify problem of obtaining suitable and attractive envelopes of proper size, special envelopes have also been prepared in a heavy, cream-white vellum stock at 20c for 25, 75c for 100, $2.65 for 500.

HCE Focal Plane Flash
- With the improvement in quality and broadening of the flash peak by manufacturers of flash bulbs, focal plane synchronization for ultra-speed action shots now is possible with the Graflex and Speed Graphic press cameras, and equipment manufacturers are meeting the demand for dependable accessories for this purpose.

Newest focal plane synchronization device on the market comes from Hollywood Camera Exchange, well-known throughout the trade for its HCE Combination Lens Shade Filter Holder, now is introducing the new HCE Synchronizer, an accurate and dependable device that has added virtue of being built into the camera so that only battery case, cord and reflector are visible, as illustrated on Page 26. A lens shutter is not required. With the use of The New HCE Focal Plane Flash Synchronizer uniform exposure with no hot spots or fadeout is guaranteed. Flashes from 1/100th to 1/1000 of a second are obtainable with this synchronization.

Simplicity of design is such that the only visible parts are the battery case, cord, and reflector. The heart of the synchronizing unit is so constructed within the camera that it is impossible for it to get out of adjustment, thus providing a perfect focal plane flash synchronization at all times. This new feature adapted to the Graflex and Speed Graphic camera broadens the field of the camera in covering sports and action ever wherever high speed synchronization is required. Price complete with sturdy battery case and reflector, $25.
New Master Leicameter

New Weston Master Exposure Meter has created much comment because of the new and advantageous features, such as readable high sensitivity, increased brightness range, streamlined rugged design, and "High Illumination" and "Low Illumination" scales to simplify the photographic process as much as possible, instead of direct scale giving readings in candles per square foot, Leicameter readings are in direct shutter speeds.

"High Illumination" scale of the Master Leicameter gives direct shutter speed readings from 1/1000 second to 1/1000 second. The reading is based on a film speed of Weston 24 (the speed of the usual medium speed type of film employed in general outdoor photography) and a diaphragm opening of f/4.3. In the "Low Illumination" scale, the film speed of Weston 50 has been chosen, since films of this speed are generally employed for indoor photography, and the scales are based on the use of a diaphragm opening of f/4.3.

A calculator dial indicates the diaphragm stop which gives the right speed for each film speed. In poor light conditions, where it is necessary to use the "Low Illumination" scale, a small latch is released to release the "cell file" to be swung out of the way. This action automatically moves the "Low Illumination" scale to position. The Master Leicameter has all of the Weston features and can be differentiated by a orange band on the face of its calculator dial.

Lex Graphic—Graflex Tome

"Graphic Graflex Photography," a new book by Willard D. Morgan and Henry M. Lester is scheduled to go on sale January 1, 1940. Derived as the most complete and authentic book ever written on the subject, it is expected to find ready acceptance by owners of all types of photographic equipment. While directed toward "cell" and Speed Graphic cameras, it is so written as to be of value to all who strive for better pictures.

According to Polner Graflex Corporation, book orders for the first time complete in one volume covers dealing with practically every phase of photographic possibility with these cameras. A monograph of the latest snapshot work to such highly specialized individuals as professional and microphotography, portraits, scenic, pictorial studies, flash photography, and many other subjects covered by authors who are specialists in their fields. Graflex dealers now have on sale, for use during the holiday season, gift certificates which may be exchanged for copies of the book after January 2.

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PATENTS

BY ROBERT W. FULWIDER

Last month the following patents of interest to readers of INTERNATIONAL PHOTOGRAPHY were issued by the U. S. Patent Office. Descriptions and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.


A motion picture camera of a size to be held in the hand, and divided by an internal web making a motor compartment and a film compartment.


A camera arranged to take two exposures in succession, one through the lens alone, and the other through the lens and a parallel faced refractor set at an angle to the lens.

No. 2,174,931—Method and Apparatus for the Production of Motion Picture Films of the Animated Cartoon Type. Paul Houlton Terry, Larchmont, and Carl Louis Gregory, New Rochelle, N. Y.; said Gregory assigned to said Terry. Application June 18, 1936. 21 claims.

A method of adapting background projection to the making of animated cartoons.


A method of producing a multi-color sensitive film by selectively dyeing the outer surface and body of the emulsion with different color sensitizing dyes.

No. 2,176,303—Sound Track on Colored Film and Method of Producing Same. Charles F. Jones, Burlingame, Calif., assignor of one-fourth to C. W. Durbow, both of San Francisco, Application Mar. 2, 1936. 7 claims.

A sound track on a multi-layer color film produced by printing the track in one layer only, exposing the other layers, and then reversing the sound track.

No. 2,177,257—Colored Photographic Pictures. Leibert Jakobs and Bruno Redt, Germany. assignors to Agfa AnSCO Corp. Application Mar. 24, 1938. In Germany Apr. 9, 1937. 5 claims.

A process of producing colored pictures in which the silver halide image is treated with a compound selected from the group consisting of an amine capable of being diazotized and an anti-diazotize thereof.

No. 2,177,342—Method of Color Photography. Edwin Wayer Hessner and Eva Louise V. Hessner, assignors to Photocolor Corp. of America. Application July 2, 1937. 5 claims.

A method of producing color pictures by exposing two areas of a film having one layer sensitive to blue and green, and a second layer sensitive to red, one area being exposed through a yellow filter to provide the green and red images, and the other area being exposed without the yellow filter.


A method of printing stereoscopic component pictures on a light-sensitive lenticular film.


A multi-emulsion color film having a red and blue picture emulsion with color formers fast to diffusion, and a third emulsion having a substantive azo-dye component.

No. 2,177,706—Apparatus for Processing Motion Picture Film. Fred W. Gage, Beverly Hills, Calif., assignor to Warner Bros. Pictures, Inc. Application May 31, 1938. 11 claims.

Film treating apparatus having a large reservoir connected to a film treating tank in which the film is processed by jets of film treating liquid.


Film treating apparatus having a series of tanks through which film may be run in one direction while the film treating solution is run thru the tanks in the opposite direction.


A camera having an objective designed to be tilted at its nodal point of emergence.


A camera making use of a beam-splitter with a polarizing semi-reflecting mirror and crossed polarizer for cutting off the light reflected from the rear surface of said mirror.

N. 2,178,450—Developing Photographic Film and Plates. Alphonso O. Jaeger and Joseph Jewett, assigns to American Cyanamid Chemical Corp. Application Apr. 6, 1938. 3 claims.

A method of developing photographic emulsions by using a developer containing not more than 0.25% of a salt of an ester of an aliphatic frohodicylic acid.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of International Photographer, published monthly at Los Angeles for October, 1939.

State of California

County of Los Angeles } ss.

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared Edward H. Gibbons, who, having been duly sworn according to law, deposes and says that he is the Editor of the International Photographer, and that the following is, to the best of his knowledge and belief, a true statement of the owner, management, and if a daily, the circulation, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, International Photographer, Los Angeles, California. Editor, Edward H. Gibbons, Los Angeles, California. Managing Editor, Herbert H. Aller, Los Angeles, California. Business Manager, Helen Boyce, Los Angeles, California.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and address of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and address and the number of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) International Photographers, Local 659, International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, 6461 Sunset Blvd., Hollywood, California. President, Hal Mohr; Vice-President, Leon Shamroy; Secretary-Treasurer, E. S. Depew; Recording Secretary, James V. King; Sergeant-at-Arms, Leo Powers.

3. That the known bondholders, mortgagees, and other security holders owning or holding per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state. None.)

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company in any capacity other than that of a bona fide owner; and this affidavit has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as stated by him.

5. That the number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is. (This information is required from daily publications only.)

EDWARD H. GIBBONS, Editor

(Signature of editor, publisher, business manager, or owner.)

Sworn to and subscribed before me this 12th day of October, 1939.

MILTON A. TAYLOR, Notary Public

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PICTORIAL FEATURES

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On the Cover

Meet Walt Disney's newest star—little Pinocchio himself! The engaging little puppet, endowed with life through the magic of Walt and his staff, is the hero of the second full-length production to issue from the Disney plant. Other scenes from "Pinocchio" are shown on page 8.

**INTERNATIONAL PHOTOGRAPHER**

Vol. 11 December, 1939 No. 11

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**INTERNATIONAL PHOTOGRAPHER** for December, 1939.
MULTIPLANE CAMERA FOR "PINOCCHIO"

Walt Disney technicians create multiplane camera for third dimensions effects that add realistic quality to animated motion pictures produced by the famed studios.

Audiences that have marvelled at the illusion of third dimension and depth in the Walt Disney productions will notice marked improvements in this technique in Walt Disney's second full-length feature, "Pinocchio."

Two factors are responsible for this increased illusion of depth. One is the development of the paint technique on the celluloids known as the "blend." This process gives a molded round appearance to the bodies, arms, and legs of the characters, with highlights and rounded contours on the face.

The second and important factor is the multiplane camera. Awe-inspiring in its complexity, bulky and incredibly precise, this multiplane camera, designed and executed by the Disney technicians, gives animated motion pictures a realism and vitality never before possible.

The chief thing the camera does is to achieve the screen effect of depth and a modeled quality in the drawings of the characters. Under the old technique, in which the animated characters moved across a background in the same plane, it was not possible to give the illusion of real-life movement. The characters were drawn upon a single or several tightly superimposed sheets of celluloid and shot as a single, flat subject, over a background. The artist was relied upon to suggest perspective.

The multiplane camera is mounted to shoot downward, with the lens above the horizontally placed drawings. The construction of the machine facilitates the breaking up of the subject matter into component parts, on the basis of their respective distances from the eyes of the observer. Figures are painted on the regulation celluloid sheets, while the backgrounds are executed on a special type plate glass. These are photographed simultaneously on the various levels. This may be from two to seven planes—depending upon the character of the scenes to be photographed. This photographic process enables the action of the characters to be filmed at a distance as great as 12 feet from the backgrounds.

The multiplane camera is of infinite accuracy. Each plane may be lighted separately, moved separately or jointly, closer to or farther away from the shooting lens, or at different speeds. A master control panel controls hairline adjustments of light levels, and the interlocking of the camera with the various background and contact levels. The various planes permit a truer perspective to be achieved as the camera dollies to or away from the key plane.

Operation of the multiplane camera is complex, requires a detailed control sheet and a special periscope finder with which the operator can check before shooting the picture. A day's work with the standard or single-plane camera nets about 50 feet of film, while the multiplane camera, functioning at par. nets approximately 10 feet of film in the same number of working hours.

Three men compose the staff for operation of the single-plane camera, while the services of from two to four times as many are required to operate the multiplane camera. For operation of the single-plane camera one man is used to focus and shoot, one to stage the successive pictures for the lens—the third man to follow script and check operation of the second man. Operation of the multiplane camera requires this staff plus two more for each plane, since the latter two operations must be duplicated for each level.

Introduced as an experiment, first use of the multiplane camera was in the short production, "The Old Mill." The process reached a high degree of success in Disney's first feature production, "Snow White and the Seven Dwarfs."

Convinced of the superiority of the multiplane camera and that it is a great forward step in the improvement of animated motion picture technique, the Disney technicians are engaged in extensive experiments with the multiplane technique whereby they hope not only to increase the amount of film footage shot per day, but to lower the cost attendant with multiplane photography. These two factors will permit the greater use of the multiplane technique in all future productions.

In the new studio which Disney has erected in Burbank, three multiplane cameras will be installed, each with its camera room and replete with the latest improvements, devices and equipment.

Dust, dirt and lint—the bugbear of the camera department—will be almost nonexistent in the camera building of the new quarters. This result is to be achieved by a device whereby anyone entering the camera room is automatically treated to specially routed air blasts guaranteed to remove all dust and lint from the clothes.

Disney maintains a complete staff of engineers who are usually experimenting with new developments in the realm of the camera. In the two years since "Snow White," many improvements have been made on the multiplane camera. Lighting of the various levels has been increased; technical obstacles overcome which permit the trucking on a scene and the making of panorama shots.

The scene in "Pinocchio" which introduces to the audience the eerie waterfront where the Red Lobster Inn is located, is made possible through the advances in multiplane camera technique.

The camera trucks past buildings into a misty, heavy fog, through which the Inn can be faintly seen. The camera continues through the fog up to the door of the Inn. Then, without being conscious of a break, the audiences finds itself inside the door, and accompanies the camera down the steps inside, to a table where sit the Fox, the Cat and the Coachman, plotting to send the puppet Pinocchio to Pleasure Island where had little boys are turned into donkeys.

As many as nine celluloid levels were used at one time in shooting the interior of the Inn.

The scene, occupying 16 seconds on the screen, is approximately 23 feet in length and took a crew of five men 46 consecutive hours to film it, one crew relieving another.

The Disney cameramen and technicians will tell you that the only limitations imposed upon animated motion pictures are the limitations of the functions of the camera. They consider it their problem and that it is up to them to develop the cameras and techniques so that any idea from the fertile imaginations of the artist may be interpreted and handled by them.
The Disney magic has been applied again to create his second full-length production and to bring to the screen the quaint character of Pinocchio. The little puppet who is well known in the pages of juvenile fiction is the central figure in one of the strangest and most engaging families ever gathered under one roof. ... At top left is seen the old woodcarver Geppetto, putting the finishing touches on our hero. Kibitzing are Geppetto's pets, Cleo the goldfish and Figaro the kitten, who are endowed by Disney with human manners and intelligence. Pinocchio and his pals—the impish kitten, the flirtatious goldfish, and the merry vagabond cricket, are seen again at top right. Brought to life in order to grant the kindly old man's wish for a son, Pinocchio is given an official conscience in the person of Jiminy Cricket, who seems to be creating a surprise in the lower left photo. The good Blue Fairy (lower right) brings the puppet to life with her magic wand. RKO Radio are releasing this Walt Disney production.

**Holiday Poster Art**

Stillmen put holidays to good publicity use with timely shots of studio players in gags appropriate to the event, for poster art of the nation.

Christmas and New Year are old as the hills but stillmen exercise their talents, shown by the interesting examples on this page, in presenting Holiday art in new dress, or undress, as the case may be.

The two pictures at top are by Robert Beene, of Paramount, veteran stillman member of Local 659, IATSE. The little gal with the big snowman is Susanna Foster, 11-year-old singing prodigy. Santa Claus assures himself a rousing welcome when accompanied by an assistant like Virginia Dale, with her bag of tricks.

Richee was responsible also for the calendar shot of Muriel Angus, the Paramount English actress, Eric Carpenter, another veteran member of Local 659, shot the action photo of June Preisser, MGM, leaping into leap year over the old year hurdle.

"Poster art" the boys call it and it is seen throughout the nation as part of the buildup for screen fame. After Christmas and New Year's come St. Valentine's, Easter, Fourth of July, and so on—just another holiday for most people but for the stillman another opportunity to do his stuff.
Echoing the sentiments expressed by these pictures, International Photographer extends to its readers and to all members of Local 659 its sincere wishes for a "Merry Christmas and a Happy New Year." We hope Mr. S. Claus will be looking your way and that he (or his helper) will leave a sackful of good things at your home. May you take 1940 in stride, starting with the first day of the New Year. For details on this poster see Page 5.
Westerns are riding high at the box office again, thanks to Gene Autry, Public Cowboy Number One. (See following pages.)
WESTERNs CARRY THE BUSINESS

Gene Autry, Republic star, heads the fast riding trend back to the old faithful Westerns, now enjoying high favor with Mr. and Mrs. America, as is demonstrated decisively where it counts most—the box office.

Rip roarin', blood and thunder he-man Westerns are back in the saddle again, carrying the business for many a box office and studio treasury while the more conventional fare that has been dished out for so many years continues to find tough sledding.

One proof of the hold Westerns have on the ticket buying populace is the astonishing fact that Gene Autry, Number One cowboy in the field, also is first in the amount of fan mail received by any Hollywood actor.

The Republic star, by the way, gives a heaping measure of credit for his success to the cooperation extended him by the still cameramen with whom he has worked. With much of the publicity built on tie-ups, stillmen, with their careful planning and painstaking execution, have been a big factor in the exploitation of the genial cowboy.

Autry hails from Texas and hit Hollywood via the medicine show trail and radio. He was nabbed from the WLS Barn Dance program, in Chicago, where his guitar and singing voice had made him a headliner.

The stills on the facing page indicate the many appeals by which his popularity has been built up and maintained. In addition to the hard riding and virile action that would be expected of any screen cowboy, Gene packs an extra box office wallop with his musical ability. The singing cowboy star has a spectacular auto trailer in which to transport his mount. Fast on the draw, he also is sure to beat the other guy to the punch. Throw in a little heart throb and it all adds up to box office success.

But Autry and Republic are not the only ones cashing in or getting ready to cash in on the new bonanza.

Universal has teamed Marlene Dietrich and James Stewart in a fast moving feature: "Destry Rides Again." Hal Mohr's photography is outstanding in this production, a number of stills from which were shown in the October issue of INTERNATIONAL PHOTOGRAPHER.

Warner Brothers are doing "Virgil City" and Sam Goldwyn is producer of "The Westerner," starring Gary Cooper.

From the cameraman's standpoint it is colorful, action stuff. "Hi-Yo Silver Let's go, Westerns! That's gold in them there box office tills."

THE EYES OF THE ARMY

Modern warfare depends increasingly upon the aerial camera, as this article points out in a timely summary of the photographer's part in current military strategy.

By COLONEL GRANT H. STONE, A.A.R.

(Opinions expressed herein are those of the writer and are not to be construed as being official representations of the U. S. Army Air Corps.)

PHOTOGRAPHY, because of the steady improvements in camera construction, because of the production of faster, more sensitive films, and because of its ever increasing importance in military and civil aeronautics, has come more to the attention of the general public in the few years just past than ever before. From the time that the box camera was perfected, near the turn of the century, to the present day of the "candid camera," photographs have become increasingly important to man and to Mars.

To this end, the United States Army, Navy, and Marine Corps have developed and proved that it is far more advisable to fight wars with the aid of the aerial camera than with men and steel alone.

Modern military strategy depends on securing accurate information pertaining to the enemy's position, without loss of time. The enemy is constantly removing their heavy artillery into newer camouflaged position. Rapid mobile units set up new positions many miles distant in a single night. All of these changes must be known during the heat of battle, therefore it is up to the aerial photographer to record these shifts in the shortest possible time so that our army may likewise set up defensive placements.

Some aerial cameras are designed specifically for oblique photography at long range or from high altitudes, others for making obliques in rapid succession, others for vertical mapping photographs only, and still others for both mapping and oblique photographs. Automatic, semi-automatic and manually operated mapping instruments are used on models which automatically record each negative with such data as altitude, date, time, serial number, level conditions of camera etc.

Special mapping cameras take one vertical photograph and three or four obliques simultaneously. A special project printer transforms the oblique photographs into verticals of proper scale. Exposure sizes from 5x7 inches to 9x11 inches are covered by the various cameras now in use. Several models are used and designed to take cut films and plates as well as roll films.

Hitherto, information pertaining the enemy depended largely upon the more or less accurate observations of men. Today, however, the modern military cameras, with their amazing magic, play stellar roles in military strategy and do so accurately and instantaneously.

While panchromatic films are more frequently used than any other emulsion, the aerial photographer is being trained to utilize the invisible rays below the visual red of the spectrum, namely "infra-red." In camouflage use, infrared detects many secrets. The enemy moves artillery into positions overnight. Guns are camouflaged by trees and bushes, trenches are concealed beneath green-painted canvas. This is, of course, a problem often encountered in aerial reconnaissance missions. (Continued on Page 27)
Effective cooperation of stillmen has been a big factor in the Gene Autry exploitation buildup. These publicity photos are representative of the various appeals used. Local 659 members whose shots are included here are Joe Walters (left center and bottom), John Jenkins (right center), and Dave Farrel (right bottom).
Ladies, please remove your hats!

The birth of the trailer, and its development to an important industry within an industry as a potent selling force for pictures, is told here in the opening article on a phase of picture making with which many perhaps are not acquainted.

By TOM BAILY
Director, National Screen Service, Hollywood Studios

If you don’t want to read an ad in a newspaper, it’s awfully easy to turn the page. And, if you’re bored by the rich, pear-shaped tones of an announcer’s remarks about “Parisienne Lip Rouge,” you can twist him into oblivion.

But trying to turn off a movie requires the agility of a contortionist. Unless you can hide beneath the seat, you can’t keep your eyes off the screen.

All of which indicates that the motion picture trailer is the most potent advertising force there is. It is the voice of the motion picture industry. But the trailer must be good to be potent. Hollywood is trying to make its trailers good... and better.

The trailer was sired by the old, hand-painted slide, for it was “way back in those glorious and hallowed days when this industry was just a kid in three-cornered breeches—when days when movies were fickers and lived up to that name—when some enterprising theatre manager ordered a couple of slides from a two-by-four outfit down the alley off 17th Street.

One of these slides urged feminine patrons to dolf their Gibson-girl millinery: the other two suggested that the operator was awfully busy changing spoons and that he’d have the second reel of the super-epic threaded in a moment.

That was the birth of the trailer. Records fail to show the name of the alias of the theatre operator, but records do show that another flicker-house proprietor down the same street added a slide which read: “A colossal event in cinema history is coming. Mary Pickford in her latest and most dramatic triumph, The New York Hat. With a cast of hundreds!”

Records also indicate that a New York newspaperman, a protege of the great Charlie Chaplin, walked into the theatre and just mentioned, that he might forget the worries of re-writing other men’s stories, and while seated in the uncomfortable little amusement temple saw the possibilities of an industry within an industry. He realized these possibilities a few years later when he became president of National Screen Service.

This company celebrates its twentieth anniversary this year. Two decades of trailer-making are behind this organization, whose home offices are in New York, whose nearly two-score exchanges cover the United States and England and whose local studios produce many of the trailers exhibited around the globe.

In the silent picture days, all of the actual trailer-making was done in New York. As a unit publicity man in a major studio, this writer recalls when he had to scrape together 1000 feet of Gary Cooper’s picture, “Beau Sabreur,” without benefit of the thrilling action scenes, ship them to New York. Any time any key scenes were unobtainable, Hollywood didn’t voice much worry, but National Screen Service did.

The heads of NSS are forward-looking men who have the utmost faith in their business. They believe in the potency of the prevue trailer, of the impotency of a bad trailer. And, believe me, they have the knack of raising Cain if some prevue emanating from Hollywood—whether it be on an epic or an independent’s low-budget picture—doesn’t contain every possible element of showmanship.

To end some of those problems, President Herman Robbins opened a studio in Hollywood, manning it with trailer-trained technicians, artists and editorial men. Located at 7026 Santa Monica Boulevard, this plant is considered one of the most ideally-laid-out miniature labs in town. Its laboratory and cameramen all are IATSE members. National Screen was the first of this type of company to sign with the IA.

The work of these units will be discussed in a later article. This installmen has to do with the editorial and art side of trailers.

Today, the trailer is not the trailer of former years. It is the product of a highly-geared industry of editorial and mechanical efficiency, recruiting and employing specialists from every branch of the film industry. Writers, artists, camera men, lab technicians, film editors—each man is a specialist. Trailer production demands the employment of specialists.

The average picture total 6000 feet or more, or a running time of 65 minutes. But, as trailer producers, we must create your desires to see that feature picture in an average of 170 feet, or nearly two minutes of screen running time. Less than two minutes to tell our story speedily and convincingly.

Therefore, the tempo of a trailer is vastly different from the tempo of a feature. We cannot establish moods. We must get to the climax of a dramatic situation; to the peak of a comedy situation to the very essence of dialogue. We must sell and sell decisively, or we have dissipated the screen’s most valued advertising medium.

No longer are such extravagant terms as “stupendous,” “colossal,” “gigantic” used as our selling forces. The public...

(Continued on Page 22)
The modern trailer has developed from the old-time slide above. Now a highly skilled industry, some of the people who make trailers are shown here. (Top, right) Tom Baily, Gene Fox, Jim Majorell, Walter Temple and Al Parmenter in a title conference. (Bottom, left) Russell Roberts, Paramount, with Don Miller, NSS art head. Title letterers at work (right).

NATIONAL PHOTOGRAPHER for December, 1939.
THE ASSISTANT CAMERAMAN’S JOB

Busier than the famed one-armed paperhanger is the assistant cameraman. An important cog in the industry, his duties are outlined here, with an explanation of the differences between black-and-white and color work.

By JIMMIE STONE

ASSISTANT CAMERAMEN fall into two classes: namely, black-and-white and color. While in each of these the men are trained along similar lines and are naturally in possession of assistant cameraman cards, there is an important difference in the two classifications.

The black-and-white assistants outnumber the present color assistants by a large majority, but color photography is making rapid strides in approaching the black-and-white output. It has been a long effort to cultivate the general theatre public to “color consciousness.” Color in its infancy was very disheartening to the “film fans” and it took endless persistence of the chemical world to bring to us the high standards of today’s color processes.

To the assistant who earns his livelihood in motion pictures, a great deal of credit is due. This statement may best be analyzed in following the responsibilities of the assistant through the course of his daily duties.

To be a good assistant cameraman necessitates a knowledge of the different types of cameras in use, the many different types of photographic accessories, studio equipment, dark-room technique and procedure, etc. He must be a “jack of all trades.”

At the start of each day’s “shooting,” it is up to the black-and-white assistant to set up the cameras, thread them, check the lenses for any particles of dust or possible fingerprints. He may have had to carry the equipment anywhere from five feet to half a mile through snow, sleet or water or possibly up the face of a cliff or mountain. Nevertheless it is up to the assistant to spot the camera where the first cameraman has decided to set-up. The assistant must assume responsibility for its safe arrival and set-up at the given camera-angle.

The next thing on his daily routine is to make the slate ready, giving the name of the studio, the production number, name of picture, name of director, cameraman and operating cameraman. He must then consult the script girl for the “scene numbers” to be used as well as the “sound track numbers” for the film cutters. In addition to this information he must keep an accurate “log” of all scenes and takes.

At any moment the first cameraman may ask for a hand-test. This means that the assistant must put into practice his knowledge of dark-room technique and give an immediate developed wet hand-test before light conditions change in the event that the scene must be reshot. Frequently, on location, he must spend his evenings in cleaning the camera and making it ready for the next day’s shooting. From this outline of duties it is obvious that the assistant cameraman’s job is indeed important.

In what way does the black-and-white assistant cameraman’s work differ from that of the color assistant? This question will be discussed in the following section.

REQUIREMENTS FOR A TECHNICOLOR ASSISTANT

To be eligible to assume the occupation of color assistant the individual must be thoroughly familiar with all the requirements of the black-and-white assistant. Meeting these requirements he is then placed under the guiding hands of an instructor who is thoroughly acquainted with the high precision equipment of Technicolor. This training takes at least six weeks, during which time he is given every opportunity to learn the importance of proper threading of the camera and care of the prism. Strictest cleanliness of the equipment is constantly demanded.

Technicolor cameras are designed to accommodate three negatives. Since registration of the three negatives is a primary factor to good color every precaution is taken to assure the producer the highest quality from the camera standpoint. Technicolor cameras, because of their great size, naturally entail great weight. It is therefore necessary to distribute this weight as evenly as possible in various carrying cases. Some idea of the equipment necessary to shoot a major picture is provided by the fact that frequently a ten ton truck is needed to transport the photographic equipment from the camera department of Technicolor to the studios.

Technicolor assistants fall into two classes: assistants and technicians. The technician is a man who has served his tour of duty with Technicolor and is sufficiently acquainted with all the principles of the camera. His judgment pertaining to the actual operation of the mechanical side of the camera is final. It is up to him to pass on every scene photographed from the camera standpoint. He must follow focus for the operator cameraman and make the necessary adjustments of the stop diaphragm, given him by the first cameraman.

He must periodically inspect the prism after each “OK, take” to make sure that there is no possibility of lint or dust blanketing the aperture or shooting surface of the prism. Failure on his part to detect the smallest of specks could easily ruin an expensive scene for the producer.

“Why?” you may ask. This can be best explained when one realizes that if a hair or bit of lint were to obscure a small portion of one of these apertures the tiny object would cast a shadow on one of the color-records (negatives). Naturally, there would be an absence of photographic image on this color-record. Therefore, in the final printing, this hair shadow would appear not as a black shadow or line but instead as a complementary color to the record its shadow had cast. Ordinarily in black-and-white photography this shadow would print black and probably never would be noticed unless it were in the sky area or on a light surface background.

It is probable that a camera accommodating three negatives might be more susceptible to scratches so the technician and assistant are always on the alert for any indications. Green or new emulsions have been known to pile-up in the apertures of both black-and-white and color cameras. This condition could easily cause a scratch if not noticed by the technician. It is up to the trained eye of both the technician and color assistant to be able to inspect in the shortest period of time the negatives and pass positive judgment on their condition.

In order to systematize these types of conditions the technician operates on the left side of the camera, where he has everything of importance at his finger tips. He changes mattes in the view-finder, follow focus, and makes lens changes. He inserts filters and effect mattes. In general he is the mainstay of the camera operator. Also on the left side of the camera is an area which affords the technician easy access to the prism for inspection.

The right side of the camera, better known as the bi-pack side, is left for the color assistant to inspect and determine whether or not the camera is operating or functioning correctly. He also has a tachometer and rheostat for ascertaining the correct camera speed in case of wild-shots.

Since Technicolor is a color service at the call of all studios and as every studio has for the greater part different types of sound equipment and electrical current.
HANDS AND HEADS

How hands help head studies is the subject of this article by a portrait artist who has specialized in developing subtle accents to facial expressions and creating interesting compositions through skillful placing of hands.

By ERNEST BACHRACH

(For twenty-five years the author of this article, which is only introductory to a detailed exposition of the part that hands play in photography, has been a portrait photographer. True, this time includes his high school interest in the art; while he was studying to be an electrical engineer, but even then he was thinking primarily in terms of the studio.

Both art and science were set aside temporarily while he was in France during the World War with a Medical Corps unit attached to the Aviation Section. In 1920, however, he signed up with old Famous Players Lasky Corporation for a seven-year stretch. During that time he was a pioneer in producing illustrated titles. Incidentally, he did some of this work again recently on "Edith Cavell." In 1925 he came from New York to Hollywood with William DeMille to shoot some action stills, which were an innovation then and the forerunner to "candids."

Bachrach has been with RKO Radio for the past twelve years. It is interesting to note that he still puts to practical use his early schooling in electrical engineering, building radio sets and electrical gadgets. Another "hobby" is painting, portraits being among his favorite work in the medium of photography at RKO.

Last not least he is one of the pioneers who attended the first meeting of Local 659, IATSE, thus rating the honor of charter member.

—ED. NOTE.—

Here Aller, our esteemed Business Manager and a general all around good guy drops in to see me the other day with the crack, "Where the hell are those pictures you’ve promised me for the last ten issues of INTERNATIONAL PHOTOGRAPHER?"

"Gee," I comes back at him, "I’ve got nothing to offer that’s original or new—take a look for yourself at those hanging in the corridor—just cast-offs. Some are three or four years old, but I have some new ones coming up," I adds, hedging.

"Now look, Ernie," that’s me, "you’ve been asking Why don’t you give us something other than the text book stuff we’re all familiar with," Aller says. "But when we call on you you want to give us something years old. Now take this one for instance of Joe Penner. How about that? Look at the way his hands are worked," goes on Herbie, souping me up to the ears, but incidentally striking one subject most interesting to me—HANDS.

Hands: subconsciously, unconsciously and consciously. I have watched and studied them all my life. The man who imparted photographic knowledge to me had the most unusual hands—long, strong, sensitive hands. His name was Frederick Holland Day. Considered in his time probably the greatest living amateur photographer, he was thirty to forty years ahead of his time, as modern as today.

"Hands," he once told me, "can make or break your pictures. Never permit your eyes to wander from your subject during a sitting, for no matter how composed they may be facially, their hands will reveal their innermost emotion."

Included in the group of pictures shown on the following pages are some studies illustrating how hands may be used to help the composition and express an emotion that will give an extra quality that is essential to successful presentation.

For example, the Joe Penner shot sans hands is just another head study. With the hands supporting the head and fingers intertwined, the perplexity indicated by his face is emphasized further. The result, I believe, is a more interesting composite.

It is characteristic of emotional people to use their hands freely while under stress. It follows then that a picture including hands will depict more than sheer beauty; it will be the expression of a complete reflex. Incidentally this is where the photographer has to use applied psychology because in order for the subject to adequately express an emotion there must be a cause, an experience, something upon which an interesting and appropriate expression can be based.

The pensive expression of Virginia Vale illustrates this point. We had been discussing her school days and experiences and the attitude of fond remembrance shown facially is enhanced by the position of hands and fingers.

Maureen O’Hara’s eyes indicate her state of perplexity or doubtingness but the position of the hands clinches the thought, while adding a certain roguish quality. In the case of Elke Seyd, hands are an important part of the whole composition. The quality of quiet interest was achieved while describing to her the beauty of a painting that I particularly admired.

By way of contrast in the layout, Am Shirley is shown without hands.

The expression in Charles Laughton’s hand is a negative one. Showing only the back of the hand, and used here to partly hide the expression of his mouth, the effect is one of shyness. The picture was taken "on the fly," with those inherent disadvantages, while Laughton was working on "The Hunchback of Notre Dame."

Again, by way of layout contrast, recent shots of Orson Welles and Raymond Massey are included. Welles is right in the middle of a unique four-way contract with RKO Radio: producing, writing, directing and acting. Massey, of course, is practically synonymous with Abraham Lincoln, the role he has portrayed so successfully on the stage and now is doing for the screen.

These last three mentioned illustrations prove that hands are not the only thing that make a picture. However, I have some more studies for next month, when I will elaborate on the fact that hands cannot be used as you find them. They must be judiciously placed—by suggestion, never by touch, until suddenly the picture is there; SHOOT IT. Next month I shall deal with the exclusive treatment and study of hands, if you are still following me.

It is necessary for Technicolor to have sufficient types of motors to meet these needs. There are wild motors, interlock, synchronous, "F" channel, high-speed and motors for single-frame or stop-motion. In order that these motors may be quickly changed to meet the condition, it is necessary for the technician or assistant to make gear changes in a moment’s notice. Proper gear ratio is necessary so that the camera will turn at the required speed.

Technicolor cameras built in their own machine and engineering departments also necessitate special equipment for their use. The blimp are of huge proportions yet very compact for this massive camera. It takes two men to carry the blimp with safety to the equipment. If the camera is in the blimp it is a general practice

(Continued on Page 22)
Hands are important in the Bachrach formula for successful portraits, as mentioned on the preceding page, but that good pictures can be had without them too is shown by the shots on these pages of a group of RKO Radio players, all made by
ich, a charter member of Local 659, IATSE. From the left, across top, are Virginia Vale, Elaine Whitney, Charles Laughton and Joe Penner; across bottom are Maureen O'Hara, Ann Shirley, Orson Welles and Raymond Massey.
South America Heard From

- From South America, where he is working on "South American Way" as assistant cameraman with a 20th Century-Fox unit, Bob Carney, member of Local 659, 1ATSE, wrote last month to say that Paul Perry also is working with the unit. Paul's many friends will be glad to hear that things are going well with him in Buenos Aires, where he has a photographic laboratory. In his letter Carney said he doubted that Paul would ever return to the States except for a visit because "this is one of the most beautiful cities in the world, he has got connections and innumerable friends and living expenses are much less than Hollywood." Paul is a life member of Local 659.

Crawford Cops News Award

- For the second consecutive year, Joan Crawford has been awarded the annual prize of the Hollywood News Photographers' Association as the "most cooperative star of the year." Bette Davis was runner-up.

At a luncheon in the MGM commissary, the news cameraman presented Miss Crawford with a solid silver cigarette box engraved with her name and the details of the award.

New Oscar Committee

- Frank Capra, president of the Academy of Motion Picture Arts and Sciences, has appointed a committee of art directors to consider any changes in rules which should be adopted to govern the Academy Award for Achievement in Art Direction. The committee, under the leadership of Bernard Herzbrun, consists of Lionel Banks, Hans Dreier, Cedric Gibbons, John Victor Mackay, Jack Otterson, Hans Peters, Victor Nest Polglase, and Bertram Teitelbaum.

Counterfeiters Exposed

- MGM Studios, working with the U. S. Secret Service, rushed a recently completed film in an effort to lessen the possibility of the passage of counterfeit bills during the Christmas shopping rush.

The latest Crime Does Not Pay subject, "Know Your Money," was made with the primary purpose of educating the public to detect counterfeit money. But, because the government was anxious to have the public see the film before Christmas, so as to guard against bogus money, the film was released six weeks ahead of regular schedule.

Noiseless Power Generator

- The new noiseless power generator, perfected by Lou Kohl at MGM, got its first workout furnishing power for the village festival scene in "Florian." It is so perfectly sound-proofed that it can be placed anywhere on a set or location and never be heard.

Mould Cuts Make-up Time

- Jack Dawn, MMG make-up chief, has perfected a metal mould for his plastic face inlays. A secret alloy is fitted to individual faces by a secret process, plastic material moulded over it, eliminating the plaster casts formerly used. It saves hours of make-up and processing of inlays, which require less baking than when on plaster.

New Derrick at Paramount

- Delivery of a $6,000 tractor crane capable of handling more than 10,000 pounds, was made last month by Lee Hanson, Paramount Studio transportation head.

The new boom, made by the Hughes-Kennam Company of Los Angeles, is being used in hoisting boats which the studio trucked to Baldwin Lake, location of "Safari," Madeleine Carroll-Douglas Fairbanks, Jr., drama. The derrick extension of the machine is 10 feet.

Sherman Unit Moves

- Because of heavy production at General Service Studio, home lot of Paramount's Harry Sherman unit which produces the Hopalong Cassidy series, filming of "Hold Your Horses" will be transferred to Grand National Studio, it was announced by Sherman early this month.

William Boyd, as usual, plays the starring role in the new picture. Julie Carter has been cast in the feminine lead, with Russell Hayden, J. Farrell MacDonald and Francis McDonald playing supporting roles.

Following two days of interiors in the studio, the company will move to Newhall to finish the picture against the rugged background of that vicinity. Lesley Seander will direct.

To Shoot Ballet Scenes

- Joe Ruttenberg and Clyde DeVinna have been assigned as cameramen in addition to Karl Fremd for Imperial Ballet scenes with Irina Baronova in "Florian" which features Robert Young, Helen Gilbert, Charles Coburn and Reginald Owen with Winfield Sheehan as producer. Edwin L. Marin is directing for MGM.

SMPE to Atlantic City

- The Board of Governors of the Society of Motion Picture Engineers has announced the selection of Atlantic City as the site of the 16th semi-annual Convention of the Society, to be held April 22 to 25, inclusive, in the Chalfont-Haddon Hall Hotel, W. C. Kunzmann, Convention vice-president, is completing tentative arrangements for the meeting. The Papers Committee, under the direction of J. I. Crabtree, editorial vice-president, and Sylvan Harris, Paper Committee chairman, has already begun its work of preparing the papers program. Members of the Society who are preparing papers for the convention are requested to communicate with the Society's office as early as possible.

Treasure Island at Night

- What is probably the last and certainly the only night motion picture of the San Francisco Fair, will serve as James A. FitzPatrick's next MGM Traveltalk. The new one-reeler, "Night Descends on Treasure Island," is the latest in the popular Technicolor series of FitzPatrick's all-American films, and will be ready for release early in 1940.

Leap Year Featured

- The fact that 1940 is leap year hasn't caught Pete Smith napping.

Accordingly, Pete's next MGM Specialty will be titled "Woman Proposes," and will deal with a specific case of a woman who is out to get her man and gets him. The story and screen play are by Johnny Hines, who will also direct.

Buying for Argentine

- After seven years at the head of technical departments of the Pampa Films, Buenos Aires, Oren Roberts, former Paramount special effects expert, has returned to Hollywood for a month's study of new equipment.

Roberts will confer with Paramount officials on the purchase of high-intensity arc lamps, set materials, such as hard enamel flooring, and projection equipment, he said. Irwin Roberts of the special effects department is his brother.

Zipser Shooting in Asia

- Carrying a Leica and a 16 mm movie camera, Sidney Zipser, veteran member of Local 659, 1ATSE, is off on a tour of Asia, to do some shooting for himself. He has been on the Technicolor staff for many years.
TELEVISION CAMERA OPERATION

By NELSON C. McEDWARD

When Herbert Aller, Business Representative of Local 639, asked me to drop in at Tommy Lee's Television Broadcasting Station W6XAO, I saw a large square box on a perambulator and wondered how live images could be reflected through it, but I soon found out.

The image is upside down and looking through the center of the camera it is made very small. The lens is about 5 1/2: focal length. It is shot wide open at 2.7 for proper results and to reduce the amount of light needed.

In television work it is vitally important to keep off the large cable between the camera and the control room, as one of the thousands of tiny wires inside it can easily be broken. This would cause a wave across the screen and necessitate hours of wasted time in making repairs. Also, the assistant must not dolly the perambulator back and forth too fast as the camera must be brought to a stop at the end of the cable and might be broken off if stopped too abruptly.

The assistant cameraman on the dolly shots is an important factor in judging timing from a long shot to a closeup, which movement must be made very slowly.

The cameraman has to focus shots while he shoots, under present conditions. However, Tommy Lee is getting a new camera soon and the focus will be taken care of in the control room, thus easing the strain on the eyesight. A finder will be installed at the left of the camera.

Light is provided by 2000 watt spots, of which there are eight and one broad. The Television studio is small, making it difficult to place the lights so as to get the correct lighting, which must be changed as the different acts take place.

The difference between Television and studio lighting is that in the studios the lights are adjusted during the various rehearsals to secure the perfection evident in the finished result flashed on the theatre screen. In Television there are eight or nine acts, with only a ten second lapse or change to move the lights for the next act. Of course a few lights can be shifted while the act is going on but it must be done very quietly as the mike is open and any noise from such adjustments would be undesirable.

I am at the camera from 8 to 9:30, which is a long time. All acts must move smoothly along until the final sign-off. The cameraman in charge of lights has earphones, the same as I have, and receives his instructions from the control room for corrections in balance on his end.

Subjects I have photographed include Bobbie Breen, Jimmie Starr, Elmer Dyer (who gave a talk on his experiences as a flying cameraman), Wyndham Standing and many other fine players who so generously contribute their talents to Television experimentation.

I particularly want to thank Kyme Mead, George Lancaster, Mr. Kline of Tech, Mr. Rhinehart, Mr. Warren, Ray Ramsey and all the rest of the boys who so kindly helped on these programs. Kyme Mead and George Lancaster deserve special credit for their patience and hard work on lighting during the Auto Show. Due to lack of space they worked under cramped conditions and terrific heat.

Television is interesting work and I enjoy it very much. I wish all the luck in the world and continued success to Tommy Lee on his programs.

Millenium Is Here

For the first time in screen history a sound film script has been completed without a single camera direction.

The scenario for “The Biscuit Eater,” written by Stuart Anthony, deals with the adventures of a white boy and his negro drum, and a bird dog which they turn into a champion from a no-good “biscuit eater.”

“Because the drama deals with one of the fastest stories I have ever read,” Producer Jack Moss of Paramount pointed out, “we deemed it advisable to write it in the same way—without technical details which always seem to slow up a scenario. As a result the completed story is much more interesting to the actors, for they are not ‘taken out’ of the feeling while reading their lines.

“Also, Anthony is humble about his ability to tell three expert cameramen—Leo Tover, Loyal Griggs and Harry Perry, as well as Director Stuart Heisler—how to set up their lights and manipulate the lenses! Any Anthony has written scores of films during the past decade.”

INTERNATIONAL PHOTOGRAPHER for December, 1939.
There's a Finer Quality in the
Print on KODABROM

Whether the exposure on Kodabrom re-
quires 45 seconds, or 1½ minutes develop-
ment, the rich velvety black tones are uniform in
color and brilliance. This remarkable latitude
makes Kodabrom easy to process. Eleven grades
to choose from. At your dealer's.

Eastman Kodak Company, Rochester, N. Y.
NEWSREEL CAMERA NEWS

It seems that newsreels, like newspapers, are taken very much for granted by Mr. and Mrs. John Public—not until a major catastrophe focuses attention on them. The antics of the powerful nations of Europe and Asia during the past three years have brought the realization of the vital need for accurate portrayal of national and international events. Few of us will ever know just how tough the assignment in China and Japan has been—but all of us may remember the splendid piece of screen journalism turned in by Eric Mayell of Fox Movietone and Norman Alley of Universal when the *USS Panay* was sunk. Of course, such things fall in the general classification of “a nine days wonder” and after their allotted time are promptly forgotten. Do you wonder, as I do, what those two fellows are doing now? Well, two years ago they stood side by side on the deck of the sinking Panay. Today they are separated by the breadth of two continents, but by war correspodents, Mayell, after a short rest, covered the capture of the ancient Chinese capital of Hankow and is now chasimg the elusive scoop in the Philippine Islands. Alley, “Somewhere in Europe,” is protecting the interests of Hearst News of the Day. Norman’s last word to his family was that he was pulling strings to get an extra ration card so that he could have another pat of butter for his Thanksgiving dinner.

But here in America, we turn to more “serious” things. Take Movietone’s Irby Koverman in San Francisco. He has had to invade the sacred campus of one of the West’s premiere girls colleges to cover the Mills College “Classroom in the Sky”—a course for air-minded co-eds.

Al Brick recently returned from Alaska where he was on location for a Movietone Short Subject to set up his camera at the U.S.C.-U.C.L.A. grid fracas for his 200th newsreel footage coverage—something of an anniversary as Al started with the newsreel back in 1919.

There is a desperate need in Los Angeles for a properly supervised and a recognized police credential for newsreel cameramen, their assistants and soundmen. Several half-hearted attempts have been made from time to time to provide newsreel cameramen with badges, cards, etc., only to have them become issued by the thousands. As a result of this loose distribution their value becomes nil and in times of stress, when minutes are precious, the newsreel cameramen find their every move hindered by the police. During the recent opening of Santa Claus Lane the merchants of Hollywood suffered inestimable loss in valuable publicity due to the ill-advised efforts of the police who foolishly took the camera cars off the line of march. As a result, nary a foot of film exposed on the parade saw the light of day in the newsreel. A suggestion—issue police and fire line cards good for only three month periods. Have a picture at least two by three inches of the licensee glued firmly to it and make each applicant appear at headquarters in person to sign for and receive his card. Applications for the card should be approved by the news editor of each company and instances of willful loading of such a card to another would constitute a revocation of the card for the remainder of that period. Such restrictions would result in a fine spirit of cooperation between the city and the newsreel.

Marshall McCarroll and award

Marshall McCarroll, member of Local 639, was among the select group awarded gold statuettes for their outstanding film work during 1939, in a presentation made in conjunction with the first anniversary of the Tele-View Theatre. Winners were decided by a patron’s poll, conducted by the theatre management.

Presentation of awards was made by C. L. Carter, theatre president and was photographed for a special news-reel by Frank Blackwell, pioneer member of Local 639.

The picture which won the award for McCarroll and Paramount was the American visit of the English King and Queen. It was a masterpiece of speed and workmanship. The King and Queen arrived in Washington, D. C., Thursday noon and at 3:00 o’clock Friday afternoon West Coast theatres were showing a full one-reel release of their reception. Air express of course was responsible for getting the film here so quickly, but to photograph, process, edit, score and print a 1000-foot subject in such a short time was some sort of a record.

The entire Eastern staff of Paramount News was concentrated upon the job. A dozen camera crews and many commentators worked feverishly in the Washington heat. Special planes flew the film to the New York laboratory and editorial offices where it was eagerly pounced upon by the waiting developing crews. Make-up editors and a room full of assistants and cutters next tore into the job of cutting the film down to the 1000-foot limit for release.

The final step was a rush to the Newark airport with the first prints for Los Angeles. Meanwhile over 100 other copies of the edition were rolling out of the shipping room for other sections of the country. Thus was history made and a prize winner born.

(Continued on Page 24)

MEMBERS OF LOCAL 644, IATSE

William Miller and Bill Kelly, with their assistants, Nick DiNapoli and Paul Rogali, have been in Pennsylvania, New York and Maryland for the past eight weeks on a production for Audio. No one can get the title as yet—a dark secret. They were home for their turkey dinner on Thanksgiving and are expected to be home by Xmas.

Harry Squires just returned on the Rotterdam with 900 other refugees. Three died en route, but not Harry. Squires has been in the Belgian Congo for the last sixteen months as chief photographer for the tenth Gatti Expedition. The European war cut his story short but we are sorry we can’t say the same about his return trip which turned out to be a nine-weeks’ cruise in mine and submarine infested waters, and was Harry glad to get back to the good old U. S. A. ! He promises to give us a story of his adventures as soon as he gets settled.

Jack Painter just finished his latest Technicolor Fashion for Movietone News, Vivian Donner directing. The report are it is the most beautiful one they have made—and the others were knockouts.

Charles Harten and Jack Etra are shooting a short for Columbia in the National Capital. Etra says it should be titled: Charlie Harten Goes to Washington “another Columbia masterpiece.”

INTERNATIONAL PHOTOGRAPHER for December, 1939.
1. New "Positive" Viewfinder

Magnifies rather than masks... with any lens, fills entire finder aperture with large-size upright image... eliminates eye parallax.

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6 Detachable cord for electric-drive models
First Photolamp Show

- Apparently taking a tip from auto shows, General Electric's lamp department staged a photolamp show last month in New York, the first of its kind ever held, according to GE officials.

Highlights of the unique show included exhibits of flash, flood, enlarger and projection lamps for still and motion pictures; displays and demonstrations of proper lighting for studios, including the new fluorescent lamps for general illumination and special lamps for color photography.

To demonstrate synchro-flash photography with focal-plane and between-the-lens shutters two jumbo cameras that operated in slow motion were on display. A motion picture, taken at 1000 frames per second, was shown to demonstrate the operation of various photoflash lamps used with synchronizers.

New Projecto Case

- New convenience in the projection of 16 mm. motion pictures with the Kodascope Model EE, Series II, and the Kodascope Model G, Series II, is afforded by a Projecto Case with folding tripod legs, just announced by the Eastman Kodak Company.

The case is designed to eliminate pre-show confusion, and supplants makeshift projector supports. It is a particular boon to projectionists who travel, and to those who must show movies before large groups. At home, it offers a more convenient and satisfactory support than the usual card table or taboret.

The case holds the projector, and a separate compartment on the side of the case houses the tripod legs. When the case is in use as a projector stand, the tripod compartment makes a convenient shelf, for extra reels and other equipment. The shelf may also be used to support a small still projector, if Kodachrome slides are shown in conjunction with the movies.

Price of the Projecto Case is $25. Present cases for the Kodascope G and EE may have tripod compartment added for $15.

Lamp and Filter Outfit

- Agfa Ansco Corporation announces the addition of a new Darkroom Lamp and Filter Outfit to its line of photographic equipment items.

The new outfit includes an Agfa 3½x 13½-inch Safelight Lamp housing and socket, one A3 Green Filter, one A6 Yellow-Green Filter and one A7 Red Filter. The filters, which are all 3¼x 13½ inches in size, are designed to provide maximum visibility with complete safety when correctly used and fitted with a standard 10-watt frosted Mazda lamp. The Safelight provides proper darkroom illumination for panchromatic films with the A3 filter, orthochromatic films with the A7 filter, and chloride, chloro-bromide or bromide papers with the A6 filter. The price is $1.95.

Agfa Memo Speedgun

- The scope of the Agfa 35 mm Memo Camera now includes synchronized flash-lamp pictures by the availability of the Agfa Memo Speedgun, especially designed and fitted for use with the camera.

Similar in design and construction to the famous Mendelsohn Speedgun, the Memo Speedgun provides accurate synchronization of flashlamp exposures at all camera speeds and with all types of flash lamps.

JUMBO CAMERA built by GE to demonstrate in slow motion synchro-flash photography at first photolamp show, held in New York. This picture was taken with one of the new midget Mazda photoflash lamps (No. 5) GE recently announced.
TRAILER INDUSTRY

(Continued from Page 10)

has long since refused to tolerate such 
supertative claims. The public does not 
believe in the Hollywood adjective. To-
day, we write down to earth.

The production head of any studio plays 
an important role in trailer production. 
A very representative time of that busy 
executive's daily routine is spent in con-
sultation on the trailer in the various 
stages of its development.

The same consideration is given to trailer production as is given to the pro-
duction of a feature. Conferences with 
studio heads . . . selling attitudes ex-
changed. Ideas and dramatic objectives 
are shared by the National Screen trailer-
editorialist with every department of the 
studios. Careers are in the hands of the 
trailer-maker. Incorrect presentation of 
a screen player in the trailer would be 
a hazard to his or her career.

And every agency used in feature pro-
duction is brought into play in the build-
ing of a trailer.

The National Screen trailer-editorialist 
is a highly imaginative and versatile per-
son. He is usually one who has served 
his apprenticeship in journalism; invari-
ablely he is the product of advertising and 
publicity in the theatre. While the cre-
tation of the trailer is the product of his in-
vention, it is the production of many 
hands.

The process of producing a trailer is 
intricate. First, the reading of the script. 
The editorialist becomes acquainted with 
the story. Then, the viewing of the rushes, 
or the completed picture. He then selects 
and orders his film and prepares his script, 
(a script as detailed in every department 
as the scenario of a feature.

The title or narrative copy of the script 
is the story of the feature script. Camera 
treatments, the dissolves, wipes and opti-
cal effects are detailed. The art depart-
ment then receives it for the title letter-
ing.

Don Miller is head of the National 
Screen art department. Here, a confer-
ence is held as to the proper type of let-
tering to be used in the superimposed 
titles. A smart letter fits a modern pic-
ture; a strong, bold letter is right for a 
"Rulers of the Sea" or a "Of Mice and 
Men," and for a western, a rough, sweep-
ing letter.

Fine letterers are required for such an 
art department. The slightest flaw is mag-
nified hundreds of times. Here, too, cre-
ative minds must develop new styles in 
type, for the lettering must be the spirit 
of the picture.

Hollywood can take off its hat to its 
trailer-makers, for theirs is a difficult job. 
They must weigh the value of every pic-
ture; they must balance the cold logic of 
an audience with the super-enthusiasm of 
a producer. They must make every trailer

an individual selling force, and make it 
different. They must sell forcefully, yet 
must be subtle. And it is important that 
they remember that brevity is the soul of 
the good trailer.

Frank Whitbeck's one-scene, 90-foot 
trailer on the Robert Taylor-Jean Harlow 
success contained as much salesmanship 
as another trailer producer's 400-foot, 35-
scene prevue.

National Screen has a large staff of 
editorial men assigned to the various 
studios. The latter, too, have their trailer 
staffs.

Herb Moulton is in charge at Para-
mount, aided by Lou Harris, and supervi-
sed by Cliff Lewis: George Weiss and 
Walter Temple have been assigned trailer 
duty by Harry Brand at Twentieth Cen-
tury-Fox: Arthur Housman is at Colum-
bia; Robert Faber at Universal, working 
with John Joseph; Jim Pollak is trailer 
man at RKO, assisted by Fred Maggrre; 
Gene Fox handles the bulk of the United 
Artists pictures; Jim Majorel gets his ad-
vice from Bill Peirce at Monogram and is 
aided by Jim Hathaway at Republic.

At Metro, Frank Whitbeck is in charge 
of advertising, publicity and trailers, and 
is assisted by Herman Hoffman and Oliver 
Garver. Ed Selzer supervises trailers at 
Warner's, with Sandy Abrams at his right 
hand.

Those are the chief trailer-makers of 
Hollywood, whose job it is to satisfy the 
producer, the director, the exhibitor, the 
New York offices and John Public.

(TO BE CONTINUED)

ASSISTANTS

(Continued from Page 11)

for four men to move it. Once the camera 
is in position on a perambulator or ve-
colator, the equipment is handled with 
the simplicity of a black-and-white camera.

The assistant cameraman starts his rou-
tine by threading the camera and making 
ready the required Technicolor tests, made 
daily. An H & D test is photographed 
on about five feet of film for the labora-
ory. By this test the laboratory is able 
to note whether or not the emulsion is 
of the same emulsion speed as it was 
when first sensitized. Any tendency for 
am emulsion to vary slightly may be cor-
rected in the laboratory before processing 
the film.

The next five foot test is called the 
R & D test. R & D stands for registra-
tion and definition. This test shows the 
actual tendencies of the camera for regis-
tration and photographic definition at the 
time of shooting. The beauty of the Tech-
nicolor camera is that perfect registra-
tion is assured at all times, accounting for 
the high quality of Technicolor pictures.

After completing these tests the assist-
ant then helps the technician in lining 
up the camera for the first scene of the 
day. He then prepares the slate and makes 
his log sheets ready for the day's shoot-
ing.

I have frequently heard people remark 
that all of the information required by 
Technicolor was unnecessary. Little does 
the individual making such a remark real-
ize the importance of these records. Actual-
ly every entry is covering what one might 
compare to three cameras since each entry 

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covers the details of the three color separation negatives. Furthermore, Technicolor motion picture film is subjected to many processes before it is ready for the screen.

The large part of all information noted by the assistant determines the ease in handling the negative in the laboratory. Let’s take, for example, failure on the part of an assistant to note the time of day or effect of the picture. If these items are not noted on the log sheets the laboratory would naturally assume that the picture should be printed in the normal manner and would proceed to do so. This could easily cause needless waste. So the complicated appearing log sheets of Technicolor are in reality a very simple and necessary negative insurance.

After every “O.K. take” the assistant is seen running out in front of the camera with the “lily.” This term is derived from the phrase: “That last scene was sure a lily,” used by directors as long as I can remember. Colorful charts and black-and-white wedges appear on the unique device held by the assistant, which is in reality a control medium used by the laboratory. The “lily” is an important chart for laboratory timing in making the rush dailies for the studios. It also has other definite uses which I am not permitted to disclose in these pages. After the “lily” has been photographed the assistant runs out of the camera angle so that a short test may be made of the actors and sets.

It is often said that it takes longer to “shoot” in the Technicolor medium than in black-and-white. This statement is greatly exaggerated. Technicolor has at all times endeavored to make color photography as easy to work with as black-and-white. This accounts for the standby camera which is always threaded and ready for immediate use. The time ordinarily lost in rethreading a black-and-white camera is reduced in the case of Technicolor.

The camera which has exposed all of its negative is removed from the blimp or tripod by the technician and is immediately replaced with the standby camera by the assistant cameraman. A continuous series of scenes may be made by these means without the producer being conscious of any delay.

The assistant’s duty is to always rethread the stand-by camera and make it ready for the next change-over. He must make out the camera cards and enter into the logs such information as is desired by the technician or cameraman. In the shooting of projection backgrounds or special effects departments it is up to the assistant to get all of the data necessary. Such information consists of: types of projectors, carbons used, lenses used, the throw of the picture and width and height of the projected image, the number of foot-candles of light on the screen surface and the make of the screen. He must also note the lens height of the camera and accurately measure the distances from the camera to the actors and screen.

The technician’s and assistant’s life is indeed a responsible one. He must be constantly on his toes to back up his profession. To be a good assistant he must be capable of “doubting in brass.” Above all he is an “Ambassador of Good-Fellowship” to everyone in the industry.

‘Drunk Driving’

- The Board of Officers of the International Association of Chiefs of Police at their quarterly meeting on Nov. 26 in Chicago adopted a resolution endorsing the film “Drunk Driving,” a short subject produced by MGM. The resolution urges all police commanders to use their influence to secure the immediate showing of the film in their communities.

“Drunk Driving” won the David S. Bayer Award for 1939, an award made each year to the organization which produces the motion picture, that, in the opinion of the judges, does most to promote traffic safety.
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Members of Local 644, IATSE
(Continued from Page 19)

• Larry Williams and Don Malkames are working on another Jewish picture at the Ideal Studio in Jersey and from reports circulating around town their assistants, Wellstead and Holcombe are now "borscht" addicts!
• The last trip of the Clipper brought in Neil Sullivan, Pathe News cameraman, from the battlefields of Finland. Neil has been over there ever since the war started. He covered the Finnish front, then went over to the German side, and his last front was the Finnish—which, we believe, was almost his finish.
• Ray Foster and Tom Hogan are shooting a short, "Information, Please," at Fox 54th Street, which is the new studio lately finished by Fox for Pathe. Frank Donovan is directing.
• George Wehler and Tom Priestley are up in Connecticut on a Paramount assignment.
• Charles Gilson, who is in charge of the March of Time's new feature production, "Ramparts We Watch," by Major Elliott, is returning to New London to finish up with his four able lensmen, Dick Maedler, John Geisel, Frank Follette and Burt Pike, Frank Callabria shooting stills. Assistant Ashley Abell is not looking forward to this with pleasure as it means he must leave his new bassinet occupant—a 10-pound daughter!
• Jay Rescher is on location at Jamaica shooting the exteriors of his picture "Pocomania," starring Nina Mae McKinney.

U. S. Watches Okie Scenes
• Uncle Sam is protecting his honor in a big way in Hollywood these days. The federal government, it seems, is anxious that its camps for the Okies, the dust bowl refugees who follow the harvests in California, be represented on the screen accurately.

Partly for that reason, the Farm Security administration loaned 20th Century-Fox Thomas Collins, manager of all the Okie camps, to serve as technical advisor on John Steinbeck's "The Grapes of Wrath."

And Collins is looking out for Uncle Sam with due perspicacity.

In one morning recently he stopped production on the picture because:

1. The garbage cans around the movie U. S. camp didn't have lids. The government would never permit such an awful situation to exist.

2. The prop men had put wash tubs in front of the Okie tents. The idea! The U. S. provides a model building where the Okies may wash their clothes to their hearts' content.

3. There was a "slow" sign at the entrance to the camp. It seems the Okies don't believe in signs. No U. S. camp ever has them. The government instead digs a shallow trench all the way across the gate and that slows the Okie jalopies down to a walk.

Reviewed by Fred Westerberg

Here we have an encyclopedia of photography for photographic engineers.

“This Handbook of Photography,” says the editor, was born of their desire “to possess for their own use a comprehensive, authoritative reference work on photography and its technical and scientific application—a reference text having the directness, rigor and authority which might be found, for example, in the various engineering handbooks.”

This aim has in large measure been attained. The work is comprehensive and is authoritative. Almost every phase of photography is dealt with in which science and engineering plays a part. The twenty-three contributors are all specialists in their own field and they make ample use of the literature that has been published to date.

A fairly good compromise has been made between directness and rigor. Any particular topic can be quickly located and easily run down with a little side-stepping here and there among the equations.

Many specialized fields of photography and the engineering problems associated with each are discussed. Prominent among these are motion picture and color photography. Also treated are ultra high speed, aerial, microscopic, spectroscopic and astronomical photography as well as other branches. Offhand, only one fruitful subject that might have been added comes to mind—undersea photography.

The fundamentals are all there: optics, development, light sources, sensitometry, exposure and all the rest. Many readers will be surprised at the large number of developing agents that have been discovered in the last few years.

There are many illustrations but as might happen in any first edition some of these have been mixed up and put in the wrong places. Unfortunately, there are all too few really serviceable working tables for a book of this scope, which aims to be the counterpart of a typical engineering handbook.

Just the same the book is a step in the right direction for it condenses into one volume the most significant aspects of photography from an engineering standpoint.


The story of the motion picture from start to finish, through every stage from the scenario to the actual screen showing, is presented in this interesting volume.

Going back to 1886 and Thomas Alva Edison’s idea to see the singer or performer whose voice was reproduced by the ancient phonograph cylinder, such highlights as the first motion picture studio in 1893 and the first public showing on any picture screen, in 1896, are reviewed.

Members of Local 659 will get a bang out of the illustrations showing the veteran cameramen of the industry working in derby hats while cranking their cameras by hand. On the other hand, the book shows a modern camera and other photographic equipment in the chapter on Photography and Lighting.

High tribute is paid to members of the photographic profession, who in the authors’ opinions rank next to the director and writer in importance in picture making. The cameraman, they point out, must effect a difficult combination of art and science, working with the most elusive of mediums—light.

Other subjects treated are the studio, the story, scenery and sets, wardrobe, make-up, sound, props, editing and related major phases of motion making. The result is a comprehensive guide of what it takes to make a picture.

Every executive and others in the industry will find something of interest in this book. The studio worker confined to a particular class of work will better understand just where he fits into the whole picture of this top ranking industry. It would make good reading for friends and relatives in the “East” who want to know “all about Hollywood and the movies.”

The text is very readable and is generously illustrated with photographs by Roman Freulich, member of Local 659, IATSE.


Here’s a real handbook for the amateur movie maker. It opens by informing the reader that he doesn’t have to master a lot of technicalities and then very concisely takes him step by step through the whole procedure, including cutting, editing, the use of filters and lenses, how to get the best results with color and how to compose the picture the professional would have. The book is written by experts and undoubtedly often would be consulted by the advanced amateur as well as the beginner.
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THE ARMY

(Continued from Page 8)

fronted by the air men. From the air the hidden position is completely invisible, but by the use of infra-red sensitive emulsions the hidden secrets become known to our forces. Because of the peculiar characteristic of infra-red, green paint will photograph as a dark gray or black, while living foliage photographs snow-white in this curious invisible “light.” The guns and troops are revealed as if they were coal black on a field of snow.

The great hae penetration qualities of infra-red also prove invaluable to air men under certain conditions where regular panchromatic emulsions would be useless. Nevertheless, infra-red is limited to a large degree but raises promising of being greatly used for military purposes in the future.

But back to cameras. One of the most successful means of detecting the enemy’s position is by the use of the “basque relic.” Almost everyone at some time or other has had fun in making this type of relief. From a military standpoint, however, they are made in the following manner: an airplane flies over the enemy’s position and makes a vertical photograph of a given terrain where known enemy emplacements are being used. The aerial photographer notes the altitude he is flying, the time of day and notes the type of light he is using. After making the exposure he returns to his base where the negative is developed and consequently printed on a process or positive film.

On the following day another plane takes off and duplicates the same conditions as the day previous and makes an exposure. The film is developed and dried and then placed over the film made the day before and carefully set in register. Much to the amazement of the novice everything which has been moved or added to this section will appear as a black area to the naked eye. By enlarging these dark areas from both the first and second negatives the hidden truths of enemy movements are revealed.

Steroscopic separations have proven highly beneficial in making aerial observations. The same principles involved in making the The type of parlor stereoscopic negatives are used but are greatly exaggerated. While the pupillary distance in making regular stereos is 2½ inches between the lens centers, the lack of foreground detail due to altitudes makes the stereo camera useless. Nevertheless, if two cameras are used with matched lenses of fixed focal length and subsequently placed on either wing tip of a bomber with a wing spread of seventy-five feet you would then have a pupillary distance of seventy-five feet.

From an altitude of 12,000 feet a definite relief is given when viewed through a special viewer, which is an elaboration of the old parlor viewer. The secrets of the ground topography are revealed in this manner. By increasing the altitude of the plane, even greater pupillary distance may be had by using only one camera. If a plane is traveling at two hundred miles an hour and the intervalmeter is set to make two exposures at five second intervals the result would be a pupillary distance of nearly 1,460 feet.

It is only natural to assume that the military claims are used as to altitude due to the similarity of the two negatives, unless exceptionally long focal length lenses may be employed. By having a known separation of the lenses and making the shot from a known altitude, and by careful measurement by special instruments to determine the height of even small objects on the ground, fake trenches are easily discernible.

These are only a few of the methods employed by the aerial photographer in present military practices. It is evident, however, that the present war is being fought to a large degree by the aerial photographers on both sides. Knowledge of the enemy’s vital military and brain centers must be had before actual military advancement. Both sides openly admit making frequent flights for photographic reasons, which accounts for the small numbers of aircraft brought down up to the present writing.

While still photography is used largely in our National armed forces, motion pictures continue to play an important role in obtaining actual visual records of battles, both in the air and on the ground. These records are kept in order that they may be used to study the actual military strategy employed, long after battles have been completed.

Most of the cinematography is naturally made on the ground showing such records as troop maneuvers, both foot troops and motorized cavalry, first-aid and hospital bases, supply bases, destruction done, etc. Those who are responsible for this cinema action are for the larger part men who have the ability to operate cameras under news-rew conditions. They must have a thorough knowledge as to what pictures are of the most importance for military records, and without regard for their own lives must get the picture.

Every cinematographer in Hollywood is far more useful to the Government with a motion picture camera on his shoulder than with a gun in the first line trenches. But that is not all. Every member of the Local 659, I.A.T.S.E., who was in the service in the last war has proved his ability “under fire” and for this reason a large majority will be commissioned as officers to operate our cinema photo sections in time of great need.

Never in the history of photography have wars been so thoroughly fought with cameras. And what nation is better qualified to fight wars with cameras than the United States of America? A foreign military commander made this startling statement only a few months ago during the present crisis: “The army with the best photographic corps will win the next war.”

PATENTS

By ROBERT W. FULWIDER


A silver halide emulsion containing a dye-sub component fast to diffusion with respect to the gelatin.

No. 2,173,673—MULTIPLE FILM RE-WINDER. Lucien Serrurier, Los Angeles, Calif. Application Nov. 10, 1937. 5 claims.

A film re-winder for simultaneously re-winding several reels of film.


A process of producing a color and sound film by exposing the picture area while the sound area is masked, developing the film in a color forming developer, baking the silver, printing the sound record
and developing it in a black and white developer, and removing the undeveloped silver halide.

No. 2,179,244—Silver Halide Emulsion for Color Photography. Wilhelm Schneider and Alfred Frohlich, Germany, assignors to Agfa Anseco Corp. Application Aug. 13, 1937. In Germany Aug. 22, 1936. 8 claims.

A photographic silver halide emulsion containing a dyestuff component fast to diffusion.


A film for making color separation negatives and having a fast rear negative emulsion having a dye sensitizing it to one spectral region, and a slow direct positive front emulsion with a dye sensitizing it to another spectral region.


A sound-proof blimp for cameras having access doors for access to the reels, camera, and motor.


A projection printer for projecting motion picture films in a step-by-step process upon a sensitized sheet which is moved between each exposure.


A photographic material comprising a silver halide emulsion layer containing a dye selected from the group consisting of a phthalocyanine, a sulfonated phthalocyanine and a metal phthalocyanine.

No. 2,180,683—Sound Insulation Means for Motion Picture Cameras. Grover Laube, Robert Colby Stevens, and Charles Melvin Miller, Los Angeles, Calif., assignors to Twentieth Century-Fox Film Corp. Application December 11, 1937. 6 claims.

A motion picture camera in which the gear drive and the intermittent mechanism are rubber mounted.


A method of producing a relief in emulsions by incorporating very small particles in the emulsion.

EASTMAN

PLUS-X
for general studio use

SUPER-XX
for all difficult shots

BACKGROUND-X
for backgrounds and general exterior work
At Year's End—
At Year's Beginning—
Day By Day—
Everyday—

Eastman
Plus X NEGATIVE

The daily diet of
The Conscientious Camera!

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