NEW MOTION PICTURE APPARATUS

THE following apparatus was described during the session devoted to announcements of new apparatus by manufacturers.

A NEW AND ADVANCED IDEA IN TRIPOD HEADS

FRED HOEFNER*

The Model "B" True Ball tripod head for the heavy professional picture cameras consists of a ball and base rigidly mounted which support the bearing housing which is the carriage for the camera. This housing rotates around the ball in a pan or tilt movement through any desired angle—the camera always remaining level.

The head may be instantly locked rigid in any position by a small wheel. Also another means is provided for either locking the pan or tilt independently by a similar hand-wheel which, when turned to the right locks the pan; when turned to the left locks the tilt.

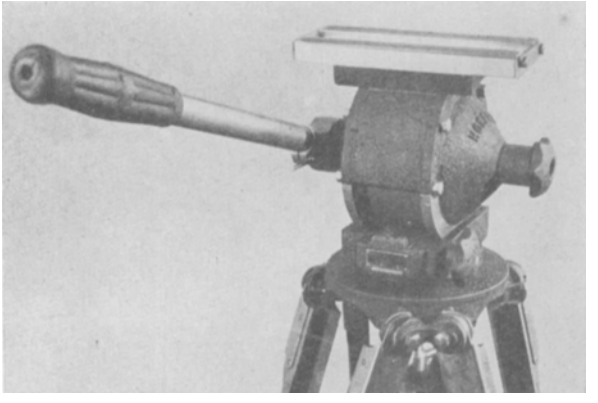

FIG. 1. The True Ball tripod head, Model B.

The apparatus is all enclosed making it dust and moisture proof so that it works perfectly under all climatic conditions being unaffected by temperature.

The handle or lever that controls the movement of the head is telescopic and adjustable to any angle or length to suit the operator. This spherical combination provides uniform friction tension for all movements due to its being a single bearing.

* Los Angeles, California.

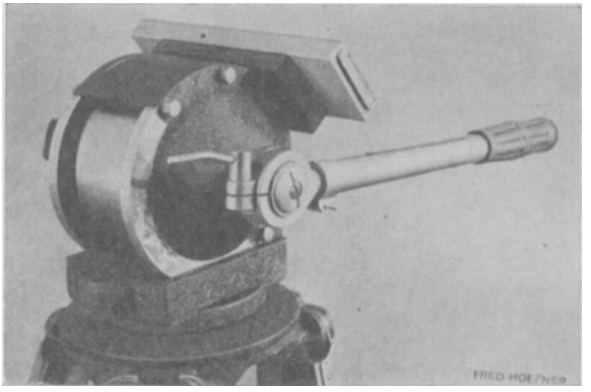

FIG. 2. The True Ball tripod head (Note adjustment of lever).

The head has but one bearing and one surface for friction tension for all motions and is locked by one lock only. In other words, the true ball head is a single friction system.

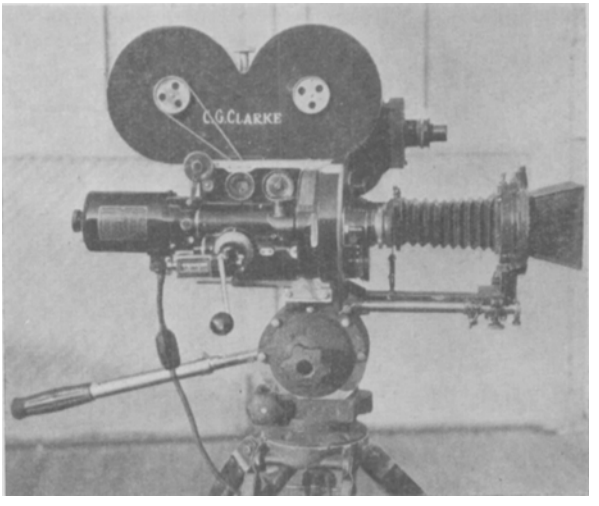

FIG. 3. The True Ball tripod head with camera mounted.

The Model "A" tripod head made to carry the small amateur motion picture cameras works on the same principle but is very much simpler. It has no independent lock for the pan and tilt. The head is locked by giving the operating handle a slight turn.

Besides carrying a camera, the tripod head may be used to direct any other apparatus or instrument, such as a spot-light, telescope, *etc.*

COOPER HEWITT NEON LAMPS

L. J. BUTTOLPH*

This announcement is of a joint development by the Engineering Department of the Cooper Hewitt Electric Company and the Research Laboratory of the General Electric Company of a line of lamps to be known as Cooper Hewitt Neon Lamps. These lamps are to be used wherever efficient sources of red light are needed and in combination with mercury lamps to give properly balanced color rendition on panchromatic motion picture film. These lamps are relatively low voltage, high current, arcs differing radically from the high voltage neon Geissler tubes commonly used for sign work. The units being first placed upon the market are identical in rating with the standard mercury lamps. The mercury and neon tubes themselves may be used interchangeably in the same auxiliary and reflector by making minor adjustments. To date our tests indicate that an economic life of at least four thousand hours may be assured and that the depreciation is considerably less than that recently published by Benford as characteristic of mercury arcs.[1]

As soon as the needs of the trade are better known, there will be available a.-c. units in multiples of 500-watt ratings operable with little or no auxiliary mechanisms and in any position. These units will permit a flexibility and portability never before possible with Cooper Hewitt Lamps.

The spectrum of the Cooper Hewitt Neon Lamp is for practical purposes limited to wave-lengths greater than 580 millimicrons and extends through the red and well beyond the limit of panchromatic sensitivity. This means that there is still a gap in the blue and blue-green region of the spectrum. Because of the very broad reflectivity of blue and green materials, this seems to be of little or no practical significance and this gap in the green and blue-green spectrum may possibly be a distinct advantage if in the course of time it becomes necessary to design lenses with the two points for which the color correction is figured, more widely separated or both moved in the direction of longer wave-lengths as this gap will obviate any aberration from out-of-focus blue-green.

DISCUSSION

DR. HICKMAN: I should like to ask how the tube is made to discharge at a low voltage. Is there any starting equipment with it?

MR. BUTTOLPH: The cathode in these lamps has been known in scientific circles as a Wehnelt cathode. In this case it is a nickel cylinder covered with calcium and barium oxide and heated by a filament inside of the cylinder. At 800–900 C. such a cathode can be used as a source of high current. It is used in the latest type of radio rectifier tubes.

* Engineering Dept., Cooper Hewitt Electric Co., Hoboken, N. J.

[1] *Visible Radiation from the Low Pressure Mercury Arc* by F. Benford, *Trans. Soc. M. P. Eng.* **11**: No. 30. 365 (1927).

MOVIOLA FILM VIEWING MACHINES

I. SERRURIER*

After the cameramen are through with their work and the laboratory has furnished a print of all the scenes that have been taken, there is a great deal of work yet to be done before the film is ready for projection in a theater.

Until about three years ago all film editing and cutting was done with the aid of an illuminated opal glass window in a table and sometimes a magnifying glass. It can be readily understood that it is very difficult to determine just by looking at a piece of film, exactly what action takes place on it, especially where the action is slow and happens only on a small part of the picture. The Moviola Film Viewing machines have been designed to make this task easier.

The machine consists of an enclosure which contains an ordinary 25-watt lamp, the light of which is diffused by opal glass behind an aperture over which the film passes. The thus illuminated film is observed through a set of viewing lenses which are so arranged that the picture can be seen best by the observer at ordinary reading distance with both of his eyes, and even by two people at the same time if one looks over the other's shoulder.

The film is moved through the machine by a standard 16-tooth sprocket which is driven by a geneva intermittent movement and this in turn is driven by a small motor. The motor is so controlled by a foot-operated rheostat that not only the starting and stopping but also the speed can be regulated. A toggle switch for reversing the direction of rotation of the motor is applied to the machine in such manner that when the machine runs the film moves in the direction in which the handle of the switch points. When the handle of the switch points upward the film moves upward which corresponds with forward action on the film.

Fig. 1 shows one of the latest machines of model C, which is equipped with a framing device and large lenses, adjustably mounted. The electrical connections are made with steel armored cable and the machine has been so designed that the motor is entirely enclosed and the parts that require cleaning and oiling can all be reached without opening the machine. The latest addition is a winding flange which is useful for winding loose film into rolls and also for braking the machine by hand when a quick stop is desired.

During the last year we have added two new models. One is similar to this machine in appearance and operation but is made for use with 16 mm. film. In this machine the film is moved by an 8-tooth sprocket for 16 mm. film and two small gears had to be inserted between this sprocket and the geneva movement in order to give the sprocket an intermittent movement of 8 steps of 45 degrees per revolution. The framing device could of course be omitted in this model.

The other new model which we added recently is the Model D or Directors' Model (Fig. 2). The principal difference is that a take-up arrange-

* Hollywood, Calif.

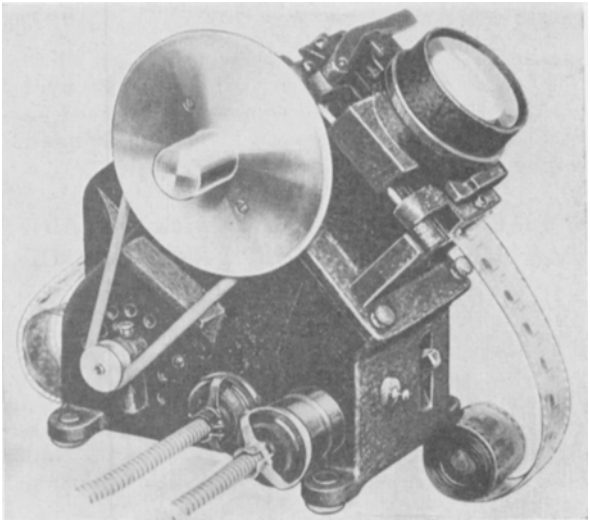

FIG. 1. Moviola Film Viewing Machine, Model C, "Cutting Room Model," for 35 mm. film.

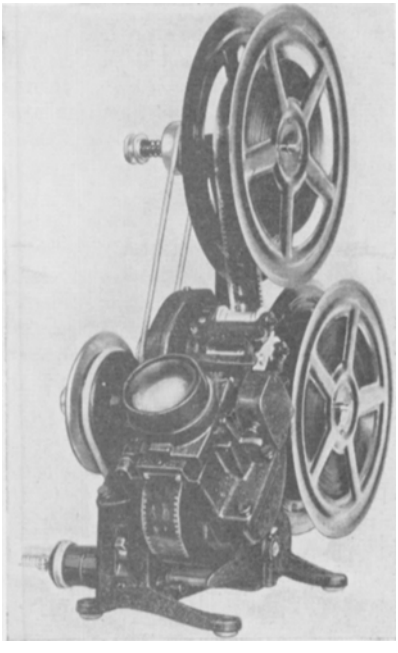

Fig. 2. Moviola Film Viewing Machine, Model D, "Directors' Model," for 35 mm. film on standard 1000 foot reels.

ment has been added so that film on a 1000-foot reel can be viewed and the take-up of the film is automatically taken care of whether the machine runs forward or backward. This machine is equipped with a hand control in addition to the foot control so that it can be operated by either one or both at the same time, as desired.

LONG LIFE PHOTOGRAPHIC CARBONS AND THE PANCHROMATIC LIGHT TRANSFORMER

E. A. WILLIFORD*

At the meeting of this society held in Norfolk, Va., in April, 1927, Mr. M. J. Dorcas of the National Carbon Co., Inc., read a paper describing the qualities of light obtainable from National White Flame and National Panchromatic Photographic carbons. Last September at the meeting of this society held in Lake Placid, N. Y., Mr. E. R. Geib of the National Carbon Company gave a demonstration of the kinds of light obtainable with these Photographic carbons.

Today, I wish to show you improved Photographic Carbons which have a life about 25% greater than was obtainable with the carbons exhibited by Mr. Geib. This applies both to the White Flame and the Panchromatic types. In addition to this increased life, these carbons burn very smoothly and have a light efficiency about 25% greater than the former carbons which corresponds to about 64 lumens per watt in the case of the White Flame carbon and about 70 lumens per watt for the Panchromatic O carbon. The photographic efficiency of the White Flame carbon arc is about 4.8 times and of the Panchromatic L carbon arc about 2.8 times that of any other known light source suitable for Panchromatic film except natural sunlight.

(*Demonstration*)

This glass is a special development for changing the invisible short wave energy of the photographic carbon arcs into visible light of a yellow-green quality. This screen may be used in conjunction with either the White Flame or Panchromatic O carbon arcs. The photographic efficiency of this lighting system is somewhat less than the bare carbon arc but is still relatively high.

DISCUSSION

MR. RAYTON: To enlarge upon the statement that the amount of radiation is greater with the screen in use, can Mr. Williford explain how far away the measurement was made?

MR. WILLIFORD: The measurements were made in our laboratory. I cannot give you the details. They were made with a spectral radiometer made after the manner of that described by Coblentz, to which Mr. Downes refers in his paper.

* National Carbon Co., Cleveland, Ohio.

MR. RAYTON: It seems as if the performance of such a unit could be pretty well predicted if sufficient information were available as to the fluorescence characteristics of the material with respect to wave-length. With a given energy distribution within the ultra-violet, a study of the ability of the material to transform the ultra-violet into visible radiation should enable predictions to be made as to the results which would be expected. I wonder whether such information is available.

MR. WILLIFORD: We have not been able to compile such data. This is a new development for us and is in an experimental stage as far as operation is concerned.

MR. CUFFE: I should like to know in regard to this 25% increased illumination per watt whether you are doing it with the projection carbons.

MR. WILLIFORD: The studio carbons are of different material from the projection carbons. Projection carbons do not contain any flame materials, so that this doesn't apply to the projector at all.

MR. BUTTOLPH: We have experimented with fluorescent screens and fluorescent reflectors, and some of you may remember the old Cooper-Hewitt rhodamine reflectors. In this application, any fluorescent device of this kind, whether a reflector or a screen, as a source of fluorescent light, is simply a diffuse source. In front of the projection device, it will be simply a filter of the projected light and a diffuse source of the fluorescent light, the glass being a secondary source of undirected radiation, so that I fail to see how this glass could contribute very much to the illumination except at a very close distance from the fluorescent device itself. It would seem difficult to get any practical intensity of fluorescent light from it at fifteen or twenty feet.

A LIGHT FOR USE IN AMATEUR MOTION PICTURE PHOTOGRAPHY

EDWARD C. RICHARDSON*

I wish to bring to your attention a new unit known as Type MR-10, which we have given the trade name "Cine-Lite." It was designed primarily for the amateur motion picture photographer, but is also doing good service in commercial and professional studios.

After numerous tests it was found that the bulb best fitted for such use, was the 1000-watt, G-40, C-13 filament, spotlight Mazda, which has a high intensity light flux and a rated burning life of 200 hours.

In establishing the form of light distribution most desirable for this work, the opinion of cameramen as to needed characteristics was given first consideration.

This lamp produces a fine general distribution of light with a slight concentration at the center, which permits modeling or accentuation at the main interest point in the shot being taken.

The curve of the aluminum reflector is a compound paraboloid, and the reflecting surface is finished to produce a diffused body of light. This reflector is mounted on an aluminum housing which supports the lamp socket.

*Mole-Richardson, Inc., Hollywood, Calif.

The head may be set to direct the beam at any angle or it may be held in the hand during a time exposure and directed at will to obtain a so called "painted-in," effect. The stand is of tube construction and nickel plated with a black enameled tripod base. Vertical adjustment allows a range of from two to eight feet. The head may be dismounted and the stand folded to compact form for packing or transporting. The complete unit with fifteen feet of conductor, switch, and plug receptacle, weighs nine pounds.

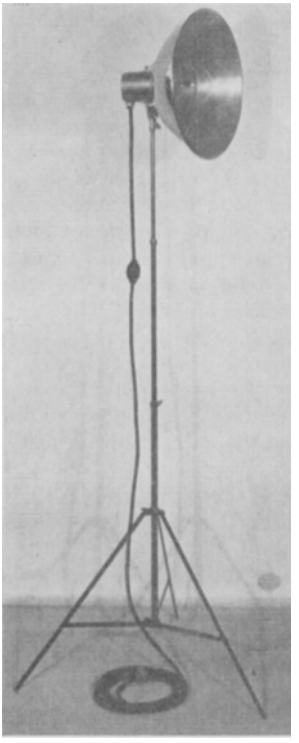

FIG. 1. The "Cine-Lite" for amateur motion picture making.

A 16 MM. FILM REEL THAT REQUIRES NO THREADING*

The most difficult operation in the threading of a motion picture projector is undoubtedly the attachment of the film to the take-up reel.

Especially in the dark, it is difficult to find the slot on the core into which the end of the film must be inserted; and even after the slot is found it is necessary to hold the end of the film there until several turns are made around the core. In addition, it is difficult to insert the end of the film into the slot.

* Eastman Kodak Co., Rochester, N. Y.

A reel (for use with amateur standard film) that requires no threading has been developed by the Eastman Kodak Company to overcome these disadvantages. The new reel grips the sides of the film by spring action when half a turn of film has been laid on the core.

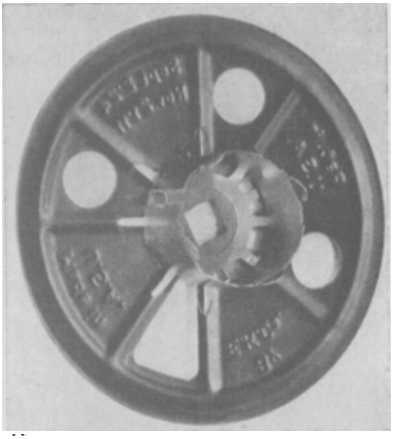

Fig. 1. New 16 mm. film reel which requires no threading with one side piece and one spring removed.

The new principle has been applied so far only to light metal reels which hold 100 feet of 16 mm. film for projection. But it is applicable also the heavier, solid-sides spools for camera use and to 400-foot reels for projector use.

The new reels are made by the addition of a radial spring at each end of the core of the reel inside the flanges. The eight tips of each spring extend slightly beyond the core.

When the film is laid on the core, it depresses the spring tips and causes them to retain thereby a constant tension against the edges of the film. When half a turn has been taken around the core, the film cannot bulge, and the springs therefore, have as rigid a ribbon to press against as if the film were of metal. Consequently, the grip of the spring tips is firm.

KODALITE*

The Eastman Kodak Company has recently announced a lighting unit which permits the use of Ciné-Kodaks indoors at *f*/3.5 without overloading the ordinary house lighting circuit, which is fused at 10 amperes (Fig. 1). Two of these lights, placed to meet the requirements of the individual user, are sufficient to illuminate the Ciné-Kodak field up to a distance of 10 or 12 feet. The designing of such a lamp necessitated extremely efficient use of the available wattage.

* Eastman Kodak Company, Rochester, N. Y.

The reflecting surface is laid out on two paraboloids with their foci both at a point in the plane of the 500-watt lamp filament. The back paraboloid is, in effect, a bulge on the front paraboloid, which is provided to make room for the lamp. A surface connecting the two paraboloid surfaces is designed to throw light back through the lamp filament on to the front paraboloid. This surface aids very materially in eliminating the dark spot in the beam which is normally caused by the lamp base shadowing or passing through parts of a reflector.

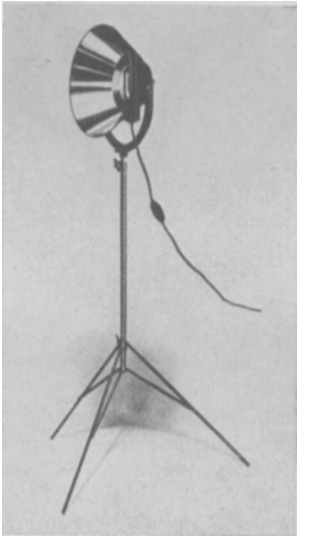

FIG. 1. The Kodalite.

A true paraboloid surface with a point source at the focus will give a beam of parallel light as wide only as the open side of the reflector. In order to cover an angle of 28 degrees—an angle corresponding to the field covered by the Ciné-Kodak lens—the paraboloid surfaces are broken up into straight line segments, each segment being a frustrum of a cone. These segments are midpoints to the respective tangential at their paraboloid on which the reflector is laid out. The slope of each conical segment differs from the slope of its adjacent segment by an angle of 14 degrees. Parallel light rays striking adjacent segments are then reflected so that the angle between them is 28 degrees.

Of the light thrown by reflection plus that which passes out directly from the lamp filaments toward the object, 82 per cent is confined in the 28-degree beam—which makes the unit very efficient. The distribution of light over the 28-degree field is not entirely uniform, but it reaches a maximum in the center and falls off toward the margins: therefore there is sufficient illumination for the main subject in the field even when the distance is comparatively great.

The reflectors are manufactured by a patented process in which silver is coated on a master mold either of glass or of highly polished metal. The silver is backed up with pure copper by an ordinary copper-plating process. When the copper is built up to the required thickness, the reflector is stripped from the master mold and the silver surface is either lacquered or given a light coat of a nontarnishable metal for its protection.

The Kodalite is equipped with a folding stand.

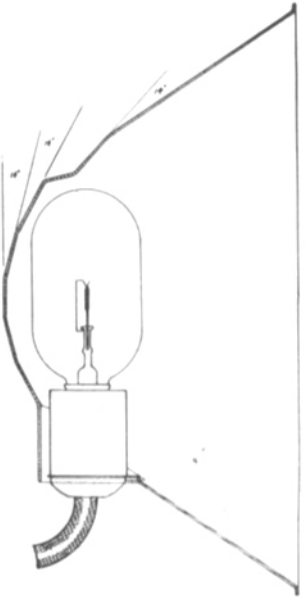

FIG. 2. The Kodalite part section showing reflection.

AN AUTOMATIC FILM REWINDING AND SPLICING MACHINE

W. F. MCLOUGHLIN*

Four years ago an executive of the motion picture industry made it clear to me that, as a manufacturer of labor-saving devices, it would be worth my while to give attention to a problem which was serious in the motion picture industry—the problem of splicing film. He explained that existing methods were comparatively crude. The industry needed a mechanism which would do two things—(1) reduce the time required to make splices, and (2) by eliminating the human equation in the process, improve the quality of splices.

* New York, N. Y.

Investigation made it clear that the quality of film splices is a matter which affects every phase of the motion picture industry. The problem is not peculiar to the laboratory alone, or to the exchange alone, or to the theater alone.

Defective splices presented three serious results: 1. The quality of the presentation of the motion picture film on the screens of the theaters was

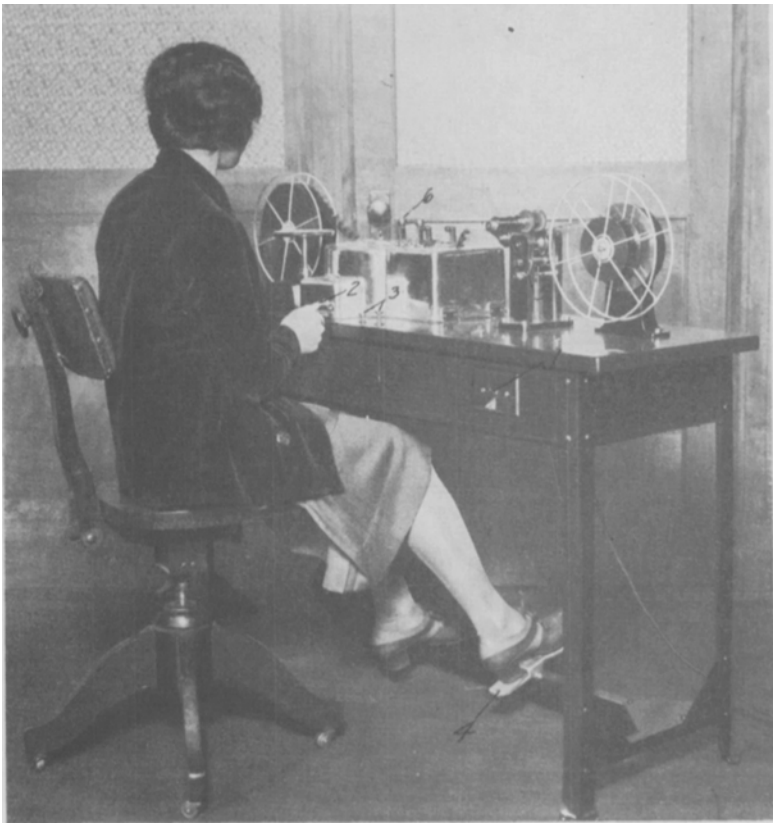

FIG. 1. The Automatic Film Rewinding and Splicing Machine.

affected. 2. Serious fire hazards, which resulted in increased insurance rates and in troublesome investigations, were inevitable. 3. The life of film was shortened because over 50% of the damage to film was due to running off at the take-up sprocket and in practically every case this could be traced to defective splices.

Four years of research have resulted in the making of the Automatic Film Rewinding and Splicing Machine. This machine does two things—(1)

it cuts down the amount of time required to inspect film and make splices, and (2) by eliminating the human equation, gives a standard splice which is free of those defects commonly found in splices.

Now, it should be admitted that good splices can be made by hand with sufficient time and skill. Even with existing mechanisms a skilled operator can make a splice that is satisfactory in one minute. Tests made at exchanges show that in over a period of a day the average for a number of operators is two minutes for each splice. The Automatic Film Machine requires five seconds to make a splice. Tests have shown that whereas forty reels a day can be thoroughly inspected and repaired with other splicing devices, one hundred and twenty reels a day, under the same conditions, can be thoroughly inspected and spliced with the Automatic Film Machine.

Speed alone would be of little value if the quality of the film splice was not superior to that made by other mechanisms, or by hand. It is generally admitted that strength alone does not make a satisfactory splice. There must be uniformity, there must be flatness, and there must be sufficient pliability of the splice.

If sprocket holes are not perfectly matched in splicing, or if the splice is not pliable, or too wide, the film will run off at the take-up sprocket because the film feeds on to the bottom sprocket out of a loop which continually flaps back and forth. At the top sprocket the film is kept taut by the tension on the reel in the top magazine, and the intermittent by the tension of the aperture shoes.

What are the causes of defective splices? If the emulsion is not entirely removed in making the splice, the cement cannot hold because the cement acts only upon the celluloid base. On the other hand, if the celluloid base is scraped too deeply, the film is weakened. If the proper amount and the proper quality of cement is not used, the celluloid will not be softened sufficiently to make the splice hold, or too much of the celluloid base will be softened instead of only the surface. In one case we have cement that will not hold, and in the other case, cement which causes the film to buckle after drying. Because film cement evaporates rapidly, pressure must be applied immediately to weld together the two pieces.

It is evident that unless the human equation is eliminated by automatic operation, the causes of bad splices cannot be eliminated. The Automatic Film Machine does eliminate the human equation. How its operation eliminates the human equation will now be explained.

The machine is operated by an electric motor which, together with all driving mechanism, is mounted on the under surface of a hinged table top. All the driving mechanisms are ball-bearing mounted and belt driven. The motor switch (see *1* in Fig. 1) is at the right side of the table apron. The film is fed in either direction and can be controlled by foot pedal (*4*.) Direction of the film is reversed by means of buttons (*5*) on the table top. The splicer is operated by a button (*2*) on the splicer cover. Thus, it is evident that the operator is left with both hands free because the examining mechanism speeds are controlled by foot pedals.

There are two forward or inspecting speeds and one reverse re-wind speed. The re-wind speed is forty-five seconds for one thousand feet. A

uniform speed for inspection winding is secured by a constant speed unit of two feed rollers. The feed roller is operated at constant speed. The other roller furnishes the necessary tension to feed the film, so that every foot is wound at the same tension, and there is no bulging or misalignment anywhere. Both rollers are under-cut to avoid scratching of the film. By the release of the tension roller, secured by pressing button *5*, the second forward speed is secured for winding at a faster rate than inspection speed.

When the operator detects damage as the film passes through her fingers, she releases the foot pedal control. This pedal applies a brake to each reel. Thus, the film is instantly stopped in a position for splicing.

The operator places the film on registering pins, which are so arranged that splices will be in frame.

Then she closes the lid and presses the button. Within three seconds both lids have opened automaticaly, the film is spliced, and the operator is ready to continue the inspection. The sequence of operation is this.

First, the emulsion is removed by two vertical revolving spiral-faced scrapers mounted on a table which rotates in a horizontal direction beneath the film. Scrapers are held up against the film under spring tension and the scraper mounting is pivoted to allow for varying thicknesses of film. This is self-adjusting. The adjustment of the angle of the spiral-faced scrapers connected with the proper spring tension and revolving table removes all emulsion without harming the film base.

Second, the film is severed. A small round hardened steel knife, which is free to turn on its own axis, with a slight escapement for horizontal movement severs both pieces of the overlapped film.

Third, cement is applied. This is done by means of a concave-faced roller, which is almost completely enclosed in a cement box. The concave face of the roller insures an even amount of cement being applied. For every operation the cement roller is moved before reaching the film to bring fresh cement to the top of the roller. By protective means, cement is prevented from entering the bearings.

Fourth, unit (*6*) moves forward the overlapping film.

Fifth, a pad moved by a cam is inserted underneath the lap.

Sixth, pressure is applied. Five rollers under strong spring pressure, and mounted to the revolving table, pass underneath the pad pressing the patch firmly and closely together, and insuring uniform pressure all along the splice.

When this operation is complete the splice is finished and the doors open automatically. By the adjustment of a cam the Automatic Film Machine will give any width of splice desired.

It has been proved that the curved or arced splice has a great many advantages over the straight line splice. For this reason the Automatic Film Machine is arranged to make an arc splice. The arc splice has not been previously used in the industry to any great extent because by hand operation it is not easily made. By automatic operation it is as practical as any other, and has the added advantage of removing undue strain from the splice.

Tests have been made where strain was applied to film spliced by the Automatic Film Machine and the result has been that in every case film has broken at some other point than at the splice. The strength of the splice is beyond dispute.

DISCUSSION

MR. CUFFE: I should like to ask Mr. Crabtree if he knows whether there is an automatic stop for tears when rewinding.

MR. CRABTREE: The manuscript does not say so.

MR. CUFFE: It is only what you feel, when you stop it?

MR. CRABTREE: Yes.

AN IMPROVED CONTROL PANEL FOR MULTIPLE ARC TYPE MOTOR GENERATOR

C. C. DASH*

The Hertner Electric Company wishes to call attention to an improvement made in the generator control panels used on multiple arc type motor generator sets.

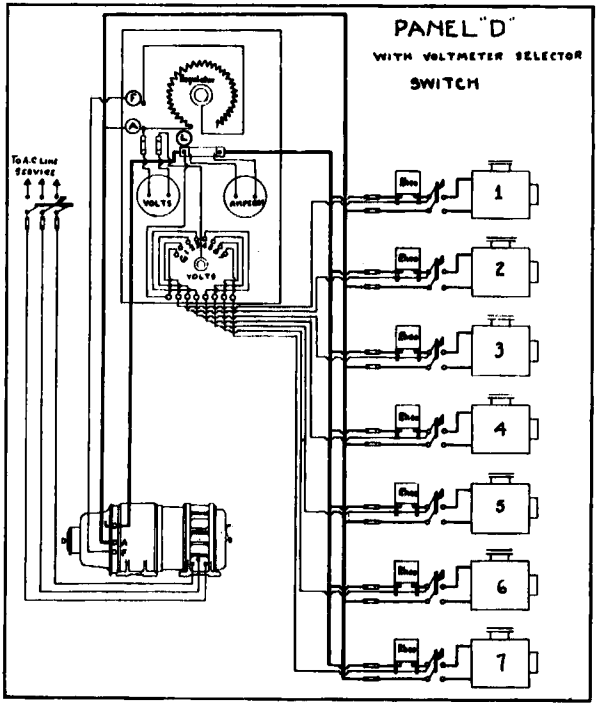

Fig. 1. Control panel with voltmeter selector switch.

* Hertner Electric Company, Cleveland, Ohio.

With the series arc type of generator the voltmeter on the panel indicates the arc voltage and the ammeter the arc current as well as generator current. The generator voltage is the same as the arc voltage. With multiple arc equipment, the ammeter registers the total amount of current being delivered by the generator and the voltmeter, the generator voltage which is arc voltage plus ballast rheostat voltage drop. In many instances of improper performance of carbons and unsatisfactory results with ballast rheostat, we have found arc controls out of adjustment and the projectionist had no way of readily determining his arc voltage or proper arc length.

We have installed within the control panel a voltmeter selector switch which can be wired in by running a light wire from the lamp side of the rheostat back to the panel and connected to the proper points on the terminal block provided for this purpose. With this arrangement the projectionist can at any time read his generator voltage or the voltage across any of his arcs which gives him a very convenient method of checking his arc regulator adjustment. The panels with this selector switch are now being funished as standard equipment with all multiple arc Transverts (see Fig. 1).

AN EMERGENCY THEATER LIGHTING SYSTEM

C. C. Dash*

The Hertner Electric Company wishes to announce a control and charging panel to be used in connection with emergency lighting systems as required in some of the states for all buildings used for public gatherings. The control equipment which we have designed is primarily for motion picture theaters. Several types of equipment are offered but the one which we will describe at this time is the completely automatic type.

This equipment consists of a battery, automatic control panel, transformer, and battery charger motor generator. The battery recommended consists of 42 cells of lead battery, the plates being particularly designed for long life on standby service. A transformer is used to reduce the 110-volt incoming a.-c. line voltage to 80 volts to be used on the emergency lighting system. A resistor is used in series with 60-volt train lighting lamps in the emergency lights. Under normal conditions, these emergency lights such as exit lights, lights in hallways and stairways are energized through the transformer from the 110-volt a.-c. power line. In the event of failure of the a.-c. line service, the automatic transfer switch disconnects the lamps from the a.-c. line and connects them to the battery.

There is a second transfer switch connected in the projection lamp circuit and is so arranged that in case of failure of the projector supply this transfer switch connects the projectors to the batteries instead of to the motor generator set. In case of a.-c. line failure, both transfer switches work and it is necessary to operate the projector with a crank as most of the projectors are equipped with alternating current motors.

The amount of discharge from the battery during an emergency is indicated on a Sangamo ampere-hour meter. As soon as the amount of cur-

* Hertner Electric Company, Cleveland, Ohio.

rent taken from the battery is approximately 10% of its rating, the ampere-hour meter closes a control circuit which will place the battery on charge as soon as the a.-c. line service is restored and this charging continues until the battery is fully charged.

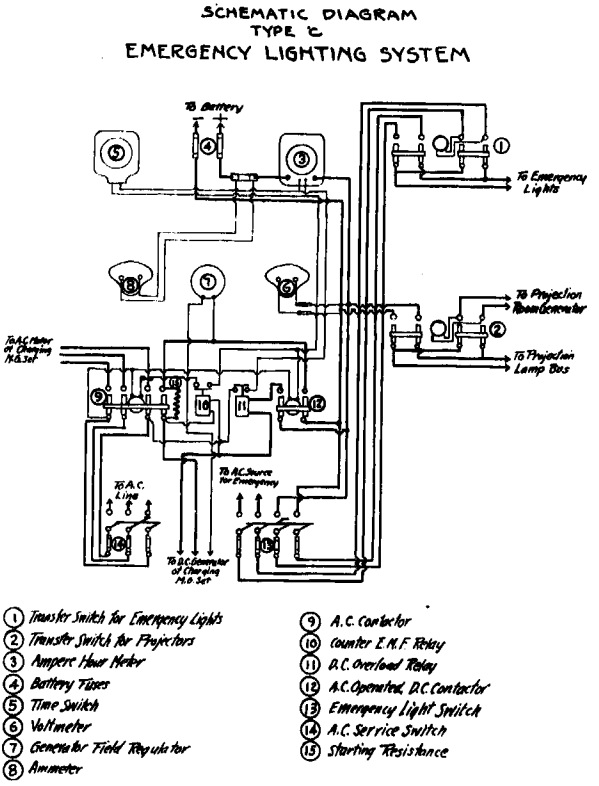

FIG. 1. Diagram of emergency lighting system.

In addition to this replacement charge, it is desirable to have the battery charged to a small extent each day so as to take care of any discharge due to local action. We have accomplished this by the use of a contact-making clock and once every 24 hours the battery will be on charge at normal rate for 10 or 15 minutes.

Other types of panels are offered which do not include so many automatic features, but this type *C* equipment does everything automatically with the exception of the winding of the eight-day clock and putting water in the batteries. The storage battery manufacturers do not recommend equipment so entirely automatic as to tempt the maintenance man to overlook the fact that the batteries occasionally need attention such as filling with water.

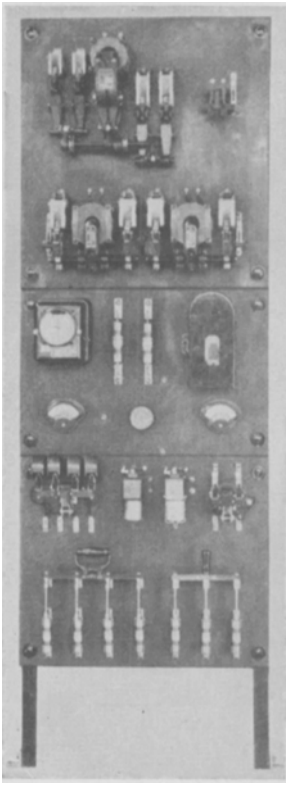

FIG. 2. Front View of emergency lighting panel.

DISCUSSION

MR. CRABTREE: It seems to me that such emergency outfits should be compulsory in every theater. Not long ago I was in a large theater when there was an explosion in the electrical conduit outside, and the whole place went dark. It was found that they could not get the power on again that night and the whole crowd was dismissed slowly. They had some flashlights, but with fire engines close by, I am afraid there might easily have been a panic.

MR. DASH: The idea of using such units was presented to us by the Electric Storage Battery Company of Philadelphia, and they are building the equipment for use in hospitals where the emergency circuit primarily takes care of operating rooms. There is a tendency among the larger theaters to put in emergency lighting equipment not only to provide emergency lights, but to provide emergency power so that the show can be run for two hours and tide over a power failure. I know of an instance similar to that mentioned by

Mr. Crabtree where there was a 4000-seat theater practically full, and when the people demanded their money back and had presented five and ten dollar bills for the admission, it was impossible to take care of them because there wasn't enough change in the cashier's office, and it led to a disturbance—not one in which anyone was injured, but it gave the theater a bad name. This was due to generator failure; duplicate generator service was installed. The battery outfit would eliminate this necessity and the battery could be used for an emergency period. The reflector arc lamp using 20–25 amperes can easily be run on batteries for a few hours.

Our fellow member, E. J. Wall, has been elected an honorary member of the Royal Photographic Society for outstanding achievements in photographic literature.