

ance of 0.0005 inch and burnished, and mechanisms are "run in" before final timing and checking.

The case contains the finder and film meters. The finder system is built through the case in such a position as to have extremely short parallax. A feature of the camera is the addition of a supplementary film meter scale adjacent to the field of the finder.

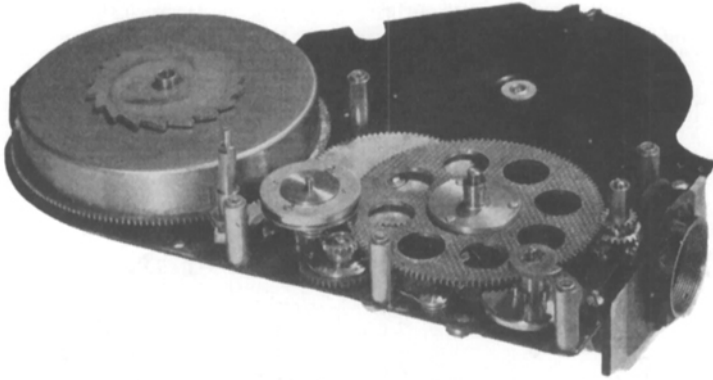


FIG. 3. The mechanism.

Standard equipment is an $f/3.5$ 20-mm. fixed-focus Kodak anastigmat lens in a standard threaded mount. Additional external features are the conventional self-setting film meter, a simplified etched exposure guide, tripod nut, and a carrying handle. A safety guard on the cover prevents closing the camera with the sprocket guards open. The camera can be used on the Cine Kodak titler or on a tripod. Without lens the camera is 8 inches long, $6\frac{3}{4}$ inches high, and $2\frac{1}{4}$ thick. It weighs approximately 5 pounds when loaded. It will take standard 50- or 100-ft. 16-mm. reels.

AN AMPLIFIER FOR CAMERA BLIMPS *

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The use of blimps to house motion picture cameras for making sound pictures places a burden upon the cameraman in that he can not be heard outside the blimp when directing the line-up of a scene. This was realized some years ago, and attempts were made at that time to overcome this obstacle. W. Daniels, cameraman at Metro-Goldwyn-Mayer Studios at that time, mounted an amplifier upon the platform of his rotambulator and placed a microphone inside the blimp.

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- (13) Extra switch should be provided to enable the amplifier to be operated without the automatic switch.
- (14) It should be compact, sturdy, and rigid.
- (15) Single-bracket mounting should be arranged, without interference with light-mounting brackets.
- (16) Storage space should be available for all cable tied to the amplifier.
- (17) Automatic switch, reversing polarity switch, and tone switch should be mounted in a convenient position near the blimp door and the operator.
- (18) The microphone should be insulated.
- (19) Microphone mounting should be adequate.
- (20) The design should be standard.
- (21) It should harmonize with surrounding equipment.
- (22) It should be accessible for servicing.

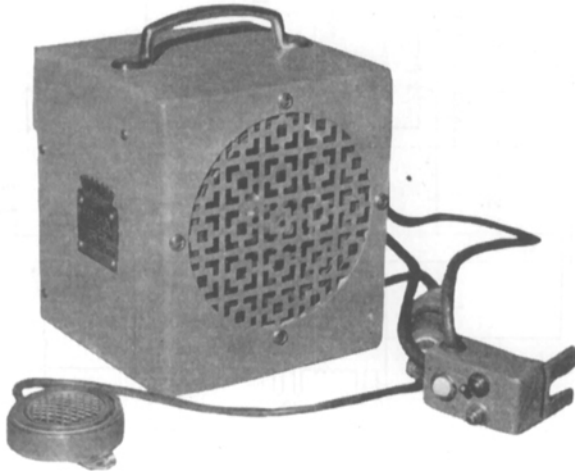


FIG. 2. The complete unit.

The introduction of the *25L6* tube made possible a design of amplifier that could meet in all respects the demands listed above. Fig. 1 shows the circuit used in the amplifier, making use of the cathode phase-inversion circuit using a *6J7* to drive two *25L6*'s in push-pull. A *25Z6* single-phase rectifier operating into a condenser input filter is used. The overall gain of the amplifier is sufficient to give full output from the *25L6*'s under normal operating conditions when the gain is 75 per cent open. The point of feedback is usually reached when the gain is totally on and the microphone is in position in the blimp. No more gain is needed, and it was found that the annoyance factor is practically minimized by providing only sufficient gain to eliminate feedback at all times. The circuit harmonic distortion is less than 5 per cent. The acoustical characteristics have some distortion due to cabinet resonance, but the distortion is not objectionable;

in fact, it gives to the output a character that enables the amplifier to be heard over normal production noises.

A six-inch dynamic speaker provides adequate coverage for the average set. Screened openings in the back of the cabinet allow for some sound distribution behind the camera as well as serving for ventilation of the unit.

The unit is operated completely on a 110-volt d-c. or a-c. circuit. The current is fed through a switch that turns on the amplifier when the blimp door is open. A polarity reversing switch enables the cameraman to change the supply polarity at the blimp when operated by direct current. A switch operating a buzzer or feedback circuit producing an amplified tone in the speaker is also built into the switch-box. The tone is used to attract attention upon the set when the cameraman has completed his work. This type of signal has been found to reduce confusion upon the set and to save production time.

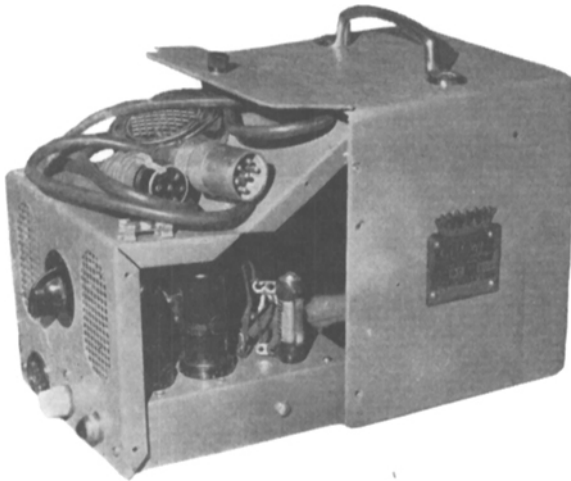


FIG. 3. Cabinet and chassis, opened.

A pilot-light is operated from the rectified current, and is used to notify the operator when the unit is operating and when the d-c. supply is properly polarized. Due to the fact that a separate voltage is supplied to the blimp to operate the camera, and in some cases one side of this camera supply voltage is grounded, it is necessary to insulate the amplifier and all other parts carefully.

Sometimes the amplifier unit is used with silent shots. In such cases the blimp may not be used and an additional switch is then used with the amplifier.

The two-button carbon microphone is suspended from the camera eyepiece, conveniently located for the cameraman when looking through the lens.

The cabinet and chassis are made of a 20-gauge body steel with reinforced corners, and is 6½ inches square and 7 inches high. A compartment to hold the cables and microphone is built in the upper part of the cabinet. All resistors and condensers are mounted rigidly upon a strip of formica. A volume control,

fuse holder, pilot light, and a four-prong adapter are mounted upon the rear panel below the cable compartment. A metal grill protects the loud speaker on the front end of the cabinet. A single socket to receive a $\frac{1}{4}$ inch by 1 inch iron bracket is used to hold the amplifier alongside the blimp. The cabinet and switch-box are finished in gray crackle paint with chrome hardware. Access to the tubes and inside the cabinet is accomplished by removing the rear panel and chassis. Sheet metal screws hold the panel and chassis in place.

The number of different kinds of blimps in use makes it difficult to standardize upon the switching and mounting methods. It has been found that in most major studios there is enough standardization of camera equipment to design a switch-box and mounting bracket for these studios and use standardized amplifier units in all cases.

Cameramen have estimated that from forty-five minutes to an hour and a half a day are saved in production time by these camera amplifiers. Directors have remarked that less confusion and noise is experienced upon the set due to the fact that the cameraman's instructions can be heard without repetition or excessive shouting.