# NEW MOTION PICTURE APPARATUS

*During the Conventions of the Society, symposiums on new motion picture apparatus are held in which various manufacturers of equipment describe and demonstrate their new products and developments. Some of this equipment is described in the following pages; the remainder will be published in subsequent issues of the Journal.*

## FIVE NEW MODELS OF 16-MM SOUND KODASCOPE*

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A new line of Eastman 16-mm sound projectors, identified by the model designations, *F, FB, FB-25, FS-10,* and *FB-40,* has been recently introduced to the public (Fig. 1). All these projectors are designed to be the ultimate in simplicity and rugged dependability, with the in-built precision so necessary to reproduce faithfully the finest existing 16-mm records.

There has been no compromise in the quality of the sound-reproducing systems or film-handling mechanism of these projectors from the lowest-priced to the most expensive. The same high accuracy of sprockets, aperture plates, film-gate, sound-drum, and film-guides is common to all models.

On all models the points at which film contact, and subsequent wear, take place, the surfaces are the same high quality. Buff chrome and stainless steel are used exclusively along the film's path through the projectors.

The basic picture projection mechanism used in the five models was developed several years ago and has since been subjected to continual refinement until we now find it capable of many hundreds of hours of good service. Technical advances in methods of hardening and toughening the film contact surfaces has added many hours to the life of the projectors. Precision cam grinders as well as sprocket and gear generators now produce mechanism parts with dimensional tolerances which were considered unattainable only a year or two ago. Tolerances of 0.0001 to 0.0005 inch are common among the sprockets, shafts, and pull-down mechanism parts.

The sound-head for these projectors is of simple, though effective design. The short, easily threaded, film path through the sound-head may be seen in Fig. 2. An easily threaded, well defined path for the film through the picture and sound-head provides positive synchronism of picture and sound.

The film need not be threaded through the sound-head when it is desired to project silent pictures. Fig. 3 shows the short film path for silent projection.

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Simplicity of threading of the film on the projectors has been considered very carefully. It is believed that the new Sound Kodascope models offer something new in their straightforward threading.

The first three projectors mentioned previously are designed to operate on a d-c or a-c supply voltage of 100–125 volts. Universal operation of the amplifiers in these models is accomplished through the use of a conventional ballast resistance unit, suitably connected to allow series operation of the tube heaters from the supply lines. The use of a ballast device in the heater supply circuit provides

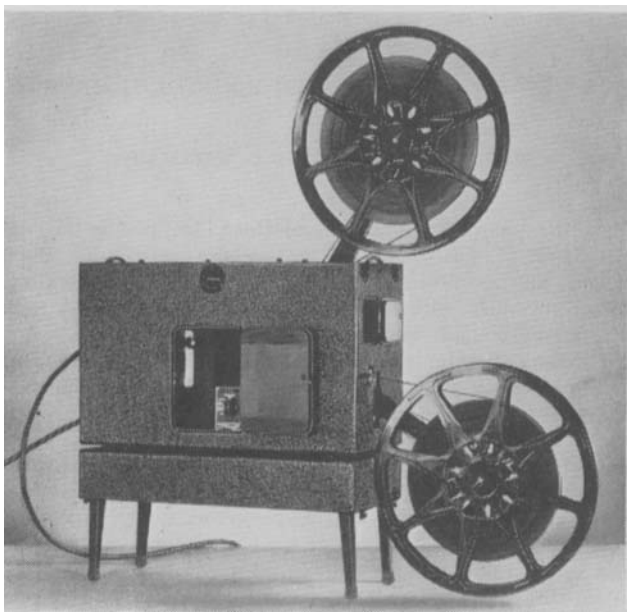

FIG. 1. Operating position for models *FB*, *FB-25*, and *FB-40* Sound Kodascopes.

essentially constant voltage on the various tube heaters in the operating range of 100–125 volts, a-c or d-c. Standard radio receiver type tubes of the metal shell or *GT* type with glass shells are used on all models.

A unique feature of the universal models is the method used in supplying plate or anode voltage for the amplifier tubes. High tube efficiency and output are obtained through the use of a combination single-unit motor-generator. By means of this device, power is provided to drive the projector mechanism, and it also provides, from the generator, a high d-c potential for the anode of the photocell and amplifier tubes. Governor control of the motor-generator unit assures constant output voltage and mechanism speed so essentail for high-quality sound and picture projection.

The last two projectors, *i. e.*, the *FS-10* and *FB-40*, are designed to operate on 50–60-cycle, 100–125-volt supply lines. Universal motors are used to drive these projectors and conventional a-c transformer-rectifier power supplies are used to supply the high d-c potential necessary for photocell and tube anodes.

Many features, such as ease of threading provided by "latchback" gates; resilient mounting of amplifier and motor units, providing freedom from microphonics; self-lubricating bearings on mechanisms and motors, assuring a mini-

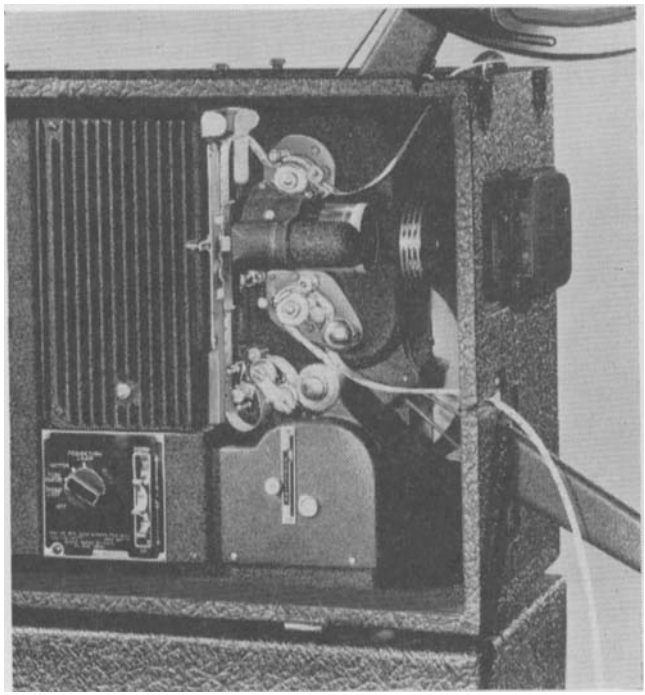

FIG. 2. Projector threaded for projection of sound-film.

mum of attention and maximum life; double-claw pull-down; aperture plate framing; and provision for the use of crystal microphone or phonograph pick-up are common to all models. Also, all projector controls are grouped in the same plane on the operator's side of the projector.

In order to reduce the mechanism noise to a minimum, models *FB*, *FB-25*, and *FB-40* have been equipped with a "blimp," or noise-reducing cover.

Provision for the reproduction of either reversal or dupe prints has been made on three models, *i. e.*, the *FS-10*, the *FB-25*, and the *FB-40*. In order to accommodate both types of film, it is necessary to shift the focus of the scanning beam from one surface of the film to the other. A carefully machined cam, guides, and lever system have been assembled so that the movement of the lever (Fig. 4)

easily shifts the focus of the scanning beam from one side of the film to the other. The scanning system is of the slitless or so-called apertureless type on all models and is characterized by greater freedom from microphonics. A standard 4-volt, 0.75-ampere, prefocus-base exciter lamp is used on all models.

Cost, accessibility, and freedom from microphonics dictated that the photocell be mounted on the main amplifier chassis for all models. A unique method of light transfer from the film to the photocell is used; it consists of a slightly bent glass rod approximately $5^1/_2$ inches long, silvered its entire length. Light, modulated by the film, falls on the end of the rod and is then transmitted through the rod to the photocell located on the other side of the sound-head. This method of light transfer permits all photocell wiring to be of minimum length. The conse-

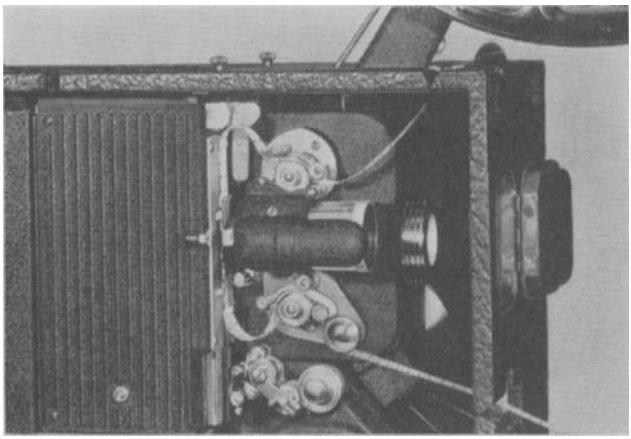

FIG. 3. Projector threaded for projection of silent film.

quent reduction of hum and stray modulation is well known to all designers and engineers responsible for sound-on-film photocell pick-up circuits.

Fig. 5 shows the entire mechanism removed from the "blimp" case or housing. It is apparent in Fig. 5 that all mechanism parts, including the flywheel, amplifier, and motor-generator, are made accessible when the "blimp" housing is removed.

On all models, a governor of the electrical, vibrating-reed type maintains constant sound speed of 24 frames per second; in addition to this, a rheostat is provided to enable the user to obtain any desired speed below 24 frames per second.

All models except the *FS-10* have a thread-lite conveniently located and controlled automatically by the main control switch. Turning off the projection lamp turns on the thread-lite.

Model *FS-10* is a single-case unit in which the speaker case acts as a carrying case for the projector when not in use. Also, the back section of the speaker case

is provided with folding legs and acts as a platform for the projector when a table is not available.

Fast rewind for all sizes of reels up to and including the 1600-ft is provided on all models through the use of a clutch, rewind lever, and main drive motor. The rewind mechanism on all models has been so designed that film damage can not occur. This feature has been accomplished by placing the rewind clutch lever in such a location that with film threaded onto the projector it is impossible to actuate the rewind lever. Also, accessory reel arms may be obtained for 2000-ft reels if desired.

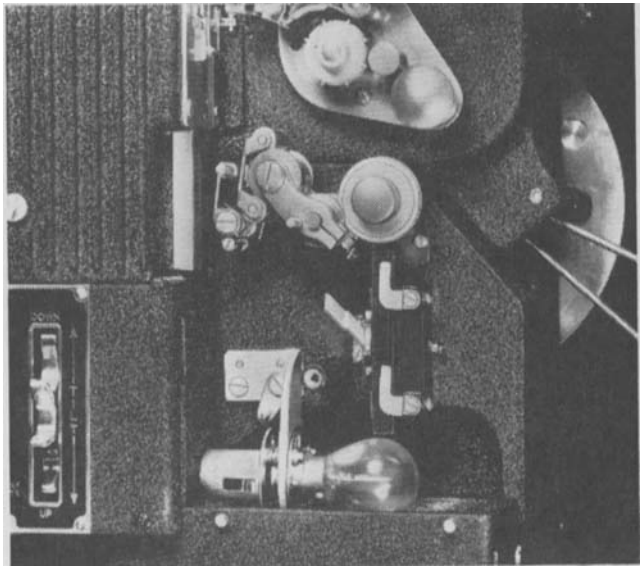

FIG. 4. Sound-head showing focusing optics and focusing lever.

Another feature common to all projectors is the use of a specially designed, oil-damped, film-driven flywheel. Uniform speed of the film at the scanning point is therefore assured.

Models *F*, *FB*, and *FS-10* provide ten watts of undistorted power output ample for most home and classroom service. Models *FB-25* (25-watt output) and *FB-40* (40-watt output) have been designed to cover large audiences. The use of twin speakers with these projectors provides good sound coverage for such assemblies. Twelve-inch permanent magnet speakers with 4.6-pound magnets are used in the twin-speaker assembly.

Model *FB-40* is provided with two jacks for inputs from phonograph and microphone plus an exciter-lamp dimmer and separate volume controls for phonograph

and microphone. Complete mixing of film, phonograph, and microphone is, therefore, possible with the input channels and controls provided.

There are six lenses available for each of the five Sound Kodascopes. They are the 1-inch, $f/2.5$; the $1^1/_2$-inch, $f/2.5$; the 2-inch lenses, $f/1.6$ and $f/2.5$; the 3-inch, $f/2.0$; and the 4-inch, $f/2.5$ lenses.

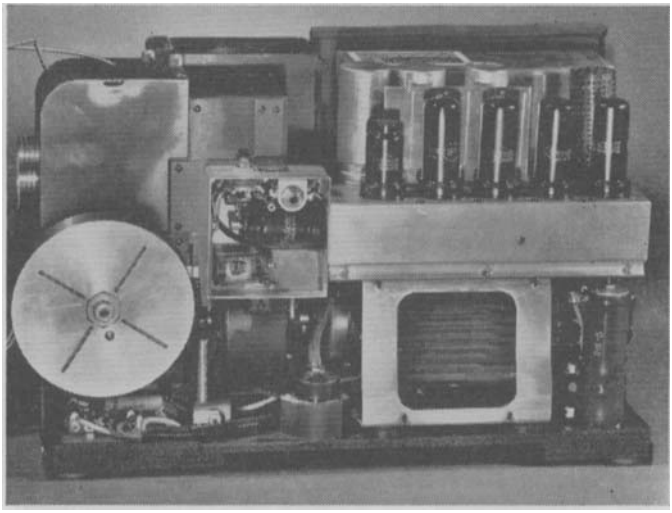

FIG. 5. Mechanism removed from "blimp."

Projection lamps of standard, medium prefocus base, construction are used, and range in wattage from 300 up to and including the 750-watt lamp recommended for large screens.

The five new projectors described fulfill a wide range of requirements in a field which demands equipment that must be reliable and economical. The design anticipates their use by many operators who have little or no experience.