KODASCOPE MODEL *E**

A. E. SCHUBERT AND H. C. WELLMAN**

The Kodascope model *E* was designed to provide optimal picture quality at a price that the average amateur can afford to pay. Heretofore, low-priced projectors have involved sacrifices as to quality, illumination, steadiness, flicker, defini-

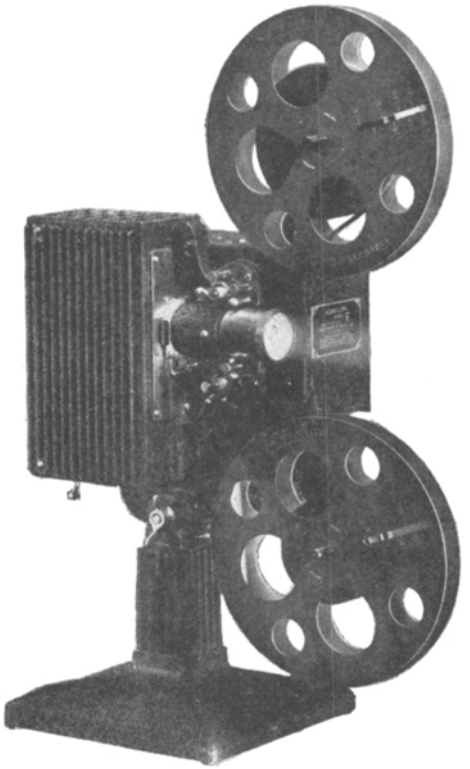

FIG. 1. Model *E* Kodascope.

tion, and mechanical noise. In the new projector it was decided that these fundamental qualities should be retained, but that some of the features that add materially to the cost and are not strictly essential might be omitted.

* Presented at the Spring, 1936, Meeting at Chicago, Ill.

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

The Kodascope *E* was the result (Fig. 1). It has neither still nor reverse, but mechanically and optically gives the maximum in performance and illumination. It is housed completely in aluminum die castings. The mechanism is rugged and extremely simple, and is designed to render satisfactory service for hundreds of hours. It has ground shafts throughout, and double bearings for all high-speed

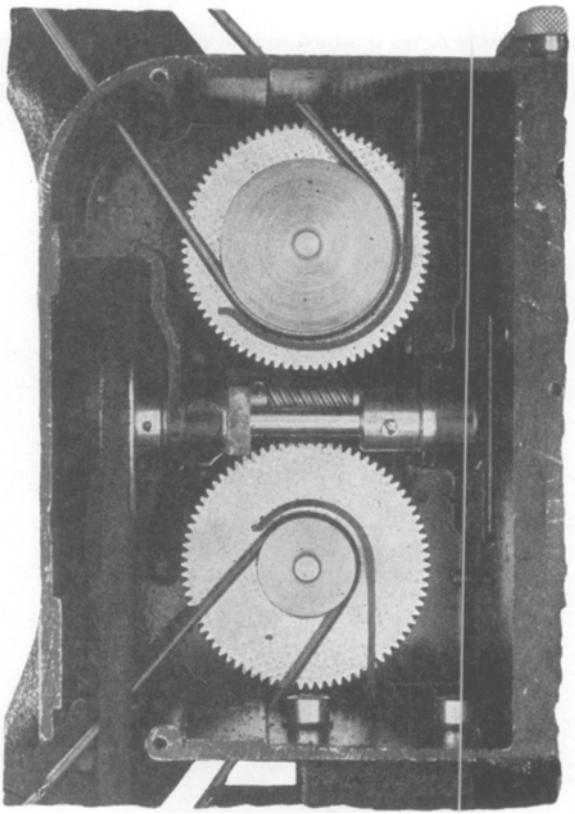

FIG. 2. Drive mechanism.

shafts to eliminate noise caused by wear. Gears are cut after the blanks are mounted upon the shafts, and each is checked for eccentricity of the pitch circle (Fig. 2). The maximum tolerance allowed in this respect is 0.0005 inch. Contacting points of the cam-operated intermittent claw are of hardened steel and phenolic composition, which eliminates metallic click from these fast-moving parts and minimizes wear. The pull-down claw is hardend at the wearing points, but straightness and flexibility are maintained by copper plating before hardening and by buffing away the plating only at the points at which wear might occur. A

three-bladed shutter, each blade of which covers an angle of 56 degrees, provides an open period of 192 degrees. Framing is accomplished by shifting the pull-down claw in relation to the aperture. After extensive research to test their worth, oil-impregnated bearings were adopted throughout, assuring permanent, positive lubrication. There are only two places to be oiled by the user of the machine, one for the pull-down claw and one for the main helical gear.

The lamp house and fan unit were designed particularly for high-wattage lamps. The very effective cooling provided results in long lamp life and maximum

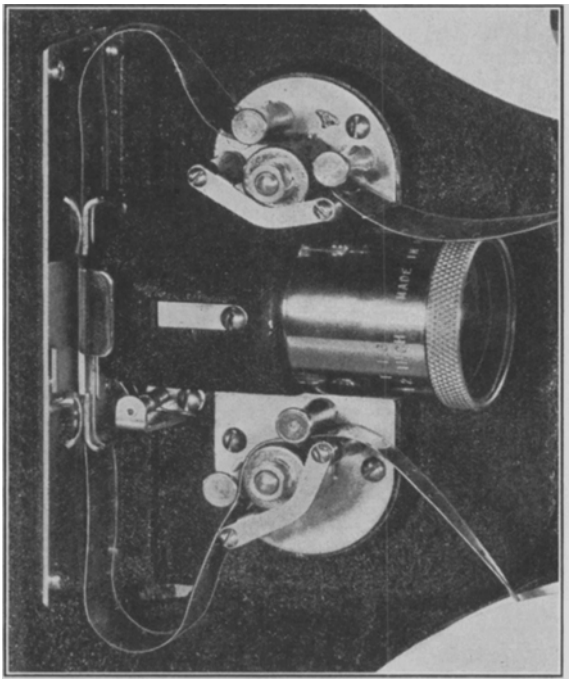

FIG. 3. Lens system and gate, showing film path.

illumination. The optical system was specially computed to provide adequate screen brilliance and picture quality, and although rigidly mounted, it is extremely accessible for cleaning. The lamp house top snaps into or out of position; the upper lamp baffle is removable; by removing the lamp, the condenser unit slips out for cleaning; and the reflector is equally accessible.

Threading is simple and conventional. The "out" position of the pull-down claw is indicated at the upper sprocket (Fig. 3). When any tooth of the sprocket is aligned to this mark, the claw is withdrawn from the gate and the film can be threaded without obstruction. Fixed film guides of hardened steel at the sprockets eliminate the necessity of opening frames or remembering to close them. Chro-

mium-plated relieved gates and aperture plates guard against wear and protect the film from being scratched or otherwise injured.

Rewinding is motor driven, simplified by a special patented reel spindle. After projecting a film, the take-up reel is merely moved into its free position, the rewind belt is placed upon the pulley, and the motor switched on.

The pedestal is of cast iron, to provide stability. The whole mechanism pivots upon the top of the base allowing a 30-degree tilt for aligning with the screen.

The model *E* will fulfill a wide range of projection requirements. While the 2-inch *f*/2.5 objective is standard equipment, the 2-inch *f*/1.6, the 1-inch *f*/2.5, the 3-inch *f*/2.0, and the 4-inch *f*/2.5 are available if desired. With these lenses, in combination with the 400-, 500-, or 750-watt lamps, it is possible to attain a maximum screen illumination of 210 lumens, a length of throw of 80 feet, and a picture $9^1/_2$ feet wide. The standard model is fitted for 400-ft. reels only. In conclusion, another feature may be mentioned. The base of the model *E* is made to fit down over the handle of the carrying case, which thus acts as a projection stand.