Feb. 12, 1924. 1,483,319

E. M. SWARTZ

MOTION PICTURE MACHINE

Filed April 28, 1923 2 Sheets-Sheet 1

Fig. 1

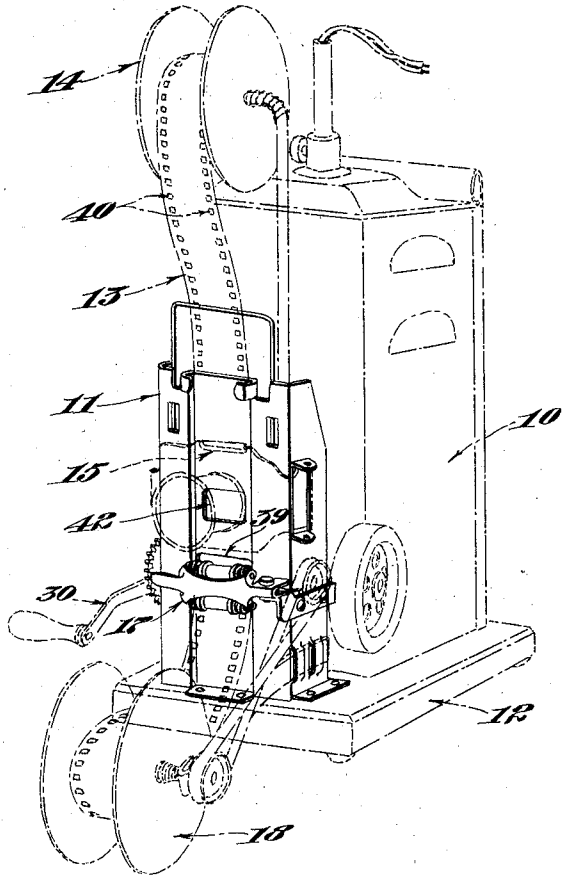
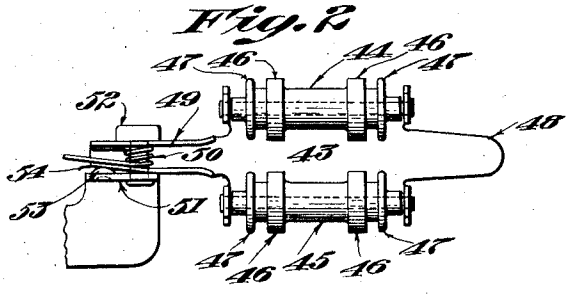


Fig. 2



Inventor
Edward M. Swartz
by Harry J. Ogden
his Attorney

Feb. 12, 1924. 1,483,319

E. M. SWARTZ

MOTION PICTURE MACHINE

Filed April 28, 1923 2 Sheets-Sheet 2

Fig. 3

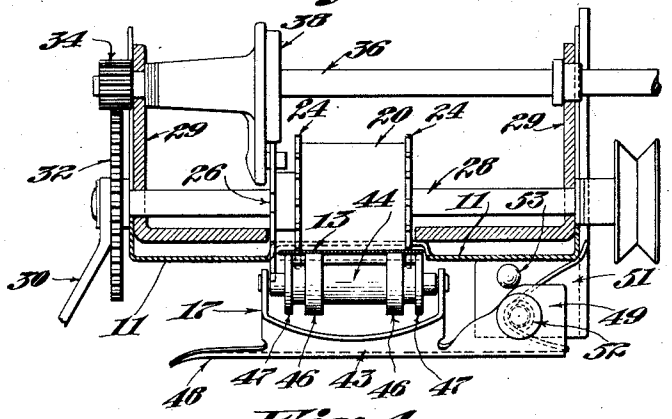


Fig. 4

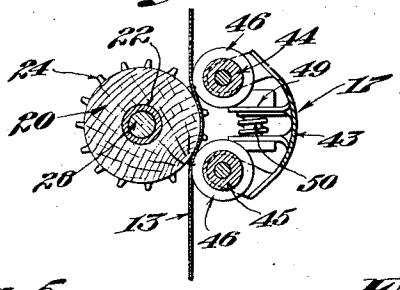


Fig. 5

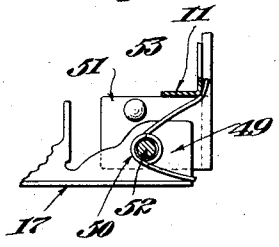
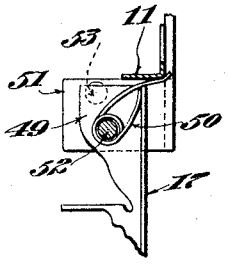


Fig. 6



Inventor
Edward M. Swartz
by Lemuel J. Ogden
his Attorney

Patented Feb. 12, 1924. 1,483,319

UNITED STATES PATENT OFFICE.

EDWARD M. SWARTZ, OF ROXBURY, MASSACHUSETTS, ASSIGNOR TO KEYSTONE MFG. CO., OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MOTION-PICTURE MACHINE.

Application filed April 28, 1923. Serial No. 635,262.

To all whom it may concern:

Be it known that I, EDWARD M. SWARTZ, a citizen of the United States, residing at Roxbury, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Motion-Picture Machines, of which the following is a specification.

This invention relates to motion picture machines and more particularly to improved film feeding mechanism for such machines.

For the purpose of disclosing the invention it will be described in connection with the "Moviegraph" illustrated in Letters Patent of the United States No. 1,345,793, granted July 6, 1920 to Isidore Marks, of Boston, Massachusetts, but the application of the invention is not limited to the particular machine illustrated. In this type of motion picture machine the film is fed by the rotation of a toothed drum, the drum being driven from a Geneva stop mechanism operated by gearing and a hand crank. In order to retain the film in feeding position against the drum, so that the feed teeth will correctly enter the marginal feed holes in the film, a film guiding plate or apron has been employed between which and the drum the film is led. It has been found that the friction thus induced wears out the film rapidly and that an ineffcient feed has been obtained because the film holes are gripped by only one or two of the teeth at each end of the drum. Furthermore the design was such that the film holding apron could be removed from the feed drum only by opening the lens frame which makes it difficult to initially thread the film in the machine or to make feed adjustments.

The objects of the present invention are to overcome the film feeding difficulties, just referred to, and to provide a film guide which is independent of any other part of the machine.

To the accomplishment of these objects and such others as may hereinafter appear, as will readily be understood from the following description by those skilled in the art, the invention comprises the features and combinations of parts hereinafter described and then particularly pointed out in the appended claims.

The preferred form of the invention is illustrated in the accompanying drawings which illustrate the invention as incorporated in a motion picture machine of the type of said patent to Marks hereinbefore referred to. In the drawings, Figure 1 is a perspective view of a complete machine the novel features being shown by full lines and the remainder of the machine by dot and dash lines; Fig. 2 is a rear view of the new film guide; Fig. 3 is a plan view of the film feeding mechanism on a horizontal section just above the feed drum and co-operating film guide; Fig. 4 is a view showing a central vertical section through the parts shown by Fig. 3, looking to the right; and Figs. 5 and 6 are fragmentary details illustrating the means for retaining the film guide in its closed and open positions, respectively.

In the embodiment of the invention illustrated in the drawings the light box 10 and feed mechanism frame 11 are mounted on a support 12 as illustrated in said patent to Marks. The film 13 is led from a reel 14 sustained upon the frame 11, beneath the pivoted lens frame 15, and between the feed drum, hereinafter described, and film guide 17 (see Fig. 3) to a rewind reel 18 carried on a bracket projecting from the frame 11, or to the floor if a rewind reel is not employed.

The feed drum comprises a spool 20 (Figs. 3 and 4) on a hollow hub 22 which also supports end sprocket wheels 24 and an outside star wheel 26 all as disclosed in Letters Patent of the United States, No. 1,411,926, granted April 4, 1922 to Isidore Marks. The feed drum is slipped loosely on a shaft 28, journaled in a reinforcement 29 (Fig. 3) of the frame 11, which is rotated directly by a hand crank 30. Intermittent rotary motion is transmitted to the feed drum through intermeshing gears 32 and 34 on shaft 28 and a parallel shaft 36 which latter carries the Geneva motion driver 38 for engaging the star wheel 26. The drum projects through an opening 39 in the frame the sides of which hold it on its shaft in position for actuation by the driver 38. If the film 13 is held in contact with the spool 20 then the teeth of the sprockets 24 will engage the marginal feed holes 40 of the film and on turning the crank 30 the film will be advanced past the lens and shaft of light which flows through the window 42 in the frame 11.

With a film feed of this character it is highly important that the feed drum secure a firm grip on the film. In order to advance

the film regularly, without slip, it is requisite that the film be so held to the drum that three or four sprocket teeth are continually engaging in the marginal feed holes. An engagement by one or two teeth at a time is not sufficient as practice has demonstrated that then the film is liable to slip, resulting in a tearing of the feed holes and consequent skipping of the projected pictures. Accordingly the film guide 17 is constructed and arranged to maintain a contact between the film and drum over substantially a quarter of the cylindrical surface of the spool 20 (see Fig. 4) and with fifteen or sixteen teeth on each sprocket wheel 24, as illustrated, this insures a steady feed without a film tearing tension from any single tooth.

The film guide 17 is produced from a metal stamping, shaped as shown in the drawing, and comprises a back bone 43 having two pairs of inturned end lugs in which are loosely journaled upper and lower pressure rolls 44 and 45. The spacing of these rolls is such that a substantial portion of the feed drum lies between their two bearing points. Each pressure roll is provided with two bearing collars 46 just inside each sprocket wheel 24 and with two thinner bearing collars 47 outside the collars 46 and engaging the extreme margins of the film. With this construction the film is prevented from curling and by being held flat against the feed drum an accurate and steady feed thereby is ensured. The smaller diameter of the pressure rolls between the collars 46 and 47 provides clearance in which the sprocket teeth may work (see Fig. 3). One end of the back bone 43 is extended to form a handle 48 and the other end is bent to a channel shape (Figs. 1 and 2) forming a housing 49 for a grass hopper spring 50. The film guide is pivotally mounted on a shelf 51, formed on a bracket secured to the frame 11, by means of a vertical pivot pin 52 passed vertically through the housing 49 and permitting the guide to be swung in a horizontal plane toward and from the film. The spring 50 is mounted within the housing, as shown in Figs. 5 and 6, to continually maintain the guide closed with the rolls 44 and 45 holding the film against the feed drum, (see Figs. 3 and 4). The shelf 51 is provided with a knob 53 (Fig. 3) which is clear of the housing 49 when the film guide is closed but which is engaged by the housing when the guide is open (Fig. 6). The lower wall of the housing is bent upward slightly, as at 54 (Fig. 2), and by engagement with the knob 53 serves to retain the guide in open position against the force of the closing spring 50.

By opening both the lens frame 15 and film guide 17 the vertical film channel in the frame 11 is cleared for the initial positioning of the forward end of the film, either hanging vertically in the channel or attached to the rewind reel 18. On closing the lens frame the film is held in the channel and this permits the operator readily to manipulate the film to bring one of its pictures into registry with the window 42 and its feed holes 40 into engagement with the feed drum sprocket teeth. This being accomplished the film guide 17 is closed holding the film in proper adjusted position for a correct projection of the picture. Should trouble with the feed develop it can be remedied by opening the film guide alone, leaving the lens frame in closed position, holding the film in its guide channel.

The nature and scope of the invention having been indicated and the preferred form of the invention having been specifically described, that which is claimed as new, is:—

1. In a motion picture machine, a shelf, a film guide having a channel-shaped end pivotally mounted on said shelf by said end, one wall of the channel being against the shelf and having its edge bent upward therefrom obliquely, a spring for turning the guide about its pivot into closed position, and a knob on the shelf for engaging said oblique channel wall as the guide is opened, whereby the friction holds the guide in its open position.

2. A film guide for motion picture machines comprising a metal stamping providing a handle at one end, a channel housing at the other end, and two anti-friction rolls mounted intermediate said handle and housing.

3. A film guide for motion picture machines comprising a metal stamping providing a handle at one end, a channel housing at the other end, two pairs of spaced lugs extending inward intermediate said handle and housing, and two anti-friction rolls journaled in said lugs with their axes parallel.

EDWARD M. SWARTZ.