

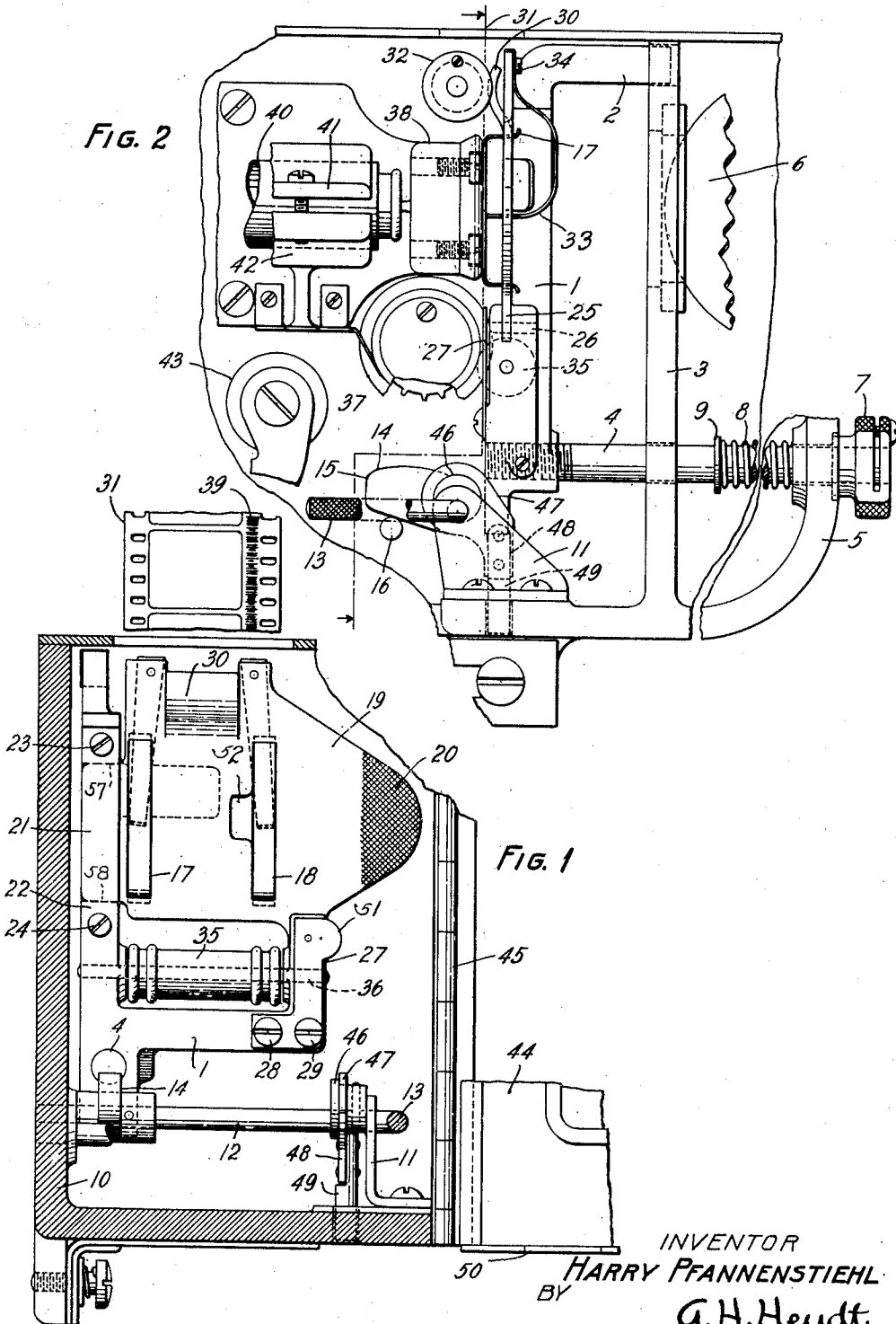
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MOTION PICTURE APPARATUS

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MOTION PICTURE APPARATUS

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This invention relates to improvements in film feeding devices, as for example, those used in motion picture projection machines and cameras.

5 The object of this invention is to provide an arrangement which shall minimize the operations of the projectionist and at the same time enable him more readily to check the condition of the machine as to its readi-
10 ness for operation.

In most present day motion picture projection it is usual to provide two machines, one of which is prepared for operation with the next reel, while the other machine is in
15 operation. When sound projection is added to the picture projection the duties of the projectionist are to some extent increased and it becomes desirable to save his time in every way possible, in order that his preparation
20 of the second machine may be completed before the completion of the run of the other machine.

In sound accompanied motion picture working one method which has become well
25 known uses a single film for both the picture and sound record. The film after passing through the projector head passes a point of illumination so that the light transmitted through the film varies in accordance with
30 the photographic record on the film. These variations in light correspondingly affect a photoelectric cell whose output may be amplified and fed into suitable electro-responsive devices by which the sound is reproduced.
35 In passing the point of illumination it is necessary that the film be held smoothly against an aperture plate by means of a pressure foot. This practice is, of course, analogous to that used in the ordinary projector
40 head. It is also, of course, necessary that there be a power driven sprocket roller to draw the film past the aperture. A film retaining roller must be provided to cooperate with the sprocket. While the film is
45 being threaded into the machine the pressure foot and retaining roller are held out of engagement with their respective cooperating apparatus. Before the machine can be run it is necessary that both the pressure foot and
50 the retaining roller be brought into opera-

tive position. In conventional arrangements this requires two operations, one for the pressure foot and one for the retaining roller.

It is a feature of this invention to provide a mounting for a pressure foot and film retaining roller so that they may be simulta-
55 neously either put out of or into engagement with their cooperating parts by means of a single lever.

It is usual to house the aperture plate, drive sprocket, pressure foot and film retaining roller of the sound projecting device in a separate compartment, for which a suitable door is provided. It is an operating
60 regulation that the machine must not be started until this door is closed. Normally, it would be possible for an operator to close the door of this compartment after which there would be nothing to indicate the fact that the pressure foot and film retaining
65 roller were not in proper position, in case he had neglected to so place them. According to the present invention and as an added feature thereof, a stop has been provided which will prevent the closure of the com-
70 partment door in case the pressure foot and film retaining roller are out of operative position. This stop is controlled from the same mechanical system as the pressure foot and retaining roller and when these are properly
75 placed the door may be closed. As a result, in case the projectionist attempts to close the door and finds that he cannot do so, he is provided with a simple, convenient and positive warning that he must release the pres-
80 sure foot and retaining roller assembly before starting his machine.

An added feature of the invention may be found in the specific structure of the pressure foot or pad, whereby it is possible to attain a satisfactory result in an economical
85 and simple manner.

A more complete understanding of the invention may be had from the following detailed description, reference being had to the
90 accompanying drawings.

In the drawings Fig. 1 is a front elevation of the device with the enclosing compartment shown partially in section, and Fig. 2
95 is a side elevation of the device wherein it is

shown with related parts of the device of which it forms a part.

Referring now to Fig. 1 it may be seen that an L-shaped frame 1 is provided as a carriage for the retaining roller and pressure pads. This frame is a casting and has a rearwardly extending arm 2 best seen in Fig. 2. The arm 2 is rectangular in section and registers with a rectangular aperture in the side wall 3 of the compartment frame. A rod 4 is threaded into the lower portion of the carriage and secured therein by means of a set screw. The rod 4 passes through a circular aperture in the compartment wall and extends through the wall 5 of the compartment which houses a photoelectric cell, a portion of which has been indicated at 6. Motion of the rod 4 and frame 1 is limited by means of a knurled knob 7 secured to the outer end of this rod. The rod and carriage tend to move to the left under the pressure of a spiral spring 8 which surrounds rod 4 and which bears on the inner face of wall 5 and against a collar 9 secured to the shaft 4. It may be seen that the tension of the pads against the film and aperture plate and the tension of the roller against the sprocket can be readily altered by changing the position of rod 4 in the carriage 1.

Suitably journaled in the rear wall 10 of the housing compartment and in a standard 11 is an operating shaft 12 which may be rotated by means of a bent over end forming a lever 13. This lever has been shown partially broken away in Fig. 2 in order to allow the clearer portrayal of various parts of the apparatus. Fixed to shaft 12 is a cam 14 which when rotated by the raising of lever 13 forces the carriage 1 to the right against the tension of spring 8. After the cam has been rotated through 180°, the flat portion 15 of its contour rests against frame 1 to hold the carriage locked in its inoperative position. It is obvious that during motion of the carriage, arm 2 and its cooperating rectangular aperture serve to form a guide to steady the motion of the carriage. A stop 16 is provided to limit the movement of cam 14.

The pressure pads 17 and 18 are carried by a separate plate 19. The plate is provided with a knurled extension 20 whereby it may be conveniently grasped for removal from the carriage. The plate 19 is provided with a tongue 21 which may be inserted in a depression in frame 1. The upper and lower edges of the tongue 21 and the depression are shown by dotted lines 57 and 58. A flat spring 22 is secured to the frame 1 by means of screws 23 and 24 to hold the tongue 21 in the depression. This spring permits the tongue 21 to be easily inserted or withdrawn from the depression even though the thickness of material for plate 19 is greater than the depth of the depression. The right-hand edge of the plate 19 fits into a slit 25, best seen in Fig. 2.

This slit is formed in the upwardly extending right-hand portion of the L-shaped carriage 1. The plate 19 is held firmly in position on the carriage by means of a pin 26 which registers with a suitably disposed aperture in plate 19. The pin 26 is spring pressed inwardly by means of a leaf spring 27 which is secured to the bottom of frame 1 by means of screws 28 and 29. A tab 51 on this leaf spring is provided to simplify the removal and insertion of plate 19 into position on carriage 1. The plate 19 is provided with a curved surface 30 which forms a guide for holding the film 31 in proper relation with respect to the idler roller 32 after it enters the compartment which houses the sound reproducing equipment.

The pads 17 and 18 are U-shaped punchings which are loosely mounted in slots in plate 19. Each of these pads is spring pressed to the left as seen in Fig. 2 by means of a light leaf spring 33 secured at convenient points on plate 19 by means of screws 34. The ends of the pads are curled over so as to prevent the pressure of spring 34 from driving these pads through the plate 19 when the carriage is moved to the right.

Referring now to Fig. 2 it will be seen that a retaining roller 35 is freely rotatable about a shaft 36 which is secured in the U-shaped lower portion of carriage 1. This retaining roller cooperates with a driving sprocket 37 which imparts motion to film 31 to draw it past an aperture in the plate assembly 38.

In the arrangement shown the sound reproduction is in accordance with the variations in the light transmitted through the film which bears a sound record 39. A light from a source from the constant intensity, not shown, is transmitted through a lens tube 40 which concentrates a narrow band of light on the film as it passes the focal point of the lens system. The light passes through the film and an aperture 52 in the plate 19 after which it falls on the photoelectric cell whose current output is varied in accordance with the variations in density of the sound record. The output of the photoelectric cell is then suitably amplified and supplied to loud speakers properly disposed. As may be seen in Fig. 2 the lens tube 40 is held in clamping members 41 and 42. The film after passing the driving sprocket 37 and retaining roller 35 passes over an idler roller 43 and thence to a take up reel placed at a convenient location.

The compartment which houses the sound reproducing equipment and pressure pad assembly is provided with a door partially indicated at 44, Fig. 1. This door is hinged to the compartment by means of a continuous hinge 45. It is an operating requirement that the projectionist close this door before starting his machine. It is to be understood that it is necessary to move the pressure pads

and retaining roller assembly to the right in order to allow the projectionist to thread the film into the machine. If now the machine is started without returning the pressure pad and retaining roller into operative relation with their respective cooperating elements the film will not be held smoothly against the aperture plate nor will it be held firmly on the sprocket 37. As a result there will be a flutter in the film which will cause inferior reproduction and there will be the added probability that the film will disengage itself from sprocket 37 which will cause the film to pile up elsewhere in the machine and probably tear.

In order to provide a simple and convenient way of assuring that the projectionist has placed the pressure pad and retaining roller in proper position before starting his machine an arrangement has been provided whereby the compartment door cannot be closed until these devices are in proper position. In order to accomplish this an eccentric 46 is secured to shaft 12 and rotates therewith. This eccentric operates as a cam to move a member 47 in a vertical direction. The member 47 is connected by means of a pivoted link 48 to a rod 49 which passes through an aperture in the bottom of the compartment housing. When lever 13 is thrown to the right rod 49 is forced downward so that the end of it projects below the outer surface of the compartment floor. The door 44 is provided with a plate 50 so placed with respect to door 44 that it will engage the end of rod 49 shortly before the door reaches its closed position. The projectionist failing in an attempt to close the door is at once notified that he has failed to place the pressure pads and retaining roller in proper position. Incidental to so placing them the end of rod 49 is withdrawn from the path of plate 50 and the door may be closed and the machine started.

What is claimed is:

1. In a device for moving a film past an aperture plate, a driving sprocket for imparting motion to said film, a retaining roller for holding said film against said driving sprocket, a spring pressed pad for holding said film evenly against said aperture plate, a device operable to move said roller and pad into and out of operative position, a compartment for containing said apparatus, a door on said compartment, a movable stop to prevent or permit closure of said door, a device operable to move said stop and a single means for operating said devices.

2. In a device for moving a film past an aperture plate, a driving sprocket for imparting motion to said film, a spring pressed pad for holding said film evenly against said aperture plate, means to move said pad into and out of operative position with respect to said aperture plate, a compartment for con-

taining said apparatus, a door on said compartment, a movable stop to prevent closure of said door, means to move said stop, and a single operating member for separately and simultaneously operating both aforesaid means to control the said movement of said pad and stop.

3. In a device for holding a film against an aperture plate, a pair of U-shaped guide rails, a mounting plate, said rails being movably mounted in slots in said mounting plate, a light pressure spring tending to thrust each of said guide rails away from said mounting plate and against said film and aperture plate, an elongated member for governing the position of said mounting plate and the pressure of said guide rail spring, a spring for pressing said member and mounting plate into said position, means to move said mounting plate away from and toward said aperture plate against the spring pressure exerted on said member, an operating lever for imparting motion to said means and mounting plate, and means to adjust said member and consequently the pressure of said rails on said aperture plate.

4. In an enclosed device for moving a film past an aperture plate, a member movable into and out of an operating position, a compartment having a door for enclosing said device during operation, a door-stop to prevent the closure of said door to indicate that said member is not in position for operation, a control unit operable for positioning said movable member and said door-stop and means in said control unit for automatically correlating the position of the movable member and door-stop.

5. In an enclosed device for moving a film past an aperture plate, a film driving sprocket, an adjustable unit comprising a film pad for pressing a film evenly against said plate and a film retaining roller for holding a film against said driving sprocket, a door for said enclosure, a door-stop arranged for adjustment according to the adjustment of said unit, a pair of cams operable for correlating the positional adjustment of said unit and door-stop, and a lever for simultaneously operating said cams.

6. In an enclosed device for moving a film past an aperture plate, a film driving sprocket, a member, having thereon a film pressure pad and a roller, movable into and out of engagement with said aperture plate, a door for said enclosure, a door-stop to prevent the closure of said door to indicate that said member is out of engagement with said plate, a control unit for positioning said movable member to carry said pad and roller into and out of operative relation with said aperture plate and sprocket and for positioning said door-stop, and means in said control unit for automatically correlating the position of the movable member and the door-stop.

7. In a device for moving a film past an aperture plate, a pressure-foot, a film retaining roller, a movable member for positioning said foot and roller into and out of engagement with said film, a rigid member for guiding the movement of said movable member, a door hinged to said rigid member, a door-stop to prevent the closure of said door to indicate that said member is out of engagement with said film, a control unit operable for positioning said movable member and said door-stop, and means in said control unit for automatically correlating the position of the movable member and the door-stop.
8. In an enclosed device for moving the film past an aperture plate, a movable member having a film pad and film retaining roller thereon, a compartment having a door for enclosing said device during operation, a door-stop to prevent the closure of said door to indicate that said member is not in position for operation, a shaft having two cams thereon, one for positioning said member and one for positioning said door-stop, and a lever for turning said shaft and consequently said cams for placing said member and stop in correlated positions.

In witness whereof, I hereunto subscribe my name this 19th day of June, 1928.

HARRY PFANNENSTIEHL.

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