Dec. 1, 1931. F. H. OWENS 1,834,496

INTERMITTENT FILM MOVING MECHANISM

Original Filed Oct. 18, 1928

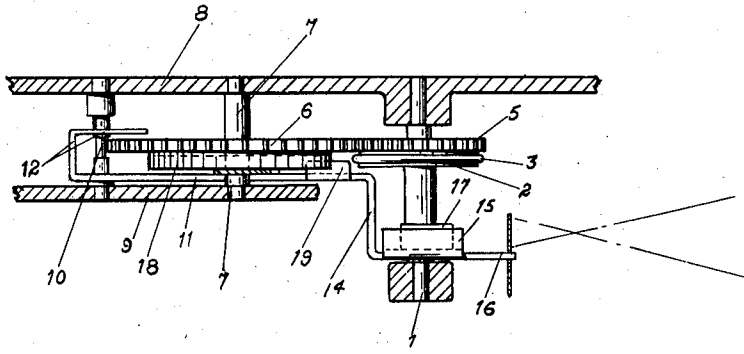


Fig. 1.

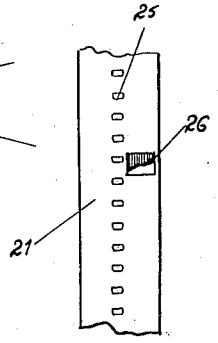


Fig. 2.

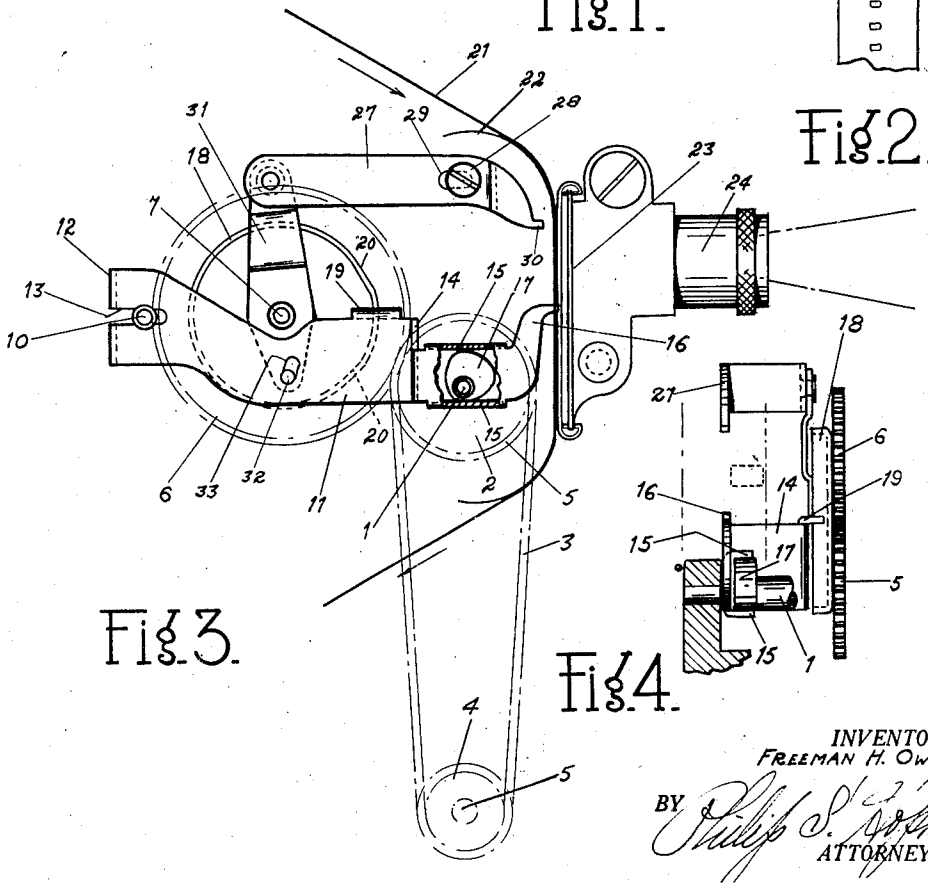


Fig. 3.

Fig. 4.

INVENTOR.
FREEMAN H. OWENS.
BY Philip S. Hopkins
ATTORNEY

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UNITED STATES PATENT OFFICE

FREEMAN H. OWENS, OF NEW YORK, N. Y., ASSIGNOR TO OWENS DEVELOPMENT CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

INTERMITTENT FILM MOVING MECHANISM

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My invention relates to an improvement in intermittent film moving mechanism and has for its primary object the provision of a simple, economical and effective film moving device of the intermittent type.

Another object of my invention is to provide in combination with the film moving device a film holding member operable by and in proper timed relation with the film moving claw.

Other objects and advantages in details of construction and arrangement of parts will be apparent as the description proceeds, reference now being had to the figures of the accompanying drawings forming a part of this application and wherein like reference numerals indicate like parts.

In the drawings:—

Figure 1 is a top plan view partly in section illustrating my invention.

Figure 2 is a detail view showing a strip of film of one form with which my improved mechanism is particularly adaptable.

Figure 3 is a side view of the intermittent mechanism, certain parts being broken away for clearness.

Figure 4 is a detail front view of the mechanism.

In carrying out my invention, I provide a main driving shaft 1, receiving its driving power by means of a pulley 2, mounted on the shaft, and a belt 3 passing over the pulley and around a pulley 4 on the shaft 5 constituting the power source. This shaft 5 may be the armature shaft of a motor.

Also mounted upon the shaft 1 is a gear 5 meshing with a gear 6 upon a stub shaft 7 suitably journaled between the supports 8 and 9.

Also supported by the supporting plate 8 and 9 and extending between them is a guide pin 10, the purpose of which will be presently apparent.

Mounted in operative relation to these elements just described is a film moving shuttle 11 having its rear end bent at right angles and then back parallel with the body portion thereof as at 12. This end of the shuttle 11 is slotted as at 13 to receive the guide pin 10 whereby the shuttle 11 is guided in its longitudinal movement and at the same time permitted to rock pivotally upon the pin 10.

The shuttle 11 is offset intermediate its ends as at 14 and at a point just beyond the offset 14 is provided with inwardly turned laterally extending spaced flanges 15. Beyond these flanges 15 the front end of the shuttle 11 is formed as a film engaging claw 16.

Mounted upon the shaft 1 and positioned directly between the lateral flanges 15 of the shuttle is a cam 17, which serves as a support for the front end of the shuttle and also provides means for vertically reciprocating the claw 16; that is, rocking the shuttle vertically on its pivot.

Rotatable with the shaft 7 and preferably carried upon the gear 6 is a cam ring 18, the peripheral edge of which is adapted to be engaged by the bifurcated lug or ear 19 on the shuttle 11. This lug 19 is preferably integral with the shuttle 11 and is turned at right angles from the upper edge therefor for engagement with the cam ring 18. Obviously therefore, rotation of the cam ring 18 will cause the shuttle 11 to reciprocate longitudinally inasmuch as the lug 19 follows the cam ring including the inwardly formed portions 20 thereof.

Obviously, the cam 17 effects one complete vertically reciprocating film feed and return movement of the claw 16 with each revolution thereof. Likewise the cam ring 18 effects one complete longitudinal film engaging and return movement of the claw 16 with each revolution thereof. The two cams 17 and 18 are arranged in such timed relation that the cam 18 will effect film engaging and disengaging movement on the part of the claw with but one of each plurality of feeding movement of the claw, and as preferably constructed, the film is advanced during but one of each two revolutions of the cam 17. The result of this timed relation between the cam and the shuttle is that the film advancing periods are relatively short and the rest periods are correspondingly long.

An independent film engaging member 27 is provided for sliding movement into and

out of engagement with said film and supported by the pin 28 engaging in the elongated slot 29 in said member. One end of this member 27 is formed as a claw as at 30 and the opposite end has pivoted connection with the upper end of a link 31 pivoted intermediate its ends on the shaft 7. The lower end of this link is provided with a pin 32 engaging in a slot 33 in the shuttle 11. The result of this arrangement is that when the shuttle 11 is moved out of film engaging position, the link 31 will move the member 27 into film engaging position, whereby to hold the film against movement during the rest or projection period. Obviously, also, upon movement of the shuttle 11 into film engaging position, the member 27 will be withdrawn from the film, permitting the claw 16 to feed the same.

A strip of motion picture film 21 is led over a guide member 22 and is held in flat engagement therewith by a suitable film gate 23, for projection through the usual lens member 24.

I have illustrated one form of motion picture film with which my intermittent mechanism is particularly adaptable, but it will be clearly understood that I do not limit myself thereto. This film 21 is as shown clearly in Figure 2 provided with a single central row of perforations at 25, leaving spaces on each side thereof for the picture frames 26. The claw 16 engages the central perforations 25 and the illuminating arrangement for the projection of the picture frame (not shown) is in such case so positioned as to project through one row of picture frames only. With this type of film, the same may be reversed and the row on the opposite side of the perforations projected. It will be obvious to those skilled in the art, however, that my improved film moving mechanism is equally adaptable to the regular standard motion picture film having perforations along the edge thereof. Obviously, also, the film moving member 11 could be provided with two claws instead of the single claw 16 if desired. Many other changes in details of construction and operation may be made without departing from the spirit and scope of my invention. I do not limit myself therefore, to the exact structure herein shown and described other than by the appended claims.

I claim:

1. An intermittent film moving mechanism comprising a shuttle having a claw at one end and a slot at its opposite end, means engaging in said slot for supporting and guiding said shuttle at that end, a cam engaging said shuttle adjacent said claw for supporting and moving the same for film feeding and return, a bifurcated lug on said shuttle and a second cam engaging said lug and operated in timed relation to said first cam for moving said claw to and from film engaging position, and a film engaging stop member operated by said shuttle to film engaging position during the period when said claw is out of film moving position.

2. An intermittent film moving mechanism comprising a shuttle plate having a claw at one end and a slot at the other end, a pin engaging in said slot forming a pivot and guide for said shuttle, a pair of spaced flanges on said shuttle, a cam rotatable between said flanges for reciprocating said shuttle and claw for film feeding and return, a bifurcated lug on said shuttle and a second cam engaging said lug and operable in timed relation to said first cam for moving said shuttle and claw to and from film engaging position.

3. An intermittent film moving mechanism comprising a shuttle plate having a claw at one end, a pair of spaced flanges extending laterally from said shuttle, a rotatable cam between said flanges for reciprocating said shuttle for film feeding and return, a bifurcated lug on said shuttle, and a second rotatable cam engaging said lug and operable in timed relation to said first cam for moving said shuttle to and from film engaging position.

In testimony whereof, I affix my signature.

FREEMAN H. OWENS.