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LOOP FORMING WING FOR MOTION PICTURE MACHINES.

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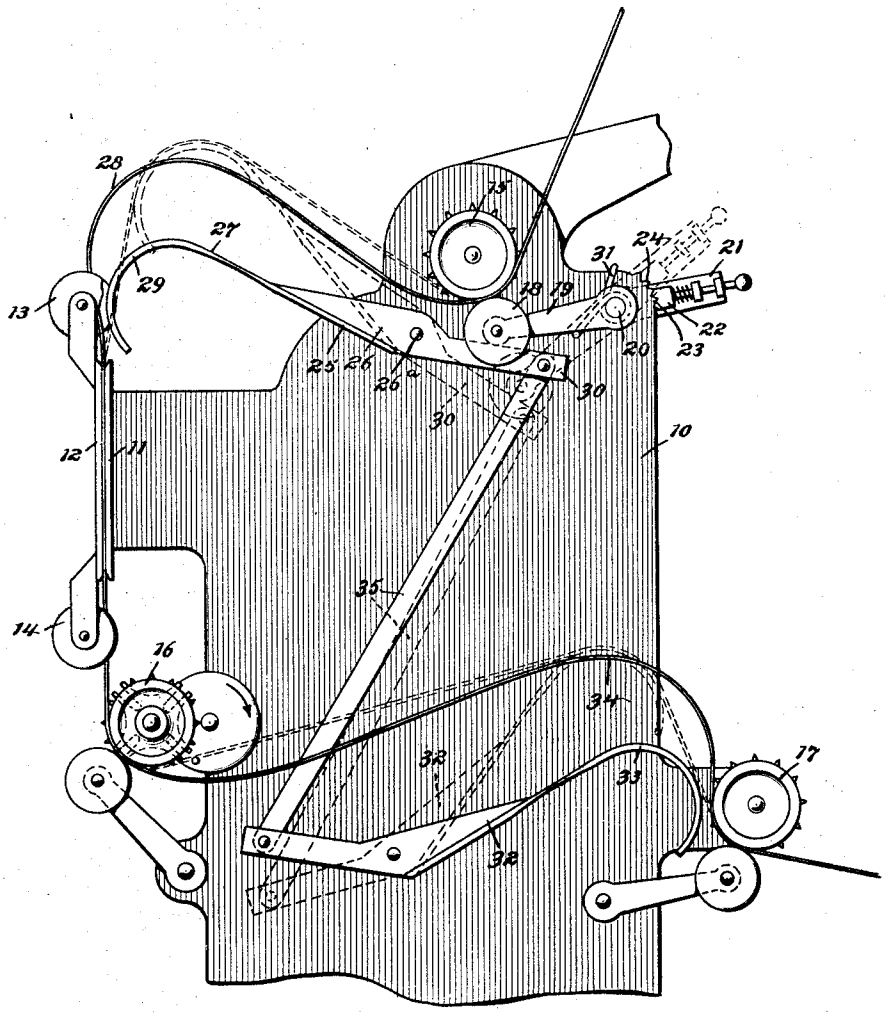

WITNESS

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LOOP-FORMING WING FOR MOTION-PICTURE MACHINES.

1,282,437. Specification of Letters Patent. Patented Oct. 22, 1918.

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To all whom it may concern:

Be it known that I, PHILIP F. KRUG, a citizen of the United States, and resident of New York city, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Loop-Forming Wings for Motion-Picture Machines, of which the following is a specification.

My invention relates in general to a moving picture machine which may be either a camera or a projector and more specifically relates to an improved means for forming one or two loops in the portions of the film to the outside of the several feed sprockets.

While the invention particularly disclosed in this application is directed to a loop forming device, it is to be understood that the invention herein disclosed constitutes part of a moving picture machine construction designed and arranged so that the picture film may be threaded through the machine with the least possible effort, so that this invention primarily has for an object the providing of means for facilitating a rapid threading of the film through the machine and into its most perfected position.

More specifically considered the invention relates to a means for insuring the proper amount or length of loop or slack play in the film formed at the time the film is threaded through the machine, so that when the film is passed once over its path, it will be accurately set and further any path defining parts not necessary to the succeeding actuation of the machine, may be quickly removed from contact with the film.

While it is admittedly not new to form a loop in the film by mechanical means, it is universally true that the present means for effecting the formation of the loop is objectionable among other reasons, because the film has heretofore been engaged by a small diametered member which frequently has the effect of cracking and even breaking the film when the member is suddenly snapped into engagement therewith. It is to be understood that while a small diametered wheel or other member may be utilized to engage the film, for instance, a small sprocket wheel or roller for changing the direction of the film having been used with satisfaction the sharply curved path which the film is compelled to take under these conditions has little if any effect on the film. However, an entirely different action on the film results from snapping these small diametered wheels into engagement with the film or even by pulling the film quickly about the rollers, as frequently happens in the necessarily hurried action incidental to the usual threading of the machines during a performance.

Accordingly, one of the objects of my invention is to provide a type of loop forming device which can be snapped quickly into engagement with the film and at the same time which will minimize the danger of cracking the film by this sudden engagement.

In some types of motion picture machines, it is necessary or at least desirable to form two loops and incidental to the underlying feature in this device relative to the facilitating of the rapid threading of the film through the machine, it is a further object of this particular invention to provide a means for forming both loops simultaneously and incidentally to move one or more of the guide rollers near the feed sprockets into an inoperative position simultaneously with the moving of the film forming members into their operative position.

Still another object of the invention is to provide a convenient form of manual control for moving one or both loop forming members to and from their operative position and a still further object is to provide a simple form of locking device for locking these members in either of their two positions.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and in part will be more fully set forth in the following particular description of one form of mechanism embodying my invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.

In the drawing, the figure is a side elevation of a portion of the moving picture machine including a preferred embodiment of my invention and showing the film engaging members in their normal inoperative position in full line and in operative position in dotted line.

In the following description and in the claims, parts will be identified by specific names for convenience of expression but they are intended to be as generic in their application to similar parts as the art will permit.

The machine includes a casing 10 which

contains the driving mechanism, constituting the several film feeding means usual with devices of this character. The casing supports the aperture plate 11 and film gate 12 together with the guide rollers 13 and 14 mounted respectively adjacent the top and bottom of the aperture plate. The film feeding mechanism includes the upper feed sprocket 15 positioned to the rear of and adjacent the upper portion of the aperture plate, the intermittent feed sprocket 16 positioned adjacent the lower portion of the aperture plate and the take-up sprocket 17 positioned to the rear of the sprocket 16, all as is usual with devices of this character.

The usual guide roller 18 for holding the film into engagement with the upper feed sprocket is pivotally mounted upon a supporting arm 19 in turn fixed to a shaft 20 mounted in the rear portion of casing 10 to the rear of the feed sprocket 15. A handle 21 projects rearwardly of the machine to clear the same and has its forward end fixed to the shaft 20 so as to rotate the same and thus swing the arm 19 and roller 18 toward and from the sprocket 15. The roller 18 is held either in the full line, in the dotted line or in any intermediate position shown by means of a conventional form of spring latch 22, the notch head 23 of which engages in teeth 24 suitably formed on the casing 10, so as to lock the roller and parts actuated thereby in the operative film engaging, in the inoperative position illustrated or in any intermediate position when it is desired to vary the extent of the upper loop.

A loop forming member 25 in the form of a lever has a body portion 26 relatively rigid and pivotally connected to the casing 10 by means of a pivot pin 26ª positioned below and slightly in advance to the axis of the sprocket 15. The body portion is provided with a long resilient extension 27 designed to engage the portion of the film between the sprocket 15 and the upper end of the aperture plate to form the film into the upper loop 28. This resilient member is J-shape in side elevation, the curved portion 29 of which engages the film and bends the same into a large arch. In order to identify the arch it may be said that it is much flatter than the arch of the feed sprocket 15, or of the other film engaging and direction changing members usually found in motion picture machines. As this end portion of the loop forming machine is preferably made of some flat and highly resilient material, it is advisable that this member, when in inoperative position, should be spaced from the film and should not engage the same and constitute a presser roller at the aperture plate. In order to space the resilient end of the member 29 from the aperture plate, the pivot 26ª is so disposed that the necessary loop may be formed when the member is in the dotted line position but this film forming member will be spaced from the aperture plate and any other film engaging parts when the member is lowered into an inoperative position. The body portion of the film forming member is extended rearwardly to form a bearing plate 30 designed to be normally disposed in the path of the guide roller 18 and so arranged that when the guide roller is lowered from the full line position into the dotted line position, it will bear on the extension to raise the film engaging end 27 into engagement with the film.

In order to shift the roller into its operative sprocket engaging position, a spring 31 has one end affixed to the machine; is looped about the shaft 20; and has its other end engaging the arm 19 and acting thereon to raise the same into the full line position shown.

In order to form the lower loop, a forming member 32 similar to the member 26, hereinbefore described, is pivotally mounted to the frame 10, between the intermittent feed sprocket 16 and the take-up sprocket 17 and in such a position as to cause the resilient film engaging part 33 of this member to engage the portion of the film between the intermittent sprocket and the take-up sprocket to move the same in the direction opposite to the direction of movement of the upper loop forming member and in this manner forms a lower loop 34. A connecting link 35 has opposite ends pivotally connected to the rearward extensions of both of the loop forming members.

In operation and when it is desired to thread the film through the machine the handle 21 is raised from the full line to the dotted line position, which action causes the roller 18 to move away from its sprocket 15 and to swing the film engaging members from the full line into the raised dotted line positions shown. The film is then looped under the sprocket 15, over the resilient portion of the upper loop forming member and is then bent downwardly between the aperture plate and film gate. The film is then looped about the intermittent sprocket 16 and where a lower loop is desired, the film is hung over the lower loop forming member and then under the take-up sprocket 17. With the film so threaded through the machine the handle 21 is then moved from the dotted line into the full line position, which motion automatically brings the film against the upper sprocket and to move the two loop forming members into an inoperative position spaced from the film path.

By means of a device of this character it is possible to insure any desired extent of loop at either top or bottom of the film path,

or both of the loops may be formed simultaneously and the formation governed by one control mechanism. The extent of the loop desired may be controlled accurately and with minute refinement by the adjustment of the position of the handle 21. Should there be any pull on the film during the threading operation, the tension created will be resisted not by a rigid member heretofore used, but by the resilient extension of the loop forming members. This resiliency either in the extension or its mounting will relieve the film of undue tension and obviously act materially to prolong its life.

While only one sprocket engaging roller is illustrated in connection with this disclosure, it is to be understood that this illustration is merely suggestive and any of the other film engaging rollers may be controlled from the device which controls the loop forming member. One of which unitary controlling devices is more fully described in my co-pending application, Serial No. 841,191, filed May 27th, 1914.

While I have shown and described, and have pointed out in the annexed claims, certain novel features of my invention, it will be understood that various omissions, substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described my invention, I claim:

1. In a motion picture machine, the combination with a film gate and a feed sprocket disposed to one side of said gate, of a loop forming member adapted to engage the portion of the film disposed between the gate and sprocket, said member being pivotally mounted to swing about an axis parallel to the axis of rotation of said sprocket, said member including a curved film engaging surface with the curvature materially flatter than the curvature of the feed sprocket whereby the possibility of cracking the film in forming the loop is minimized and manually controlled means acting on said member for moving the film engaging surface from an operative loop forming position into an inoperative position.

2. In a motion picture machine, the combination with a film gate and a feed sprocket disposed to one side of said gate, of a loop forming member adapted to engage the portion of the film disposed between the gate and sprocket, said member being pivotally mounted to swing about an axis parallel to the axis of rotation of said sprocket, said member including a curved film engaging surface with the curvature materially flatter than the curvature of the feed sprocket whereby the possibility of cracking the film in forming the loop is minimized and manually controlled means acting on said member for moving the film engaging surface from an operative loop forming position into an inoperative position and a lock for securing said member in its operative and in its inoperative position.

3. In a motion picture machine, the combination with a film gate, a feed sprocket adjacent the top of the gate and a take-up sprocket adjacent the bottom of the gate, an upper loop forming member adapted to engage the portion of the film between the feed sprocket and the gate to form the upper loop, a lower loop forming member adapted to engage the portion of the loop between the gate and the take-up sprocket to form the lower loop, a manually actuated controlling device operatively connected to both of said loop forming members to move the same simultaneously to and from their loop forming positions, and means for locking said controlling device thereby to hold both of the loop forming members in inoperative positions.

4. In a motion picture machine, the combination with a film feeding mechanism of the type requiring a loop in the film, of a loop forming member and means for moving the member to and from its loop forming position, the portion of the member adapted to engage the film in forming the loop being resilient whereby any accidental strain on the film during the film threading operation will be taken up by the resilient part of the loop forming member.

5. In a motion picture machine, a loop forming member including a pivotally mounted body portion, a resilient extension from said body portion adapted to engage the film to make the loop and means engaging the body portion to move the resilient extension to and from its loop forming position.

6. In a motion picture machine, a loop forming member including a pivotally mounted body portion, a resilient extension from said body portion adapted to engage the film to make the loop, means engaging the body portion to move the resilient extension to and from its loop forming position and means for locking said member in an inoperative position with the resilient extension spaced from the film path.

7. In a motion picture machine, the combination of a feed sprocket, a guide roller adapted to bear on the film to hold the same in engagement with said feed sprocket, a swinging support for said guide roller mounted so that the roller may be moved toward and from the sprocket, a loop forming member mounted to have two positions and adapted in one of said positions to engage the film to form the same into a loop at one side of the sprocket and spaced from the film path in the other of said positions,

said member provided with an extension disposed in the path of movement of said guide roller and its support whereby the roller in its movement away from the sprocket and film will engage the loop forming member to move the same from its inoperative into its operative loop forming position.

8. In a motion picture machine, the combination of a feed sprocket, a guide roller adapted to bear on the film to hold the same in engagement with said feed sprocket, a swinging support for said guide roller mounted so that the roller may be moved toward and from the sprocket, a loop forming member mounted to have two positions and adapted in one of said positions to engage the film to form the same into a loop at one side of the sprocket and spaced from the film path in the other of said positions, said member provided with an extension disposed in the path of movement of said guide roller and its support whereby the roller in its movement away from the sprocket and film will engage the loop forming member to move the same from its inoperative into its operative loop forming position, and means engaging said swinging support for locking the guide roller in its inoperative position and for locking the loop forming member in its operative position.

9. In a motion picture machine, the combination of a feed sprocket, a guide roller adapted to bear on the film to hold the same in engagement with said feed sprocket, a swinging support for said guide roller mounted so that the roller may be moved toward and from the sprocket, a loop forming member mounted to have two positions and adapted in one of said positions to engage the film to form the same into a loop at one side of the sprocket and spaced from the film path in the other of said positions, said member provided with an extension disposed in the path of movement of said guide roller and its support whereby the roller in its movement away from the sprocket and film will engage the loop forming member to move the same from its inoperative into its operative loop forming position and a spring latch for locking the guide roller in its film engaging position.

Signed at New York city, in the county of Queens and State of New York, this 29th day of January, 1917.

PHILIP F. KRUG.