Dec. 4, 1928. 1,694,111

H. C. WELLMAN

MOTION PICTURE PROJECTOR

Filed June 21, 1927

FIG. 1.

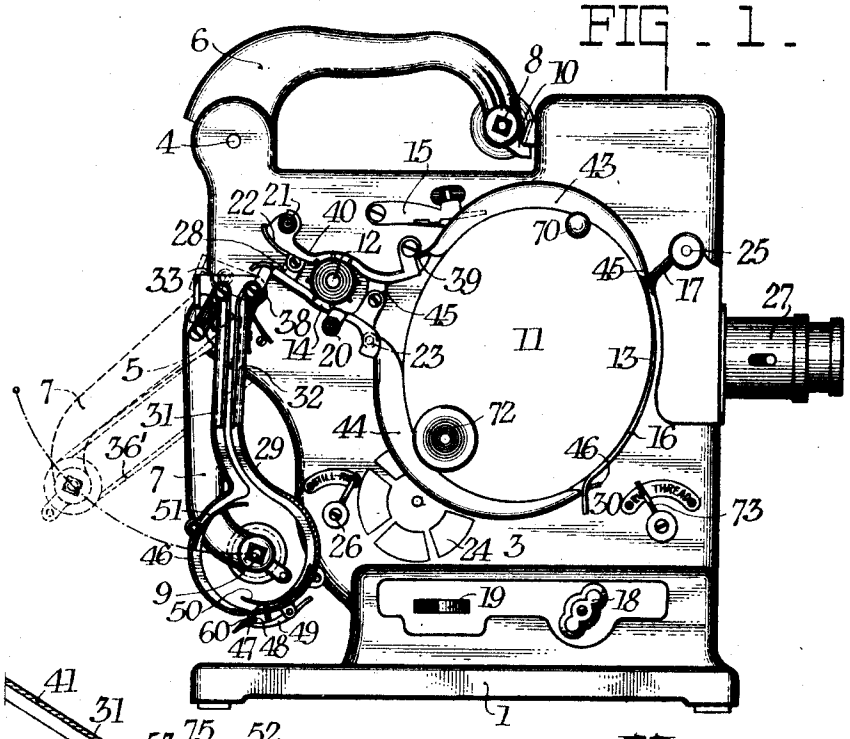


FIG. 2.

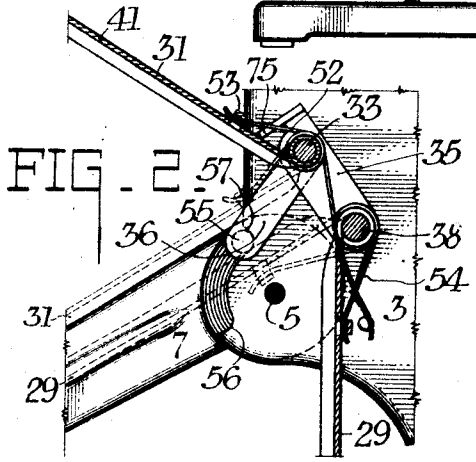


FIG. 3.

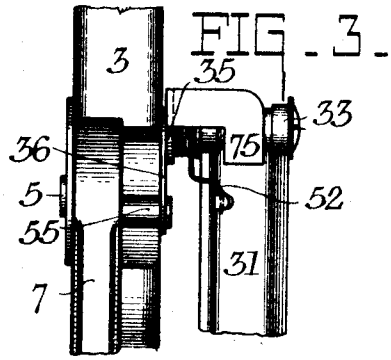
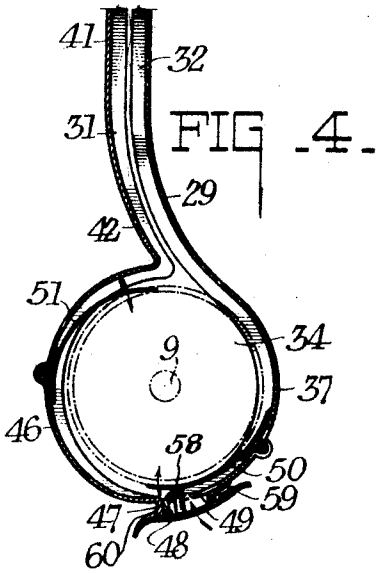


FIG. 4.



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UNITED STATES PATENT OFFICE.

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MOTION-PICTURE PROJECTOR.

Application filed June 21, 1927. Serial No. 200,456.

This invention relates to a motion picture projector and particularly to such apparatus of the type in which the film is automatically threaded and wound. Specifically it is an improvement on the structure disclosed and generically claimed in the patent of A. Stuber, 1,645,882, issued October 18, 1927, relating to means for the automatic winding of the film upon the take-up reel.

Among the objects of the present invention are the provision of a structure that will permit the supporting arm for the take-up reel and the automatic winding attachment operative therewith to be folded simultaneously and compactly and the provision of means that will insure the opening of the attachment as it is withdrawn from folded position to permit the placing of a reel upon the shaft.

These and other objects and advantages will appear from the following specification wherein reference is made to the accompanying drawings, in the several figures of which the same reference characters denote the same parts, and in which:

Fig. 1 is a side view of a projector embodying my invention,

Fig. 2 is a fragmentary side view partly in section of the pivotal arrangement of the reel support and the automatic attachment,

Fig. 3 is an end view of the same portion,

Fig. 4 is a section of the reel-surrounding portion of the attachment.

The apparatus in the form shown comprises a base 1 and a longitudinal wall or frame 3 to which is pivoted at 4 and 5 arms 6 and 7 carrying reel supporting shafts 8 and 9. The upper arm 6 is held when closed by a latch 10 and is shaped to constitute a carrying handle when closed.

The wall 3 carries a casing 11 about which the film may be looped being propelled by sprocket 12. The projection gate is constituted of the curved front wall 13 of the casing 11 and a curved presser member 16, the latter having at its lower end an inclined extension 30 and at its upper end an inclined arm 17 pivoted at 25 to wall 3. The usual objective mount 27 is shown in alignment with the gate.

Near sprocket 12 are trunnions 38 and 39 on which are pivoted two guide members 14 and 40 respectively, these being held normally in the position shown by latches 20 and 21. These guide members have edge flanges 22 between which are fixed guide members 28 outside of the sprocket and other guide members 45 between the sprocket and casing 11.

Pivoted on trunnion 39 is a film guiding and threading member 43 and pivoted on a lower trunnion 23 is a second film guiding and threading member 44. The ends 45 and 46 of these members have paths of movement engaging the inclined ends 17 and 30 of the presser 16 and are adapted to cam this out as described in the application of Stuber and Underwood, Serial No. 73,119, filed December 4, 1925.

Other structural features which are shown but are not important to the present invention, are rewind latch control 15, control switches 18 and 19, ventilating apertures 24, a control 26 for stopping the mechanism to project stills, a latch 70 for the cover of casing 11 and a knob 72 for adjusting the mechanism, and a control 73 for operating the guides 43 and 44.

Pivoted on the same trunnion 38 with guide 14 is a guide member 29 which has a straight portion 32 of a length sufficient to extend nearly to the core 34 of a reel mounted on the shaft 9 carried by arm 7. This shaft is frictionally driven by a coil wire belt 36′ from a pulley (not shown) coaxial with sprocket 12. The guide member 29 is bowed at 37 in substantially a semicircle of somewhat greater radius than core 34. A complementary guide member 31 is pivotally mounted on a floating pin 33 which also acts as a pivot for links 35 and 36, the former having a stop 75 limiting the upward movement of guide 31 and being pivoted at its other end to pin 38 and the other being pivoted to a pivot pin 55 on arm 7. This pivot pin 55 coacts with abutments 56 and 57 on the rear edge of frame 3 to limit the movements of the arm 7.

Guide member 31 has a straight portion 41 terminating in a curve 42 which follows curve 37 for a short distance, sufficient to start a film end in that direction, but is then sharply rebent to form substantially a semicircle 46 which, with bow 37, surrounds core 34. A spring 52 is coiled around pin 33 and its end is secured under a lug 53 on guide arm 31 to move the latter upwardly. A similar spring 54 coiled around pin 38 tends to move guide arm 29 to the right, that is away from arm 7 to open position.

Members 29 and 31 have at their extreme

ends outwardly directed lips 47 and 48 and a pivoted spring latch 49 on bow 37 tends to hold them together. Light springs 50 and 51 are secured within bows 37 and 46 and assist in the guiding action, pressing the film gently toward the core in the directions indicated by small arrows in Fig. 4. The spring latch 49 carries a pin 58, projecting through bow 37. When spring 50 is pressed outwardly, a sufficient distance by the convolutions of the film being wound upon the core, it presses this pin and forces the latch 49 outwardly against the force of its spring 59 and releases the catch 60 carried by the latch 49 from engagement with lip 47, so that the guide members 29 and 31 will spring apart.

In Fig. 1, the parts are shown in full lines in closed or folded condition and in dotted lines in partially opened position. If arm 7 is moved to the left or toward the dotted line position, it will exert a pushing action through link 36 upon pin 33, giving the guide arm 31 a longitudinal motion. This motion is not communicated to arm 29 since this is mounted on a fixed pivot 38, and moreover spring 54 tends to hold this guide arm 29 in its position. The result is that arm 31 slides with respect to arm 29 and the lip 47 slides upwardly with respect to lip 48 and the latching projection 60, releasing itself from the latter and permitting the arm 29 to swing upwardly under the influence of spring 52. This is desirable since the guides 29 and 31 must be separated to permit the insertion of a reel on shaft 9.

It is to be noted that when the shaft 9 is central of the bows 37 and 46 the pivot pins 33 and 38 are in a line substantially at a right angle to the direction of the straight portion 41 and 32 of the guide arms. This is the position shown in Figs. 1 and 4. The shaft 9 occupies the central position in the bows when the arms are in the folded position and also when reel shaft is in operative position and the guide arms encircle it, the parts being in the dotted line position, Fig. 2. When the shaft is moved to the left eccentrically of the central position, toward bow 46, it will act to release the latch in the manner just described.

When, however, the shaft 9 is moved toward the right, this action is reversed and the latch is securely held. Accordingly when the projector is to be folded up after use, the guides may be brought together around the shaft either before or after the arm 7 is returned to folded position. If brought to this position prior to its return, they will remain latched.

It follows that when the projector is being prepared for use the guide arms will, automatically and without attention from the operator, assume an open position for the insertion of a reel; but they will not open automatically when the parts are being folded up. The mounting of one guide arm on a floating pivot permits the arms to be folded together in a compact position, in addition to the automatic feature just noted and it is obvious that alternative mechanical equivalents of the particular linkage could readily be devised within the scope of my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a motion picture apparatus, a frame, an arm having a reel support, two film guiding arms shaped to direct film to and around said reel support, all of said arms being movably connected to the frame whereby they may be moved between positions adjacent the frame and extended positions and a force transmitting connection between at least two of said arms controlling their relative positions.

2. In a motion picture apparatus, a frame, an arm having a reel support, two film guiding arms shaped to direct film to and around said reel support, all of said arms being movably connected to the frame whereby they may be moved between positions adjacent the frame and extended positions and a force transmitting connection between at least two of said arms controlling their relative positions, the film guiding arms being foldable to and from positions close to and on opposite sides of said reel support.

3. In a motion picture apparatus, a frame, an arm having a reel support, two film guiding arms shaped to direct film to and around said reel support, all of said arms being movably connected to the frame whereby they may be moved between positions adjacent the frame and extended positions and a force transmitting connection between at least two of said arms controlling their relative positions, the film guiding arms being foldable to and from positions close to and on opposite sides of said reel support and being normally spring pressed away from said positions and a latch for holding them in said positions.

4. In motion picture apparatus, a frame, an arm having a reel support, two film guiding arms shaped to direct a film to and around said reel support, all of said arms being movably connected to the frame and capable of movement between positions adjacent the frame and extended positions, the film guiding arms being also movable to and from positions on opposite sides of and close to said reel support and normally spring pressed away from such positions, and a latch for holding them in such positions, said latch being operative both when the arms are in their positions close to the frame and when they are in extended positions.

5. In a motion picture apparatus, a frame, an arm having a reel support, two film guid-

ing arms shaped to direct film to and around said reel support, all of said arms being movably connected to the frame whereby they may be moved between positions adjacent the frame and extended positions and a force transmitting connection between at least two of said arms controlling their relative positions, the film guiding arms being foldable to and from positions close to and on opposite sides of said reel support, and a latch for holding them in said position, said latch being operative both when the arms are in the positions adjacent the frame and when they are in extended position.

6. In motion picture apparatus, a frame, an arm pivoted to said frame and adapted thereby to be swung between a folded position near said frame and an extended position away from said frame, a reel shaft carried on said arm, two film guiding arms having complemental bowed portions extending about said reel shaft and pivotally connected to said frame may be swung with the first named arm, the pivoted end of one guiding arm being also mounted for movement with respect to said frame.

7. In motion picture apparatus, a frame, an arm pivoted to said frame and adapted thereby to be swung between a folded positions near said frame and an extended position away from said frame, a reel shaft carried on said arm, two film guiding arms having complemental bowed portions extending about said reel shaft and pivotally connected to said frame, one of said arms having a fixed pivotal connection to said frame, the other of said arms having a movable pivotal connection with said frame.

8. In motion picture apparatus, a frame, an arm pivoted to said frame and adapted thereby to be swung between a folded position near said frame and an extended position away from said frame, a reel shaft carried on said arm, two film guiding arms having complemental bowed portions extending about said reel shaft and pivotally connected to said frame may be swung with the first named arm, the pivoted end of one guiding arm being also mounted for movement with respect to said frame, and interengaging latch members on the guiding arms to hold them together with the bowed portions surrounding the reel shaft.

9. In a motion picture projector, a frame, an arm pivoted thereto, a reel support carried by said arm, two film guiding arms pivotally connected to said frame and having bowed portions opposite the reel support, the pivoted end of one guiding arm being also mounted for movement with respect to said frame, and a latch operative to hold the bowed portions around said reel support, the said guide arms being spring pressed away from each other.

10. In a motion picture projector, a frame, an arm pivoted thereto, a reel support carried by said arm, two film guiding arms pivotally connected to said frame and having bowed portions opposite the reel support, the pivoted end of one guiding arm being also mounted for movement with respect to said frame, the pivotal mounting of the three arms permitting them to be swung simultaneously between positions near the frame and extended from the frame and the movable mounting of the said one guiding arm permitting it to be moved so that its bowed portion will be opposite the bowed portion of the other arm and closely surrounding the reel support when the arms are in either position.

11. In a motion picture projector, a frame, an arm pivoted thereto, a reel support carried by said arm, two film guiding arms pivotally connected to said frame and having bowed portions opposite the reel support, the pivoted end of one guiding arm being also mounted for movement with respect to said frame, the pivotal mounting of the three arms permitting them to be swung simultaneously between positions near the frame and extended from the frame and the movable mounting of the said one guiding arm permitting it to be moved so that its bowed portion will be opposite the bowed portion of the other arm and closely surrounding the reel support when the arms are in either position, said guiding arms being spring pressed away from each other and cooperating latch elements on the guiding arms operative to hold them together when the arms are either in their position near the frame or in extended position.

12. In a motion picture projector, a frame, a real arm pivoted thereto, a reel support carried by said arm, a first film guiding arm pivoted to said frame, a second film guiding arm having a bodily movable point at which it is pivotally connected with said frame and having a force transmitting connection between said point and the reel arm whereby movement of the reel arm will transmit motion to the said pivotal point of the second guiding arm, the said guiding arms having complementary bowed portions positioned on opposite sides of the reel support.

13. In a motion picture projector, a frame, a reel arm pivoted thereto, a reel support carried by said arm, a first film guiding arm pivoted to said frame, a second film guiding arm having a bodily movable point at which it is pivotally connected with said frame and a link connecting said point and said reel arm.

14. In motion picture apparatus, a frame, an arm with a reel support pivoted thereto, two film guiding arms having pivotal connections with said frame, whereby all of said arms may be swung from positions near the frame to positions extended from said frame, the two guiding arms being also movable to

and from positions embracing the reel support, a latch for holding the guiding arms in such embracing position, the reel supporting arm being connected to said latch to release the latch upon movement of the reel supporting arm from its position near the frame to its extended position.

15. In motion picture apparatus, a frame, an arm with a reel support pivoted thereto, two film guiding arms having pivotal connections with said frame, whereby all of said arms may be swung from positions near the frame to positions extended from said frame, the two guiding arms being also movable to and from positions embracing the reel support, a latch for holding the guiding arms in such embracing position, the reel supporting arm being connected to said latch to release the latch upon movement of the reel supporting arm from its position near the frame to its extended position and being inoperative to release the latch upon a reverse movement.

16. A motion picture apparatus comprising a frame, an arm pivoted thereto for movement to and from the frame and having a reel support, two film guiding arms also having a pivotal connection thereto, the film guiding arms having bowed portions opposite the reel support and adapted to be swung together with their bowed portions surrounding the reel support, interengaging latch means on the arms to hold them in such position, the pivotal connection of one of said arms comprising a floating pivot up which the said arm can turn and a connection between the floating pivot and the first named arm and communicating motion to the said pivot and hence to the guiding arm when the first arm is moved away from the frame, such motion of the guiding arm causing the latch members to be disengaged.

17. A motion picture apparatus comprising a frame, an arm pivoted thereto for movement to and from the frame and a reel having support, two film guiding arms also having a pivotal connection thereto, the film guiding arms having bowed portions opposite the reel support and adapted to be swung together with their bowed portions surrounding the reel support, interengaging latch means on the arms to hold them in such position, the pivotal connection of one of said arms comprising a floating pivot upon which the said arm can turn and a connection between the floating pivot and the first named arm and communicating motion to the said pivot and hence to the guiding arm when the first arm is moved away from the frame, such motion of the guiding arm causing the latch members to be disengaged, and spring means causing the separation of the arms upon the disengagement of the latch members.

18. A motion picture apparatus comprising a frame, an arm pivoted thereto for movement to and from the frame and having a reel support, two film guiding arms also having a pivotal connection thereto, the film guiding arms having bowed portions opposite the reel support and adapted to be swung together with their bowed portions surrounding the reel support, interengaging latch means on the arms to hold them in such position, the pivotal connection of one of said arms comprising a floating pivot upon which the said arm can turn and a connection between the floating pivot and the first named arm and communicating motion to the said pivot and hence to the guiding arm when the first arm is moved away from the frame, such motion of the guiding arm causing the latch members to be disengaged, and such motion being inoperative to release the latch upon movement of the arm toward the frame.

19. In motion picture apparatus, a frame, an arm pivoted thereto and having a reel support, two film guiding arms having portions shaped to direct a film to and around said reel support and pivotally connected to said frame and adapted to be swung to and from positions on each side of and close to said reel support, a latch for holding said guiding arms in such positions, all of the arms being adapted to be swung to positions near said frame, the latch being operative when the arms are in the last named positions and a force transmitting connection between the reel supporting arm and one of the guiding arms and operative when the reel supporting arm is moved from the position near the frame to move the said connected guiding arm and release the latch.

20. In a motion picture projector, a frame, an arm pivoted thereto, a reel shaft on said arm, a film guiding arm, pivoted directly to the frame eccentrically of the pivot of the first named arm, a second film guiding arm, two links pivoted to each other and to the second guide arm, one of said links being pivoted to the first named arm and the other being pivoted coaxially with the first guiding arm, each of the guiding arms extending past the reel shaft and having bowed portions opposite said reel shaft, a spring latch for holding the bowed portion around the shaft, and springs operative on the two guiding arms and tending to swing them away from one another.

Signed at Rochester, New York, this 16th day of June, 1927.

HOWARD C. WELLMAN.