Feb. 23, 1937. R. S. HOLLOWAY 2,071,527

REWINDING DEVICE FOR MOTION PICTURE FILMS

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Fig. 1.

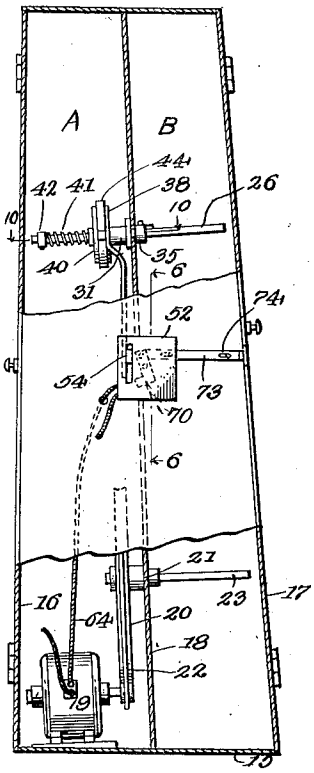
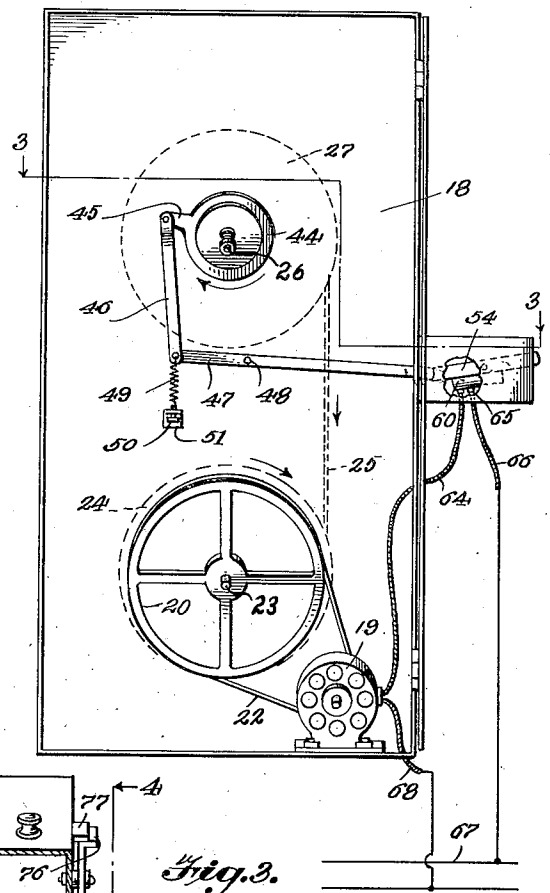


Fig. 2.



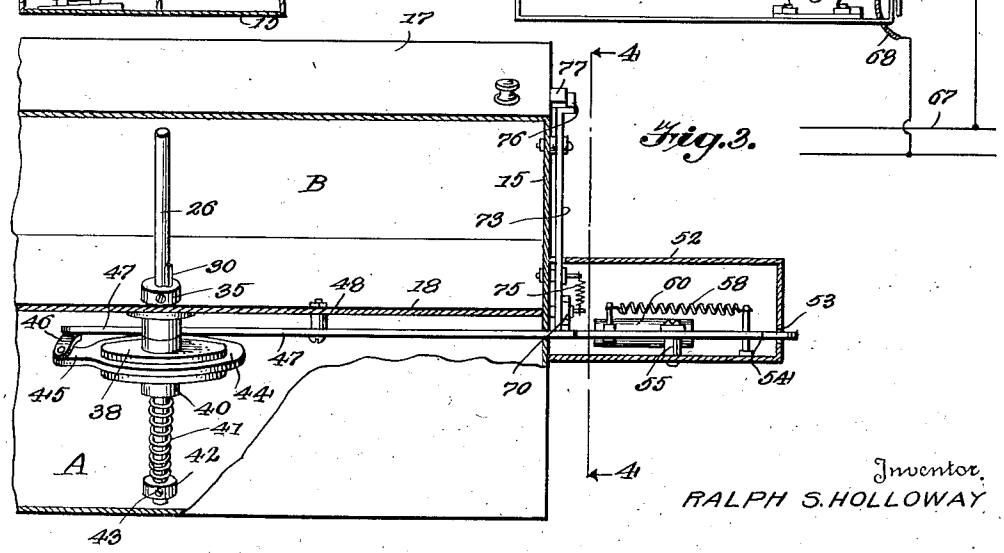


Fig. 3.

Inventor.
RALPH S. HOLLOWAY

By Wm. A. Cathcart
Attorney

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Fig. 4.

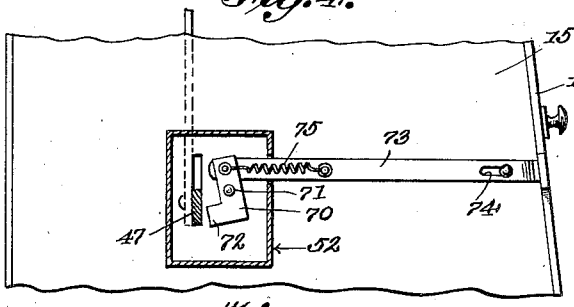


Fig. 9.

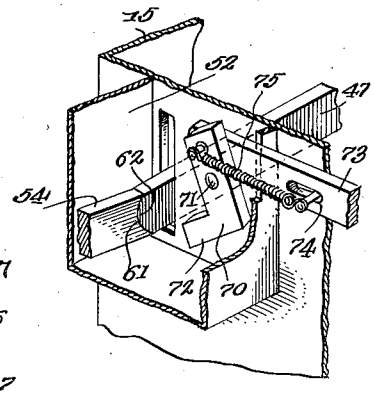


Fig. 5.

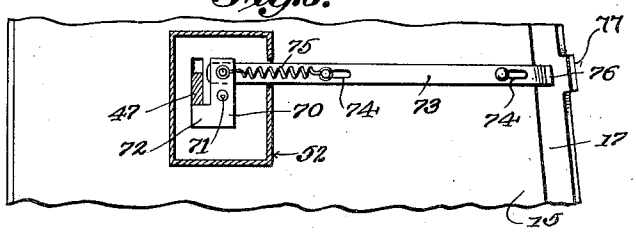


Fig. 8.

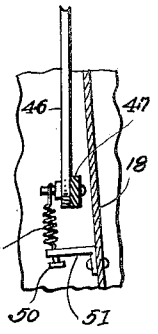


Fig. 6.

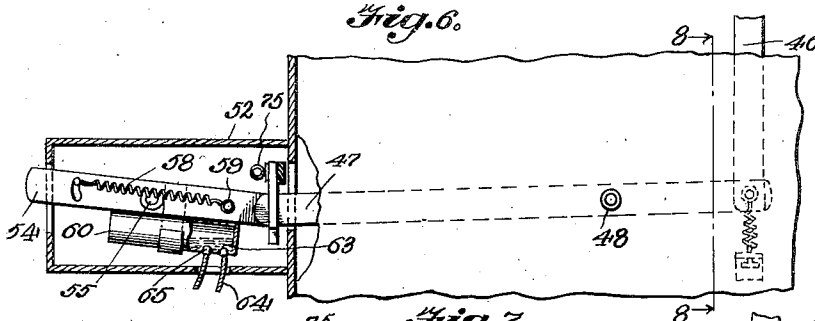


Fig. 7.

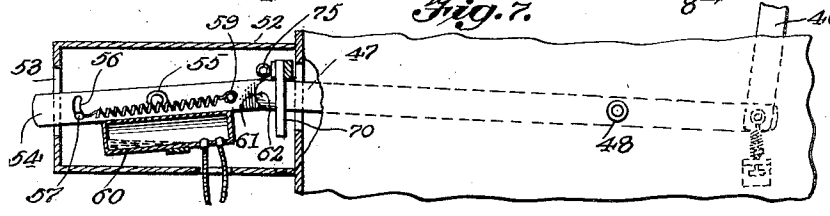
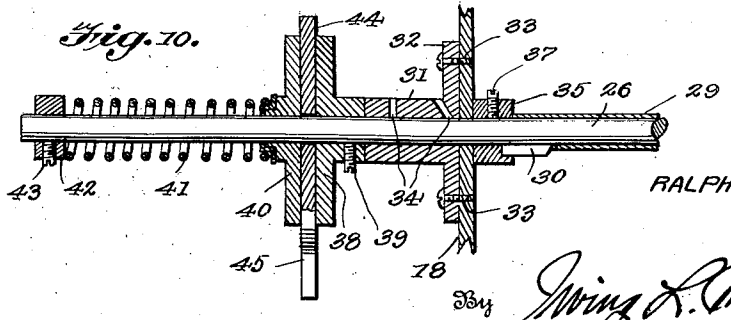


Fig. 10.



Inventor
RALPH S. HOLLOWAY

By Irving L. McCathran
Attorney

Patented Feb. 23, 1937

2,071,527

UNITED STATES PATENT OFFICE

2,071,527

REWINDING DEVICE FOR MOTION PICTURE FILMS

Ralph S. Holloway, Amarillo, Tex.

Application May 4, 1935, Serial No. 19,877

2 Claims. (Cl. 242—57)

This invention relates to rewinding devices especially adapted for use in rewinding moving picture films, and has for its principal object the production of a simple and efficient rewinding device and automatic circuit-breaking means mounted within a vertical cabinet, so constructed as to be accommodated in a minimum amount of space.

Another object of this invention is the production of a positive switch and operating mechanism therefor, which after the contact has been made or broken no backlash will occur, thereby permitting the motor to gradually start or stop without causing a sudden jerk.

A further object of this invention is the production of a simple and efficient rewind device which is mounted in a supporting casing, the supporting casing being so constructed as to eliminate the necessity of anchoring the casing, in this way permitting the operator to move the casing to a convenient position while adjusting the mechanism, even while the mechanism is in operation.

A still further object of this invention is the production of a simple and efficient means for applying a braking action to the reel from which the film is being unwound, after the film has been wound therefrom or the pull is released.

Other objects and advantages of the present invention will appear throughout the following specification and claims.

In the drawings:

Figure 1 is a side elevation of the rewinding device and supporting casing therefor, the casing being partly shown in section;

Figure 2 is a rear view of the rewinding device, the rear door being shown in an open position;

Figure 3 is a transverse section taken on line 3—3 of Figure 2;

Figure 4 is a section taken on line 4—4 of Figure 3, showing the door controlled latching device in an unlatched position;

Figure 5 is a view similar to Figure 4 showing the latching device in a latching position;

Figure 6 is a fragmentary side elevation of the casing showing the switch box in section and illustrating the switch in a closed position;

Figure 7 is a view similar to Figure 6, showing the switch in an open position;

Figure 8 is a section taken on line 8—8 of Figure 6;

Figure 9 is a sectional perspective view through a portion of the switch box and casing illustrating the latching trigger and associated parts;

Figure 10 is an enlarged section taken on line 10—10 of Figure 1.

By referring to the drawings, it will be seen that 15 designates the casing or housing which is preferably of an elongated relatively narrow structure having a rear hinged door 16 and a front hinged door 17. The casing 15 is preferably arranged to support the rear door in a vertical position, whereas the front door 17 is preferably arranged to lie on an incline to the vertical plane when in a closed position. The casing 15 is provided with a centrally located vertically extending partition 18 which also extends at an incline to the vertical plane and is inclined from top to bottom toward the rear door 16, as shown in Figure 1.

An electric motor 19 is mounted upon the bottom of the casing or housing 15 and a driving pulley 20 is journaled upon the partition 18, as at 21, a drive belt 22 being employed for driving the pulley 20 from the motor 19. The bearing 21 also carries a reel supporting spindle 23 of the conventional type, but this spindle 23 is inclined upwardly toward its outer end due to the fact that the bearing 21 supporting the pulley 20 is carried by the inclined partition 18, note Figure 1. This inclining of the spindle 23 will tend to hold the reel against accidental displacement from the spindle. The spindle 23 is adapted to support the empty reel 24, shown in dotted lines in Figure 2, upon which the film 25, also shown in dotted lines, is adapted to be rewound.

A spindle 26 is supported upon the partition 18 in vertical alignment with the spindle 23, and this spindle 26 is adapted to support the loaded or upper reel 27, shown in dotted lines in Figure 2, from which the film 25 is to be unwound. This spindle 26, shown in detail in Figure 10, supports the conventional sleeve 29 and key 30 which are engaged by the reel 27 in the conventional manner. The spindle 26 is supported within a journal or bearing 31, which journal or bearing 31 is provided with an annular flange 32 through which securing screws 33 pass for detachably or removably securing the bearing or journal 31 upon the partition 18. Because of this structure the bearing or journal may readily be replaced when desired. Suitable lubricating ports 34 are provided in the journal 31. A collar 35 is carried by the spindle 26 and is locked thereon by means of a set screw 37, the collar 35 limiting the longitudinal movement of the spindle 26 in one direction. A flanged collar constituting a frictional disc 38 is locked upon the spindle 26 by means of a set screw 39 and normally abuts against one end of the

journal 31, as shown in Figure 10. A friction disc 40 is slidably mounted upon the spindle 26 near its outer end and this disc 40 is engaged by a coil spring 41 which coil spring abuts at its opposite end against a collar 42 which is anchored in position by means of a set screw 43. The coil spring 41 is adapted to yieldably hold the disc 40 in frictional engagement with a circular plate 44, which circular plate 44 is interposed between the discs 38 and 40, as shown in Figure 10, and is loosely mounted upon the spindle 26. The circular plate 44 is provided with a projecting arm or finger 45 extending from the periphery thereof, as shown in Figure 2. This finger engages a vertically extending link 46, which link in turn is pivotally connected to the inner end of a switch controlling lever 47, which switch controlling lever 47 is pivoted, as at 48, upon the partition 18. A tension coil spring 49 is connected to the lower end of the vertically extending link 46 and the lower end of this spring 49 is connected to an adjusting screw 50 supported upon the bracket 51, which bracket 51 is carried by the partition 18, as shown in Figure 8.

Extending from one side of the casing 15 is a switch box or housing 52 which is provided at its outer end with a slot opening 53 through which slot opening extends a trigger bar 54 constituting a switch carrying member, the trigger bar being pivotally mounted, as at 55, within the switch box 52.

This trigger bar 54 is provided with an arc-shaped transversely extending slot 56 through which a stop pin 57 extends for limiting the swinging movement of the trigger bar 54. A longitudinally extending coil spring 58 is connected at one end to the pin 57 and at the other end to a pin 59 carried by the inner end of the trigger bar 54, connections for the spring being so mounted as to swing the spring 58 from one side of the central pivot of the trigger bar when the bar is raised and to the other side of the center of the pivot when the trigger bar is lowered, thereby providing a positive and sudden movement for the trigger bar when it is swung for the purpose of efficiently closing the mercury switch 60 which is suspended below the trigger bar 54. Although a mercury switch has been illustrated, it should be understood that any suitable type of electrical contact may be employed without departing from the spirit of the invention although a mercury switch is found preferable. The inner end of the trigger bar 54 is provided with a concave notch 61 which concave notch 61 receives the convex outer end 62 of the switch controlling lever 47, note Figure 6. This structure will provide a swivel connection between the trigger bar 54 and the switch controlling lever 47 thereby causing the lever 47 to be swung as the trigger bar 54 is swung and vice versa.

The mercury switch 60 is provided with a contact point 63 to which is secured a wire 64 leading to the motor and this switch 60 carries also a contact point 65 which is connected to a wire 66 leading to one side of the line 67, the motor 19 also being connected to the other side of the line by means of a wire 68. It will, therefore, be seen that as the switch is swung to the position shown in Figure 6, the circuit will be closed through the motor causing the pulley 22 to be actuated for the purpose of driving the rewinding device. When the trigger bar 54 is swung to the position shown in Figure 7, the circuit will be broken and the motor 19 will discontinue its operation. In order that the switch may be held in an open position when the front door 17 is open and while the reels are being set in place upon the spindles, a safety latching device is provided, as is shown in detail in Figures 4, 5, and 9, which safety latching device comprises a trigger hook 70 substantially L-shaped in formation, pivoted as at 71, and having a projecting lug 72 at its lower end which, when swung under the bar 47, will hold the same in a position whereby the switch 60 will be held open, such as is illustrated in Figure 7. This trigger hook 70 is connected to an operating arm 73 carried by the side of the casing 15, note Figure 3, the arm 73 being slotted, as at 74, and being engaged by a coil spring 75 to normally hold the trigger latch 70 in a vertical position, such as is shown in Figure 5. The operating arm 73 is provided with an offset finger 76 which is adapted to be engaged by a lug 77 carried by the front door 17, and as the front door 17 is closed, the arm 73 will be forced inwardly against the tension of the spring 75 and the latching trigger 70 will be moved to an angular position out of engagement with the bar 47 to freely swing and permit the switch to be closed. As soon as the motor 19 discontinues operation and the film has been rewound, and upon the opening of the door 17 after the bar 47 has been moved to the position shown in Figure 7 due to the opening of the switch, the latching trigger 70 will engage under the bar 47 and hold the same against swinging movement.

The operation of the device is as follows:

The loaded reel 27 is placed upon the spindle 26 and the empty reel 24 is placed upon the spindle 23, the door 17 being open to permit access to the spindles 23 and 26. The free end of the film 25 is then connected to the empty reel 24. The door 17 is then closed, this causing the latching trigger 70 to be swung to the position shown in Figure 4, out of engagement with the bar 47. The operator will lift the outer end of the trigger bar or switch carrying member 54 which extends through the slot 53 thereby closing the circuit in the switch 60 and immediately starting the motor 19. The film 25 will then wind upon the reel 24 and should the film break or when the film is completely rewound upon the reel 24 from the reel 27 and tension is relieved from the spindle 26, the spring 49 will pull downwardly upon the arm 46 against the centrifugal pull exerted by the discs 38 and 40 thereby swinging the outer end of the lever 47 upwardly to the position shown in Figure 7 for opening the switch and immediately cutting off the motor. It should be understood that the constant pull of the film 25 in the direction of the arrow, shown in Figure 2, would cause the disc 44 to tend to move in the direction of the arrow, indicated in Figure 2, and tend to pull the arm 46 upwardly for holding the trigger bar 54 in a position to close the circuit. When this pull is released from the spindle 26, the spring 49 will naturally pull the arm 46 downwardly thereby causing the circuit to be broken and the coil spring 41 will also constitute a braking means to bring the empty reel to rest and prevent the spinning thereof after the film has been unwound.

By means of the present structure, it should be understood that the present device provides a cabinet which extends in a vertical plane accommodating itself to a minimum amount of vertical space, and at the same time this structure permits the device to be easily and conveniently moved and its position to be easily shifted whereby access may be had to the interior, when desired. The door 16 is provided in order that ac-

cess may be had to the rear of the device for the purpose of repair or replacement of parts.

All of the working parts are mounted in the rear compartment A, whereas the reels are mounted within the front compartment B.

It should be understood that certain detail changes in the mechanical construction, combination and arrangement of parts may be employed without departing from the spirit of the invention, so long as such changes fall within the scope of the appended claims.

Having described the invention, what I claim as new is:—

1. A device of the class described comprising a winding spindle, an electric motor for actuating said winding spindle, a switch carrying member, a switch carried by said switch carrying member for controlling the operation of said motor, an unwinding spindle, a disc carried by said unwinding spindle and fixed thereon, a friction plate frictionally engaging said disc, a spring pressed disc engaging the opposite face of said plate whereby said plate may be yieldably and frictionally held in contact with both of said discs to cause said plate to tend to rotate in the direction of travel of said unwinding spindle, said plate having a projecting arm, a link connected to said arm and adapted to be pulled upwardly when said unwinding spindle operates, a spring for exerting a downward pull upon said link when said unwinding spindle discontinues rotation, and a lever pivotally mounted intermediate its length and having one end pivoted to said link and its other end engaging said switch carrying member for swinging said switch to an open position.

2. In a device of the class described, a winding spindle, an electric motor for actuating said winding spindle, a switch for controlling the operation of said motor including a housing, a bar pivotally mounted intermediate its ends in the housing, and having one end concaved, a mercury tube carried by said bar, terminals in the tube bridged by the mercury to close a circuit when the bar is tilted in one direction, a spring for pulling the bar over a dead center, and means for actuating the switch including a lever pivoted intermediate its length and having one end convexed and engaged in the concaved end of said bar for tilting the bar about its pivot to an adjusted position when the lever is moved.

RALPH S. HOLLOWAY.