May 30, 1933. A. A. MONSON ET AL 1,912,153

REWINDING MECHANISM FOR CINEMATOGRAPHS

Filed March 24, 1930 2 Sheets-Sheet 1

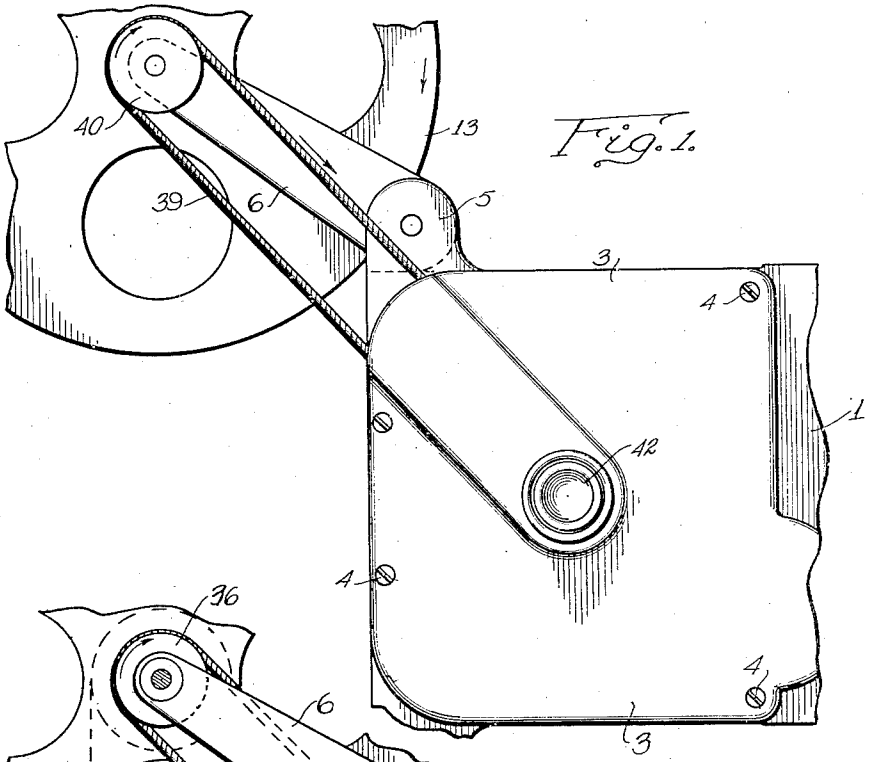


Fig. 1.

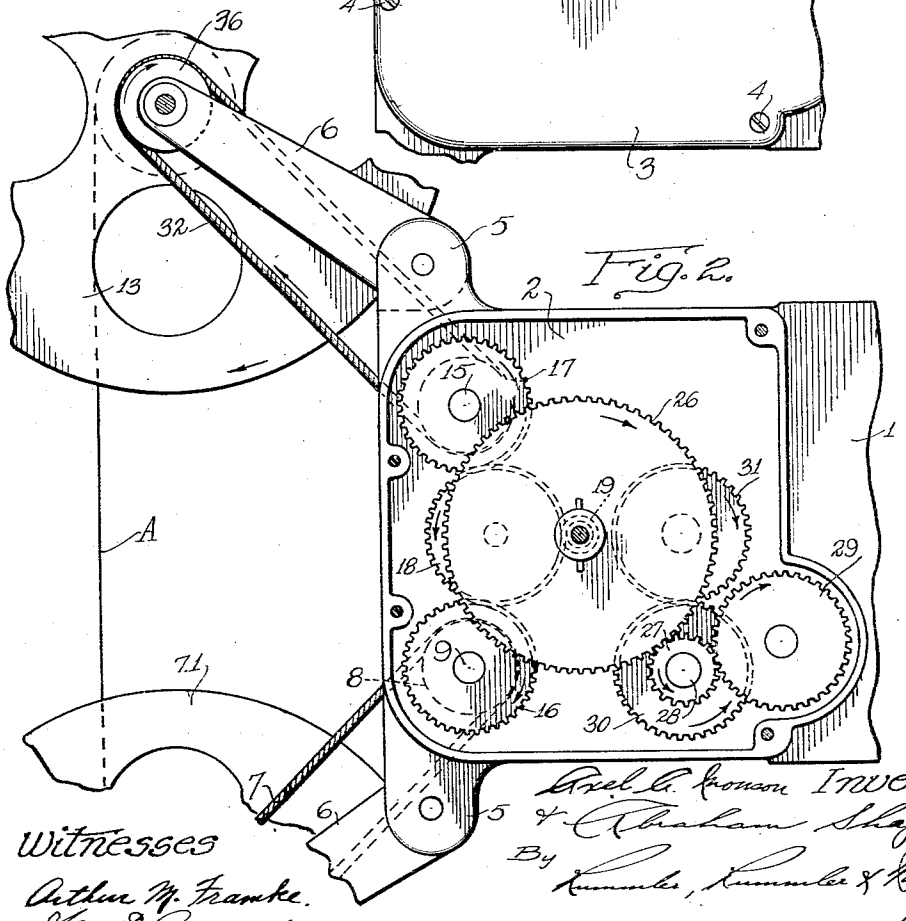


Fig. 2.

Witnesses
Arthur M. Franke.
V. E. Anderson

Abel A. Monson Inventors,
& Abraham Shapiro,
By Lummus, Lummus & Woodworth,
Attys.

May 30, 1933. A. A. MONSON ET AL 1,912,153

REWINDING MECHANISM FOR CINEMATOGRAPHS

Filed March 24, 1930 2 Sheets-Sheet 2

Fig. 3.

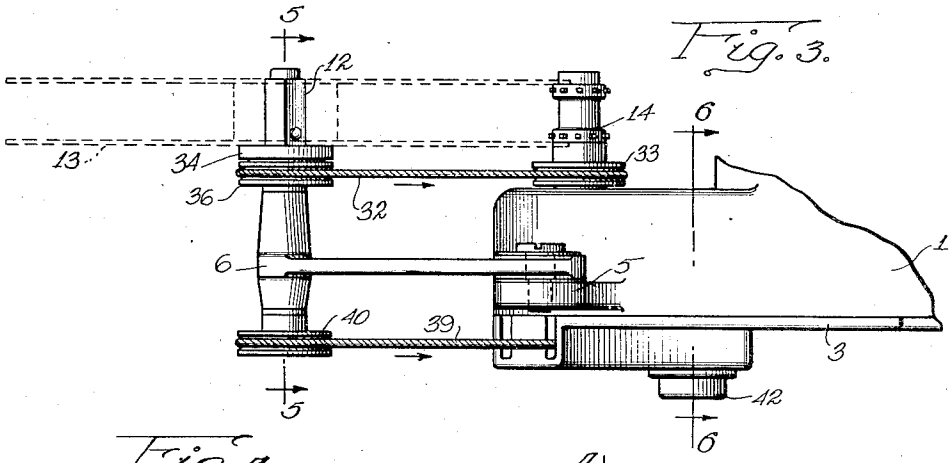


Fig. 4.

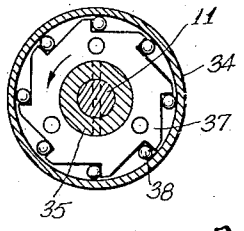


Fig. 5.

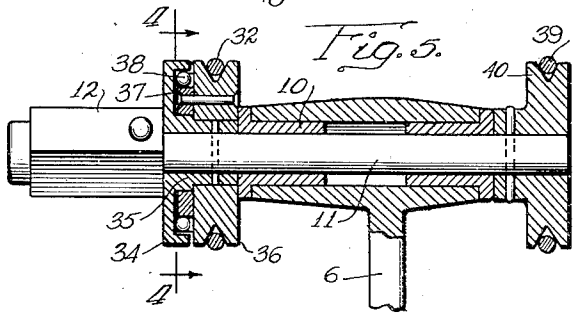


Fig. 6.

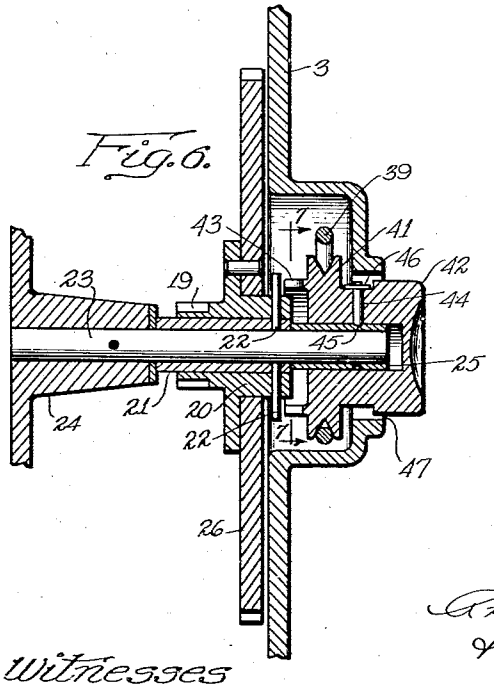


Fig. 7.

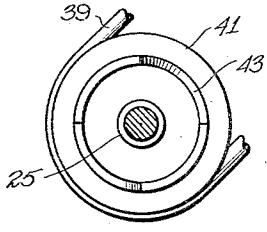
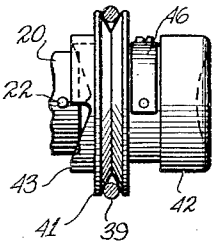


Fig. 8.



Witnesses

Arthur M. Franke.

K. E. Anderson,

Arel A. Monson Inventors,

& Abraham Shapiro,

By Kummler, Kummler & Goodwin,

Attys.

Patented May 30, 1933 1,912,153

UNITED STATES PATENT OFFICE

AXEL A. MONSON AND ABRAHAM SHAPIRO, OF CHICAGO, ILLINOIS, ASSIGNORS TO UNIVERSAL STAMPING & MFG. CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

REWINDING MECHANISM FOR CINEMATOGRAPHS

Application filed March 24, 1930. Serial No. 438,497.

The main objects of this invention are to provide an improved form of cinematograph; to provide a cinematograph having improved mechanism for rewinding the film from the take-up reel to the feed reel; and to provide a film rewinding mechanism which operates at high speed.

An illustrative embodiment of this invention is shown in the accompanying drawings, wherein:

Figure 1 is a fragmentary side elevation of the front portion of a cinematograph to which the improved rewinding mechanism has been applied.

Fig. 2 is a similar view but with the side plate of the casing removed to show the gears, and with the rewinding belt and pulley removed.

Fig. 3 is a top plan of the parts shown in Fig. 1, but showing the feed reel in dotted outline.

Fig. 4 is a vertical section, taken on the line 4—4 of Fig. 5, showing the clutch of the shaft of the feed reel.

Fig. 5 is a vertical section, taken on the line 5—5 of Fig. 3.

Fig. 6 is an enlarged vertical section, taken on the line 6—6 of Fig. 3.

Fig. 7 is a section, taken on the line 7—7 of Fig. 6.

Fig. 8 is a detail in elevation showing the clutch which connects the rewinding belt to the gearing.

Inasmuch as this invention relates particularly to the rewinding mechanism, the accompanying drawings show only as much of an entire projector as will be helpful in apprehending the invention.

The improved rewinding mechanism may be used in connection with various types of cinematographs but, in the form shown, it is applied to a cinematograph of the type shown in the co-pending application Serial No. 374,630, filed June 29, 1929, in the name of Abraham Sapier.

Cinematographs generally include an upright casing on which is mounted the usual light interceptor between the light bulb and the film guideway. The film is supported by a pair of reels and is usually fed from the feed reel to the take-up reel by a pair of continuously driven sprockets. As the film passes through the guideway, an intermittent motion is imparted to it by suitable means, such as a reciprocating claw, for momentarily positioning each picture directly in the path of light.

In the construction herein shown, the casing of the machine, which is only partly shown, includes a side wall 1 having a gear housing 2 formed at its front end for housing a train of gears which drives the light interceptor, feeding claw, and film sprockets. A removable plate 3 is secured to the gear housing by screws 4.

Formed on the forward end of the wall 1, is a pair of lugs 5, on which is hinged a pair of arms 6. The lower arm 6 supports a take-up reel 7.1, which is driven by a belt 7 connected to a pulley 8 on a shaft 9, which is journaled in the gear housing 2. Also secured to the shaft 9, is a take-up sprocket, not shown, which engages the cinema film A, as is well understood.

Supported on the upper arm 6, are bushings 10, in which is journaled a shaft or spindle 11, having a head 12 for supporting a feed reel 13. During the normal operation of the machine, the feed reel 13 and spindle 11 are rotated solely by the action of the film which is unwound from the feed reel by means of a feed sprocket 14 mounted on a shaft 15 which is journaled in the gear housing 2.

The train of gears in the housing 2 includes gears 16 and 17 fast on the shafts 9 and 15, respectively, and meshing with an intermediate gear 18, which meshes with a pinion 19. The pinion 19 has a hub 20, which is keyed to a sleeve 21 by a pair of pins 22, which project outwardly beyond the hub, as shown in Fig. 6, so as to serve as part of a clutch hereinafter described. The sleeve 21 is rotatable on a shaft 23 which is fixed on a bracket 24 in the housing 2. Axial movement of the sleeve 21 is prevented by the bracket 24 and a collar 25 fixed on the outer end of the shaft 23.

Fixed on the hub 20, is a comparatively large gear 26, which meshes with a pinion 27

on a main drive shaft 28. The pinion 27 also drives a gear 29, which operates the film feeding claw, not shown. A gear 30 on the drive shaft 28 meshes with a gear 31 for operating the light interceptor, not shown.

All of the arrows which appear on the drawings for indicating direction of movement are pointed so as to indicate the direction of movement during the rewinding operation. During the normal operation of the machine for displaying the pictures, the parts move in directions opposite to those indicated by the arrows.

The projector herein shown includes reversing means and an independent rewinding mechanism. Both the reversing means and the rewinding mechanism serve to reverse the feed reel so as to cause the film to rewind onto the feed reel. However, the reversing means alone, without the rewinding mechanism, is employed when it is desired to merely partially rewind the film as, for instance, when the operator desires to bring a picture back to the light aperture after it has passed through the film guideway.

The rewinding mechanism is generally used only when it is desired to rewind the entire film from the take-up reel to the feed reel.

In the form shown, the reversing means comprises a belt 32 which is connected to a pulley 33 on the shaft 15 and to a clutch on the spindle 11. This clutch includes a drum 34 having a hub 35 fixed on the spindle 11. Loosely mounted on the hub 35, is a pulley 36 for the belt 32. Secured to one face of the pulley 36, is a ratchet 37 which coacts with balls 38 for binding the pulley 36 to the spindle 11 only when the belt 32 is reversed in the direction of the arrows shown in Figs. 3 and 4. This reversing means could be employed for rewinding the entire film but it is not fast enough for the average requirements. The rewinding mechanism is therefore employed for rewinding the film at a high rate of speed.

In the form shown, the rewinding mechanism includes a belt 39 connected to a pulley 40 on the spindle 11 and to a pulley 41 integrally formed on a button 42. The button 42 is axially shiftable on the collar 25 and has a ratchet part 43, which is adapted to engage the pins 22 for locking the pulley 40 to the gear 26 when the button is manually depressed.

To secure the button 42 against accidental axial movement, it carries a pin 44 which rides in an annular groove 45 on the shaft 23. The pin 44 is yieldingly urged inwardly by a spring 46 secured to the periphery of the button. As shown in Fig. 6, the button projects through an opening 47 in the casing wall 3. With this construction, the button 42 and pins 22 serve as a clutch for connecting the rewinding belt to the operating mechanism.

In the normal operation of the projector, the film passes from the feed reel 13 to the sprocket 14 and then to the film guideway, not shown, where it engages the feeding claw. It then passes around the take-up sprocket on the shaft 9 and is wound onto the reel 7.1 which is driven by the belt 7. During this operation of the machine, the gears, reels, and belts travel in directions opposite to those indicated by the arrows.

When it is desired to partially rewind the film, the electric motor, not shown, is reversed, thereby causing the moving parts to travel as indicated by the arrows. When the mechanism is reversed, the belt 32 drives the reel 13 through the clutch parts 34 and 36.

When it is desired to rewind the entire film, as distinguished from merely reversing the mechanism, its free end is secured to the feed reel 13, a shown in Fig. 2, without passing around the feeding sprockets. The motor is then reversed so as to cause all the operating parts to travel as indicated by the arrows. When the parts are operating in reverse, and the button 42 is not depressed, the reel 13 is rotated by the belt 32. To increase the speed of rewinding, the button 42 is pressed inwardly so as to connect the spindle 11 with the gear 26 which rotates at a very high speed.

During the rewinding operation, the belt 7 should be removed so as not to retard the speed of the rewinding mechanism.

To retract the button 42 to the position shown in Fig. 6, the operating mechanism is driven forwardly instead of in reverse, thereby causing the pins 22 to ride along the inclined edges of the ratchet 43 so as to force the button outwardly.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

We claim:

1. A cinematograph comprising a casing, a feed reel shaft and a take up reel shaft on said casing, reels mounted on said shafts for supporting a cinema film normally movable from the feed reel to the take up reel, operating mechanism, driving means connecting said take up reel shaft with said operating mechanism for driving said take up reel shaft during the normal operation of the cinematograph, other means actuated in a reverse direction and mounted on said feed reel shaft for connecting said feed reel shaft with said operating mechanism for reversely driving said feed reel shaft at a certain speed, and rewinding mechanism also mounted on said feed reel shaft for con-

necting said feed reel shaft with said operating mechanism for reversely driving said feed reel shaft at a greater speed than said other means.

2. A cinematograph comprising a casing, a feed reel shaft and a take up reel shaft on said casing, reels mounted on said shafts for supporting a cinema film normally movable from the feed reel to the take up reel, a reversible drive shaft rotatable in one direction for actuating said shafts to feed the film from the feed reel to the take up reel, driving means connecting said take up reel shaft with said drive shaft for driving said take up reel shaft during normal operation, other means actuated by said drive shaft in a reverse direction and mounted on said feed reel shaft for connecting said feed reel shaft with said drive shaft for reversely driving said feed reel shaft at a certain speed when said drive shaft is reversed, and rewinding mechanism also mounted on said feed reel shaft for connecting said feed reel shaft with said drive shaft for reversely driving said feed reel shaft at a higher speed.

3. In a cinematograph, a casing, a feed reel shaft and a take up reel shaft on said casing, reels mounted on said shafts for supporting a cinema film, said feed reel shaft being rotatable in one direction in feeding the film to the take up reel, operating mechanism, means mounted on said feed reel shaft and connecting said feed reel shaft with said mechanism for rotating said feed reel shaft at a certain speed in the opposite direction, and rewinding mechanism also mounted on said feed reel shaft for connecting said feed reel shaft with said operating mechanism for reversely driving said feed reel shaft at a higher speed.

4. In a cinematograph, a casing, a feed reel spindle on said casing, a feed reel on said spindle for supporting a cinema film, a take up reel, said spindle being rotatable in one direction in feeding the film from said feed reel to said take up reel, a belt mounted on said feed reel spindle for rotating said feed reel spindle in the opposite direction at a certain speed, operating mechanism, means connecting said take up reel with said operating mechanism for driving said take up reel during normal operation, and rewinding mechanism for reversely driving said spindle at a higher speed, said rewinding mechanism comprising another belt also mounted on said spindle and a clutch adapted to connect said other belt with said operating mechanism.

5. In a cinematograph, a casing, a feed reel spindle on said casing, a feed reel on said spindle for supporting a cinema film, a take up reel, said feed reel spindle being rotatable in one direction for feeding the film from said feed reel to said take up reel during normal operation, means mounted on said feed reel spindle for rotating said feed reel spindle in the opposite direction at a certain speed, operating mechanism having a rotatable member, a manually operable button coaxial with said rotatable member and movable axially toward and from said member, coacting clutch elements on said member and button, and a belt also mounted on said spindle for connecting said feed reel spindle and button for rotating said spindle in the opposite direction to rewind the film onto said reel at an increased speed, said clutch elements being automatically disengaged by the rotation of said rotatable member during the normal operation of the cinematograph.

6. In a cinematograph, a casing, a feed reel spindle on said casing, a feed reel on said spindle for supporting a cinema film, a take up reel, said spindle being rotatable in one direction for feeding the film from said feed reel to said take up reel, a rotatable operating member housed within said casing, a shaft supporting member, an axially movable button on said shaft and projecting through an aperture in said casing, coacting clutch elements on the inner end of said button and on said operating member, and a belt connecting said spindle and button for reversely driving said spindle and reel to rewind the film, said clutch elements being automatically disengaged by the rotation of said operating member during the normal feeding of the film from said feed reel to said take up reel.

7. In a cinematograph, a casing, a feed reel spindle on said casing, a feed reel on said spindle for supporting a cinema film, a take up reel, a sprocket for feeding the film from said feed reel to said take up reel so as to rotate said spindle in one direction, a reversible drive shaft, gears housed within said casing and connecting said shaft with said sprocket, a driven shaft supporting one of said gears, an axially movable button on said driven shaft adapted for manual operation, said button projecting through an aperture in said casing, coacting clutch elements on said one gear and button and housed within said casing, and a belt connecting said button and spindle for reversely driving said spindle and reel to rewind the film.

Signed at Chicago this 21st day of March 1930.

AXEL A. MONSON.
ABRAHAM SHAPIRO.