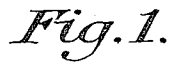


APPLICATION FILED AUG. 29, 1913.

2 SHEETS—SHEET 1.



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By his Attorneys,
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R. J. EMORY.
TAKE-UP REEL FOR KINETOSCOPES.
APPLICATION FILED AUG. 29, 1913.

1,299,566.

Patented Apr. 8, 1919.
2 SHEETS—SHEET 2.

Fig. 2.

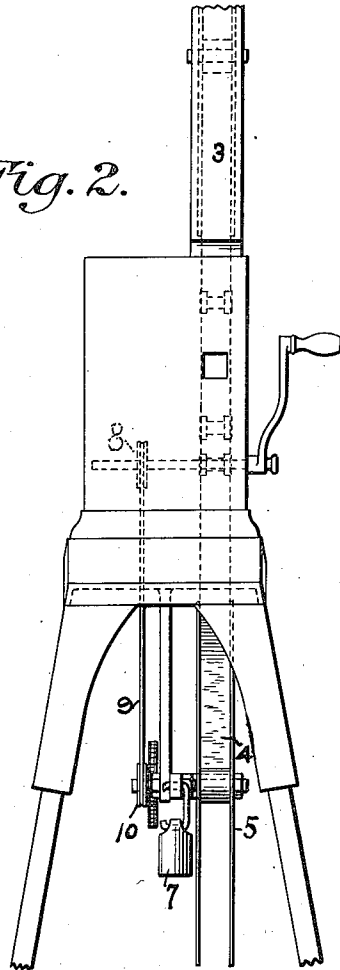
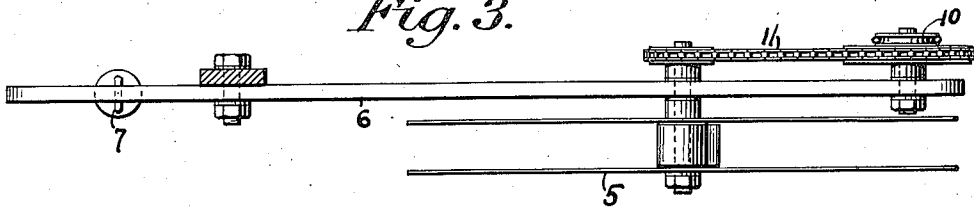


Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT J. EMORY, OF NEWARK, NEW JERSEY, ASSIGNOR TO BAIRD MOTION PICTURE MACHINE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TAKE-UP REEL FOR KINETOSCOPES.

1,299,566.

Specification of Letters Patent.

Patented Apr. 8, 1919.

Application filed August 29, 1913. Serial No. 787,266.

To all whom it may concern:

Be it known that I, ROBERT J. EMORY, a citizen of the United States, residing in Newark, in the county of Essex, in the State of New Jersey, have invented certain new and useful Improvements in Take-Up Reels for Kinetoscopes, of which the following is a specification.

My invention relates to take-up devices for moving picture machines and particularly relates to a compensating device for automatically regulating the tension on the picture film as the same is wound onto the take-up reel.

One of the objects of my invention is to provide a means for taking up the film after it has passed the feeding mechanism in such manner, that it will be under a uniform tension at all times from the beginning to the end of the winding.

Accordingly I provide a loose driving connection for the take-up reel arranged so that the driving engagement with the reel will be automatically increased with an increase in the amount of film on the reel and which will be automatically decreased by any increase of tension in the film.

Various other objects and advantages of the invention will be in part obvious and in part more fully set forth in the following description of a physical embodiment of the invention which also discloses various new and novel features of construction and combination of parts hereinafter set forth and claimed.

In the accompanying drawing, wherein is shown one of the various possible embodiments of the invention;

Figure 1 is a side elevation of a conventional form of moving picture machine, showing a preferred form of my invention in place thereon;

Fig. 2 is a rear elevation of the machine shown in Fig. 1, and

Fig. 3 is a horizontal sectional view taken on the plane indicated by the lines *xx* of Fig. 1.

Referring to the drawing, there is shown the usual table 1 supporting the lamp house 2, the film supply reel 3 from which the film 4 is drawn across the picture aperture by the usual intermittent feed mechanism. The exposed film is then wound upon the take-up reel 5, which may be placed in any suitable position, preferably below the table.

The reel 5 is rotatably mounted on one arm of a lever 6 which is pivoted to a suitable part of the table 1 and is free to move in the direction of the portion of the film about to be wound on the reel. The lever with the empty reel is substantially counterbalanced by any suitable means, such as weight 7, whereby a refined adjustment of the counter balancing may be obtained. The reel 5 is driven from a driving pulley 8 preferably operatively connected with the film actuating mechanism that is connected by a belt 9 with a pulley 10, which is pivotally mounted on the arm of the lever 6 carrying the reel and supported by the belt. The reel 5 is driven from the pulley 10 by any suitable connection, preferably by a positive connection, such as the chain and sprocket 11.

In operation, the forward end of the film is fastened as usual to the core of the take-up reel and the weight 7 is shifted along the lever until there is a desired tension on the portion of the film between the last set of feed rollers forming a part of the film feeding mechanism, and the film roll on the reel. The machine is operated as usual, to draw the film across the picture aperture, and simultaneously to wind the spent film upon the take-up reel 5. As the weight of the reel 5 is substantially counterbalanced, the pulley 10 will bear very lightly upon the belt 9, but as more and more of the film is wound on the reel 5, the greater and greater will be the engagement of the belt 9 with the pulley 10. In this way the pulling power of the belt 9 is increased by the increased weight of the film on the reel, since the weight increases the frictional engagement between the belt and pulley. This increased pulling power of the belt compensates for what would be a decrease in tension on the film due to its increasing diameter and in this way the initial pre-set tension on the film is not varied and there is thus eliminated the tendency of the film to tear as it is about to be drawn onto the take-up reel.

With an increase of tension in the part of the film about to engage the roll on the reel, the rotating reel will be held from rotating by the tension on the film thus permitting the belt to slip on the pulley, thus giving the film feeding mechanism time to advance the film and release the tension thereon. As soon as the tension on the film is released,

the driven pulley settles into better engagement with the driving belt and continues its speed of rotation. Let it be assumed that the film has one or two turns on the take-up reel and that the driving member 8 is rotating at constant speed and with a constant force, and that the film feeding mechanism of the machine is feeding the film down toward the take-up reel at the usual speed which is approximately constant and assumed to be for the purpose of this discussion. Now, under these conditions the pulley 10 is resting lightly on the belt and the force of the belt is acting to rotate the take-up reel at a constant speed depending of course on the gear ratio of the several driving members. Initially the force of the driving parts acts on the take-up reel through the short radius arm provided by the first few turns of the film to cause the same to draw on the film with a preset tension. As more and more turns of film are taken up by the reel, the radius arm of course increases. If the same power factors are applied under these conditions as when the arm was short the pull on the film must be less than before. However, with the increase in diameter of the reeled film, the weight on the reel increases, thus automatically increasing the engagement of the pulley 10 with the belt and thus increasing the pulling effect of the belt 9 on the pulley. In this way as the force from the belt is caused to act on the film over a longer radius arm, the power must be increased in order to maintain the preset tension on the film and this is done by the increase of weight on the take-up reel. Considering the action of the device from another standpoint, it is apparent that the pulley will wind up the film on the reel so long as there is any frictional engagement between the pulley and belt and as long as the feeding mechanism is feeding the film thereto. If at any time the pull of the belt is such as would tend to cause the reel to wind more rapidly than the film is fed thereto, the reel would be held momentarily by the tension on the film and the belt would merely slip about the pulley until the holding of the reel was released.

This device is simple in its operation, has a minimum number of parts to get out of order, and may be readily installed upon the usual form of picture machine now in general use at little additional expense. It is entirely automatic in its operation, and when once set, promptly decreases the speed of rotation of the reel when an increase in tension takes place in the film, thus reducing the danger of tearing the film.

Although I have shown one form of mechanism embodying my invention with various modifications thereof, it is obvious that many other changes within the skill of the mechanic may be made without departing

from the spirit of the invention, provided the means set forth in the following claims be employed.

I claim as my invention:—

1. In a moving picture machine, the combination with a take-up reel and a film adapted to be drawn thereon, a movable bearing for said reel, of a driving belt normally assisting to support the reel in operative position and operatively connected therewith to rotate the same.

2. In a moving picture machine, the combination with a take-up reel and film therefor, driving means operatively connected with the reel to actuate the same and to support the weight of film carried by the same, said reel designed to place a tension on the film determined by the weight of film on the reel and means whereby excess tension on the film automatically decreases the weight carried by said driving means.

3. In a moving picture machine, the combination with a movable arm, a take-up reel rotatably mounted on said arm, a driven pulley rotatably mounted on said arm, a driving pulley, a belt looped about said driving and driven pulleys and supporting said arm and a driving connection between said driven pulley and said reel whereby said reel is driven from and supported by said driving pulley.

4. In a moving picture machine, a take-up reel, means for counterbalancing the weight of said reel, a belt for driving said reel, said belt supporting the weight of the film on said reel whereby the weight of the film on said reel will control the driving engagement of the belt.

5. In a moving picture machine, mechanism for feeding the film, driving means operatively connected with the feed mechanism, a take-up device for winding up the film after it has passed the feeding mechanism, driven means operatively connected with said take-up device and a driving belt supporting said driven means from said driving means whereby the excess tension on the film will automatically move the take-up device relative to the driving means.

6. In a moving picture machine, the combination with a pulley and a drum operatively connected to said pulley to be actuated thereby, a belt looped about said pulley for winding films upon said drum, of movably mounted means controlled by the weight of the drum and film being wound thereon for regulating the tension of the belt.

7. In a moving picture machine, the combination with a pulley shaft, a pulley coupled to said shaft to drive the same, a drum operatively connected to said shaft to be driven thereby and a belt looped about the pulley and used for rewinding films upon said drum, of a supporting member for the shaft, controlled by the weight of

the drum and film being wound thereupon for regulating the tension of the belt, means acting on said member for causing the same to assume its normal position after having
5 been pressed downwardly by the weight of the drum and means for regulating the action of said first named means

8. In a device of the class described, the combination of a driving means and a shift-
10 able mechanism including a take-up reel adapted to wind a film thereon, and vertically movable means controlled by the tension on the film for causing the driving means to become inoperative.

15 9. In a device of the class described, the combination of a driving member and a shift-able mechanism including a take-up reel adapted to wind a film thereon, and a horizontally disposed lever controlled by ten-
20 sion on the film to cause a slipping on the driving of the reel by the driving member.

10. In a device of the class described, the combination of a driven member mounted to revolve and adapted to receive an increasing weight thereon and a constantly moving
25 driving member normally in light driving engagement with the periphery of the driven member to turn the same, the driving engagement between the driving and driven
30 member being dependent upon the weight acting on the driven member.

11. In a device of the class described, the combination of a driven member mounted to revolve and adapted to receive an increasing weight thereon, a constantly moving
35 driving member normally in light driving engagement with the periphery of the driven member to turn the same, the driving engagement between the driving and driven
40 members being dependent upon the weight acting on the driven member, the engaging surfaces of said driving and driven members being smooth whereby said driv-

ing member is permitted to slip relative to the driven member.

12. In a device of the class described, the
45 combination of a reel adapted to wind a film thereon, a driven member operatively connected to said reel to turn the same, a driving member engaging said driven member to turn the same, and means controlled
50 by the weight of film on the reel to increase the driving engagement of the driving member with the driven member with increase in weight of the film on the reel, said means
55 controlled by the tension on the film to reduce the driving engagement of the driving member with the driven member.

13. In a device of the class described, the combination of a reel adapted to wind a film thereon and free to move vertically for
60 a limited distance, a driven member operatively connected to said reel to rotate the same, and means engaging said driven member to rotate the same, said means including
65 a slip clutch connection automatically actuated by the film for maintaining a constant tension on the film as it is drawn on the reel.

14. In a device of the class described, the combination of a support, a member carried
70 by said support and having a portion thereof capable of a falling movement, means acting on said portion and tending to resist the falling of the same, a driven pulley carried by said portion, a driving means and
75 a connection actuated from said driving means and looped under said driven pulley to support the same and a drum operatively connected to said driven pulley to be driven thereby.

This specification signed and witnessed
80 this 26th day of August, A. D. 1913.

ROBERT J. EMORY.

Signed in the presence of—

M. J. COOPER,
S. THORNTON