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(54) **MOTION PICTURE PROJECTION APPARATUS**

(57) **Abstract:**

(54) **APPAREIL DE PROJECTION DE VUES ANIMEES**

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This invention relates to a motion picture projection apparatus of small size or toy motion picture device which may be operated with facility and used with advantage by amateurs. Among other advantages, the loading of the apparatus and the re-winding of the film after the projection are effected in a very easy and rapid manner, as will be set forth hereunder.

One characteristic feature of this apparatus consists in the fact that the film entraining mechanism is controlled by the action of a lever or similar element co-operating with a contact element which is caused to bear upon one edge of the film in such manner that when the said contact element falls into a notch in the edge of the film the said lever or like element will act upon the film entraining element in order to separate the same from the film, whereby the entraining mechanism still continues to operate but with no effect and without acting upon the film, the latter being thus immobilized, either to carry out a stationary projection or to prevent the film from being ~~torn~~ from its storage reel when near the end of the projection.

An advantage is thus afforded by the said device, from the fact that the transfer can be made with facility from a motion picture projection to a stationary picture projection such as a title, a fixed object or the like, and vice versa, without being obliged to stop the entraining mechanism and consequently obviating all shocks or effects of

inertia. On the other hand, when at the end of the projection the film will be automatically immobilized without any risk of tearing the film away from the storage reel to which the rear end of the film is preferably secured in a permanent manner. Other characteristic features and advantages will be set forth in the following description.

In the accompanying drawings, given by way of example:

Fig. 1 is a vertical lengthwise section of the apparatus on the line A-A, Fig. 2.

Fig. 2 is a cross-section on the line B-B, Fig. 1.

Fig. 3 is a diagrammatic view of the mechanism for stopping the film either during the course of the projection or at the end of the same by removing the claws of the entraining mechanism from the film.

1 indicates the storage reel with the revoluble core 2 having permanently secured thereto one end of the film to be projected, the said core being provided at one end with a diametral groove 5 for actuating the same by mechanical means. 3 indicates the cheeks of the storage reel and ⁴the aperture formed in the walls thereof. 6 is the support or bracket for securing the storage reel to the projection apparatus. 7 is a guide-way for the film and 8 the projection aperture of the apparatus. 9 is a cam for actuating the frame 10 which carries the support 11 for the feeding claws 12. 13 is a helical disc plate or cam providing for the forward or backward movement of the claw support 11. The said disc cam 13 is slidable on the shaft 14 of the cam 9 and is separated from the said cam by a spring 15; the

cam 13 is caused to rotate together with the shaft 14 by means of a suitable key connection.

A lever 16 (Figs. 1 and 3) acts upon a ring 17 for impelling the cam 13 towards the cam 9. 18 is a slidable member having disposed at the end thereof a contact roller 19 adapted to bear upon the edge of the film, the said member actuating a pawl or catch 20 whereof the nose 21 engages the lever 16 in normal operation. A spring 22 maintains the contact between the roller 19 and the edge of the film. When the roller enters a notch in the film under the action of the spring 22, the lever 16 is disengaged and the cam 13 actuated by the spring 15 will withdraw the claw 12 from the film. To resume the projection, the operator pushes by hand the lever 16 at the end 16^a, whereupon the nose 21 of the pawl, 20 will again engage the lever, the film will commence to travel and the lever can now be released.

23 is a driving worm mounted on the shaft 14 and in engagement with the worm wheel 24. 25 is a pulley mounted on the shaft of the actuating crank 26. 39 is a flat circular casing wherein the film is caused to enter directly after passing through the guide 7, the film moving before the aperture 8 and engaging the claw of the intermittent entraining mechanism. The film becomes wound upon itself within the said casing which may be provided with suitable means for preventing friction between the film and the inner surface, such for instance as rollers disposed around the periphery and ribs disposed upon the cheeks and the periphery.

The mechanism for re-winding the film is constituted by the shaft 27 having disposed at the end

thereof the screwdriver member 28 adapted to engage the groove 5 of the core 2 forming part of the storage reel 1. The said shaft is actuated by the movement of the hand crank by means of the pulley 25, the belt 29, the pulley 30, the worm wheel 31 and the worm 32.

The teeth of the wheel 31 and the worm 32 are situated in the oblique direction in such manner that the shaft 27, which has a sufficient play at the journals, is withdrawn from the storage reel when the crank is turned in the direction corresponding to the projection, but will engage the said core upon rotating the crank in the contrary direction.

The apparatus is completed by the objective 33, a combined fly wheel and shutter 34, and an optical arrangement for projection purposes comprising the lantern 35, the lamp 36, mirror 37 and condenser 38.

In the form of construction shown in the drawing, the apparatus is further completed by a winding device disposed as follows. The driving shaft 26^a has mounted thereon a gear wheel 41 engaging a gear wheel 42 mounted in a casing 40 which is secured to the casing 39. The gear wheel 42 has secured thereto the pulley 43 which is connected by a belt 44 with a second pulley 45 whose shaft 46 extends within the casing 39 at the centre of the same. To the shaft 46 is secured a radial arm 47 having at the end thereof a small pin 48 disposed parallel to the shaft.

Upon turning the crank 26 for the projection of the views, the film will move downwardly under the action of the claws 12 while at the same time the arm 47 is given a movement of rotation within the

casing 39. The pin 48 is thus brought in contact with the film and acts upon the latter by friction in the direction of the winding, thereby facilitating the formation of the spiral turns.

To facilitate the winding, it is advantageous to previously give a slightly curved shape to the film in such manner that the end of the film will itself take a suitable position for the engagement with the pin 48. One method for obtaining this deformation of the film consists in placing the reels of film in a drying room at a temperature of about 50° centigrade. Films thus prepared will roll up in a very satisfactory manner in coils having regular turns.

By the use of the described device, a considerably greater length of film can be stored in the casing 39 than if the said device were not employed.

It will be observed that there is still obtained with the said device the important advantage arising from the facility with which the film may be disposed in the operating position without being obliged to secure the forward end of said film to a winding reel as in the major part of the known devices.

The operation of the whole device is as follows.

Upon turning the crank 26, the shaft 14 is rotated by means of the worm 23. The cam 9 actuates the claw support 11, and the claws 12 engaged in the perforations of the film will cause the latter to descend. The cam 13 when rotating will act to withdraw the claws 12 at stated intervals to release the same from the film, thus causing the claws to move upwardly

in the disengaged position. Should it be desired to temporarily obtain a fixed projection, such for instance as the projection of a title, the roller 19, Fig. 3 will fall into a notch provided in the edge of the film, the lever 20 will be drawn by the spring 22, the nose 21 of the same will disengage the lever 16, and the cam 13 may thus recede under the action of the spring 15, thereby maintaining the claws 12 constantly out of engagement with the film. The latter will thus be immobilized while at the same time the whole mechanism of the apparatus is still operating in a continuous manner, thus affording the advantage of obviating all shocks when changing over from the motion picture to the fixed projection or the contrary. The motion picture projection is recommenced by operating the lever 16 by hand.

When near the end of the projection, the roller 19 will fall into another notch in the film which is formed in the edge towards the end of the same, and in this manner the film is stopped, as in the case of the fixed projection shortly before it has become entirely unwound, thus preventing all tearing of the film from the core 2 of the storage reel. The re-winding of the film on the storage reel is carried out as above indicated.

The invention is not limited to the detailed arrangements as hereinbefore set forth, these being given solely by way of example.

C L A I M S .

1. A motion picture projection apparatus comprising a feeding member adapted to impart to the film an intermittent feeding movement, means for actuating said feeding member, a contact member adapted to engage with the film and means controlled by said contact member for permanently disengaging the feeding member from the film.

2. A motion picture projection apparatus comprising a feeding member adapted to engage the film, means for imparting^{to} the said feeding member an intermittent feeding movement, a spring actuated cam adapted to periodically disengage said feeding member from the film, a pivoted lever adapted to hold the cam in its operative operation, a spring controlled pawl engaging with the lever and a roller adapted to engage with the film operatively connected to said pawl.

3. A motion picture projection apparatus comprising a storage reel for the film, a revoluble core in said storage reel, to which one end of the film is^{adapted to be} permanently secured, a feeding member adapted to impart to the film an intermittent feeding movement, means for actuating said feeding member, a contact member adapted to engage with the film and means controlled by said contact member to permanently disengage the feeding member from the film, whereby the film is prevented from being torn off the said revoluble core, at the end of the projection.

4. A motion picture projection apparatus comprising a storage reel for the film, a revoluble core in said storage reel to which one end of the film is adapted to be permanently secured, a feeding mechanism adapted to impart to the film an intermittent feeding

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movement, a rotary member for actuating said mechanism, and means for operatively connecting said rotary member to the revoluble core of the storage reel in order to re-wind the film after the projection.

5. A motion picture projection apparatus comprising a storage reel for the film, a revoluble core in said storage reel, to which one end of the film is adapted to be permanently secured, a feeding mechanism adapted to impart to the film an intermittent feeding movement, a rotary member for actuating said mechanism, a worm adapted to be displaced axially and to engage with the revoluble core, a worm wheel engaging with said worm and means for operatively connecting said rotary member to said worm wheel.

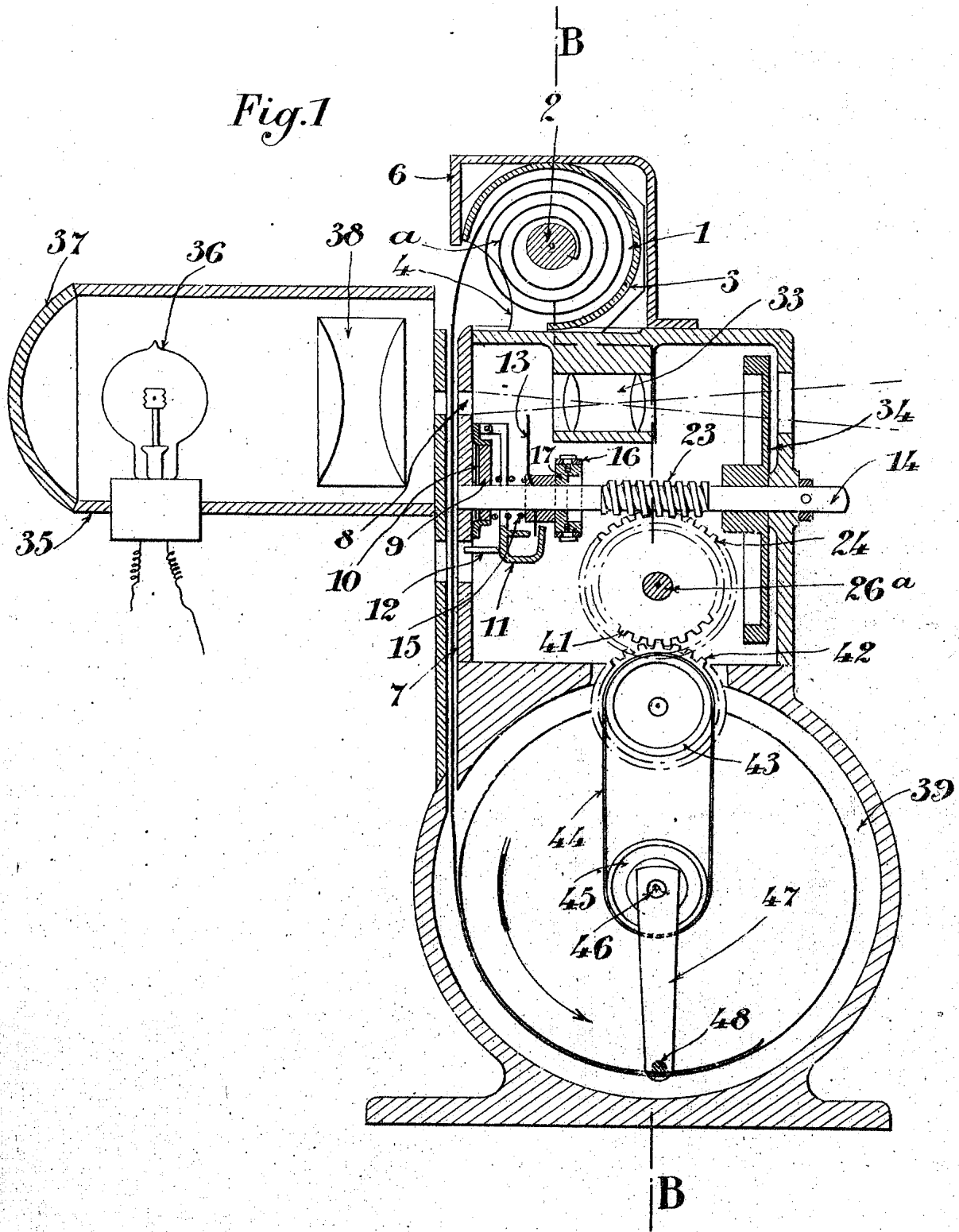
6. A motion picture projection apparatus comprising a storage reel for the film, a revoluble core in said storage reel, to which one end of the film is adapted to be permanently secured, a feeding mechanism adapted to impart to the film an intermittent feeding movement, a rotary driving member for actuating said mechanism, means for operatively connecting said rotary member to the revoluble core of the storage reel in order to re-wind the film after the projection and a flat circular box which the film is adapted to enter in an approximately tangential direction after leaving the feeding mechanism, the film being thus enabled to roll up automatically in spiral form within the said chamber during the projection and to be unrolled in like manner during the re-winding.

7. A motion picture projection apparatus comprising a storage reel for the film, a revoluble core in

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said storage reel, to which one end of the film is adapted to be permanently secured, a feeding mechanism adapted to impart to the film an intermittent feeding movement, a rotary driving member for actuating said mechanism, means for operatively connecting said rotary member to the revoluble core of the storage reel in order to re-wind the film after the projection, a flat circular box which the film enters in an approximately tangential direction after leaving the feeding mechanism, a radial arm adapted to rotate in said circular box, a transverse pin in the outer end of said arm and means for operatively connecting said arm to said rotary driving member.

Fig. 1



In presence of
J. W. Archambault

Ch. G. Robit Certified to be the drawing referred to
in the specification herewith annexed.

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Fig. 2

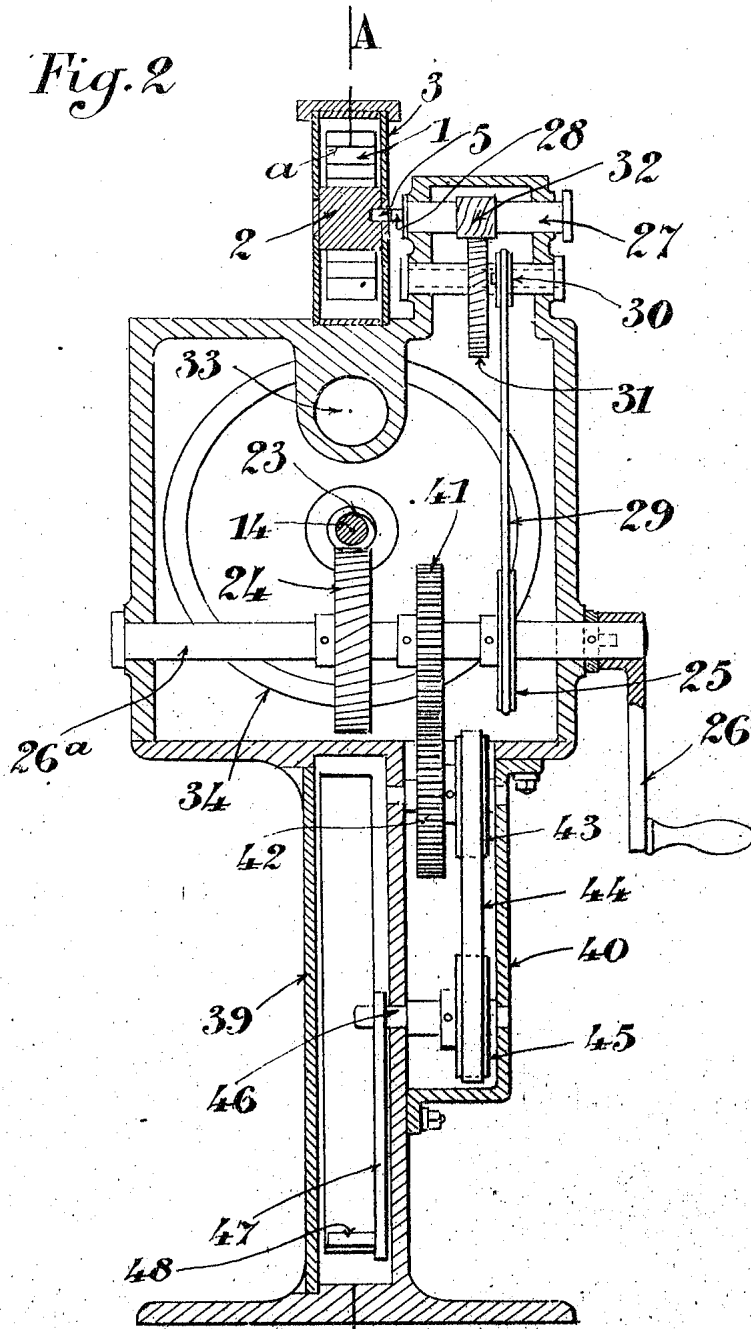
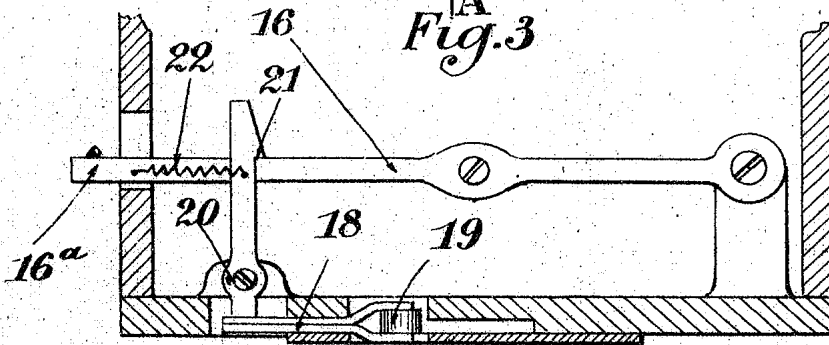


Fig. 3



In presence of
J. Wareham

Certified to be the drawing referred to
in the specification hereunto annexed.
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