Feb. 19, 1924. 1,484,545

W. B. ASPLEY

REWINDING MACHINE FOR MOVING PICTURE FILMS

Filed March 28, 1923 4 Sheets-Sheet 1

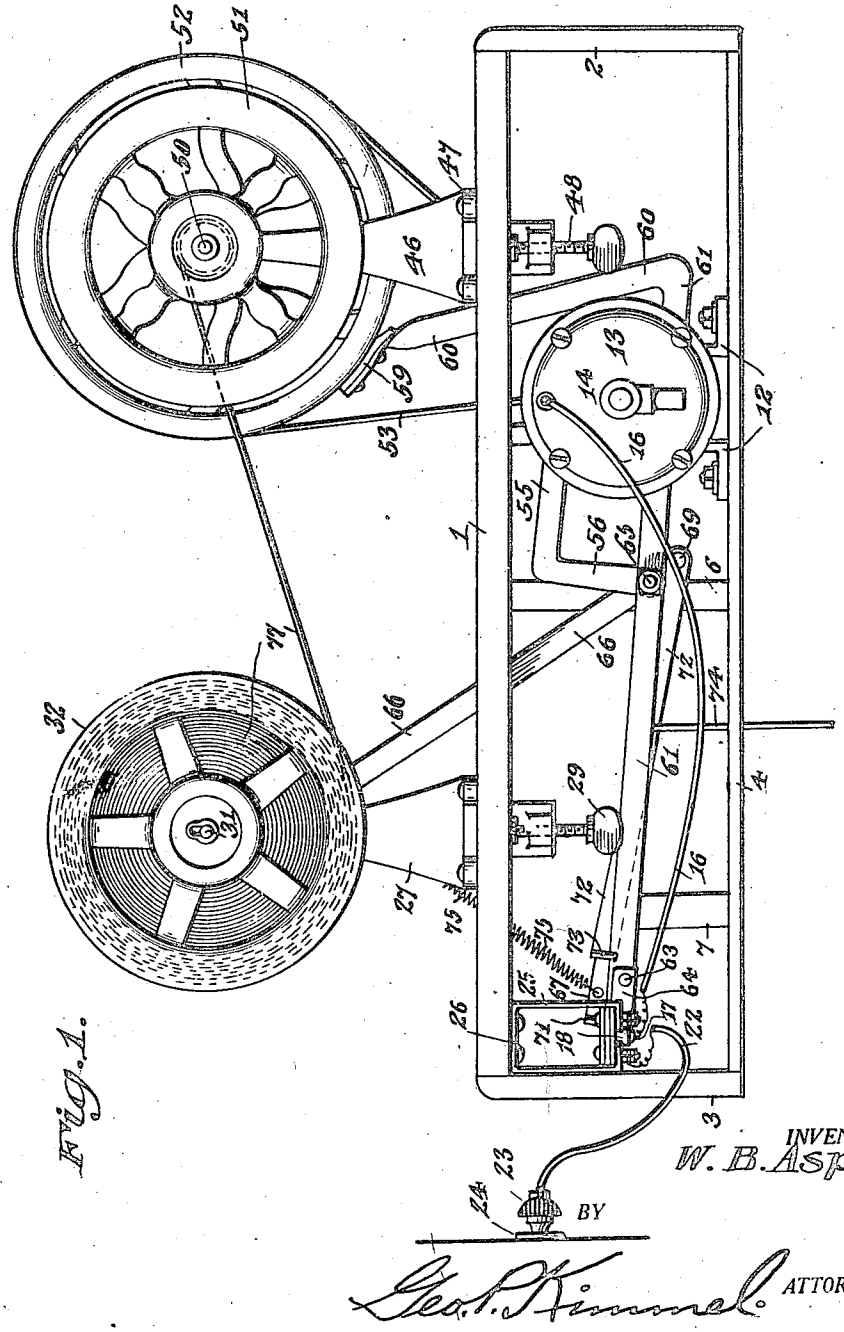


Fig. 1.

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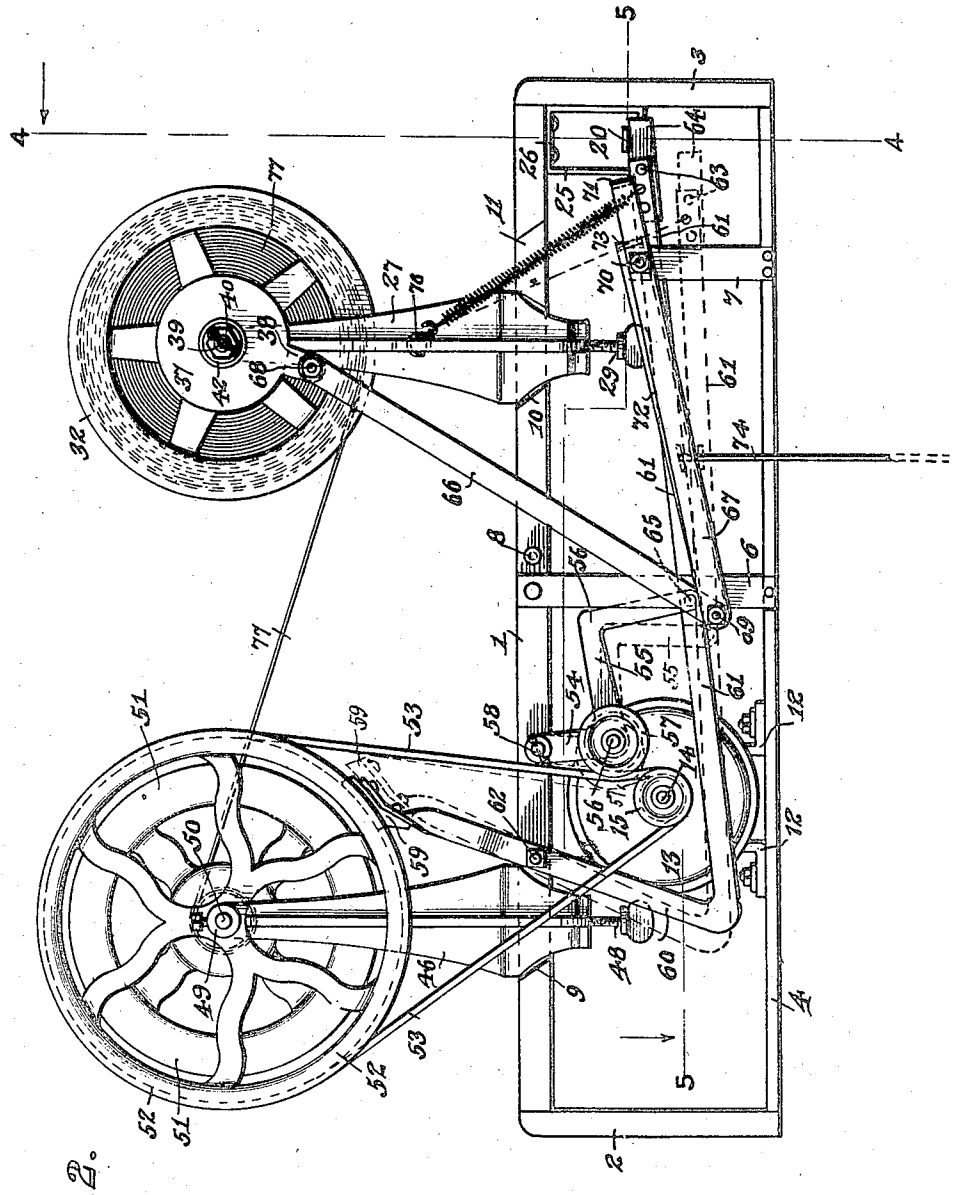


Fig. 2.

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Filed March 28, 1923 4 Sheets-Sheet 5

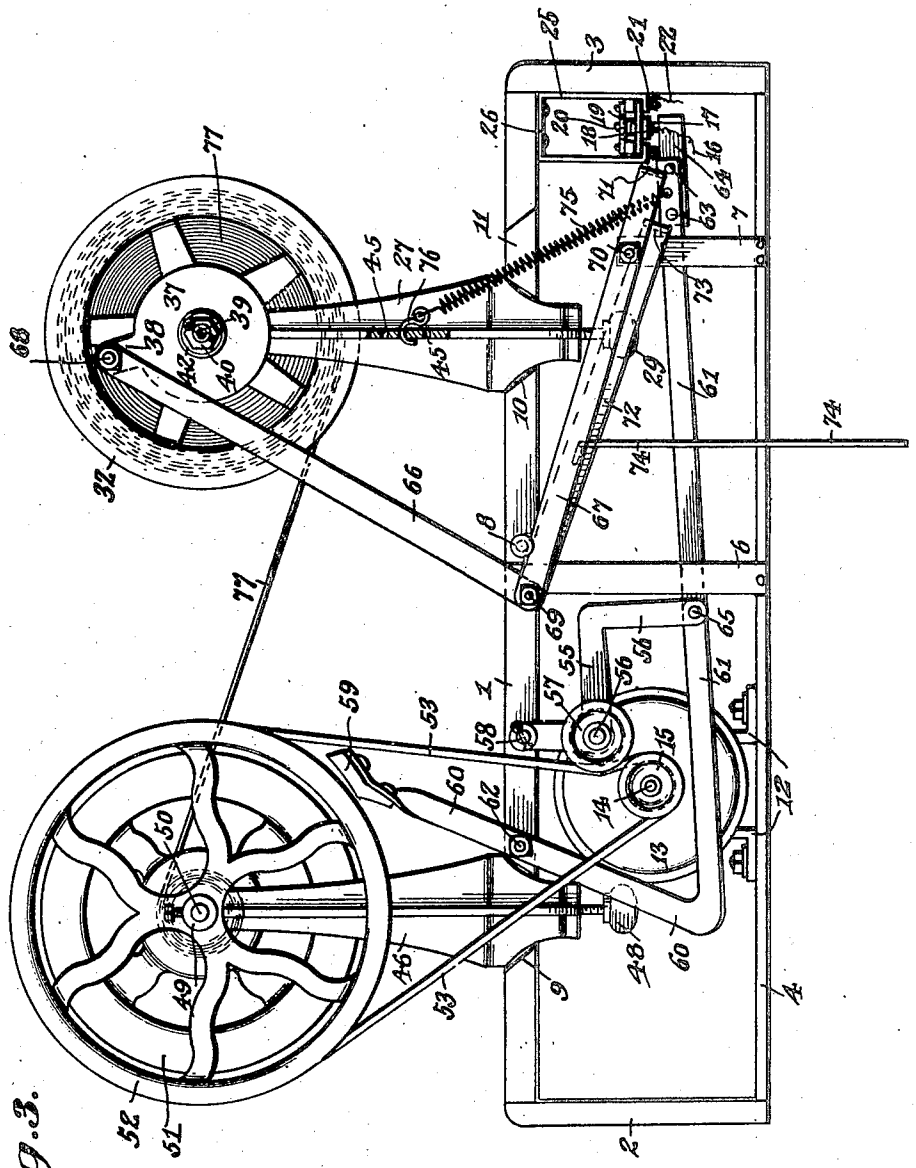


Fig. 3.

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REWINDING MACHINE FOR MOVING PICTURE FILMS

Filed March 28, 1923 4 Sheets-Sheet 4

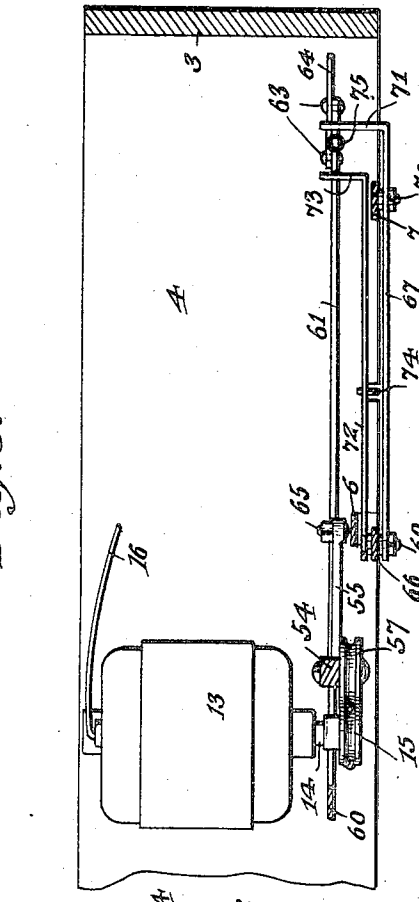


Fig. 5.

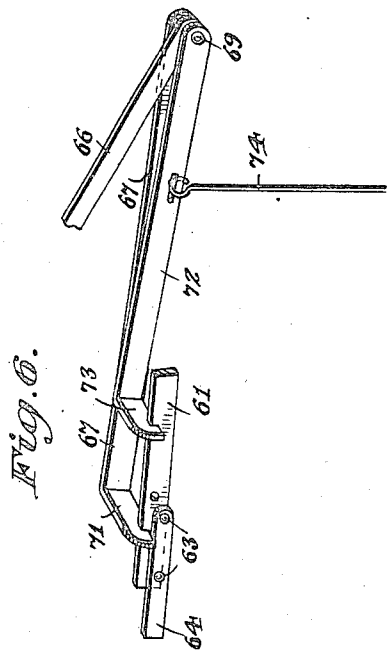


Fig. 6.

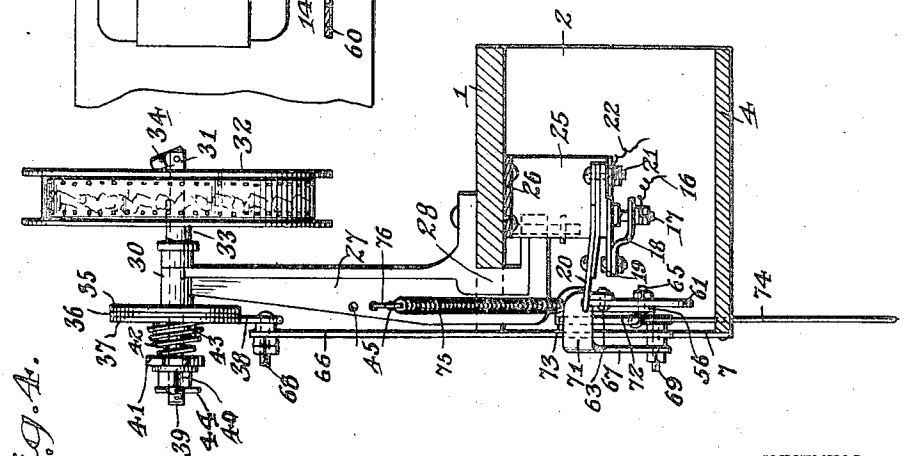


Fig. 4.

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Patented Feb. 19, 1924. 1,484,545

UNITED STATES PATENT OFFICE.

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REWINDING MACHINE FOR MOVING-PICTURE FILMS.

Application filed March 28, 1923. Serial No. 628,320.

To all whom it may concern:

Be it known that I, WALTER B. ASPLEY, a citizen of the United States, residing at Glasgow, in the county of Barren and State of Kentucky, have invented certain new and useful Improvements in Rewinding Machines for Moving-Picture Films, of which the following is a specification.

This invention relates to re-winding machines for moving picture films and has for its object to provide a machine of such class, in a manner as hereinafter set forth, with a re-winding device for automatically re-winding a film, and such device having associated therewith means for not only automatically discontinuing its operation if the film breaks, but further for automatically discontinuing its operation after the completion of the re-winding of the film, and to further provide the machine with means associated with the re-winding device to provide for the re-winding of a film for inspection so as to control the speed of the film during re-winding so that it can readily be inspected during such operation.

Further objects of the invention are to provide a re-winding machine for the purpose set forth, which is comparatively simple in its construction and arrangement, automatic in its action, strong, durable, compact, readily assembled, thoroughly efficient in its use, conveniently handled, and comparatively inexpensive to set up.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is an elevation looking towards one side of the machine and with the elements arranged in a non-re-winding position.

Figure 2 is a view similar to Figure 1 looking towards the other side of the machine.

Figure 3 is a side elevation of the machine with the elements thereof in re-winding position.

Figure 4 is a section on line 4—4, Figure 2.

Figure 5 is a section on line 5—5, Figure 2.

Figure 6 is a fragmentary view, in perspective, of the lever elements of the machine.

Referring to the drawings in detail, the machine includes a base in the form of a rectangular frame consisting of a top bar 1, a pair of end bars 2, 3, and a bottom bar 4, and which are of substantial width to support the various elements of the machine. One side of the support has a brace bar 6 connected to the top and bottom bars 1, 4, respectively of the frame, and that side of the support to which the brace bar 6 is secured the bottom bar 4 has fixedly secured therewith an upright 7 of less height than the brace bar 6. The top bar 1 of the support, in proximity to the brace bar 6, is formed with a lateral stop 8, for a purpose to be presently referred to. The top bar 6, at a point between its center and the end bar 2, is cut away as at 9, to provide a clearance, and said top bar 1, at a point between the brace bar 6 and end bar 3 is also cut away as at 10 to provide a clearance. The cut-away portions 9 and 10 open at that side edge of the bar 1 to which the brace bar 6 is secured. The top bar 1, between the cut-away portion 10 and the end bar 3, is formed with a cut-out portion 11 which provided a clearance and which is of less depth than the cut-away portion 10.

Arranged within the support, and secured to the upper face of the bottom bar 4, are standards 12 for supporting an electric motor 13, the shaft of which is indicated at 14 and is provided with a grooved pulley 15. The circuit connections for the motor 13 are indicated at 16 and which are attached to a binding post 17, carried by a conducting plate 18 provided with a contact point 19, cooperating with a resilient contact member 20 extending from a binding post 21, to which is connected circuit connections 22 carrying a plug 23 adapted to be inserted in a socket 24 leading from a source of electrical energy, not shown. The elements 17, 18, 19, 20 and 21 are carried by a bracket 25, which is secured to the top bar 1, by the hold-fast devices 26. The bracket 25 de-

pends from the top bar 1, and the elements 17 to 21 are suitably insulated therefrom and the elements 17, 18 and 19 are suitably insulated from the elements 20 and 21. Under normal conditions the contact member 20 is out of engagement with the contact 19, so that the motor circuit will be open and the motor not operating, and the means for maintaining the contact member 20 clear of the contact 19 will be presently referred to.

Extended into the cut-away portion 10 and projecting above the top bar 1, is a vertically disposed standard 27 having a yoke-shaped lower portion 28 overlapping the top bar 1, and the said lower portion 28 carries a clamping screw 29 capable of engaging with the top bar 1 whereby the standard 27 will be removably secured to the support. The upper end of the standard 27 provides a bearing 30 for a shaft 31 which projects from both sides of the bearing 30 and carries at one end a film carrying reel 32. The reel 32 is connected to the shaft 31 so as to rotate therewith and is provided with the film which is to be rewound. The shaft 31 carries a sleeve 33 and has one terminus thereof bifurcated for the reception of a pivoted reel retaining latch 34, between which and the sleeve 33 is mounted the reel 32. The latch 34 can be shifted to extend in a direction lengthwise with respect to the shaft so that the reel 32 can be removed from the shaft when desired. The sleeve 33 is carried with and rotated by the shaft 31 and extends through the bearings 30, and has arranged thereon a series of frictional coupling disks, three in number, indicated at 35, 36 and 37. The disk 36 is formed of fiber and the disks 35 and 37 of metal and the disk 36 is interposed between the disks 35 and 37. The disk 35 is fixed to the sleeve 33 and the disks 36, 37 are loose on the sleeve 33. The disk 37 has extending therefrom a lug 38, for a purpose to be presently referred to. The shaft 31 has its outer end threaded, as at 39, and engaging with said threaded end 39 is an adjusting nut 40 against which is positioned a collar 41 having extending therein a coiled spring 42, which surrounds, as well as being connected to a collar 43 carried by the disk 37. The spring 42 in connection with the disks 35, 36 and 37 constitutes a drag mechanism and provides for a frictional coupling action to maintain the lug 38 in an elevated position during the rotation of the shaft 31. When the machine is at rest, the lug 38 is in the position as shown in Figures 2 and 4, but when the machine is operating, the lug 38 is in the position shown in Figure 3. When the lug 38 is shifted from the position shown in Figure 2 to the position as shown in Figure 3, it is maintained in such position by the frictional binding action between the disks and the action is such as to maintain the lug elevated during the operation of the shaft 31, but when the operation of the latter is discontinued the frictional binding or coupling action will be broken and the lug will then fall to the position shown in Figure 2. The lug 38 has associated therewith means for automatically discontinuing the operation of the machine when the shaft 31 has stopped, due to the breaking of a film or the complete unwinding of a film from the reel 32 and such means will be hereinafter referred to.

The end 39 of the shaft 31 is provided with a cotter pin 44 which bears against the nut 40. The standard 27 is formed with a series of openings 45 for a purpose to be presently referred to.

Extended into the cut-away portion 9 is a vertically disposed standard 46, having its lower portion 47 overlapping the top bar 1 and said lower portion 47 is provided with a clamping screw 48 which engages the top bar 1, whereby the standard 46 is detachably secured to the support. The upper end of the standard 46 is provided with a bearing 49 in which is journaled a shaft 50, having fixed therewith a re-winding reel 51. Fixed to the shaft 50 is a grooved driven pulley 52, having associated therewith a driving belt 53 which connects the pulley 52 with the pulley 15, so that when the motor 13 is operated, the shaft 50 will be rotated carrying the reel 51 therewith.

Supported by, as well as depending from the top bar 1 is a shiftable supporting member consisting of an upper arm 54, an intermediate arm 55 and a lower arm 56. The arm 54 projects upwardly from one terminus of the arm 55 and the arm 56 depends from the other terminus of the arm 55. The arms 54 and 56 are disposed at right angles with respect to the arm 55 and at the point of joinder of the arm 55 with the arm 54 a stub shaft 56 is mounted which carries a grooved pulley 57, arranged in proximity to the pulley 15. The upper end of the arm 54 is shiftably mounted on a stud 58, which projects laterally from the top bar 1. The function of the pulley 57 will be presently referred to.

Associated with the pulley 52 for the purpose of applying a braking action thereto, is a brake shoe 59, which is carried on the upper end of a brake lever formed of an upwardly extending arm 60 and a longitudinally extending arm 61. The arm 60 is pivotally connected, as at 62 to the top bar 1 and is arranged, when the brake shoe 59 is in inoperative position, slightly forward of the motor 13. The arm 60, at its lower end terminates in the forward end of the arm 61, and the latter arm extends rearwardly to the bracket 25. The rear terminus of the arm 61 has secured thereto, by the hold-fast devices 63, a contact breaker

64, formed of a strip of insulation material of substantial length and which is adapted to engage the contact member 20 and shift it clear of the contact 19 thereby opening the motor circuit and discontinuing the operation of the motor 13. The lower arm 56 of the supporting member for the pulley 57 is pivotally connected to the arm 61, as at 65.

In Figure 2 of the drawings the brake lever is illustrated in full and in dotted lines, and also the shiftable supporting member for the pulley 57, and further Figure 2 illustrates in dotted lines the position of the brake lever as well as the supporting member when the brake lever is shifted to normal position. The pulley 57 permanently contacts with the belt 53, and is designed when the brake lever is shifted to normal position to take up the slack in the belt 53. The position of the brake lever 61 in full lines in Figure 2 is illustrated as with the brake applied to discontinue the operation of the pulley 52, and as the supporting member 57 for the pulley is also shifted from dotted to full lines the position of the belt 53 becomes loose and will not perform its driving function with respect to the pulley 52. The full line position of the brake lever and the supporting member for the pulley 57 as shown in Figure 3 illustrates the position of such elements when the machine is operating.

Connected with the lug 38 for the purpose of shifting it to the position shown in Figure 3, as well as maintaining it in such position, when the machine is operating for the purpose of re-winding a film, is a shifting lever consisting of an upper arm 66 and a lower arm 67. The arm 66 is pivotally connected at its upper end, as at 68, to the lug 38 and said arm 66 is pivotally connected, as at 69 to the forward end of the arm 67. The arm 67 in proximity to its rear end is pivotally supported, as at 70, by the standard 7. The rear end of the arm 67 is provided with an inwardly extending projection 71, which overlaps the arm 61 of the brake lever. The upward movement of the shifting lever for the lug 38 is arrested by the stop 8 which is engaged by the arm 67 of the shifting lever, as clearly shown in Figure 3.

The pivot 69 between the arms 66 and 67 of the shifting lever, has mounted on the inner end thereof a manually operated lever arm 72, having its free end provided with an inwardly extending projection 73 which overlaps the lower arm 61 of the brake lever. Connected to the lever arm 72, is an operating element 74, which may be a wire rod or a flexible member and operated either by hand or foot tread. As shown, the element 74 consists of a wire rod. The extension 73 overlaps the lower arm 61 of the brake lever forwardly with respect to the overlapping of said arm 61 by the projection 71. The arm 61 of the brake lever has connected therewith the lower end of a pulling spring 75 which has its upper end provided with a hook 76 for the purpose of adjustably engaging in the standard 27. The openings 45 provide means for connecting the hook 76 with the standard 27.

The brake lever is maintained in inoperative position when the machine is in operation, through the medium of the projection 71 on the lever arm 67, and against the action of the pulling spring 75, and by this arrangement when the shifting lever which consists of the arms 66 and 67 is lowered so that the said arms 66 and 67 will assume the position shown in Figure 2, the action of the spring 75 will elevate the arm 61 of the brake lever so that the member 64 will shift the contact member 20 out of engagement with the contact 19, under such conditions opening the motor circuit and discontinuing the operation of the motor. When the arm 61 of the brake lever is shifted in a direction to open a motor circuit, the arm 66 of said brake lever will move forward so that the brake shoe 59 will engage the pulley 52 and arrest the action thereof.

The film carried by the reel 32 is indicated at 77 and during the re-winding operation the film must unroll from the bottom of the reel 32.

In connection with the manner of operation after the reel 32 has been mounted in position, the film unwinding the reel 32 has the end fastened to the reel 51, and care should be taken so as not to turn the reel 51 with the film on it prior to the connecting of the end of the film to the reel 51. The shifting lever consisting of the arms 66 and 67 is then moved to the position shown in Figure 3. When the film 77 is connected to the reel 51 the shifting lever will be maintained in the position shown in Figure 3. The plug is then inserted in the socket and the current turned on and the reel 32 given a slight turn to the left and the machine will then continue to operate until the film 77 is entirely re-wound on the reel 51 and when the film entirely leaves the reel 32 the shifting lever automatically lowers causing thereby the operation of the brake lever and the opening of the motor circuit. If the film 77 should break during the re-winding operation, the shifting lever will automatically lower causing the machine to discontinue operation.

The operation of the machine can be controlled through the medium of the manually operated member 74 which is attached to the lever 72 and when the member 74 is pulled downwardly to its central position, it will stop the operation of the machine, and when pulled down further will again start the machine. By the employment of the member 74 the speed of the machine can be con-

trolled, due to the fact that the braking element can be controlled relative to its braking action with respect to the pulley 52 and this enables the re-winding of the film to be slow for the purpose of inspection.

The base can be made either of wood or metal. When made of metal it will be formed of an integral body and will also have integral with itself parts 27 and 46, and will also include a hanging base for the motor which will be suspended from the under side. The switch will also be attached thereto. Part 15 may be either a grooved or flat pulley, or gear for chain. The friction may be either flat surface or friction disk.

The drag mechanism specified as having three disks must be optional so as to allow the use of more than three disks. These are to alternate to give one another more friction where necessary, and the additional disks are set up so as to provide for a frictional clutching action when necessary.

Lug 38 can be made longer than it is and drilled for adjustment of the leverage. That is, have a series of holes allowing for the changing of element 66 and placing it at different distances from the center of the disk, thereby changing its tension and allowing for the use of the machine for large or small hub reels.

It is obvious that the motor can be set up in any suitable manner and have associated therewith any character of transmission mechanism.

The spring 75 should be equipped with threader hanger for adjusting its tension.

The re-winder can be built for use in series, i. e., more than one unit operating from central power source, controlled by foot pedal alone or combination of both automatic and foot pedal or hand lever.

The preferred embodiment of the re-winding machine is as described and illustrated, but it is to be understood that changes can be had in connection with the details of construction without departing from the spirit of the invention as claimed.

What I claim is:—

1. A rewinding machine for moving picture films comprising a rotatable element from which the film is unwound, a rewinding reel for the film unwound from said element, an electric motor including a driving circuit therefor, a transmission belt extending from said motor to said rewinding reel for operating the latter, a circuit opening and closing device for said driving circuit, a lever mechanism including means to constitute a brake for said reel and a tension applying roller for said belt and a contact breaker for said device, said brake and said contact breaker being in operative engagement with said reel and device and said roller being in inoperative engagement with said belt when the operation of the reel is discontinued, and a frictional drag mechanism connected with said element and maintained in operative position during the operation of said reel to hold said lever mechanism in non-braking position with respect to said reel and said roller in tension applying position with respect to said belt and said contact breaker clear of said device to provide for the closing of the driving circuit.

2. A rewinding machine for moving picture films comprising a rotatable element from which the film is unwound, a rewinding reel for the film unwound from said element, an electric motor including a driving circuit therefor, a transmission belt extending from said motor to said rewinding reel for operating the latter, a circuit opening and closing device for said driving circuit, a lever mechanism including means to constitute a brake for said reel and a tension applying roller for said belt and a contact breaker for said device, said brake and said contact breaker being in operative engagement with said reel and device and said roller being in inoperative engagement with said belt when the operation of the reel is discontinued, a frictional drag mechanism connected with said element and maintained in operative position during the operation of said reel to hold said lever mechanism in non-braking position with respect to said reel and said roller in tension applying position with respect to said belt and said contact breaker clear of said device to provide for the closing of the driving circuit, supporting means for said element and reel, means for pivotally connecting said lever mechanism to said supporting means, and means for pivotally connecting said drag mechanism with said supporting means.

3. A rewinding machine for moving picture films comprising a rotatable element from which the film is unwound, a rewinding reel for the film unwound from said element, an electric motor including a driving circuit therefor, a transmission belt extending from said motor to said rewinding reel for operating the latter, a circuit opening and closing device for said driving circuit, a lever mechanism provided with means to constitute a brake for said element, a tension applying roller for said belt and a contact breaker for said device, said brake and said contact breaker in engagement with said rewinding reel and device and said roller in inoperative position with respect to said belt when the operation of the machine is discontinued, a frictional drag mechanism connected with and normally maintained in operative position during the operation of the re-winding reel to hold said lever mechanism in non-braking position with respect to said element, in tension applying position with respect to said belt and clear of said device to close the driving circuit, said drag

mechanism including means to shift it to inoperative position on the discontinuance of the operation of the re-winding reel to actuate said lever mechanism to braking position, to engage said device to open the driving circuit and to relieve tension on said belt, and said drag mechanism having a portion thereof arranged in superposed relation with respect to the contact breaker of said lever mechanism.

4. A rewinding machine for moving picture films comprising a rotatable element from which the film is unwound, a rewinding reed for the film unwound from said element, an electrically operated driving means for said rewinding reel, means to provide a driving circuit for the said driving means, a circuit opening and closing device for the driving circuit, a lever mechanism including means to constitute a brake for said reel and further including means engaging with said device to open said driving circuit, a frictional drag mechanism connected with said element and maintained in operative position during the operation of the reel to hold said lever mechanism in non-braking position and clear of said device to close the driving circuit, said drag mechanism including means for shifting it to inoperative position on the discontinuance of the operation of the reel to actuate said lever mechanism to braking position with respect to the reel, and to engage said device to open the driving circuit, and manually operated means connected with the lever mechanism for shifting it for controlling the operation of said reel.

In testimony whereof, I affix my signature hereto.

WALTER B. ASPLEY.