

**June 18, 1935.**

P. S. MALICKSON

**2,005,096**

## REEL ARM FOR MOTION PICTURE PROJECTORS

Filed Sept. 29, 1934

2 Sheets-Sheet 1

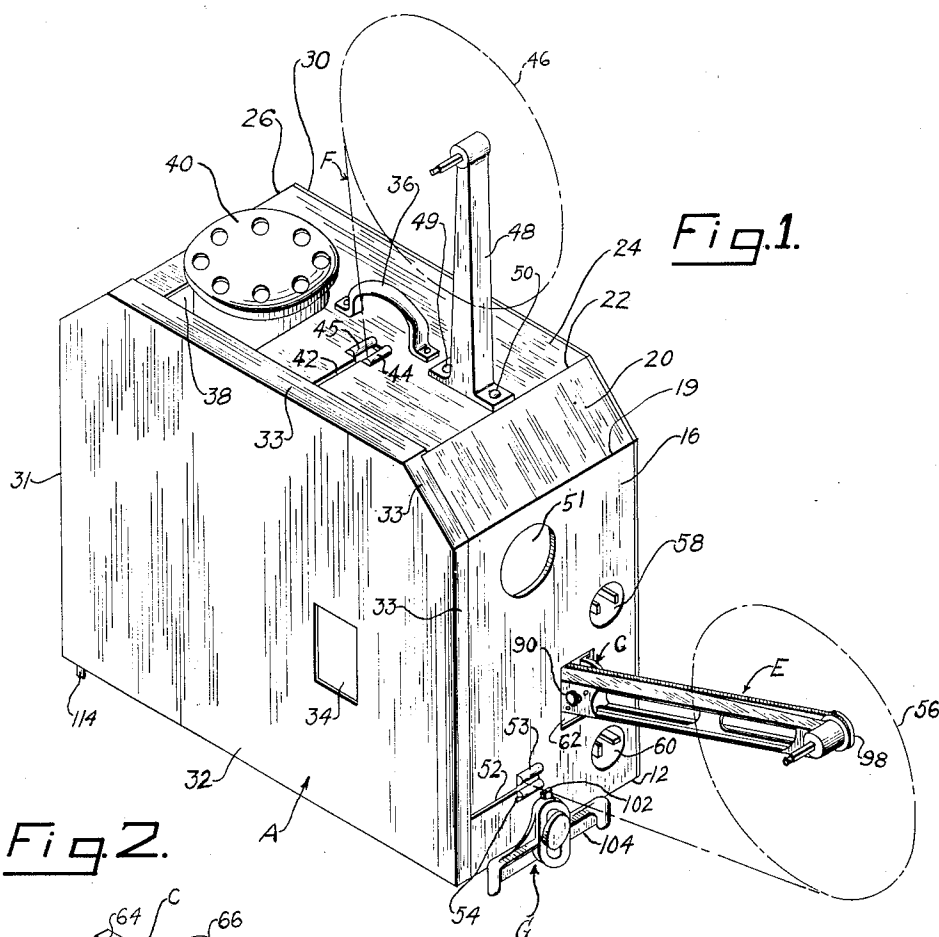


Fig. 2.

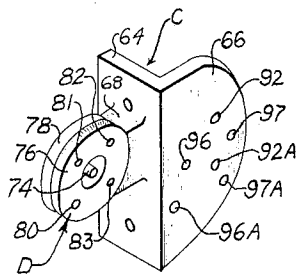


Fig. 4.

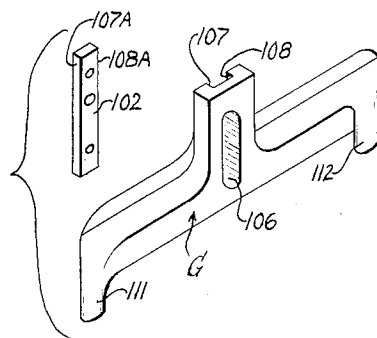
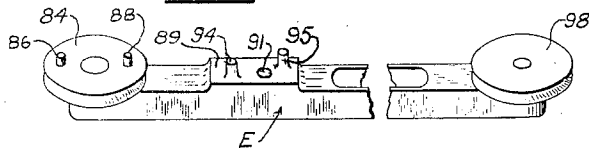


Fig. 3.



INVENTOR  
Philip S. Malickson  
BY  
Harry Langsam  
ATTORNEY

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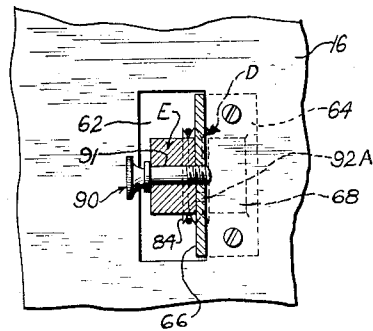
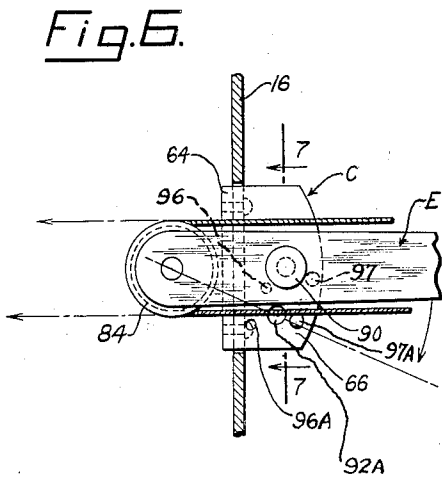
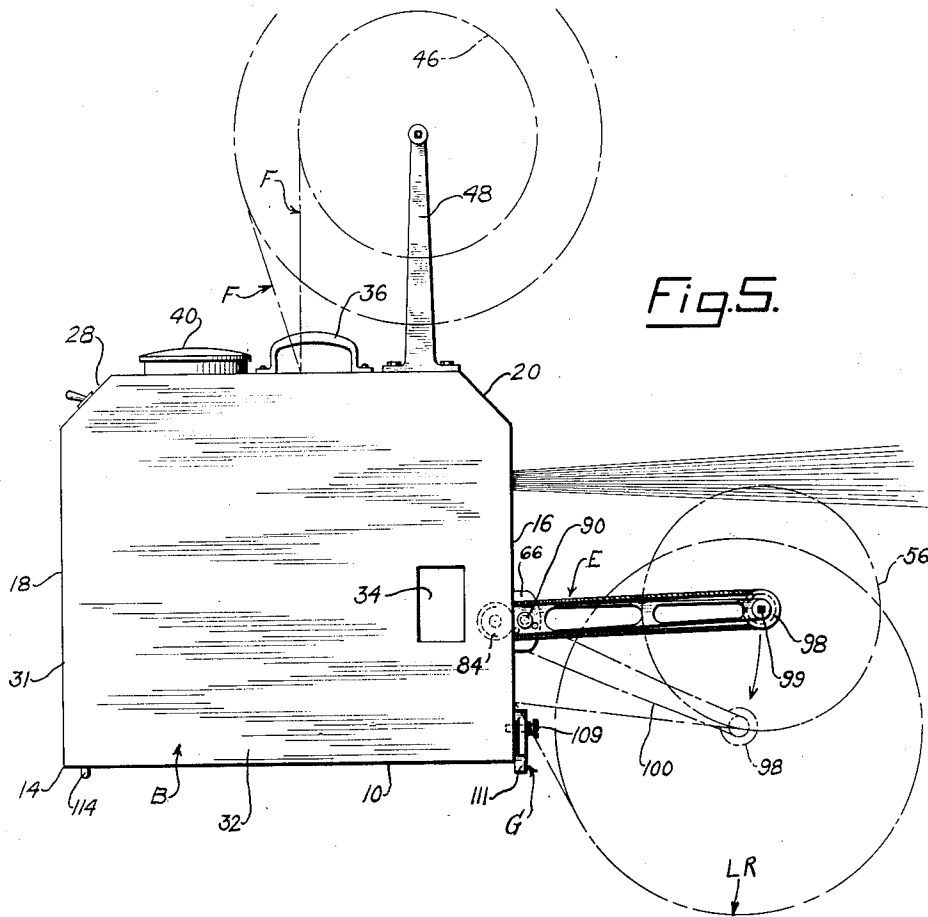
P. S. MALICKSON

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REEL ARM FOR MOTION PICTURE PROJECTORS

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2 Sheets-Sheet 2



INVENTOR  
Philip S. Malickson  
BY  
Harry Langsam  
ATTORNEY

## UNITED STATES PATENT OFFICE

2,005,096

REEL ARM FOR MOTION PICTURE  
PROJECTORS

Philip S. Malickson, Bala, Pa.

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14 Claims. (Cl. 242—55)

My invention relates to talking-motion picture equipment and relates more particularly to the take-up reel supporting member of a portable talking-motion picture unit.

5 Heretofore, it has been customary to use reels or spools of different diameters depending upon the length of that film that is wound about or is to be wound about the particular reel. To accommodate the use of reels of different diameters on the same projector various devices have been employed. In some cases the arms carrying the reel spindles have to be removed and arms of a different length substituted. In other cases the arms carrying the reel spindles have been fixed in length but it is necessary to place the machine adjacent an edge of the support upon which the entire machine rests so that the take-up reel will not engage the support. Obviously the above devices require extra parts; such as, an extra take-up reel support arm, to be carried; or the talking-picture projector must be placed in but one definite position on the table or support upon which the entire device is carried.

It is, therefore, an object of my invention to produce in a combined picture and sound projector a take-up reel support which has a minimum number of parts.

It is a further object of my invention to utilize a detachable support having rotatable means thereon for a take-up reel which does not necessitate the removal of the belt therefrom or the readjustment of the belt thereon.

A further object of my invention is to provide a bracket for the film take-up reel which is fixed in length but which may be easily adjusted to carry either a small size take-up reel or a large size take-up reel.

Other objects of my invention are to provide an improved device of the character described, which is easily and economically produced, that is sturdy in construction, and which has a maximum efficiency and accuracy in operation.

With the above and related objects in view, my invention consists in the following details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawings, in which:

Fig. 1 is a perspective view of the assembled housing and the reel supporting arms;

Fig. 2 is a perspective view of the pulley and the bracket that carries the take-up reel support;

Fig. 3 is a fragmentary perspective view of the take-up reel support that is adapted to be positioned adjacent the bracket shown in Fig. 2;

Fig. 4 is a perspective view of the elevating bracket;

Fig. 5 is a side elevational view of Fig. 1 also showing in broken lines the position of a 1600 foot 16 mm. take-up reel;

Fig. 6 is an enlarged fragmentary side elevational view of the film take-up reel support and its sustaining bracket.

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6.

Referring in detail to the drawing in Fig. 1, is shown a casing, or housing, generally designated as A, and comprised of metal such as cast aluminum. Since the projection mechanism, described in my copending patent application Serial No. 481, filed January 5, 1935 is of considerable weight the housing must possess the requisite strength and, also, must withstand the strain imposed without the various elements moving from their original position. The housing A is comprised of a substantially rectangular base 10 of relatively thin metal. Integrally formed with the base 10 at its transverse edges 12, 14 are vertically extending parallel front and back walls 16, 18, respectively.

From the upper edge 19 of the front wall is an angularly extending wall 20 which is joined at its uppermost transverse edge 22 by a ceiling 24. The ceiling or top wall 24 extends parallel to and over the base 10, and a rear transverse edge 26 of the ceiling is joined to the rear wall 18 by an angularly extending wall 28.

To form a substantially enclosed chamber for the projecting apparatus a side wall 30 is provided to close one side of the chamber. A hinged door, generally designated as B, provides the closure for the second side of the chamber.

The door B, hinged at its rear edge 31, has a main flat body portion 32 and, also, folds 33 extending perpendicular to the main body portion. The perpendicular extended folds embrace a portion of the walls 16, 18, the angularly extending walls 20, 28, and the ceiling 24. Thus, the folds serve as additional braces to prevent the buckling or the expanding of the various portions of the housing A when the device is carried or otherwise handled.

A rectangular opening 34 is suitably positioned in the door B so that the film passing by the sprockets may be viewed by the person operating the projector while the door is closed.

A handle or grip 36 is permanently attached to the central portion of the ceiling 24 in order to provide a convenient carrying device for the machine. An opening 38 adjacent the rear portion

of the ceiling enables a casing 40 for the source of light to protrude therethrough.

To one side of the handle 35 is a slit 42 which extends to the side edge of the ceiling. The slit 42 enables film F schematically shown, to be passed through the slit to a position adjacent rollers 44, 45. The rollers 44, 45 are positioned such that film F from a reel 46, schematically shown by dotted lines, will pass substantially in a vertical direction from the film supply reel.

A supply reel support 43 is detachably mounted on the upper surface of the ceiling 24 by means of screws 49, 50. The screws may easily be removed so that the arm may be detached when the machine is to be carried or disassembled.

On the front wall 16 is a circular opening 51 through which the rays of light from the projector may pass.

A horizontally extending slit 52 terminates into an aperture where two rollers 53, 54 extend parallel to one another in a horizontal plane. The slit enables the film to be easily threaded upon the sprocket and rollers of the projector. The film F is guided on the rollers to the film take-up reel 55 which reel is schematically shown. Each set of rollers 44, 45 and 53, 54 are in substantially the same vertical plane so that the film always moves in the same vertical plane.

An aperture 58 in the front wall 16 permits the passage of an electrical plug whereby the leads from the photoelectric cell may be attached to the amplifying circuit, and a plug may be inserted through aperture 60 to connect it to the exciter lamp.

A bracket, generally designated as C, and well illustrated in Fig. 2, is mounted upon the front wall 16 of the housing adjacent a substantially rectangular opening 62, by means of suitable screws or rivets passing through the bracket's base 64 and the wall 16. An arm 66 is integrally formed with the base 64 and the arm extends perpendicular to the base 64. The arm 66 when positioned on the housing extends perpendicularly to the front wall 16.

Integrally formed with the bracket base 64 and extending interiorly of the housing chamber is a horizontally positioned bearing 68. One end of a shaft is fixedly mounted in the bearing 68 and the other end of the shaft serves as a pivot for a pulley, generally designated as D. The head 74 of the shaft is sufficiently wide so that the pulley D is constrained to move along the longitudinal axis of the shaft, in an outwardly direction, but the pulley may rotate about the longitudinal axis of the shaft. The head 74 of the shaft fits into a circular recess which opens into a vertical extending wall 76 of the pulley D, and the head 74 does not protrude beyond the vertical wall 76.

A substantially V-shaped groove 78 on the curved surface of the pulley D is adapted to seat a rotatable belt, the latter being connected in a suitable manner to be actuated by an electric motor.

Extending through the vertical wall 74 of the pulley D are a plurality of circular recesses, designated as 80, 81, 82 and 83.

An elongated take-up reel support arm, generally designated as E, is constructed preferably of cast aluminum and at one end, see Figs. 2 and 3, the support E has a pulley 84 rotatably mounted upon a shaft thereon. The outermost flat surface of the pulley 84 has a plurality of circular studs 86 and 88 thereon which studs are adapted to interfit into any two diametrically positioned

circular recesses 80, 81, 82 and 83 of the pulley D. When the pulleys D and 84 have their complementary studs and recesses interfitting, the rotation of pulley D will cause the rotation of pulley 84.

The support E is detachably connected to the arm 66 by means of a screw 90 passing through an opening 91 into a threaded hole 92 of the arm 66, and the screw has a knurled head thereon which head engages a surface of the support and enables the operator to easily turn the screw.

A plurality of extending studs 94, 95 located upon a short extension 89 adjacent the opening 91 on the support E are adapted to interfit with recesses 96, 97 in the wall 66. Rotatably mounted on the other end of the support E is a pulley 98 which rotates in the same plane as the plane of rotation of the pulley 84. An endless belt passes over the two pulleys 84 and 98 so that movement of pulley 84 rotates the pulley 98; and the pulley 98 is mounted upon a rotatable take-up reel spindle 99. The short extension 89 positions the pulleys 84 and 98 so that the endless belt therebetween does not engage the front wall 16 or the bracket C.

It is particularly to be noticed that upon the shifting of the reel support arm E from one position to another, there is no necessity to change the belts in any of the apparatus.

When the support E is positioned so that the recesses 92, 96, and 97 of the bracket C are engaged by their complementary interfitting members from the support E, then a small take-up reel, such as a 400 foot reel, may be used on the reel spindle 99. To use a larger size take-up reel, such as a 1600 foot reel, and generally designated as LR, while the support E is in the aforesaid stated position would result in the rays of light from the projector impinging upon the take-up reel LR. Therefore, I lower the support E to avoid the rays of light from impinging upon the reel. Of course, the larger size reel extends much lower than the surface of the base 10, so the take-up reel is usually supported by the bracket E to extend over the edge of the support upon which the entire machine rests. The lowering of the support E is accomplished as follows: Upon the wall 66 are a second series of openings, designated 92A, 97A and 96A, which are placed in the same relative position as the openings 92, 97 and 96, but the openings designated with an A after the numeral designation are so positioned that the support E is inclined downwardly to the position designated 100, see Fig. 5 so when a large reel, such as a 1600 foot 16 mm. take-up reel is placed upon the spindle 99, the 1600 foot reel will not be in the path of the rays of light.

In order to vertically adjust the housing, I mount a rectangular strip 102 upon the central lowermost portion of the front wall 16.

A movable elevating device, generally designated as G, has a main body portion 104 and a central slot 106 therein. The portion of metal adjacent the slot 106 is milled so that its sides 107, 108, are complementary to sides 107A, 108A of the strip 102; thus, tilting of the housing relative to the longitudinal vertical plane will not occur. A threaded opening in the strip 102 is adapted to receive a thumb screw 109 which passes through the slot 106. The head of the thumb screw engages the metal defining the slot in order to retain the elevating device G in fixed position. Legs 111, 112 at each end of the elevating device are separated sufficiently to provide a two point front support. By unloosening

the thumb-screw 109 and moving the elevating device G downwardly and then tightening the thumb-screw 109, the front portion of the housing will be elevated. The housing is lowered by a converse operation. The change of vertical position is limited only by the length of the slot 106.

Upon the bottom of the base 10 adjacent the rear wall 18 are a plurality of legs 114, preferably composed of rubber, the legs are so positioned that the housing will rest in a stabilized position, either when the elevating device G is in raised or in lowered position.

Although 400 foot and 1600 foot reels have been designated as examples, it is well known that reels are constructed to hold 50, 100, 400, 600, 800, 1200, and 1600 feet of 16 millimeter film, which film is projected at the approximate rate of 25 feet per minute. Therefore, it is to be understood that the mention of size is not to be taken as a limiting factor in the consideration of my invention.

In order to rewind the entire film, the take-up reel with the film thereon is placed on the supply reel support, and the free end of the film is secured to the feed reel which has been placed upon the take-up reel spindle. The film, however, is not passed around the feeding sprockets. The motor is started and the film is removed; however, it is not necessary to disconnect any of the belts during the rewinding operation.

The belts constitute a frictional drive and compensate for the unequal peripheral speed of the take-up reel as the film is wound about the reel.

Although I have disclosed the pulleys 84 and D as being driven in unison because of an interfitting lug and recess, it is within the scope of my invention to employ a frictional drive, a gear and pinion drive, or a plurality of interfitting serrations.

Although my invention has been described in considerable detail, such description is intended to be illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

I claim as my invention:

1. In a housing for motion picture apparatus, a bracket, a take-up reel support arm mounted upon said bracket, a pulley rotatably mounted on said bracket, another pulley rotatably mounted on said support arm, said pulleys adapted to have one of their sides placed adjacent one another, means between said pulleys whereby the rotation of one pulley will result in the rotation of the other pulley, said means comprising an interfitting lug and recess, and means whereby said take-up reel support arm may be changed in position with respect to the bracket, said means comprising a plurality of interfitting recesses and studs, at least two sets of recesses variously located for one set of studs.

2. A base for a take-up reel comprising angularly disposed members, a pivot mounted on one of said members, a pulley rotatably mounted upon said pivot, said pulley comprising a grooved curved surface and a flat surface lying in the plane of rotation of said pulley, and a plurality of recesses having their outlet in said flat surface.

3. A base for a take-up reel comprising angularly disposed members, a pivot mounted on one of said members, a pulley rotatably mounted upon said pivot, said pulley comprising a grooved curved surface and a flat surface lying in the plane of rotation of said pulley, a plurality of

recesses having their outlet in said flat surface, and two sets of recesses having their outlets in the surface of the other member of the base.

4. In combination, a base for a take-up reel comprising angularly disposed members, a pulley operatively supported from one of said members, said pulley including a flat surface lying in the plane of rotation of said pulley, a plurality of recesses having their outlet in said flat surface, a second pulley detachably mounted upon the other of said angularly disposed member of the base, said second pulley having a stud to interfit any of the recesses in the flat surface of the first pulley whereby rotation of one pulley will result in the rotation of the other pulley.

5. A take-up reel mechanism for a motion picture projector comprising a bracket, a take-up reel support arm mounted upon said bracket, a pulley rotatably mounted on said bracket, another pulley rotatably mounted on said support arm, both of said pulleys adapted to have one of their sides placed adjacent one another, means between said pulleys whereby the rotation of one pulley will result in the rotation of the other pulley, said means comprising an interfitting lug and recess and means whereby said take-up reel support arm may be changed in position with respect to the bracket, said means comprising at least two recesses and a stud, said recesses being located in different positions, and said stud being adapted to interfit with each recess.

6. A take-up reel mechanism for a motion picture projector comprising a bracket, a take-up reel support arm mounted upon said bracket, a pulley rotatably mounted on said bracket, another pulley rotatably mounted on said support arm, said pulleys adapted to have one of their sides placed adjacent one another, means between said pulleys whereby the rotation of one pulley will result in the rotation of the other pulley, said means comprising an interfitting lug and recess, and means whereby said take-up reel support arm may be changed in position with respect to the bracket, said means comprising a plurality of interfitting recesses and studs, at least two sets of recesses variously located for one set of studs.

7. In a motion picture apparatus, a rotatable pulley operatively mounted upon a shaft, means to rotate said pulley, a detachable arm, a pulley rotatable about a shaft mounted upon one end of said detachable arm, a second pulley rotatably mounted on the other end of said detachable arm, means to support said arm in a plurality of different predetermined positions so that the pulley rotatable about a shaft will be placed adjacent said first named rotatable pulley, means between said rotatable pulley and the pulley on the arm adjacent said rotatable pulley whereby the rotation of one pulley will rotate said second pulley, and means on the outer portion of said arm for rotatably mounting a film reel and said means operatively connected to said second pulley.

8. A take-up mechanism for a motion picture projector comprising a demountable support arm, a pulley upon a shaft rotatably mounted at one end of said support arm, a second pulley rotatably mounted on the other end of said demountable arm, an endless belt rotatable about each pulley on said support arm, a rotatable pulley having its shaft fixed in position, one side of said first named pulley on the support arm adapted to be positioned adjacent a side of said rotatable pulley that is mounted on the shaft which is fixed

in position, means between said adjacent pulleys whereby the rotation of one pulley will result in the rotation of said other pulley, means to retain said demountable support arm in a plurality of different positions whereby reels of different diameters may be supported without changing the endless belt, and means operatively connected to said second pulley for rotatably mounting a film reel.

9. A detachable take-up support arm, means to mount said support arm in different positions in order to support reels of different diameters, a pulley mounted upon the inner end of said support arm and a second pulley mounted upon the outer end of said support arm, an endless belt passing over both of said pulleys on said support arm, a rotatable pulley fixedly mounted in position, said inner pulley adapted to be positioned adjacent said rotatable pulley fixedly mounted in position, means between said adjacent pulleys whereby rotation of one pulley will rotate the other pulley and whereby adjustment or detachment of the support arm will not disturb the endless belt on the pulleys of the detachable arm.

10. In combination, a housing, a rotatable pulley fixedly and operatively attached to the housing, a detachable take-up reel support arm having a pulley at each end thereof and said pulleys being rotatable in the same plane, means to which said support arm may be attached, in a plurality of different positions whereby reels of different diameters may be carried, one of said pulleys on the support arm having its axis in alignment with the axis of the pulley fixedly and operatively attached to the housing, and means between said adjacent pulleys whereby the rotation of one pulley will result in the rotation of the other pulley.

11. A take-up reel support for a motion picture projector comprising a demountable support arm, a pulley upon a shaft rotatably mounted at one end of said support arm, a second pulley rotatably mounted on the other end of said demountable support arm, an endless belt rotatable about each pulley on said support arm, said endless belt being retained in said pulleys irrespec-

tive of whether the arm is mounted or demounted, and means to enable the support arm to be securely held in operative position.

12. A take-up reel support for a motion picture projector comprising a demountable support arm, a pulley upon a shaft rotatably mounted at one end of said support arm, a second pulley rotatably mounted on the other end of said demountable support arm, an endless belt rotatable about each pulley on said support arm, said endless belt being retained in said pulleys irrespective of whether the arm is mounted or demounted, and means to enable the support arm to be securely held in operative position, and means operatively connected to said second pulley for rotatably mounting a film reel.

13. A take-up reel support for a motion picture projector comprising a demountable support arm, a pulley upon a shaft rotatably mounted at one end of said support arm, a second pulley rotatably mounted on the other end of said demountable support arm, an endless belt rotatable about each pulley on said support arm, said endless belt being retained in said pulleys irrespective of whether the arm is mounted or demounted, and means to enable the support arm to be securely held in operative position, and means operatively connected to said second pulley for rotatably mounting a film reel, and means whereby said support may be mounted in different positions in order to accommodate take-up reels of different sizes.

14. A take-up reel support for a motion picture projector comprising a demountable support arm; means at each end of said support adapted to be rotated, said means comprising a driving member and a driven member, means between said driving member and said driven member whereby the rotation of the driving member will rotate the driven member, a reel spindle operatively connected to said driven member, all of said means being retained in the same position irrespective of whether the arm is mounted or demounted.

PHILIP S. MALICKSON.