July 5, 1949. M. LOPEZ-HENRIQUEZ 2,475,036

FILM REEL

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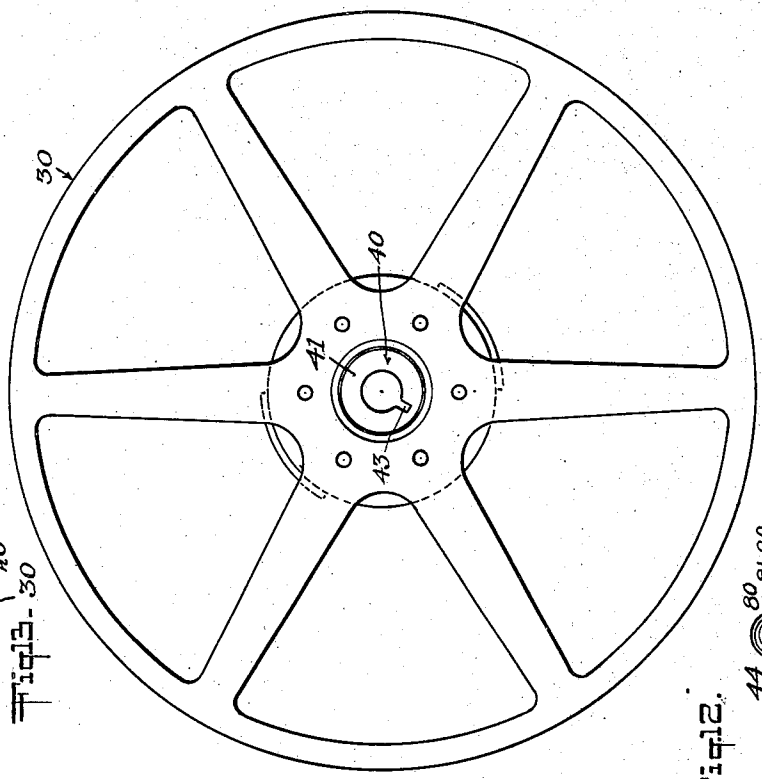


Fig. 3.

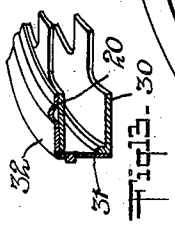


Fig. 3.

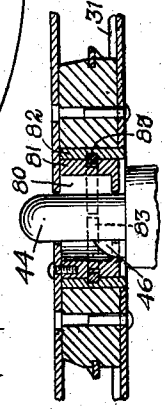


Fig. 2.

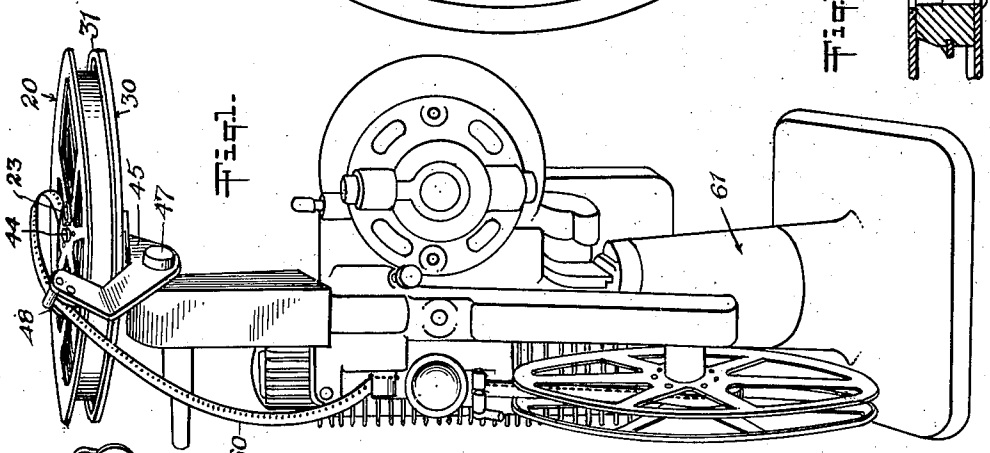


Fig. 1.

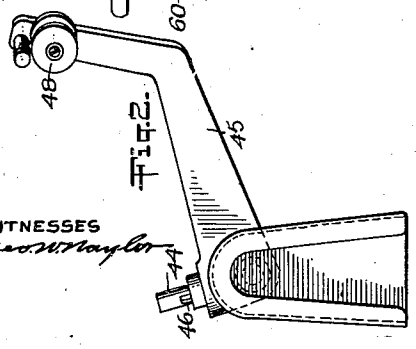


Fig. 2.

WITNESSES

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Fig 4.

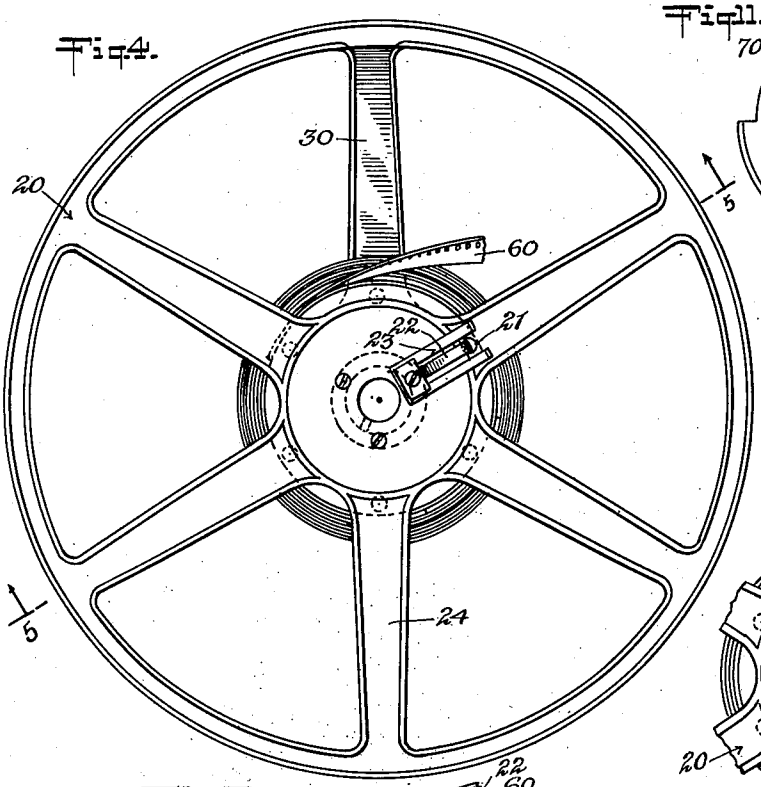


Fig 11.

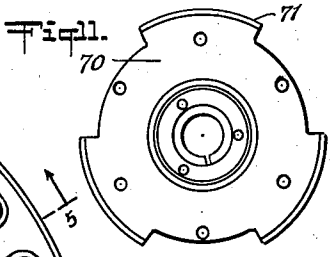


Fig 8.

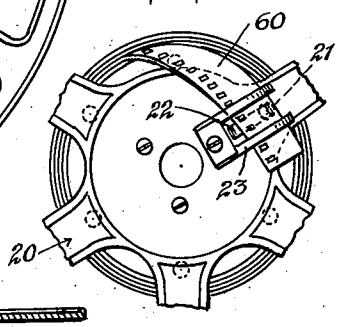


Fig 5.

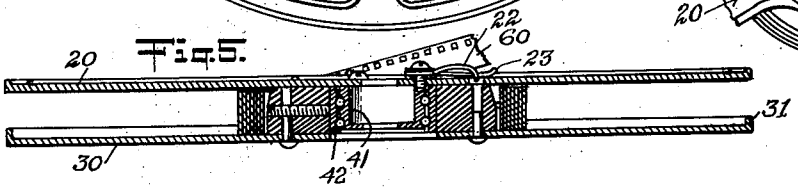


Fig 6.

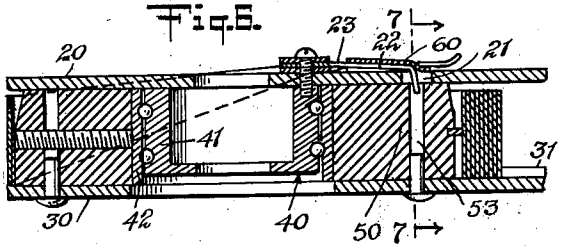


Fig 9.

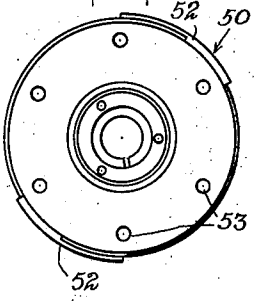


Fig 10.

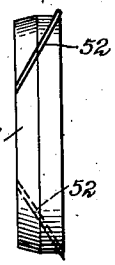
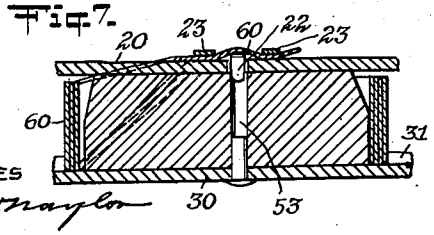


Fig 7.



WITNESSES

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Patented July 5, 1949 2,475,036

UNITED STATES PATENT OFFICE

2,475,036

FILM REEL

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Application May 3, 1945, Serial No. 591,693

14 Claims. (Cl. 242—70)

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The present invention relates to film reels.

The principal object of the invention is the provision of a practical film reel of the type which may be unwound from the center.

Another object is the provision of a film reel of the type described which is of light, simple, inexpensive construction and which is susceptible of fool-proof operation.

A preferred embodiment of the invention is illustrated in the accompanying drawing in which

Fig. 1 is a perspective view of a moving picture projecting machine equipped with a reel in accordance with the invention;

Fig. 2 is a perspective view of a support for said reel which enables it to assume a substantially horizontal position.

Fig. 3 is a face view of one side of the reel;

Fig. 4 is a face view of the other side of the reel.

Fig. 5 is a section on the line 5—5 of Figure 4;

Fig. 6 is an enlarged view of the hub portion of the reel shown in Fig. 5;

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

Fig. 8 is a view of the hub portion of the reel shown in Fig. 4, showing how the film engages and locks the locking device thereon;

Fig. 9 is a face view of the drum member of the reel;

Fig. 10 is an edge view of the drum member;

Fig. 11 is a modified form of the drum member, and

Fig. 12 is a section of a modified form of the hub portion of the reel showing it mounted on the support therefor, and

Fig. 13 is a fragmentary sectional view of a ring cap for said reel.

The reel has a pair of side wheels 20 and 30 affixed, respectively, to an inner hub 40 and an outer hub 50, the latter being mounted on the former.

The inner hub 40 comprises a ball bearing, the wheel 20 being affixed to the inner sleeve 41 thereof. The outer hub 50 comprises a drum which is relatively fixedly mounted on the outer sleeve 42 of hub or ball bearing 40. Actually, therefore, the outer hub or drum 50, and hence the wheel 30 thereto affixed, are rotatably mounted relative to the inner sleeve 41 of the inner hub or ball bearing 40 as well as to the wheel 20 affixed thereto.

As can be seen in Figures 3 and 6, the inner sleeve 41 is provided with an internal flange in which is formed a radial key slot 43. When the reel is mounted on the supporting shaft 44 of supporting arm 45, said key slot 43 is engaged by key 46 with which said shaft is provided.

In Figures 9 and 10 it will be seen that outer hub or drum 50 has a partly beveled peripheral surface 51 on which are formed spirally disposed beads or ridges 52. Said peripheral surface is beveled in the direction away from the wheel 30 to which said drum or hub 50 is affixed. In the free side of said hub 50, equidistant from the center thereof, a plurality of uniformly spaced holes 53 is formed.

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The wheel 20 is provided with an aperture 21 which may be made to register with holes 53 when said wheel is rotated in axial alignment with wheel 30. Affixed to wheel 20 is an engaging finger 22 which may be made of spring steel. Said finger is bent to project into aperture 21. A pair of fingers 23 flanks said bent finger 22. It will be noted in Figure 4 that wheel 20 has a plurality of spokes 24 which are uniformly spaced throughout, except in the vicinity of said fingers, where a relatively wide space separates said spokes.

The reel is wound in the usual manner, mounted on a rotating shaft connected to a motor in the projector 61, but prior to the winding operation the end of the strip of film 60 is inserted under fingers 23 and over engaging finger 22. This has the effect of forcing engaging finger 22 inwardly against its own tensioned resistance, through aperture 21 and into one of the holes 53, thus locking wheel 30 and its drum 50 against rotation relative to wheel 20. The peripheral flange 31 on wheel 30 prevents unwinding of the film, as does the cap ring 32 shown in Fig. 13. This is particularly true when the reel is mounted on a horizontal axis during the feeding operation. It may be found desirable to eliminate the peripheral flange 31 when the cap ring 32 is used, although both may be used together. The space between the inner edge of flange 31 and wheel 20 is sufficient to permit the film to freely pass therethrough and accordingly the film may readily be wound on the reel when supported in vertical position as shown in the lower portion of Fig. 1.

When it is desired to unwind the reel, the film end which engages finger 22 is withdrawn from under fingers 23, thus freeing finger 22 from engagement with drum 50. Wheel 30 and drum 50 are now free to rotate relatively to wheel 20. The reel is placed on supporting shaft 44, the key 46 thereon entering key slot 43 of hub 40, thus locking said hub and its wheel 20 against rotation relative to the support and to the projector 61 itself. Wheel 30 and its drum 50 are, however, still free to rotate relatively to wheel 20. It will be understood that the film is wound on drum 50. Pulling the film end therefore, which had previ-

ously engaged finger 22, causes rotation of drum 50 and wheel 30 in consonance with the movement of the film, thereby effecting the unwinding of the film from the center of the reel. This is done through the wide space between the spokes of wheel 20. The beveled periphery 51 of drum 50, assists in easing the film off the drum. So do the beads 52 which are particularly useful when the film is wound tight around the drum.

It has been found that a substantially horizontal position of the reel during the unwinding operation is conducive to an easy flow of the film from the reel. Accordingly, the supporting arm 45 is provided with a substantially horizontal pivot construction 47 and a substantially horizontal idler pulley construction 48, the supporting shaft 44 on said arm being of substantially vertical construction. This can be seen in Figures 1 and 2. When the reel is mounted on said support, it is placed thereon with its wheel 30 facing downwardly, and its wheel 20 facing upwardly.

In Figure 11, the drum 70 is a modified form of drum 50. Its periphery 71 is not continuous. Rather sections are cut out of it to provide additional room for the moving film during the course of the unwinding operation.

In Figure 12 the hub 80 is a modified form of hub 40. It comprises an externally grooved inner hub member 81, an internally grooved outer bushing 82 and a split retaining ring 83, said ring being carried within the grooves of said hub and bushing members. The split ring prevents axial movement of the hub and bushing members relative to each other, but permits of relative rotary movement of said members. This form of hub is a greatly simplified form, and one which is presently preferred.

The reel hereinabove described is only a presently preferred embodiment of the invention. Modifications thereof may be incorporated therein without departing from the broad principles of the invention.

Note should be made of the fact that the reel herein disclosed may be used in a wholly conventional manner in addition to the manner above described.

I claim:

1. A film reel construction comprising a pair of spaced side wheels which are mounted rotatably with respect to each other, a pair of hubs affixed to said wheels, one of said hubs being carried within the other, means, during the winding operation, to lock the two hubs against rotation relative to each other and means to rotate said inner hub, and means, during the unwinding operation, to fix the inner hub against rotation, the outer hub being released for rotation relative to said inner hub.

2. A film reel comprising a pair of spaced side wheels which are mounted rotatably with respect to each other, a pair of hubs affixed to said wheels, one of said hubs being carried within the other and being arranged to maintain the wheels in permanently assembled relationship, and releasable locking means for locking the one wheel and hub unit to the other wheel and hub unit against rotation relative to each other.

3. A film reel in accordance with claim 2 whose outer hub comprises a drum whose peripheral surface is beveled at one edge, said edge being the more distant edge from the wheel to which said drum is affixed.

4. A film reel in accordance with claim 2 whose outer hub comprises a drum upon whose peripheral surface spirally disposed beads are formed.

5. A film reel in accordance with claim 2, the outer hub being provided with a plurality of holes which are equidistant from the center of the hub, the wheel to which the inner hub is affixed, having a hole which, when said wheel is rotated relatively to the outer hub, registers with said outer hub holes, a tensioned engaging finger affixed to said inner hub wheel which is adapted, under pressure, to enter said outer hub holes through said inner hub wheel hole, and a pair of fingers adjacent said engaging finger, adapted to hold the end of a strip of film in pressure engagement with said engaging finger.

6. A film reel in accordance with claim 2 in which the inner hub comprises a roller bearing, the wheel which is affixed thereto being affixed to the inner sleeve thereof.

7. A film reel construction in accordance with claim 1 in which the inner hub is provided with an inner key slot and the means to fix said hub against rotation during the unwinding operation consists of a key bearing, substantially vertically disposed shaft upon which said hub is caused to be mounted, said shaft being affixed to a substantially horizontal supporting arm pivoted on a substantially horizontal pivot, to a projector.

8. A film reel in accordance with claim 2 in which the inner hub comprises an inner hub member having an annular external groove, an outer bushing member having an annular internal groove, and a split ring member, said ring being carried within said grooves to prevent axial movement of said inner hub member and said bushing member relative to each other.

9. In combination a film reel and a film strip wound thereon, said reel comprising lower and upper side wheels and bearing means supporting said side wheels so that they may rotate freely with respect to each other and permanently maintaining the wheels in spaced parallel concentric relationship, said lower wheel having a flange projecting upwardly towards the other wheel adjacent the periphery thereof the space between the inner edge of the flange and the other wheel being greater than the width of the film.

10. A film reel comprising a pair of side wheels, means for permanently retaining the wheels in spaced parallel concentric relationship while permitting them to rotate freely around their central axis with respect to each other, and a winding hub adapted to receive a film thereon mounted on one of said wheels so as to rotate therewith, a portion of the width of the periphery of the hub being transversely straight and parallel with the axis of the wheel and another portion being transversely beveled and tapered inwardly towards the center of the reel to facilitate withdrawal of the film therefrom.

11. A film reel as set forth in claim 10 in which the transversely straight portion of the hub is positioned adjacent the wheel on which the hub is mounted.

12. A film reel comprising a pair of side wheels and a pair of bearing members one connected to each of the wheels and supporting the wheels in spaced parallel relationship so that they may rotate freely with respect to each other, said bearing members being arranged in concentric relationship with one inside the other and the inner bearing member having an internal keyed aperture extending therethrough whereby the inner bearing and the wheel connected thereto may be retained against rotation.

13. A film reel comprising a pair of side wheels and a pair of bearing members, one connected to each of the wheels and supporting the wheels in spaced parallel relationship so that they may rotate freely with respect to each other, said bearing members being arranged in concentric relationship with one inside the other, the inner bearing member having an external groove extending around its periphery and the outer bearing member having an internal groove in alignment with the groove on the inner bearing member and a retaining ring positioned in the groove between the two bearing members so that the bearing members are free to rotate but are retained against axial separation.

14. A film reel comprising a pair of side wheels, means for permanently retaining the wheels in spaced parallel concentric relationship while permitting them to rotate freely around their central axis with respect to each other, and a winding hub adapted to receive a film thereon mounted on one of said wheels so as to rotate therewith, at least a portion of the hub being transversely

bevelled and tapering inwardly in a direction away from the wheel to which it is secured to facilitate withdrawal of the film therefrom.

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