Nov. 12, 1940. O. W. GITHENS ET AL 2,221,089

MOTION PICTURE PROJECTOR

Original Filed June 3, 1937

Fig. 1

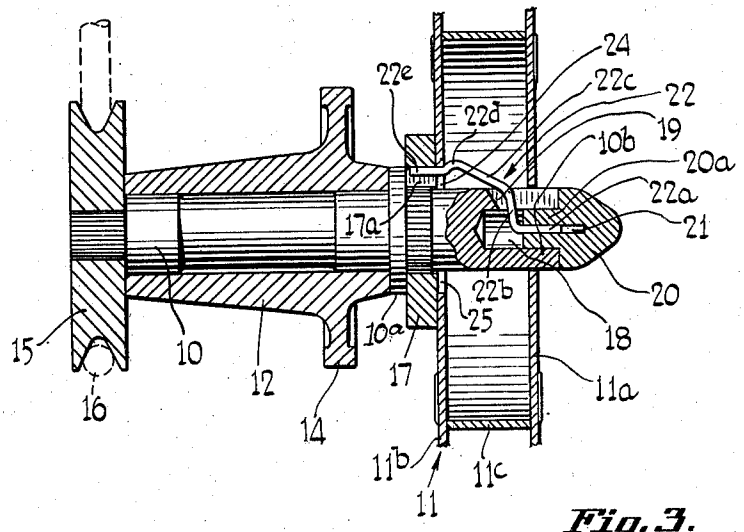


Fig. 2.

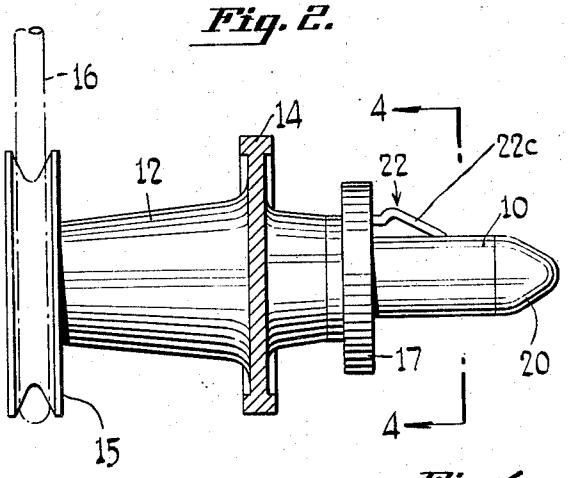


Fig. 3.

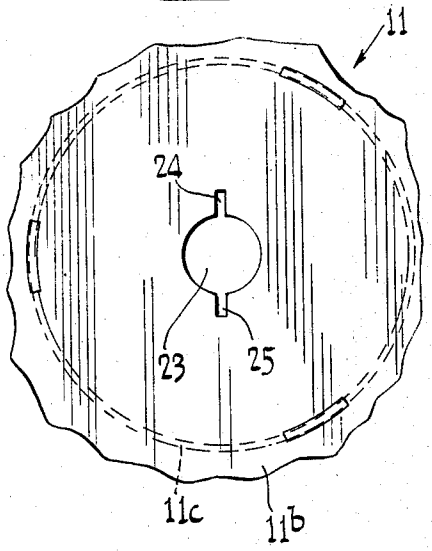
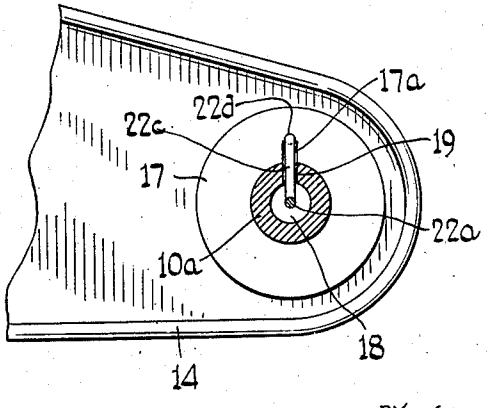


Fig 4.



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MOTION PICTURE PROJECTOR

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Original application June 3, 1937, Serial No. 146,182, now Patent No. 2,190,658, dated February 20, 1940. Divided and this application December 21, 1939, Serial No. 310,342

7 Claims. (Cl. 242—70)

This invention relates generally to motion picture projectors. More particularly, our invention relates to an improved construction of a film reel and reel mounting shaft.

One of the objects of our invention is to provide an improved combination reel and reel mounting shaft whereby a film reel may be readily mounted and removed from a shaft and which at the same time shall be so designed that the reel will be resiliently held captive on the said shaft during the operation thereof.

Another object of our invention is to provide a reel shaft construction adapted to have a film reel mounted thereon, which shaft construction shall be characterized by its novel and simple constructional features and which at the same time shall possess a high degree of efficiency for the purposes intended.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the claims.

This application is a divisional of the co-pending application Serial No. 146,182, filed June 3, 1937, for Motion picture projectors.

In the accompanying drawing, in which is shown one of the various possible embodiments of this invention:

Fig. 1 is a transverse sectional view of a portion of a motion picture projector bearing and reel shaft constructed in accordance with our invention and illustrating the manner of mounting the reel on said shaft;

Fig. 2 is an elevational view, partly sectional, similar to Fig. 1 but with the reel removed;

Fig. 3 is a side elevational view of the reel shown in Fig. 1; and

Fig. 4 is a cross-sectional view taken substantially on the line 4—4 of Fig. 2.

Referring now in detail to the drawing, there is disclosed a shaft 10 constructed in accordance with my invention and adapted to have a film reel 11 mounted thereon in the manner soon to be described. The shaft 10 is journaled in a bearing 12 which may in turn be mounted on a supporting member 14 of any motion picture projector such as, for example, of the type shown and described in our co-pending application Serial No. 146,182, which has matured into Patent No. 2,190,658, granted February 20, 1940.

Mounted on the shaft 10 for rotation therewith is a pulley 15 adapted to be driven by a belt 16 connected to a main driving shaft pulley (not shown). A shoulder 10a is provided on the shaft 10 which, together with the pulley 15, serves to prevent axial displacement of the said shaft 10. Fixedly mounted on the shaft 10 for rotation therewith and adjacent said shoulder 10a is a disc 17 provided with a notch 17a extending radially outwardly from adjacent the shaft 10 for a predetermined distance. The end 10b of the shaft 10 is provided with an axially disposed opening 18 extending inwardly from the end of the shaft portion 10b for a predetermined distance. A portion of the wall of the shaft portion 10b is provided with a notch 19 communicating with the opening 18. A plug member 20 having a shank portion 20a frictionally received in the opening 18 serves to close off the said opening 18. It is noted that the outer diameter of the plug 20 is substantially the same as the outer diameter of the shaft portion 10b and that the plug end is smoothly rounded off to facilitate the ready mounting of the film reel 11.

The plug member 20 is provided with an opening 21 extending inwardly from the end of the shank portion 20a, into which opening there is frictionally received one end 22a of a resilient wire member 22. The wire member 22 comprises an integral second portion 22b extending at an angle to the first portion 22a and out through the notch 19, a third integral portion 22c extending at an angle to the portion 22b, and terminating in an integral fourth portion 22e. It is noted that the axis of the said fourth portion 22e is substantially parallel to the axis of the portion 22a and that the said portion 22e is received in the notch 17a of the disc 17. Due to the resilience of the wire member 22 and to the design thereof, the said portion 22e thereof will normally be spaced from the adjacent portion of the shaft 10. At the junction of the portions 22e and 22c, a hump 22d is provided which extends slightly above the top wall of the notch 17a, the purpose of which will soon become apparent.

As clearly shown in Figs. 1 and 3, the reel 11 is of standard construction for motion picture reels, comprising a pair of flanges 11a and 11b interconnected by the hub 11c adapted to have a film wound thereon. The reel flanges 11a and 11b are provided with a pair of aligned central apertures 23 designed to freely and slidably fit on the shaft 10. In accordance with our invention, the aperture in the flange 11b communicates

with a radially extending notch 24 of predetermined depth. The said notch 24 is adapted to receive therein a portion of the resilient wire member 22. In mounting the reel 11 on the shaft 10, it is merely necessary to fit the apertures 23 over the shaft portion 10b with the reel notch 24 in proper alignment to receive the upwardly inclined portion 22c therein. Upon continued sliding movement of the reel 11 inwardly on the shaft 10, the wire spring portions 22c and 22e will be moved in a direction toward the shaft until the said notch 24 has passed the hump 22d to abut the disc 17 at which time the portion 22e of the member 22 will spring back upwardly to its original position. The reel 11 will thus be held captive on the shaft 10 between the shoulder 17 and the hump 22d of the resilient wire member 22.

To remove the reel 11 from the shaft 10, it is merely necessary to exert sufficient force to overcome the resilience of the member 22 to cause the notch 24 to pass over the hump 22d.

To facilitate the rapid mounting of the reel 11, the said reel flange 11b may be provided with an additional notch or notches 25 similar in design and function to that of the notch 24.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. For use with a motion picture reel having a flange provided with a central aperture and a notch extending radially from said aperture, a shaft adapted to be received in said central reel aperture, said shaft comprising an opening in one end thereof, a cap member closing off said opening, a shoulder on said shaft adapted to limit the inward axial movement of said reel in one direction, said shoulder having an opening therein, and a resilient wire member, one end of said wire member being fixedly attached to said cap member and the other end of said wire member being received in said shoulder opening.

2. For use with a motion picture reel having a flange provided with a central aperture and a notch extending radially from said aperture, a shaft adapted to be received in said central reel aperture, said shaft comprising an opening in one end thereof, a member closing off said opening, a shoulder on said shaft adapted to limit the inward axial movement of said reel in one direction, said shoulder having an opening therein, and a resilient wire member, one end of said wire member being fixedly attached to said closure member and the other free end of said wire member being received in said shoulder opening, a portion of said wire member adjacent said free end being disposed outside of said shaft and a portion of said wire member adjacent said fixed end being disposed within said shaft opening.

3. For use with a motion picture reel having a flange provided with a central aperture and a notch extending radially from said aperture, a shaft adapted to be received in said central reel aperture, said shaft comprising an opening in one end thereof, a member closing off said opening, a shoulder on said shaft adapted to limit the inward axial movement of said reel in one direction, said shoulder having an opening therein, and a resilient wire member, one end of said wire member being fixedly attached to said closure member and the other free end of said wire member being received in said shoulder opening, a portion of said wire member adjacent said free end being disposed outside of said shaft, a portion of said wire member adjacent the fixed end being disposed within said shaft opening, and a portion of said wire member between the said ends thereof being adapted to be received in said reel notch.

4. For use with a motion picture reel having a flange provided with a central aperture and a notch extending radially from said aperture, a shaft adapted to be received in said central reel aperture, said shaft comprising an opening in one end thereof, a cap member closing off said opening, a shoulder on said shaft adapted to limit the inward axial movement of said reel in one direction, said shoulder having an opening therein, and a resilient wire member, one end of said wire member being fixedly attached to said cap member and the other end of said wire member being freely received in said shoulder opening, the free end of said wire member being disposed outside of said shaft opening, the fixed end of said wire member being disposed within said shaft opening, a portion of said wire member between the said ends thereof being adapted to be received in said reel notch, and a portion of said wire member adjacent the portion which is adapted to be received in said notch being cammed to limit the lateral movement of said reel in a direction away from said shoulder to thus hold said reel captive on said shaft.

5. For use with a motion picture reel having a flange provided with a central aperture and a notch extending radially from said aperture, a shaft adapted to be received in said central reel aperture, said shaft comprising an opening in one end thereof, a cap member closing off said opening, a shoulder on said shaft adapted to limit the inward axial movement of said reel in one direction, said shoulder having an opening therein, and a resilient wire member, one end of said wire member being fixedly attached to said cap member and the other end of said wire member being freely received in said shoulder opening, the free end of said wire member being disposed outside of said shaft opening, the fixed end of said wire member being disposed within said shaft opening, a portion of said wire member between the said ends thereof being adapted to be received in said reel notch, and a portion of said wire member adjacent the portion which is adapted to be received in said notch being cammed to resiliently hold said reel captive on said shaft and against said shaft shoulder.

6. For use with a motion picture reel having a flange provided with a central aperture and a notch extending radially from said aperture, a shaft adapted to be received in said central reel aperture, said shaft comprising an axial opening extending inwardly from one end thereof, a second opening in the shaft wall surrounding said axial opening, said second opening communicating with said first opening, a cap member closing off said axial opening, and a resilient wire member having one end thereof fixedly attached to said cap member in said axial opening, leaving the opposite end free and unattached, and having an integral portion of said wire member between the ends thereof passing through said

second opening, said free end being disposed outside of said shaft.

7. For use with a motion picture reel having a flange provided with a central aperture and a notch extending radially from said aperture, a shaft adapted to be received in said central reel aperture, said shaft comprising an axial opening extending inwardly from one end thereof, a second opening in the shaft wall surrounding said axial opening, said second opening communicating with said first opening, a cap member closing off said axial opening, and a resilient wire member having one end thereof fixedly attached to said cap member in said axial opening, leaving the opposite end free and unattached, and having an integral portion of said wire member between the ends thereof passing through said second opening, said free end being disposed outside of said shaft, a portion adjacent the said free end of said wire member being adapted to be received in said reel notch.

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