LE ROY M. FULTON.

REEL.

APPLICATION FILED JAN. 30, 1920.

1,353,901.

Patented Sept. 28, 1920.

Fig. 1

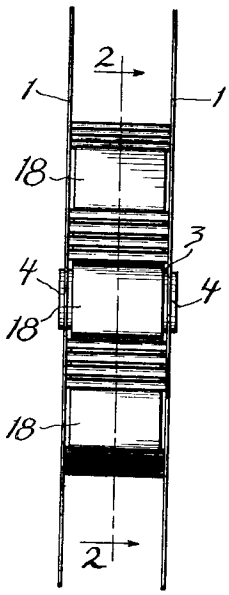


Fig. 2

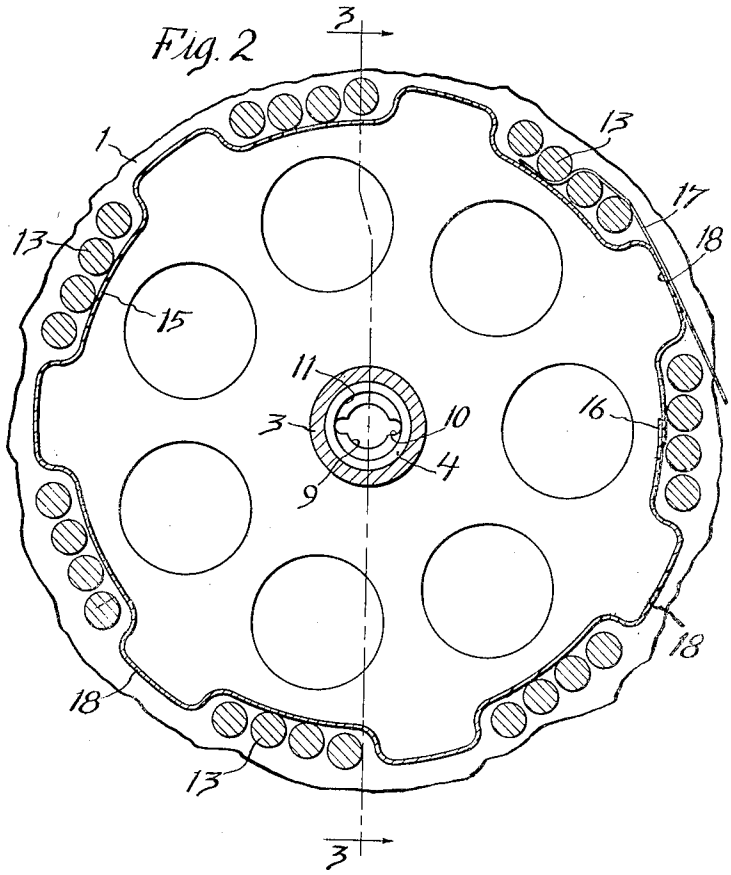


Fig. 3

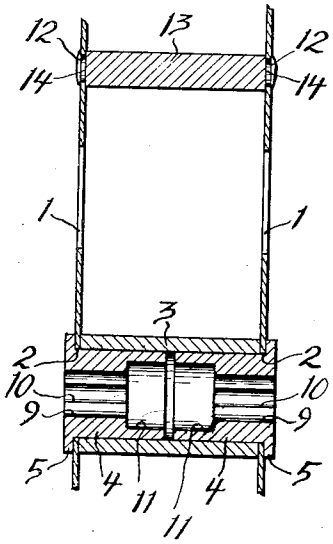


Fig. 4

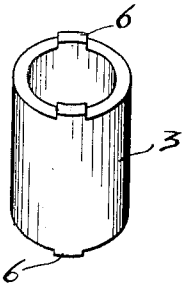


Fig. 5

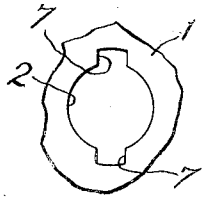
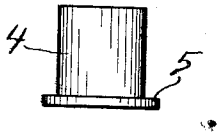


Fig. 6



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REEL.

1,353,901. Specification of Letters Patent. Patented Sept. 28, 1920.

Application filed January 30, 1920. Serial No. 355,139.

To all whom it may concern:

Be it known that I, LE ROY M. FULTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Reels, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to reels and has particular relation to motion picture film reels although not limited to this use alone.

One of the features of my invention relates to the assembly of the disk and hub of a reel which permits of a very substantial construction, which is well adapted to withstand long hard use, which is well adapted to withstand the torsional strains to which it is subjected in use, and which may be assembled easily and quickly.

Another feature relates to a strong and light construction of the winding cage of the reel which affords a continuous winding surface, and a supplemental feature to this relates to the arrangement of this construction to adapt certain of the elements thereof to hold the end of the article to be wound.

With these features in view my invention consists in certain features of novelty in the construction, combination and arrangement of parts by which the said features and certain other features hereinafter appearing are attained, all as fully described with reference to the accompanying drawing and more particularly pointed out in the claims.

In the said drawings—

Figure 1 is a view in front elevation of a reel embodying my invention in its preferred form.

Fig. 2 is an enlarged partial sectional view in side elevation on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged partial sectional view in front elevation on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged oblique perspective view of one of the core members hereinafter described.

Fig. 5 is an enlarged partial view in side elevation of one of the disks hereinafter described.

Fig. 6 is an enlarged view in side elevation of another of the core members hereinafter described.

Like characters of reference indicate like parts in the various views.

In the drawings 1 indicates the disks which comprise the sides of the reel, there being two disks used in the preferred embodiment. These disks are provided with centrally disposed apertures 2, see Fig. 5, which are engaged by the hub of the reel now to be described. The hub comprises a bored spacing hub member 3 and an additional pair of hub members 4. The main portions of the hub members 4, extending from the ends thereof, are of such a diameter that they pass through apertures 2 of the respective disks and tightly fit within the respective ends of the bore of the hub member 3 and are entered into the bore of hub member 3 under great pressure, so that when assembled the friction of the engaging surfaces secures the hub members together and prevents relative movement thereof. The apertures 2 of the disks 1 fit snugly upon the respective hub members 4 to center the disks. Circumferential flanges 5 are formed at the other ends of hub members 4, see Fig. 6, and form shoulders which bear against the adjacent sides of the respective disks when the reel is assembled. Projections 6, see Fig. 4, are formed at each end of the hub member 3 and extend from the ends thereof, forming radial surfaces, and openings 7, see Fig. 5, are formed in the disks, forming radial surfaces, the radial surfaces of the projections and corresponding openings being adapted to interengage when the reel is assembled. In the assembly of the reel the hub 3 is disposed between the disks 1 with its ends abutting the adjacent sides of the disks and with projections 6 entered into respective openings 7 of the disks. The main portions of the hub members 4 are then passed through the apertures 2 of respective disks and pressed into respective ends of the bore of the hub member 3 until the flanges 5 clamp the disks against the ends of hub member 3. The projections 6 are slightly lower than the thickness of the disks so that the flanges 5 do not clamp against them instead of the disks.

The hub members 4 are bored concentrically with the cylindrical surface thereof, as designated at 9, see Figs. 2 and 3, and these bores are provided with keyways 10, whereby the reel may be supported from these bores and driven through said key-

ways. The portions of the bores 9 adjacent the inner ends of the hub members 4 are enlarged, as designated at 11, to lighten the assembly.

It will be noted that the assembly firmly secures the disks and hub so that the disks cannot work loose, and that an ample and solid bearing is provided to support the reel from the bores 9 and to drive the same through keyways 10.

The disks 1 are provided with corresponding series of holes 12 which are arranged concentrically around the apertures 2 thereof. Cage members 13 are provided which extend between the disks and have their ends reduced, as designated at 14, see Fig. 3, to form outwardly facing shoulders. These cage members have their reduced ends entered into corresponding holes of said series of holes 12 of the disks and upset on the side of the disks opposite the shoulders formed on said cage members. These cage members 13 form in outline a winding cage and the holes 12 of the disks are so arranged that the cage members are separated from each other and are arranged in groups, there being considerable space left between each group, so that the weight of the reel is not unduly increased by forming the entire surface of the cage by cage members 13, there being enough of the cage members provided to give the reel sufficient strength. Arranged within the cage is a flat coiled spring 15 adapted to normally bear against the cage members, the cage members and the disks serving to retain the same in place. The ends 16 of the spring 15 overlap so that the spring may be contracted without interference. When it is desired to hold the end of the film 17 or other article to be wound, the end of the same is inserted through the space between two of the cage members and between the spring and one of the cage members as shown in Fig. 2.

The spring 15 is provided with offset portions 18 disposed outwardly of the coil of the spring, which offset portions are disposed to correspond with respective spaces between the groups of cage members 13, and serve to complete the winding cage. These offset portions 18 are shorter than the respective spaces between the groups of cage members 13 to allow the spring 15 to be contracted to a certain extent for the purpose above pointed out, and the outer surfaces of these offset portions are disposed to complete the surface of the winding cage as outlined by the cage members 13. This construction provides a winding cage, the winding surface of which is practically continuous, and which is light and strong.

This application is a continuation in part of my U. S. application for Letters Patent, Serial No. 277,429, filed February 17, 1919, for improvement in reels.

While I have herein shown and particularly described the preferred embodiment of my invention I do not wish to be limited to the precise details of construction shown as changes may readily be made without departing from the spirit of my invention, but having thus described my invention I claim as new and desire to secure by Letters Patent:—

1. A reel including a disk provided with a central aperture; a bored hub member; a second hub member adapted to pass through the aperture of the disk and into the bore of said first mentioned hub member and adapted to be secured therein; a circumferential flange formed on said second hub member adapted to engage the adjacent side of the disk to clamp the same against said first mentioned hub member; and means for rotatively fixing the disk and one of the hub members including interengaging radial surfaces formed on the disk and said one hub member and disposed to be maintained in interengaging relation when the disk is clamped between said flange and first mentioned hub member.

2. A reel including a disk provided with a central aperture; a bored hub member; a second hub member adapted to pass through the aperture of the disk and into the bore of said first mentioned hub member and adapted to be secured therein; a circumferential flange formed on said second hub member adapted to engage the adjacent side of the disk to clamp the same against said first mentioned hub member; and means for rotatively fixing the disk and one of said hub members including an opening formed in the disk and a projection on said one hub member extending into said opening when the disk is clamped between said flange and first mentioned hub member.

3. A reel including a disk provided with a central aperture; a bored hub member; a second hub member adapted to pass through the aperture of the disk and into the bore of said first mentioned hub member and adapted to be secured therein; a circumferential flange formed on said second hub member adapted to engage the adjacent side of the disk to clamp the same against said first mentioned hub member; and means for rotatively fixing the disk and said first mentioned hub member including an opening in the disk and a projection on said first mentioned hub member extending into said opening when the disk is clamped between said flange and first mentioned hub member.

4. A reel including a disk provided with a central aperture and having an opening therein adjacent said aperture; a bored hub member; a second hub member adapted to pass through the aperture of the disk and into the bore of said first mentioned hub member and adapted to be secured therein;

a circumferential flange formed on said second hub member adapted to engage the adjacent side of the disk to clamp the same against the end of the other hub member; and a projection extending from said end of said first mentioned hub member into the plane of the disk and adapted to enter the opening thereof when the disk is clamped between said flange and end of said first mentioned hub member.

5. A reel including a pair of disks, each being provided with a central aperture and having an opening therein adjacent said aperture; a bored hub member between the disks; a pair of additional hub members, each adapted to pass through the aperture of a respective disk and into the bore of said first mentioned hub member at the opposite ends thereof; a circumferential flange formed on each of said pair of hub members adapted to engage the adjacent side of the respective disk to clamp the same against the respective end of the first mentioned hub member; and a projection formed at each end of said first mentioned hub member extending into the plane of the respective disk and adapted to enter the opening thereof when the disks are clamped between respective flanges and ends of said first mentioned hub member.

6. A reel including a disk; a series of separated cage members arranged around the axis of said disk to form a cage; and a flat element coiled within the cage and having portions thereof offset outwardly of the coil and arranged to project into respective spaces between the cage members to cooperate therewith to complete the surface of the winding cage.

7. A reel including two spaced disks; a series of separated cage members arranged around the axis of said disks and between the same to form a winding cage; and a flat element coiled within the cage and having portions thereof offset outwardly of the coil and arranged to project into respective spaces between the cage members to cooperate therewith to complete the surface of the winding cage.

8. A reel including a disk; a series of separated cage members arranged around the axis of said disk to form a cage; and a flat coiled spring within the cage and having portions thereof offset outwardly of the coil and arranged to project into respective spaces between the cage members to cooperate therewith to complete the surface of the winding cage.

9. A reel including two spaced disks; a series of separated cage members arranged around the axis of said disks and between the same to form a winding cage; and a flat coiled spring within the cage and having portions thereof offset outwardly of the coil and arranged to project into respective spaces between the cage members to coöperate therewith to complete the surface of the winding cage.

In witness whereof I hereunto affix my signature this twentieth day of January, 1920 A. D.

LE ROY M. FULTON.