Sept. 2, 1924. 1,507,357

A. S. HOWELL

REEL AND SPINDLE MOUNT THEREFOR

Filed March 8, 1923

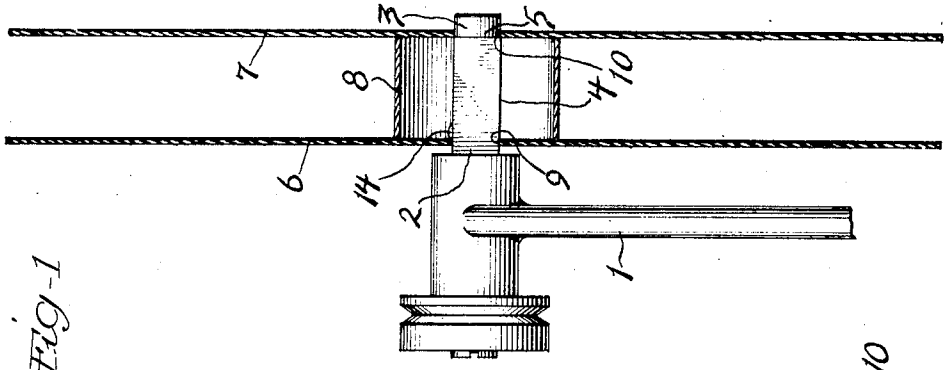

Fig-1

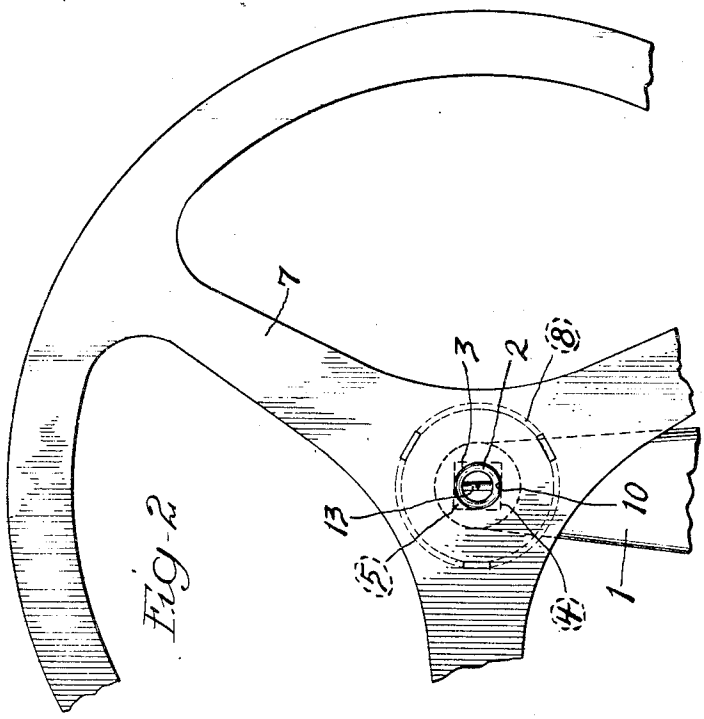

Fig-2

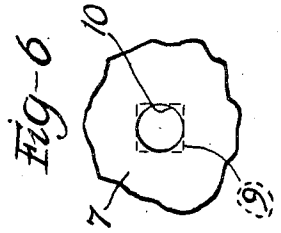

Fig-6

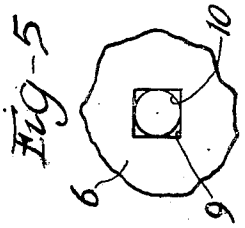

Fig-5

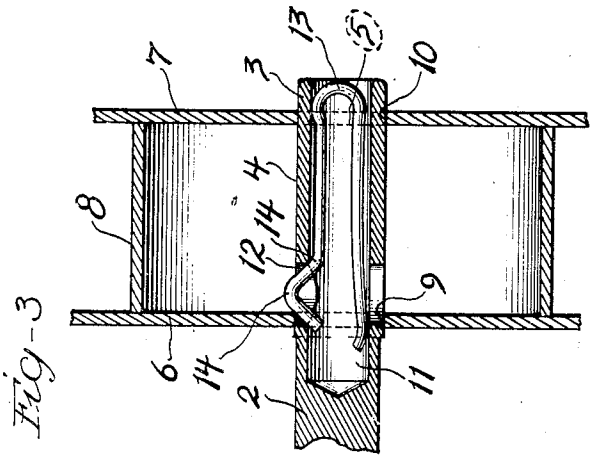

Fig-3

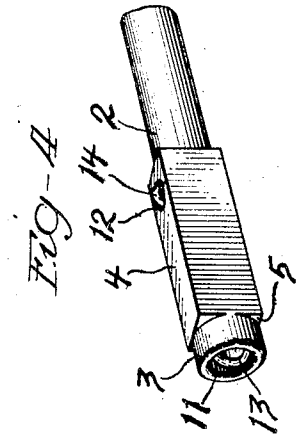

Fig-4

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UNITED STATES PATENT OFFICE.

ALBERT S. HOWELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO BELL & HOWELL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

REEL AND SPINDLE MOUNT THEREFOR.

Application filed March 8, 1923. Serial No. 623,689.

To all whom it may concern:

Be it known that I, ALBERT S. HOWELL, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Reels and Spindle Mounts Therefor, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of the specification.

My invention has particular relation to reel and spindle mounts of the type usually employed on motion picture machines although not limited to this use alone.

One feature of the invention relates to a simple and effective means for preventing reverse mounting of a reel on a spindle.

Another feature relates to a simple, compact, and effective releasable spring latch equipped spindle for releasably maintaining a reel on the spindle.

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 effected, all as fully described with reference to the accompanying drawing and more particularly pointed out in the claims.

In the said drawing—

Figure 1 is a side elevation of a spindle mount structure with a reel shown in central vertical section, mounted thereon.

Figure 2 is a partial front elevation of the spindle mount structure with a reel mounted thereon.

Figure 3 is an enlarged partial central vertical section of the same.

Figure 4 is a partial perspective view of the spindle.

Figures 5 and 6 are partial views of opposite sides of the reel.

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

In the said drawings 1 designates a support arm, and mounted for rotation in a hub of this arm is a spindle 2, the reel mount portion of which extends outwardly from one end of the hub. This extending portion of the spindle is provided with a longitudinally varied reel mount surface comprising a round outer portion 3 and a square or polygonal inner portion 4 having its faces tangential to the round portion and accordingly extending laterally beyond the round portion and terminating in an outwardly facing shoulder 5.

The reel includes spaced side plates 6 and 7 secured in a usual manner to opposite ends of a central tubular member 8, and the side plates 6 and 7 are provided respectively with central coaxial spindle apertures 9 and 10 forming a spindle opening. The spindle aperture 10 of the plate 7 is round corresponding with the outer portion 3 of the reel mount surface of the spindle to fit over the same in the mounting of the reel on the spindle, and the aperture 9 of the plate 6 is square or polygonal corresponding with the inner portion 4 of the reel mount surface of the spindle to fit over the same in the mounting of the reel on the spindle, the sides of the square or polygonal aperture 9 being in planes tangential to the round aperture 10, and, as shown, the length of the sides of the square aperture 9 being the same as the diameter of the round aperture 10, see Figs. 5 and 6, thus forming a longitudinally varied spindle opening corresponding with the longitudinally varied reel mount surface of the spindle. It is an inherent characteristic of a reel with such apertures that it will fit over and rotate satisfactorily on a spindle which is cylindrical throughout, such as one having throughout the same diameter as portion 3.

The reel is mounted on and removed from the reel mount portion of the spindle over the outer end thereof, and by reason of the fact that the aperture 10 of the plate 7 will not fit over the portion 4 of the reel mount surface of the spindle, the reel can only be mounted on the spindle in one way, i. e., with the plate 6, having the spindle aperture 9, inward as shown. The engagement of the aperture 9 of the plate 6 with the portion 4 of the reel mount surface of the spindle provides for driving the reel from the spindle.

When the reel is mounted on the spindle the inner surface of the plate 7, forming a shoulder surface, engages the shoulder 5 of the spindle to limit inward movement of the reel. The reel is releasably maintained against outward movement by means now to be described. The reel mount portion of

the spindle is bored from the outer end thereof as designated at 11, and is provided with a radial aperture 12 communicating with the bore of the spindle and disposed at a point adjacent the position of the plate 6 when the reel is mounted on the spindle. Within the bore of the spindle is a U-shaped spring 13 extending longitudinally of the bore and having reverse bends 14 in and adjacent the end of a leg thereof forming a portion extending first from this leg of the spring in a direction away from and then extending in a direction toward the other leg of the spring, said portion projecting outwardly through said radial aperture 12 to form an outwardly spring pressed latch. The reversely bent portion of the spring normally extends outwardly of the surface of the portion 4 of the reel mount surface of the spindle, and the arrangement is such that this portion of the spring is disposed in front of the inner plate 6 of the reel when the reel is mounted on the spindle and maintains the reel against outward movement on the spindle with the outer plate 7 against the shoulder 5. The spring is depressed to permit the plate 6 to ride over the same in both the mounting of the reel and the removal thereof by excess axial pressure exerted on the reel in the proper direction.

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 the following:—

1. A device of the character described including a spindle adapted for the removable mounting of a reel over an end thereof and provided with a longitudinally varied reel mount surface having an inner portion extending laterally beyond the outer portion thereof and terminating in an outwardly facing shoulder disposed intermediately of the reel mount surface, and a reel having a corresponding longitudinally varied and shouldered spindle opening adapted to cooperate with the reel mount surface of the spindle to prevent reverse mounting of the reel on the spindle, the shoulders of the spindle and reel being engageable when the reel is mounted on the spindle.

2. A device of the character described including a spindle adapted for the removable mounting of a reel over an end thereof and provided with a longitudinally varied reel mount surface comprising an outer round portion and an inner polygonal portion extending laterally beyond the round portion, and a reel having a longitudinally varied spindle opening comprising corresponding polygonal and round portions adapted to cooperate with the reel mount surface of the spindle to prevent reverse mounting of the reel on the spindle.

3. A device of the character described including a spindle adapted for the removable mounting of a reel over an end thereof and comprising an outer round portion and an inner portion extending laterally beyond the round portion and terminating in an outwardly facing shoulder, and a reel having a longitudinally varied spindle opening adapted to be placed over the spindle and having a shoulder surface engageable against said shoulder of the spindle, one portion of the spindle opening being of a size to pass over the inner portion of the spindle, and the portion beyond the shoulder having a bearing engagement with the outer portion of the spindle.

4. A device of the class described including a spindle adapted for the removable mounting of a reel over an end thereof, and a reel having an axial opening and adapted to be mounted on the spindle, the spindle comprising an outer round portion and an inner portion extending laterally beyond the round portion and terminating in an outwardly facing shoulder, said inner portion and the reel being interlockingly connected for rotation together, the reel having in its axial opening a shoulder surface engageable with the said shoulder of the spindle, and the axial opening beyond the shoulder being round to fit the outer end of the spindle.

5. A device of the character described including a spindle adapted for the removable mounting of a reel over an end thereof and provided with a longitudinally varied reel mount surface having an inner portion extending laterally beyond the outer portion thereof and terminating in an outwardly facing shoulder, and a reel having a longitudinally varied spindle opening adapted to cooperate with the reel mount surface of the spindle to prevent reverse mounting of the reel on the spindle and having a shoulder surface engageable against said shoulder of the spindle, and releasable means for maintaining the reel against outward movement on the spindle.

6. A device of the character described including a spindle adapted for the removable mounting of a reel over an end thereof and provided with a longitudinally varied reel mount surface comprising polygonal and round portions and having the inner portion extending laterally beyond the outer portion and terminating in an outwardly facing shoulder, a reel including two axially spaced side plates provided with spindle apertures corresponding with respective portions of the reel mount surface of the reel and forming a longitudinally varied spindle opening adapted to cooperate with the reel mount

surface of the spindle to prevent reverse mounting of the reel, and releasable means on the spindle for maintaining the reel against outward movement on the spindle.

7. A device of the character described including a spindle adapted for the removable mounting of a reel over an end thereof and provided with a longitudinally varied reel mount surface comprising polygonal and round portions and having the inner portion extending laterally beyond the outer portion and terminating in an outwardly facing shoulder, a reel including two axially spaced side plates provided with spindle apertures corresponding with respective portions of the reel mount surface of the spindle and forming a longitudinally varied spindle opening adapted to cooperate with the reel mount surface of the spindle to prevent reverse mounting of the reel, and a releasable spring pressed latch on the spindle for engagement with the inner side plate of the reel to maintain the reel against outward movement on the spindle and with the outer plate of the reel against said shoulder.

8. A device of the character described including a hollow spindle adapted for the removable mounting of a reel over an end thereof and provided with a longitudinally varied reel mount surface comprising polygonal and round portions and having the inner portion extending laterally beyond the outer portion and terminating in an outwardly facing shoulder, said spindle having a lateral opening at said inner portion communicating with the bore thereof, a reel including two axially spaced side plates provided with spindle apertures corresponding with respective portions of the reel mount surface of the spindle and forming a longitudinally varied spindle opening adapted to cooperate with the reel mount surface of the spindle to prevent reverse mounting of the reel, and a releasable spring pressed latch within the spindle and projecting outwardly through said lateral opening of the spindle and adapted to engage the inner plate of the reel for maintaining the same against outward movement on the spindle with the outer plate of the reel against said shoulder.

9. A motion picture film reel or the like provided with a longitudinally varied spindle opening having one portion extending laterally beyond another portion thereof and having a shoulder surface intermediate said portions, said spindle opening being adapted to cooperate with a corresponding longitudinally varied and shouldered reel mount surface of a spindle to prevent reverse mounting of the reel on the spindle, and said shouldered surface of the spindle opening being engageable with the shoulder of the spindle when the reel is mounted on the spindle.

10. A motion picture film reel or the like provided with a longitudinally varied spindle opening comprising polygonal and round portions one of which extends laterally beyond the other and adapted to cooperate with a corresponding longitudinally varied reel mount surface of a spindle to prevent reverse mounting of the reel on the spindle.

11. A motion picture film reel provided with a longitudinally varied spindle opening comprising coaxial polygonal and round portions, the sides of the polygonal portion being in planes tangential to the round portion.

12. A motion picture film reel provided with a longitudinally varied spindle opening comprising coaxial square and round portions, the length of the sides of the square being the same as the diameter of the round portion.

13. A motion picture film reel or the like including two axially spaced side plates provided with spindle apertures one of which extends laterally beyond the other, said apertures forming a longitudinally varied spindle opening having an intermediate shoulder surface, said spindle opening being adapted to cooperate with a correspondingly longitudinally varied and shouldered reel mount surface of a spindle to prevent reverse mounting of the reel on the spindle and said shoulder surface of the spindle opening being engageable with the shoulder of the spindle when the reel is mounted thereon.

14. A motion picture film reel or the like including two axially spaced side plates provided with spindle apertures one of which is round and the other of which is polygonal and extends laterally beyond the round aperture, said apertures forming a longitudinally varied spindle opening adapted to cooperate with a corresponding longitudinally varied reel mount surface of a spindle to prevent reverse mounting of the reel on the spindle.

15. A reel spindle adapted for the removable mounting of a reel thereon over an end thereof and provided with a longitudinally varied reel mount surface having an inner reel mount surface portion extending laterally beyond the outer reel mount surface portion thereof and terminating in an outwardly facing shoulder disposed intermediately of the reel mount surface and adapted to cooperate with the spindle opening of a reel, varied longitudinally and shouldered in correspondence, to prevent reverse mounting of the reel on the spindle, said shoulder of the spindle being engageable with the shoulder of the reel spindle opening when the reel is mounted on the spindle.

16. A reel spindle adapted for the removable mounting of a reel thereon over an end thereof and provided with a longitudinally varied reel mount surface comprising po-

lygonal and round portions and having the inner portion extending laterally beyond the outer portion thereof and adapted to cooperate with the spindle opening of the reel varied longitudinally in correspondence to prevent reverse mounting of the reel on the spindle.

17. A reel spindle adapted for the removable mounting of a reel thereon over an end thereof and provided with a longitudinally varied reel mount surface comprising a round outer portion and a polygonal inner portion having its faces tangential to the round portion and adapted to cooperate with the spindle opening of the reel varied longitudinally and comprising corresponding polygonal and round portions to prevent reverse mounting of the reel on the spindle.

18. A device of the character described including a hollow spindle provided with a lateral opening communicating with the bore thereof and a spring doubled on itself and extending longitudinally in the bore of the spindle and having reverse bends in a leg thereof forming a portion extending first from this leg of the spring in a direction away from and then extending in a direction toward the other leg of the spring, said portion projecting outwardly in said lateral opening to form an outwardly spring pressed latch.

19. A device of the character described including an axially bored spindle provided with a radial aperture communicating with the bore thereof and a U-shaped spring extending longitudinally in the bore of the spindle and having reverse bends in and adjacent the end of a leg thereof forming a portion extending first from this leg of the spring in a direction away from and then extending in a direction toward the other leg of the spring, said portion projecting outwardly through said radial aperture to form an outwardly spring pressed latch.

In witness whereof I hereunto affix my signature this 5th day of March, 1923.

ALBERT S. HOWELL.