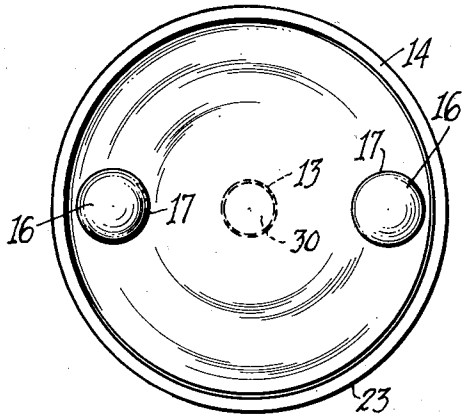
Oct. 16, 1951 C. HILL ET AL 2,571,879

OVERLOAD RELEASE COUPLING

Filed July 25, 1946

FIG. 1.



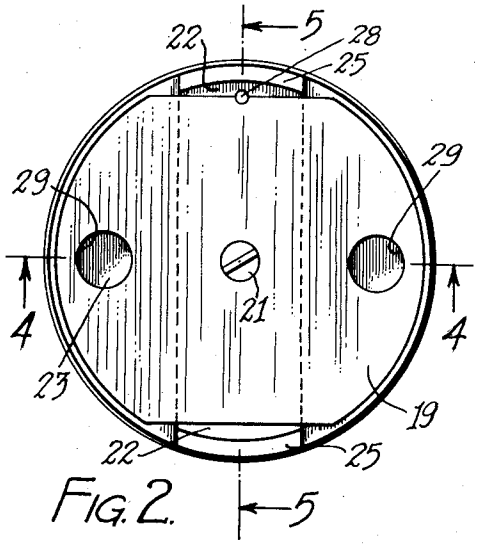


FIG. 2.

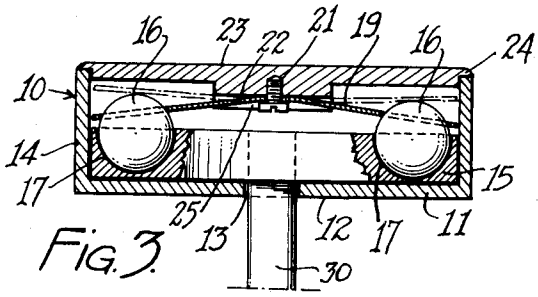


FIG. 3.

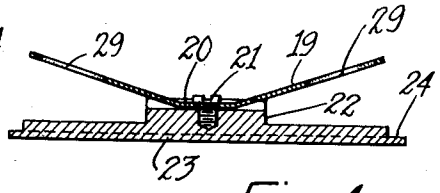


FIG. 4.

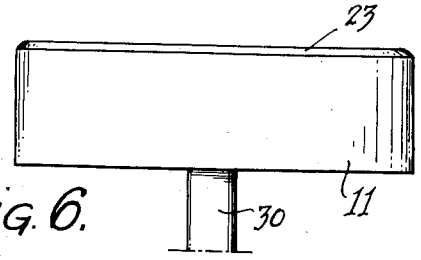


FIG. 6.

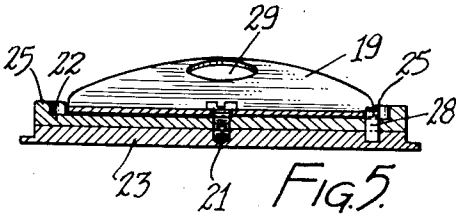


FIG. 5.

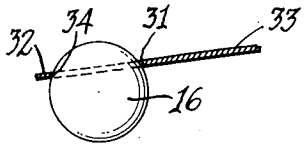


FIG. 7.

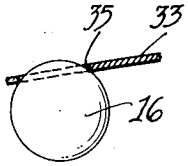


FIG. 8.

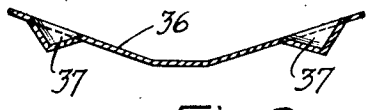


FIG. 9.

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UNITED STATES PATENT OFFICE

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OVERLOAD RELEASE COUPLING

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6 Claims. (Cl. 64—29)

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This invention relates to spring winding devices and in particular to one which may be applied to toys, clocks or watches and which will prevent the overwinding of the spring.

A particular object of the invention is to provide a device of the character referred to which is of extremely simple construction and employs a novel form of friction member that can be turned out in mass production so that no adjustment of tension is needed when the friction member is applied to springs having substantially the same resistance to winding.

In the use of overwind preventative devices, the application of such a device to the very small crown of watches, such as ladies' wrist watches has been a problem due to the restricted space in the crown of a watch in which such a device could be incorporated. The use of coil springs is disadvantageous due to the size thereof and it is a further object of our invention to provide a device that can be placed in the crown of a watch, or in the small winding key crown of a toy and which will occupy a minimum of space, will resist a spring and part fracturing winding pressure and one that will provide an audible click sound so that the person doing the winding will be warned that the spring has been fully wound.

This invention is an improvement in the form of spring winding device covered in our application Serial No. 565,342 filed November 27, 1944 and provides for close adjustment of the tension of the friction member.

With these and other objects in view, the invention comprises certain constructions hereinafter described and then particularly pointed out in the claims and a preferred embodiment of our invention is illustrated in the accompanying drawing, in which:

Figure 1 is a plan view of the cup in which part of the friction device is mounted,

Figure 2 is a plan view of the cap of the device removed and inverted to show the relative arrangement of the parts.

Figure 3 is a view in cross section through the device assembled with the parts shown in Figures 1 and 2 in their cooperating relation,

Figure 4 is a section on the line 4—4 of Figure 2 showing the mounting of the spring that forms a part of the device,

Figure 5 is a section on the line 5—5 of Figure 2 further showing the means for mounting the spring in the cap member,

Figure 6 is an exterior view of the winding device illustrated in Figure 3,

Figure 7 is a fragmentary view in enlarged

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section showing the use of one size of hole in the spring to obtain a degree of tension in winding operation,

Figure 8 is a view similar to Figure 8 showing another size of hole for varying the tension of the winding device, and

Figure 9 is a view in section through a modified form of spring or tension plate showing the use of cups instead of openings.

Referring to the drawing in detail, 10 indicates the winding crown of a watch, or the winding key of a toy and consists of a cup 11 having a bottom 12, a bottom concentric opening 13 and flanged side wall 14. The cup is circular in shape and is arranged to receive for rotary movement in the bottom thereof, the ball disk 15 in the upper face of which is formed ball sockets of hemi-spherical shape which are deep enough to permit the balls to rest therein with the centers below the level of the upper surface of the disk 15. The balls 16 are the usual hardened steel balls used in bearings.

One or more holes or sockets 17 may be used depending upon the use to which the device is to be put. Where increased tensional resistance is desired in the winding of the heavier springs found in toys, the number of sockets and balls may be increased. Two are shown in the present instance for illustration.

The resistance to the winding of the spring is provided by the use of a ball spring 19 which is provided with a horizontal center strip portion 20 which is secured as by a screw 21 to the central raised portion 22 formed integrally or separately with respect to the top or crown piece 23 which has an annular edge flange that is used when the member 23 is secured in place on top of the cup 11 to provide material 24 for swaging the top in place, as in the crown of a watch.

The opposite ends of the spring 19 are round and the opposite sides thereof are parallel to fit within the seat defining upstanding lips 25 formed at the opposite ends of the portion or platform 22. The latter allows for the flexing of the spring 19 when the ends thereof ride off the balls when the spring being wound reaches a certain tension. Shift of the spring 19 is prevented by the lips 25 and by the use of a plug pin 28 engaging one of the parallel sides of said spring. The outer rounded end portions of the spring 19 are provided with holes 29 constituting ball seats, which, when the cover or crown piece 23 is in place as shown in Figure 3 fit over the balls 16 with a tension that is provided by the pressure of putting the cover in place on top of the cup 11. The

outer ends of the spring 19 are disposed downwardly at an oblique angle and are so tempered that a lateral force produced by the balls on the inner circumference of the holes 29 will raise the ends of the spring clear of the balls when the spring being wound by the integral shaft or winding stem portion 30 of the ball disk 15 becomes fully wound. The rotary movement of the cup 11 and with it the top 23 will produce a clicking sound after the tension is sufficient to cause the ends of the spring to ride over the balls.

The temper of the spring 19 may be varied for different uses and thus in large production of like things employing springs that have to be wound, one degree of temper will be necessary to get the degree of tension desired. In like manner, the Figures 7 and 8 illustrate the use of holes 31 in the outer ends 32 of spring plate 33 which may be varied in size. The large hole 34 will require a greater tension or winding effort to release than will the smaller hole 35. These tension control features are an important part of the device as quantity production present a problem in making parts that will all have the same degree of tensional resistance and yield.

In the form of the spring 36 shown in Figure 9, the spring itself is of the same shape as the one shown in Figure 2, but instead of holes, the depressions, cups or pimples 37 may be provided to afford the detent action desired. It is evident that any number of holes or depressions or balls may be used or in any combination desired, to obtain the desired tensional resistance of the winding crown member which includes the top 23 and cup 11.

Our invention is not to be restricted to the precise details of construction shown since various changes and modifications may be made therein without departing from the scope of the invention or sacrificing the advantages to be derived from its use.

What we claim is:

1. A spring winding device comprising a cup having an opening therein, a disk rotatably mounted in said cup and having an integral winding stem portion extending through said opening for winding a spring a ball and a ball seat in said disk, a top for the cup arranged to be secured thereto so that the cup and top can be turned as a unit, with respect to said disk, a spring plate having a ball opening adjacent the periphery thereof for detachable engagement with said balls, and means for connecting said spring and said top member for turning movement together and for passage of said spring over the ball when the tension of the spring being wound provides a predetermined resistance to the rotary movement of said disk.

2. A spring winding device comprising a cup, a disk in said cup having a spring winding extension thereon and shaped to provide on the upper surface thereof ball seats arranged peripherally thereof, balls in said seats having their centers below the plane of the top surface of said disk, a spring plate having openings adjacent the periphery thereof for engagement with said balls to provide a yieldable spring winding action for rotating said disk and means for connecting said spring and said cup for turning movement together and for passage of said spring over said balls when tension of the spring being wound provides a predetermined resistance to the rotary movement of said disk.

3. A spring winding device comprising a cup, a disk rotatably mounted therein, cavities in said disk, a spring plate fixedly associated with said cup and presenting obliquely disposed flexible end portions, means associated with said spring end portions and said cavities for tensional interengagement to provide a releasable winding action between the cup and the disk and a stem on said disk for winding a spring and a closure top on said cup for holding the spring plate under tension.

4. A spring winding device comprising a disk having ball seats and a spring winding projection thereon, a cup in which the disk is housed, a cover for said cup, a spring rotatable with said cover and shaped to provide obliquely disposed flexible ends having holes adjacent the periphery thereof and balls in the disk for releasable engagement by said holes when the spring being wound reaches a predetermined tension.

5. In a spring winding device a cup member, a disk mounted for rotation relatively to said cup, said disk having ball sockets therein balls in said sockets with the centers thereof below the top plane of said disk, a top secured to said cup and constituting a closure therefore, a leaf spring secured to said top and having angularly extended end portions provided with ball engaging openings and a spring winding stem on said disk extending through said cup.

6. In a spring winding device, a cup, a disk in the cup having ball seats, balls in said seats, a cover secured to the cup to provide therewith a winding crown, a spring secured to the cover and depending therefrom to engage at its ends the balls in said disk under tension afforded by connecting the cover to the cup, said spring having ball seats formed therein, a platform extending laterally of said cover at the center thereof to provide depth spaces at opposite sides thereof in which the tensioned spring may act when riding over said balls in release movement, and a spring winding extension on said disk.

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