

May 12, 1953

C. HILL ET AL

2,637,987

OVERLOAD RELEASE COUPLING

Filed Feb. 18, 1947

2 Sheets-Sheet 1

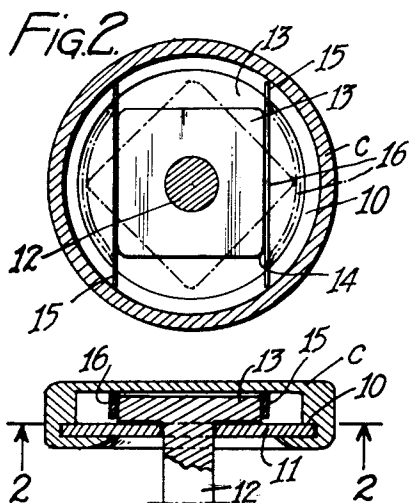


Fig. 1

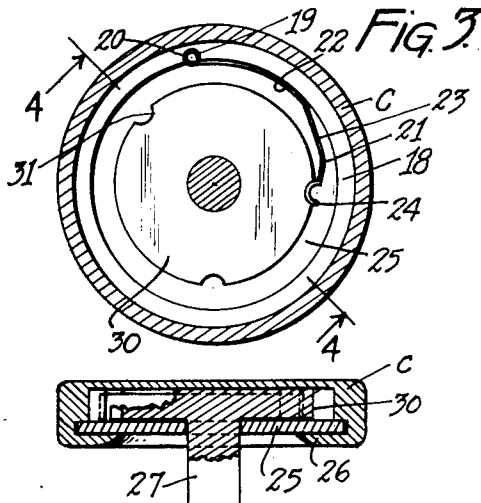


Fig. 4

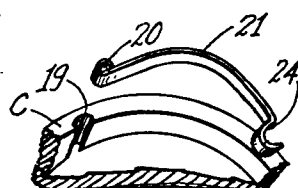


Fig. 5

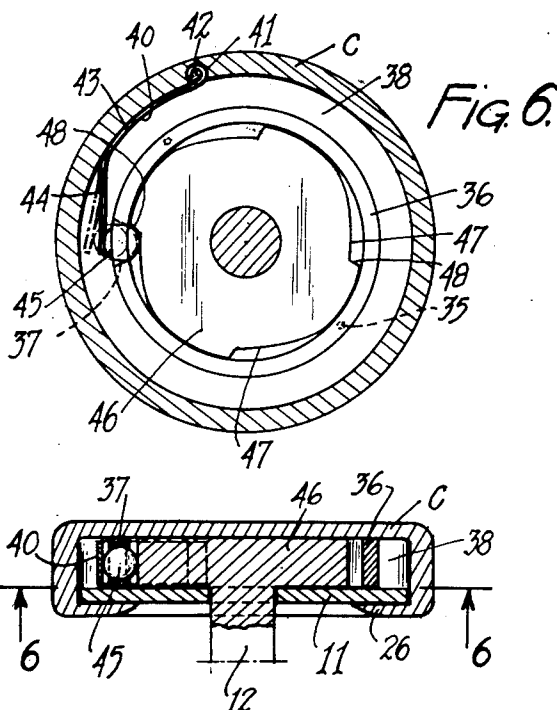


Fig. 7

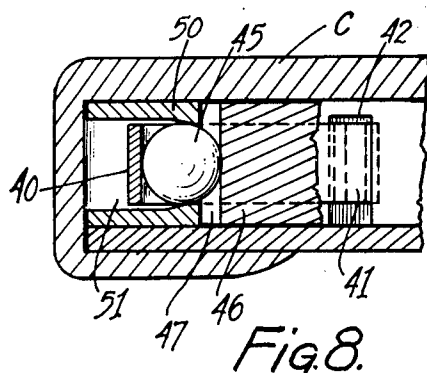


Fig. 8

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2 Sheets-Sheet 2

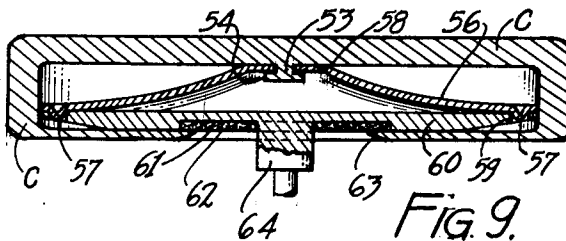
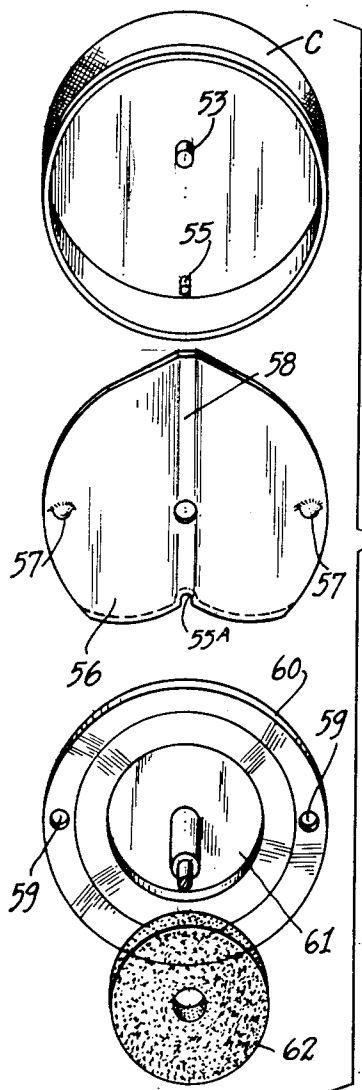


Fig. 10.

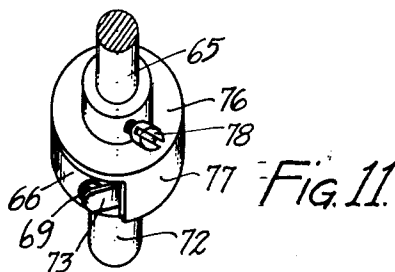


Fig. 11.

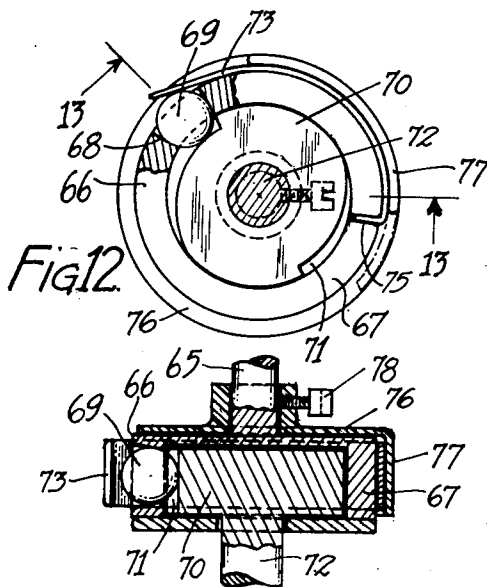


Fig. 12.

Fig. 13.

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Application February 18, 1947, Serial No. 729,300

2 Claims. (Cl. 64—29)

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This invention relates to spring winding devices and in particular to the type particularly adapted to prevent overwinding of springs in watches, toys or other appliances such as music boxes or the like.

In view of the fact that watches, and those of the very small type in particular, have a crown of limited dimension, the application of a slip catch to the crown so that the appearance of the latter will not be altered in appearance or dimensions is difficult, due to the small space available within the crown. It is an important object of the invention to provide a device of the character referred to that can be made with few parts, can be easily assembled into the watch crown, can be made a part thereof, and will provide a slip device effective when the tension of the watch spring has reached a predetermined wound resistance so that further winding of the spring is prevented and so that breakage of the parts associated with the winding stem of the watch is obviated.

A further object of the invention is to provide slip-catch spring disc device which, in winding the watch rotates with the stem of the watch and at the same time may have a reverse winding motion relatively thereto to permit the crown to be wound by an oscillatory rotary movement as used by some persons in winding watches.

Still further objects of the invention are to provide a device that will permit adjustment of the tension of the spring providing counter resistance to the tension of the spring being wound; to provide an arrangement of parts that permits assembly in minimum time and with minimum skill; to provide for an audible signal to indicate when the watch or other appliance spring is fully wound, and to provide a structure wherein the parts can be assembled without the need of separate holding means such as screws or rivets.

With these and other objects in view, the invention comprises certain constructions hereinafter described and then particularly pointed out in the claims and preferred embodiments of our invention are illustrated in the accompanying drawings in which:

Figure 1 is a view in vertical section taken through a watch crown in which our device is incorporated,

Figure 2 is a section on the line 2—2 of Figure 1,

Figure 3 is a view similar to Figure 2 showing a modified form of the invention,

Figure 4 is a section taken on the line 4—4 of Figure 3,

Figure 5 is a slightly enlarged fragmentary

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view in perspective showing the relation of the spring and crown parts of the device shown in Figure 3,

Figure 6 is a view similar to Figure 3 showing a further modified form of the invention, the view being taken on the line 6—6 of Figure 7,

Figure 7 is a view in cross section through a watch crown in which a ball is employed as a part of the slip catch device,

Figure 8 is an enlarged view of a side edge of a crown showing a modified form of the disc as used in Figure 7,

Figure 9 is a view in vertical cross section taken through a crown showing a modified form of the invention,

Figure 10 is an exploded view showing the parts of Figure 9 in assembly related position,

Figure 11 is a view in perspective of a winding device that may be applied to appliances other than a watch and which a spring tension adjustment feature is incorporated,

Figure 12 is a bottom plan view of the device shown in Figure 11 with parts being illustrated in section, and

Figure 13 is a section on the line 13—13 of Figure 12 showing the arrangement of the parts.

Referring to the drawings in detail, a crown cap C common to all the forms of the invention as used in a watch, may be, as illustrated in Figure 2, provided with an annular ledge 10 constituting a supporting shoulder for a sealing plate 11 through which extends the winding stem 12 which carries at its upper end, a rectangular disc 13 whose corners are rounded as at 14 to decrease wear. The ledge 10 is notched as at 15 to provide pockets into which the ends of short spring strips are positioned, the strips being indicated as at 16 and being of suitable tempered metal. The disc 13 fits between the spring strips 16 with its flat sides abutting the springs so that the crown and stem are revolved as a unit in winding of the watch until the watch spring is fully wound when the strips 16 will yield as indicated in the outline position of Figure 2 to permit the crown to revolve without damage to the watch parts and with sufficient snap to warn the winder that the watch has been completely wound.

In Figure 3, the crown C is provided with an annular ledge 18 provided with an outwardly opening cylindrical pocket 19 in which is imprisoned a looped end 20 of a spring strip 21. This strip is shaped to provide a support arm section 22 which hugs the wall formed by the ledge 18 and a free power or yield arm 23 terminating in a hook or catch end 24. A sealing plate 25

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rests on the ledge 18 and is held in place, as in Figure 1, by the peening over of the lower edge of the crown as at 26. The plate 25 is provided with a central opening through which passes the winding stem 27 which forms a part of a slip-catch spring disc 30 of circular shape provided on its periphery with spaced recesses or notches or seats 31 into which engages the looped catch end 24 of the spring strip 21. The relative variation of the length of the support arm 22 and the yield arm 23 provide means for decreasing or increasing the winding effort of the winding device. The shorter the yield arm 23, the greater the resistance to lift of the loop end 24 out of the seat of the disk and the greater the effort that may be put into winding the watch or appliance spring. In this form of the device the parts are hand assembled and after the crown is peened, the device is complete.

In the device shown in Figures 6 and 7, the crown C has secured thereto in any suitable manner, such as by pins 35, a ring 36 provided with a ball seat 37, the ring being spaced as at 38 from the inner wall of the crown to provide a well in which is positioned a strip spring 40 having a loop 41 removably positioned in an open-sided pocket formed in the inner wall of the crown as at 42. The spring 40 is shaped to provide a support section and a yield section 43, 44, respectively which may be varied in relative length to produce the necessary resistance to a raising movement of a ball 45 positioned in the seat 37 and projecting inwardly of said ring 36 to engage the periphery of a slip catch disc 46. The disc is provided with one or more peripheral recesses 47 shouldered as at 48 so that the ball in the position shown in Figure 6 will be yieldably held in any recess 47 until the winding movement of the crown, produces at the winding stem and its associated disc 46, sufficient resistance to rotary motion to cause the ball to rise against the resistance of spring 40 and ratchet over the periphery of the disc with an audible click to warn that the spring is fully wound. In a slightly modified form of disc and ring combination as set forth for Figures 6 and 7, the ring 50, in Figure 8 may be channelled as at 51 so that it can be dropped centrally into the crown and then secured in place as desired. This channel will maintain the spring in parallel relation to the disc.

In the form of the invention shown in Figures 9 and 10, the crown C is provided with a central pin 53 which may be rivet headed as at 54 and which cooperates with a dowel pin 55 to maintain a spring disc 56 within the crown. The disc 56 of suitably tempered spring steel or other metal is ridged laterally as at 58 and adjacent the periphery thereof is dimpled as at 57 to provide projections which coact with recesses or openings 59 in a winding disc 60 positioned within the crown. The disc 60 is centrally recessed as at 61 to receive a washer, gasket or sealing disc 62 made of felt, cork or composition and impregnated with a suitable moisture proofing compound. The disc 62 may be made of charmois or other suitable material and when the parts are assembled as shown in Figure 9 and the lower edge of the crown peened over the winding disc as at 63 and the edges of the sealing disc 62, the crown is rendered moisture and dust proof. The winding stem 64 and disc 60 are made in a unit and when the resistance of the wound watch spring is sufficient, the spring disc 56 will rotate independently of the winding disc 60, to prevent overwinding of the watch spring. Notch 55A receives dowel 55.

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In the form of the invention shown in Figures 11 to 13, the device is particularly adapted to heavier spring wound appliances than watches and consists of the winder shaft 65 having formed integrally therewith a cup 66, the wall 67 of which is provided with a ball seat 68 in which a ball 69 rests and protrudes to the inner side of the wall. Within the cup 66 is positioned a disc 70 having one or more recesses 71 in the periphery thereof with which the ball engages to yieldably transfer the winding motion of the winder shaft 65 to the shaft 72 to be wound. The ball is urged against the periphery of the disc 70 by the free end of a strip spring 73 which passes about an arcuate portion of the cup 66 and is attached to the cup in the slot 75. The winding shaft 65 has secured thereto a cap 76 having an arcuate shaped apron 77 depending about the side of the spring 73 and adjustable in rotary direction with respect to said spring to cover or uncover varying portions of the free end thereof so that the tension of said free end may be varied in accordance with the tension of the spring being wound. The cap is adjustable by use of the set screw 78, which engages the shaft 65.

While we have described what we consider to be highly desirable embodiments of our invention, it is obvious that many changes in form could be made without departing from the spirit of the invention, and we, therefore, do not limit ourselves to the exact form herein shown and described, nor to anything less than the whole of our invention as hereinbefore set forth and as hereinafter claimed.

What we claim as new and desire to secure by Letters Patent is:

1. In a spring winding device, a hollow winding crown shaped to provide an annular ledge about the inner periphery thereof, a cylindrical well in said ledge opening at one side into the hollow interior of said crown, said ledge presenting a vertical wall, a sealing plate supported on said ledge and secured thereto by a peened-over edge of said crown, a winding stem extending through said sealing plate and having a disc portion associated therewith and disposed in the hollow interior of said crown, the peripheral edge of said disc being notched and being spaced from the vertical wall of said ledge to provide a spring space, a strip spring having looped ends, one of which is disposed in said well to removably position the strip spring in said space and the other of which engages the notched edge of said disc, and said spring being shaped to provide a wall abutting support arm portion and a free yield arm portion for yieldably connecting the crown and the winding stem disc.

2. In a spring winding device, a hollow winding crown shaped to provide an annular wall and shoulder portion about the inner periphery thereof, a cylindrical well in said shoulder portion, opening at one side through the wall and into the hollow interior of said crown, a sealing plate supported on said shoulder and secured thereto by the peened-over edge of the crown, a winding stem extending through said sealing plate and having a disc portion associated therewith and disposed in the hollow interior of said crown, the peripheral edge of said disc being notched and being spaced from said wall to provide a spring space, a strip spring having a looped end disposed in said well to removably position the strip spring in said space, means associated with the free end of said spring and urged thereby into yieldable engagement with the

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notched edge of said disc and said spring being shaped to provide a wall abutting support arm portion and a free yield arm portion for yieldably connecting the crown and the winding stem disc.

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