Nov. 21, 1950 H. W. BATCHELLER 2,531,246

CLICKER MECHANISM FOR SPINDLES

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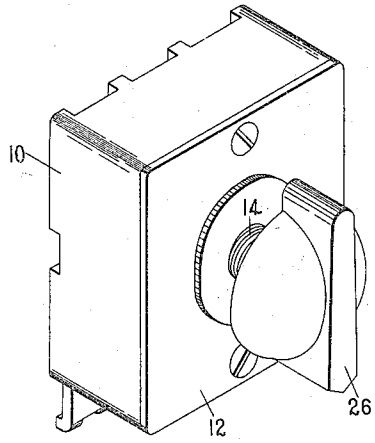


Fig. 1

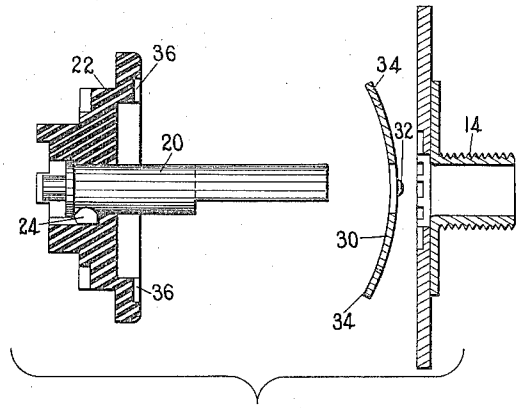


Fig. 2

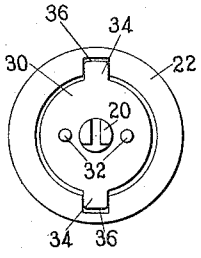


Fig. 3

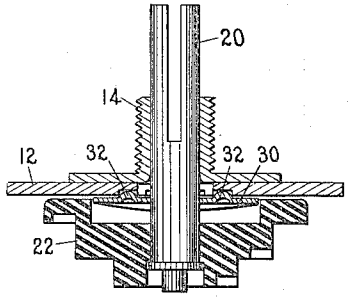


Fig. 4

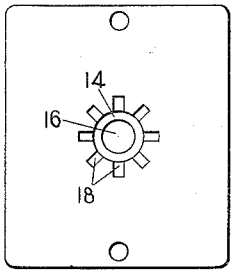


Fig. 5

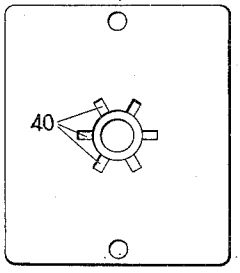


Fig. 6

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CLICKER MECHANISM FOR SPINDLES

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Application February 15, 1947, Serial No. 728,838

5 Claims. (Cl. 74—527)

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This invention relates to a clicker mechanism or spring detent for use with rotating members which should be releasably held in any one of a number of angular positions. Mechanism of this kind may be employed, for example, in certain electric switches which are operated by the rotation of a shaft or stem. A switch of this type is described and illustrated in my co-pending application, Serial No. 713,233, now Patent No. 2,520,270, filed November 30, 1946, the rotatable spindle or stem of this switch having eight angular positions corresponding to different combinations of connections between the various switch elements therein.

It is an object of the present invention to provide an improved clicker mechanism which is simple, easy to assemble, and effective in operation.

For a more complete understanding of the invention, reference may be had to the following description thereof, and to the drawings, of which:

Figure 1 is an isometric view of an electric switch containing an embodiment of the invention;

Figure 2 is an exploded sectional view of parts of the switch structure embodying the invention;

Figure 3 is an end elevation, on a smaller scale, of the rotatable parts shown in Figure 2;

Figure 4 is a sectional view of the parts shown in Figure 2, in assembled relation;

Figure 5 is a rear elevational view of the cover plate;

Figure 6 is a modified form of cover plate.

The invention may be employed in a manually operable switch such as is illustrated in Figure 1, the switch elements being enclosed in a suitable casing 10 having a cover plate 12. On the front face of the cover plate is a tubular neck 14 which is aligned with a hole 16 through the center of the plate. A series of depressions 18 are in the rear face of the plate surrounding the hole 16. These depressions may conveniently be radial grooves, eight such grooves being illustrated in Figure 5.

A spindle 20 extends through the hole 16 and is rotatable therein. Within the casing 10 is a rotor 22 which is mounted on the inner end of the spindle 20 and is keyed thereto by suitable means such as a key 24 on the spindle fitting into a conjugate recess in the rotor 22. The rotor, as shown in Figure 2, is a circular member having a stepped formation, the steps having high and low areas for the operation of switch elements (not shown) such as are described in my co-pending application, Serial No. 713,233, now patented. On the outer end of the spindle 20 is a suitable finger piece 26 which can be manipulated to rotate the spindle 20 and the rotor 22. Between the rotor and the inner face of the cover plate 12 is a spring washer 30 which is preferably made of thin sheet brass. As shown in Figure 3, this washer is circular in form with a central hole large enough to permit it to be mounted on the spindle 20. The washer is cylindrically curved as shown in Figure 2, the convex face of the washer being presented toward the cover plate 12. On the high portion of the curved washer 30 are two bosses 32, these bosses being diametrically opposed to each other and equally spaced from the center of the washer. When the washer is pressed against the cover plate 12, the bosses 32 enter diametrically opposed recesses 18. The low portions of the washer 30 are provided with radially projecting tongues 34 which engage in suitable depressions 36 in the front face of the rotor 22 so that the washer is thus keyed to the rotor and rotates with it and the spindle 20. When the switch is assembled, the rotor 22 is maintained in a position close behind the cover plate 12 as indicated in Figure 4, the inner end of the spindle bearing against the rear wall of the casing 10 when the cover 12 is in place. The rotor thus presses the washer 30 resiliently against the rear face of the cover plate 12 so that the bosses 32 are yieldingly held in two of the recesses 18 when in registry therewith. When the spindle 20 is rotated, the bosses 32 ride out of the recesses in which they are engaged and spring into the next successive recesses when they come into registry therewith. Thus the spindle is yieldingly held in any one of eight predetermined angular positions, these positions being determined by the arrangement of the recesses 18.

Figure 6 shows a cover plate having six recesses 40 similar to the recesses 18 but fewer in number, this cover plate being designed for a switch having fewer contact combinations.

I claim:

1. A mechanism of the class described, comprising a plate having a hole therethrough and a plurality of depressions in a face of said plate arranged around said hole, a spindle extending through said hole, a cylindrically bent spring washer on said spindle and keyed thereto to rotate therewith, said washer being arranged to present its convex face to the recessed face of the plate and having bosses on the high portion of said convex face adapted to enter said re-

cesses successively as the washer is rotated with the spindle, and means bearing against the low portions of said washer to press said bosses resiliently against said plate.

2. A mechanism of the class described comprising a plate with a hole therethrough and a plurality of radially extending grooves in one face thereof around the hole, a rotatable spindle extending through said hole, a rotor keyed to said spindle for rotation therewith, a spring washer on said spindle keyed to said rotor between the rotor and the grooved face of the plate, said washer being cylindrically bent with bosses at its high portion equally and oppositely spaced from the center of the washer and adapted to enter successive grooves in said plate when the washer is rotated with the spindle so as to hold said spindle releasably in any of a number of predetermined angular positions.

3. A mechanism of the class described, comprising a plate having a hole therethrough surrounded by a circular series of depressions in a face of said plate, a spindle extending through said hole, a rotor keyed to said spindle on the same side of said plate as said depressions, said rotor having two recesses in the face thereof which is toward the plate, and a thin spring washer on said spindle between said plate and rotor, said washer being cylindrically curved with the convex face toward the plate, bosses on the high portion of the washer arranged to enter successive recesses in the plate when the washer is rotated, and two tongues projecting from the periphery of said washer at the low points thereof, said tongues engaging in the recesses in the rotor to key the washer to the rotor.

4. In an electric switch having a casing, a cover plate on said casing with a hole therethrough and a series of depressions in its inner face arranged around said hole, a rotor within said casing, and a spindle keyed to said rotor and extending through said hole; a clicker mechanism comprising a cylindrically curved spring metal washer on and rotatable with said spindle between the rotor and the cover plate with its convex face toward the plate, said washer having on its high portion two bosses arranged to enter said depressions successively when the spindle and washer are rotated so as to hold said spindle releasably in any of a number of predetermined angular positions.

5. In a clicker mechanism, a spring washer consisting of a thin disk of resilient material with a central hole, said disk being curved so that one face is cylindrically convex and the other cylindrically concave, two bosses projecting from the high portion of the convex face and arranged symmetrically with respect to said hole, and two tongues extending outward from the edge of said disk at points angularly spaced 90° from said bosses.

HUGH W. BATCHELLER.

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