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J. R. CARLSON

ELECTRIC SWITCH

Filed Nov. 7, 1922

1,690,052

Fig. 1.

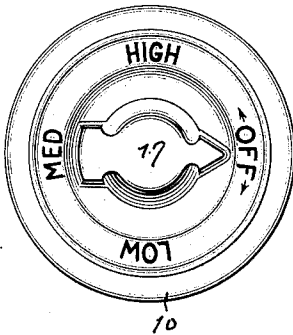


Fig. 3.

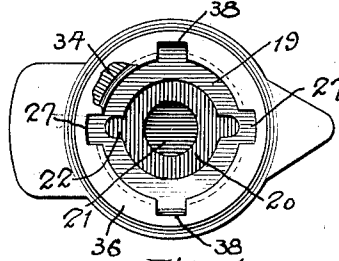


Fig. 4.

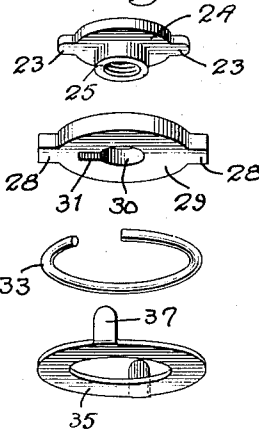


Fig. 2.

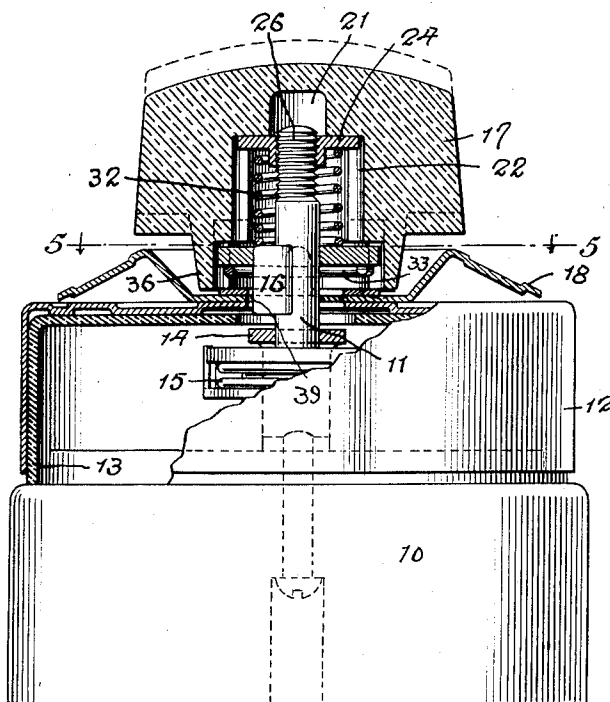


Fig. 5.

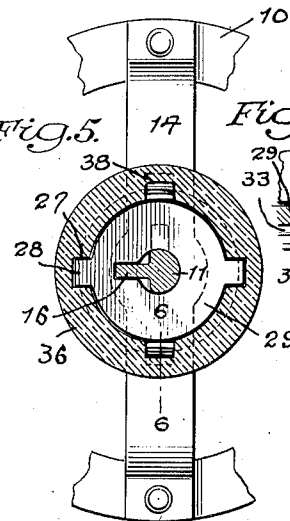
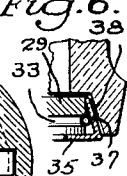


Fig. 6.



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ELECTRIC SWITCH.

Application filed November 7, 1922. Serial No. 599,506.

My invention relates to electric switches, and particularly to rotary snap switches. The object of my invention is to provide an improved switch handle and associated parts affording certain advantages in manufacture or use hereinafter pointed out or shown in the accompanying drawings, in which

Fig. 1 is a plan view of a switch in which my invention is embodied in one form;

Fig. 2 is a broken side elevation thereof drawn to a larger scale;

Fig. 3 is a broken inverted plan of the switch handle detached;

Fig. 4 is a dropped perspective of certain of the parts;

Fig. 5 is a section on the line 5—5, Fig. 2; and

Fig. 6 is a section on the line 6—6, Fig. 5.

In the accompanying drawing I have shown the invention applied to a rotary snap switch of large capacity adapted to control the circuit of a heater element of an electric range, the snap mechanism of the switch being in part omitted since it forms no portion of my invention.

On an insulating base 10 is mounted the switch spindle 11 which carries the mechanism (not shown) which is enclosed by the usual switch cover 12 with the insulating lining 13 through which the upper end of the spindle projects. The spindle is preferably steadied by a bearing in the cross bridge 14 at a point within the cover but above the switch-operating spring 15, which, as shown, is of the type illustrated in the copending application of Benjamin C. Perkins, filed November 4, 1922, Serial No. 599,015, now Patent No. 1,564,016 issued December 1, 1925. The bridge 14 engages the spindle below an elongated fin 16 struck from the spindle 11 and affording means for operative connection with the handle 17, and also with the rotary indicating dial 18.

The switch handle 17, which is preferably of insulating material, is centrally recessed from its switch-adjacent face, to afford a stepped well of three diameters, 19, 20 and 21.

The intermediate portion 20 of the well has longitudinally extending side channels 22 to receive and engage the lugs 23 at opposite sides of the nut 24, which thus rotates with the handle. An internally tapped boss 25 on the nut extends toward and is adapted to engage the threaded end 26 of the switch spindle 11.

The portion 21 of the well is plain and affords clearance for the end of the spindle 11 passing through the nut 24. The portion 19 of the well is provided with longitudinally extending channels 27 to receive and engage the lugs 28 on opposite sides of the spindle driving plate 29, which thus also rotates with the handle. This plate is centrally apertured at 30 to slip freely over the spindle, while a slot 31 extends laterally from the aperture 30 to receive and engage the fin 16 on the spindle 11. To retain the spindle driving plate 29 against escape I provide a spring retaining clip 33 which may be sprung into an annular groove 34 formed in the wall of the portion 19 of the well.

Interposed between the nut 24 and the driving plate 29 is a coil spring 32 which, in assembled position of the parts, is under slight compression.

While the foregoing parts constitute the essential elements of the handle, I prefer to provide also a bearing washer 35 which overlies the end face of the handle boss 36. The bearing washer 35 may be secured in position by means of lugs 37 which enter recesses 38, the outer walls of which are beveled inward. When the washer is forced into position the lugs 37 are bent inward by the beveled walls of the recesses 38, and overlie the retaining clip 33 which thus not only holds the driving plate 29 in position, but also prevents the escape of the bearing washer 35.

The assembly of the parts of the switch handle will of course be readily understood. The nut 24 having been dropped in the bottom of the well 20, and the spring 32 placed in position, the spindle driving plate 29 is then adjusted and the spring clip 33 snapped into

its retaining groove 34. If the bearing washer 35 is used, it is then forced into position and the handle is complete.

To assemble the handle on the switch spindle, it is merely necessary to pass the threaded end 26 of the latter up through the central hole 30 in the spindle driving plate 29, and through the spring 32, into engagement with the boss 25 of the nut 24. It will be noted that the length of the spindle beyond the fin 16 is greater than the distance between the boss 25 and the outer face of the driving plate 29. Consequently it is possible to secure the engagement of one or two threads of the spindle with the boss 25 of the nut before the fin 16 on the spindle meets the driving plate 29. After such threaded engagement has been made, it is possible to longitudinally displace the handle outward with respect to the spindle, while the nut is retained on the spindle end and the spring 32 compressed. Further rotation of the handle in its drawn-out position, indicated in dotted lines in Fig. 2, forces the nut 24 further down on the spindle, so that when the spring 32 is permitted to expand it forces the handle toward the switch, and when the slot 31 of the driving plate registers with the fin 16 on the spindle, the latter slips into the slot and affords the driving connection between the handle and the spindle.

It is obvious that the expansion of the spring 32 serves to constantly press the handle downward, and thus to maintain the switch cover 12 seated against the base 10.

When the indicating dial 18 is of the rotary type illustrated in Fig. 2 it is provided with an aperture 39 shaped like the apertures 30-31 of the plate 29, and is positioned on the spindle above the cover before the handle is attached. The downward pressure of the handle serves to maintain it in position, and the fin 16 on the spindle is of sufficient length to engage both the dial and the plate 29 in the various adjustable positions of the handle.

When a rotary dial of this type is used, it is undesirable to impart a particular shape to the handle 17, but I have shown the latter shaped as an arrow, since it is possible to secure the dial in fixed position on the cover, or to form the dial indications directly on the cover, in which case the handle will serve as a pointer as it travels around with the switch spindle.

The construction has the advantage of extreme simplicity and inexpensiveness from the manufacturing standpoint, while at the same time it is mechanically strong and very easily attached. No attaching means are visible, thus adding to the attractiveness of the appearance of the handle, and also eliminating the possibility of tampering by the inexperienced. The position of the handle on the spindle, and of the rotary dial, when used, is positively determined by the slot 31 in the

driving plate. Exact alignment is thus secured. Moreover, it is impossible to place the handle on the dial in incorrect position on the spindle. The longitudinal play of the nut on the spindle makes possible an easy adjustment of the handle to take up any variations in size of the switch cover, dial, handle or base which may occur in the course of manufacture.

Various modifications in detail of construction will readily occur to those skilled in the art, which do not depart from what I claim as my invention.

I claim—

1. A rotary snap switch handle comprising a handle body recessed to receive the threaded end of a switch-operating spindle, and an eccentrically arranged spindle-driving member fast with the spindle, a tapped member slidable but non-rotatable in said handle recess and adapted to make screw connection with the end of the switch spindle, an abutment member secured to the handle, a spring interposed between said abutment and tapped member and stressed by the attaching engagement of the spindle with said tapped member and the incidental displacement of the latter toward the abutment, said eccentrically arranged spindle-driving member entering and engaging a handle element for rotation with the handle in both directions, said engagement being automatically effected in predetermined relative positions of the part by the movement of the handle toward the spindle.
2. In a rotary snap switch handle, a bearing washer overlying the switch-adjacent face of the handle, lugs on said washer, a spring abutment ring engaged by said lugs in assembled position, and means permanently deforming said lugs into engagement with said abutment ring when the washer is forced into assembled position.

3. In a rotary snap switch, a rotary spindle having a threaded end and a laterally extending fin spaced from said end, a handle having means for engaging said spindle end and fin to secure the handle to the spindle in operating relation, said fin extending beyond said handle to afford means for operating an associated switch element.

4. In a rotary snap switch, a rotary spindle having a threaded end and a laterally extending fin spaced from said end, a handle having means for engaging said spindle end and fin to secure the handle to the spindle in operating relation, said fin extending beyond said handle, together with a rotary indicating dial operatively engaged by said extended portion of the fin.

5. The combination of a spindle, an operating handle therefor recessed from one face to receive said spindle, means within the handle recess to establish separable screw connection with the spindle end, a sheet metal driving plate secured to the handle and aper-

tured to permit the spindle to pass there-
through, together with a driving dog rigid
with and projecting laterally from said
spindle and having an axial length exceeding
the thickness of said sheet metal driving plate,
said plate being apertured to one side of said
spindle-receiving aperture to permit the free
passage of said dog therethrough but estab-

lishing a drive connection with said dog, and
a spring within the handle serving to main- 10
tain the dog and plate in driving engagement
after the connection between the spindle and
handle has been established.

In testimony whereof I have signed my
name to this specification.

JOHANNES R. CARLSON.