

March 5, 1929.

A. H. NERO

1,704,625

ELECTRIC SWITCH

Filed March 30, 1925

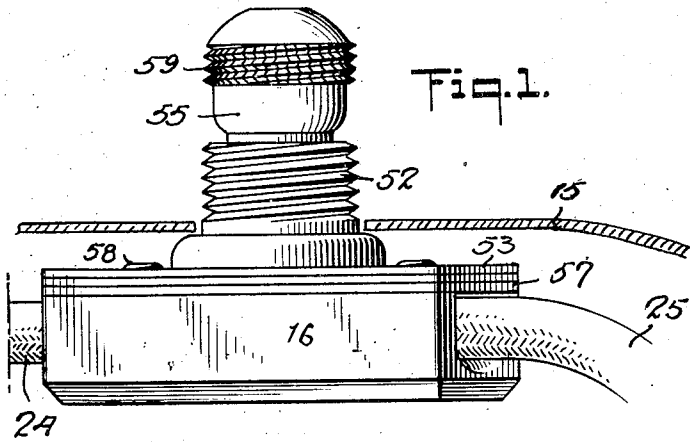


Fig. 1.

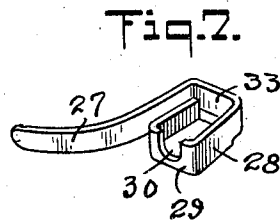


Fig. 2.

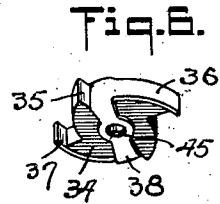


Fig. 3.

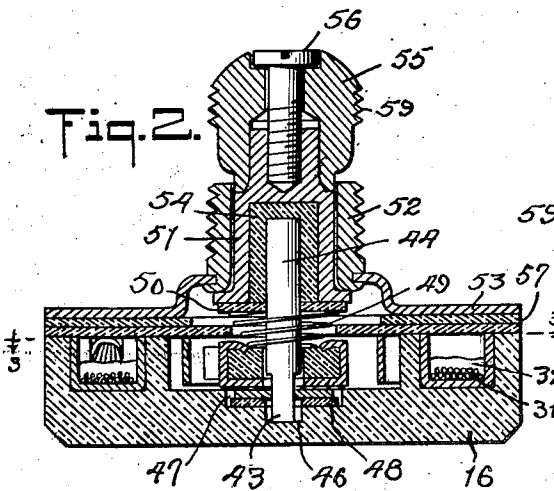


Fig. 4.

Fig. 5.

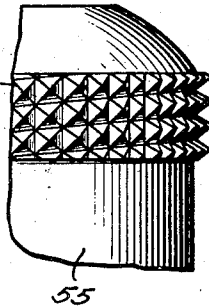


Fig. 5.



Fig. 6.

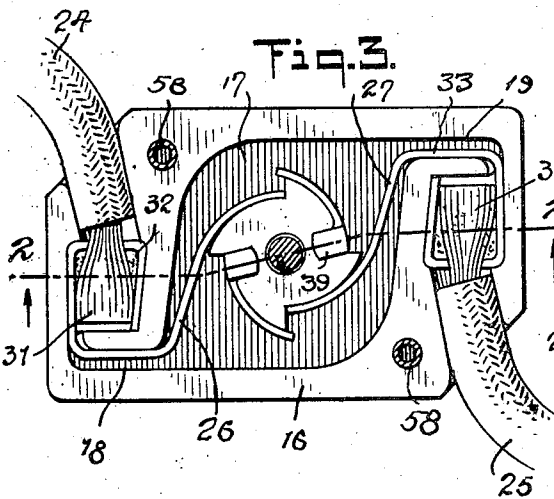


Fig. 7.

Fig. 8.

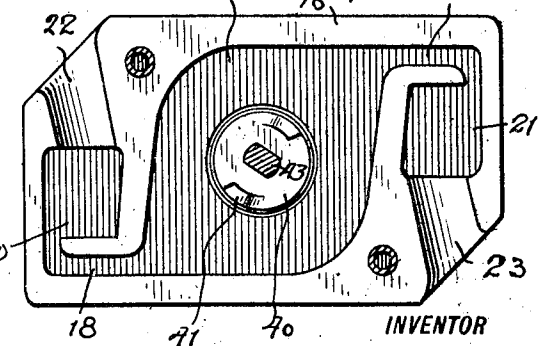


Fig. 8.

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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

Application filed March 30, 1925. Serial No. 19,525.

My invention relates to electric switches, and particularly to a rotary switch. The object of my invention is to provide a simple and inexpensive construction of both the switch body and the switch mechanism, which lends itself to manufacture in diminutive size adapted for installation in wall canopies, lamp standard bases and the like.

In the accompanying drawings—

Fig. 1 is a side elevation of a canopy switch in which my invention is embodied in one form; but drawn to a greatly exaggerated scale;

Fig. 2 is a vertical section on the same scale;

Fig. 3 is a section on the line 3—3, Fig. 2;

Fig. 4 is a similar view with the wire leads and switch contacts removed and the section taken below the rotary contact member on the spindle;

Figs. 5, 6 and 7 are perspective views of details of the switch mechanism; and

Fig. 8 is a partial elevation of the operating handle drawn to a still larger scale.

While the present switch may be made in any appropriate size, it is primarily designed as a so-called canopy switch, and is commonly mounted in a canopy shell, diagrammatically indicated at 15. Inasmuch as very little space is afforded between the canopy shell and the surface of the wall against which the canopy lies, the switch body and mechanism must be of extremely shallow construction. In the commercial product the over-all length of the switch body is approximately an inch, and the depth of the insulating base approximately one quarter inch. In order to adequately illustrate the construction, the scale of the drawings is approximately three to one.

The insulating base 16 as shown comprises a molded, substantially rectangular one-piece body, having in the upper surface a central depression 17 constituting the switch chamber. From diagonally opposite corners, long angular passages 18 and 19 lead to end wire terminal chambers 20 and 21, while channels 22 and 23 leading thereto accommodate the "pig tails" 24 and 25.

A pair of switch contacts, in the form of flat spring brushes 26 and 27, enter the switch chamber through the channels 18 and 19, and are of like construction. Each contact brush is formed as an integral extension of a side flange of a cupped terminal member

28 (Fig. 7) shaped to the outline of the terminal chamber 20 or 21. The side flange 29 of the cup, facing the channel 22 or 23, is notched at 30 to admit the bared end 31 of the pig tail 24 or 25 to the terminal cup, to which it is electrically and mechanically connected by welding or by solder 32. The connection between the pig tail and the terminal cup may be effected at any convenient location about the shop to form an assembly unit, which is thereafter assembled on the base 16 by merely laying the unit in position, that is, with the cup in chamber 20 or 21, the shank 33 of the contact passing through channel 18 or 19 and serving, with the cup, to maintain the contact brush 26 or 27 in proper position within the switch chamber 17.

The rotary switch member comprises an insulating block 34 with a series of peripheral ratchet teeth 35. Overlying alternate teeth are the wings 36 and 37 of the switch bar 38, which is integral therewith and extends diametrically across the lower face of the ratchet block 34. Lugs 39 extending from the opposite margins of the wings 36 and 37 overlie the opposite face of the block 34 and secure the switch bar thereon.

The rotation of the switch block 34 is accomplished by a driving disc 40 having ratchet teeth 41 struck therefrom to engage the opposite edges of the switch bar 38, beneath which it lies. The washer 40 is provided with a non-circular central hole 42 through which passes the non-circular lower end 43 of the rotary spindle 44. The latter passes freely through a central hole 45 in the block 34 and switch bar 38, and is received in a central well 46 in the base 16. A shallow recess 47 surrounding the well 46 may be provided to facilitate the location of the disc 40 and its subjacent bearing washer 48 during the assembly of the switch parts.

Surrounding the spindle 44 and bearing against the upper face of the block 34 is a compression spring 49 which serves to yieldingly press the switch bar 38 against the driving ratchet disc 40 to maintain these parts in cooperating relation. Against the opposite end of the spring bears a washer 50 upon which rests a flanged ferrule 51, which in turn is held in position by the bushing 52 secured to the cover plate 53. One end of the spindle 44 is embedded in insulating bushing 54 contained in the fer-

rule 51 and is thus electrically isolated. A thumb piece 55 attached by screw 56 to the ferrule, affords means for rotating the spindle.

5 Between the metal cover plate 53 and the insulating base 16 are interposed sheets of insulation 57 which are centrally apertured to accommodate the spindle 44 and spring 49, but overlie the receptacle chambers 20 and
10 21 and serve to completely house-in the terminal and contacts. Rivets 58, molded into the insulating base, pass through registering holes in the sheets 57 and cover 53 and are offset above the latter to rigidly unite the
15 parts in assembled relation. Inasmuch as the cover plate carries the bushing 52 and the latter engages the flange of the spindle ferrule 51, the switch mechanism is thus securely held in position.

20 At the periphery of the thumb piece 55 a thread 59 is formed for the reception of a cap carrying luminous material, and of any appropriate construction, such for instance as that indicated in the copending applica-
25 tion of Perkins, Ser. No. 571,137, filed June 27, 1922. The appearance of the thumb piece is improved, as well as the finger grip thereon, if the threads are milled. The knurled effect is clearly illustrated in Fig. 8.
30 The over-all diameter of the bushing 52 is slightly greater than that of the thumb piece 55, so that clamping nuts (not shown) by means of which the switch is secured to the canopy 15, or the like, may be readily
35 passed over the thumb piece 55 and engaged upon the bushing in a manner well understood in the art.

The construction as a whole is extremely simple, economical and readily assembled,
40 and affords a double-break in the circuit which is ample to take care of the current commonly impressed upon the line in systems of the type which this switch is intended to control. It possesses the decided
45 advantage of a ratchet drive which, so far as I am aware, is new in switches of this diminutive style. In canopy switches now in the market, rotation of the thumb piece results in the unscrewing of the operating
50 handle from the switch spindle. In the present switch the reverse rotation of the spindle merely causes the ratchet teeth 41 of the driving disc 40 to ride idly over the switch bar 38, the switch block 30 being
55 held against reverse rotation by the contact brushes 26 and 27 which bear against its peripheral ratchet teeth 35.

Modifications in detail of construction will occur to those dealing with the problem
60 which do not depart from what I claim as my invention.

I claim:—

1. An electric switch comprising an insulating base recessed to afford a switch
65 chamber, and on opposite sides thereof con-

tact chambers connected to the switch chamber by long angular passages at diagonally opposite corners of the switch chamber, together with entrance channels to the outer ends of the contact chambers, cupped
70 terminals located in said contact chambers and shaped thereto, and spring contact brushes extending from said terminals through said angular passages into said switch chamber. 75

2. As an element of an electric switch, a cupped terminal having an integral side extended to form a spring contact brush.

3. As an element of an electric switch, a cupped terminal having an integral side
80 extended to form a spring contact brush, said side being notched to admit a bared wire end to the interior of the cup.

4. As an element of an electric switch, a cupped terminal having an integral side
85 extended to form a spring contact brush, said side being notched to admit a bared wire end to the interior of the cup, said wire end being mechanically and electrically connected to the terminal by solder
90 confined within the sides of the cup.

5. In an electric switch, a base, a rotary switch spindle substantially normal thereto, a driving ratchet rotating with the spindle and supported from the base, a switch bar
95 engaged by the ratchet for a one-way drive, a spring bearing on the switch bar member to hold the same in engagement with the ratchet, and a spring abutment rigid with the spindle, serving to maintain the spring
100 stressed.

6. In an electric switch, a base, fixed contacts thereon, a rotary switch member comprising an insulating block and switch bar rotating therewith, means for driving said
105 block, said means including cooperating ratchet elements, one of which is yieldable to permit said elements to ride each other without actuation of the switch bar on rotation of one of the ratchet members in pre-
110 determined direction, together with a switch cover secured to the base and serving to maintain the ratchet members in cooperating relation.

7. In an electric switch, a switch mechanism comprising a one-way ratchet drive, a driving ferrule rigid with one of the cooperating ratchet members, a thumb piece having a friction fit with said ferrule, and a screw passing through the thumb piece
120 and taking into the ferrule to clamp said thumb piece and ferrule in frictional engagement.

8. In an electric switch, an insulating base, a cover overlying the same, a bushing
125 in the cover, a ferrule rotatable in the bushing, a ratchet-operated switch mechanism, one of the ratchet members rotating with the ferrule, said ferrule being engaged by the cover to hold the parts assembled. 130

9. In an electric switch, comprising a dielectric base provided with a central depression and a plurality of recesses communicating with said depression, a plurality of removable resilient contact members registering at one of their ends with said recesses and extending with their other ends into said depression, a toothed dielectric rotary member disposed within said depression and adapted to be engaged by said contact members, conductive contact faces provided upon some of the teeth of said rotary member, a dielectric cover element disposed above said base, a closing member holding said cover member and the base together, and an actuating member for said rotary member passing through and guided by said closing member.

10. In an electric switch, comprising a dielectric base having a central depression and a plurality of recesses communicating with said depression, a plurality of ex-

changeable spring contact elements set edgewise into said base and held at one of their ends within said recesses and extending into said depression with their other ends, a dielectric member rotatably mounted in said depression and provided with a plurality of teeth, adapted to be engaged by said contact elements, a spider of conductive material associated with said rotatable member and forming contact faces at some of said teeth, a spindle connected with said rotary member for operating it, a dielectric cover, disposed over the recessed face of said base, a closing member holding said cover and base together and an attaching element extending from said closing member and forming a bearing for said spindle.

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

ARVID H. NERO.