Jan. 24, 1928.

1,657,336

C. E. ANDERSON

ELECTRIC SWITCH

Filed Aug. 15, 1923

2 Sheets-Sheet 1

Fig. 1.

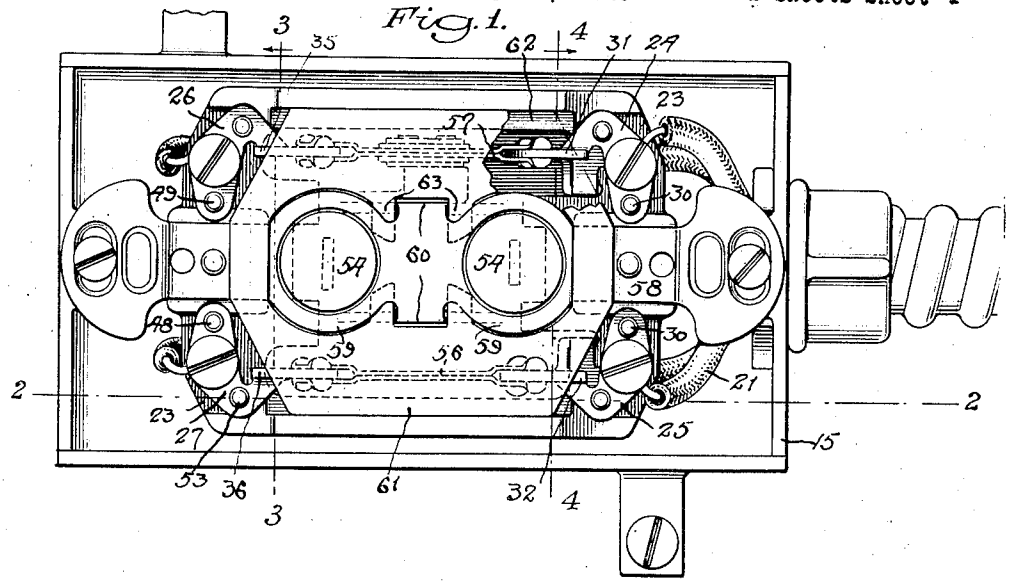


Fig. 2.

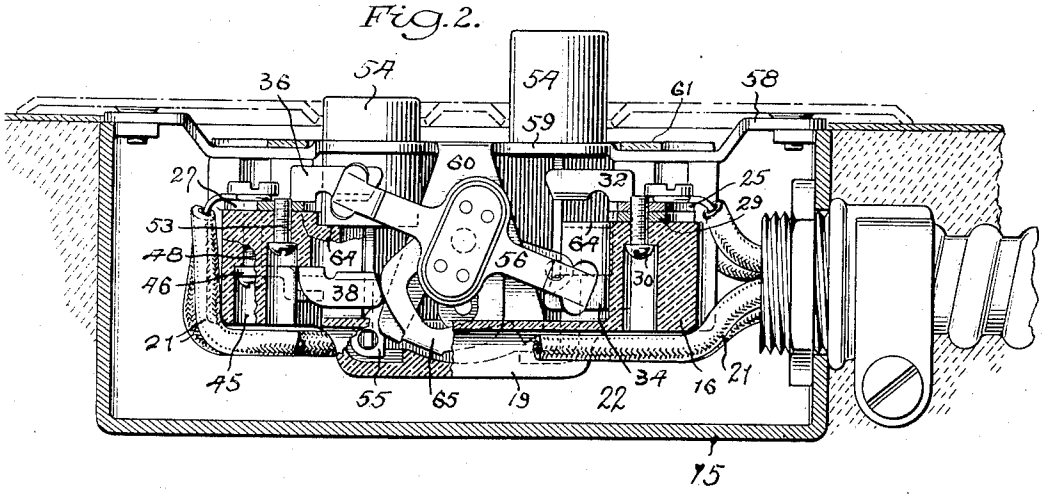
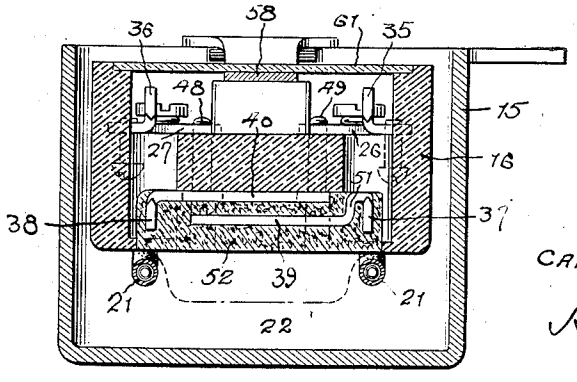


Fig. 3.



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Fig.4.

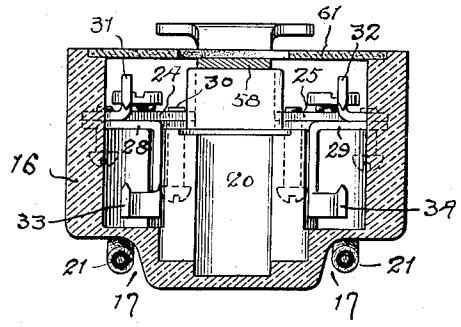
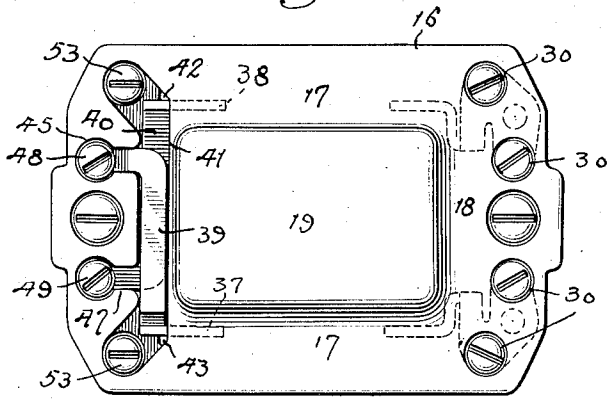


Fig.5.



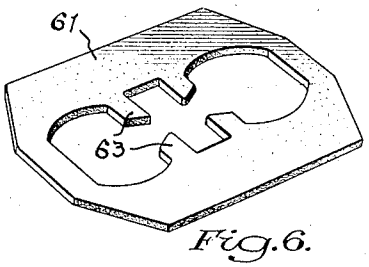


Fig.6.

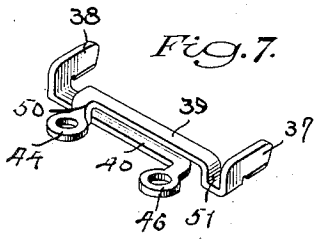


Fig.7.

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Patented Jan. 24, 1928. 1,657,336

UNITED STATES PATENT OFFICE.

CARL ERIC ANDERSON, OF STRATFORD, CONNECTICUT, ASSIGNOR TO THE BRYANT ELECTRIC COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

ELECTRIC SWITCH.

Application filed August 15, 1923. Serial No. 657,585.

My invention relates to electric switches, and particularly to flush switches. The object of my invention is to provide a switch of shallow construction having among other features of novelty an improved arrangement of the shunt straps by which the switch is adapted for four-point or pole-changing use.

In the accompanying drawings—

Fig. 1 is a broken plan view of a switch embodying my invention in one form;

Fig. 2 is a section on the line 2—2, Fig. 1, certain of the parts being broken away beyond the section line;

Figs. 3 and 4 are sections on the lines 3—3, 4—4, respectively, Fig. 1;

Fig. 5 is an inverted plan view of a switch body; and

Figs. 6 and 7 are perspective views of details.

The present switch has been designed particularly for installation in a shallow outlet box 15, such as is commonly used in walls, room partitions and the like, in which compact structure and slight depth are desirable. In outlet boxes of this type, space for the wiring connections to the switch is often not available by reason of the depth of the usual switch body. I have met this difficulty by so designing the insulating switch body 16 as to provide exterior longitudinal side channels 17 and transverse end channels 18 in the lower surface of the switch body, while the intermediate central boss-like portion 19 on the lower face of the body is of sufficient size to permit an interior chamber 20 of sufficient size to accommodate the mechanism which I employ. It will be noted that the channels 17 and 18 are of ample depth and size to accommodate within the area of the fitting the wires 21 which lead to the several wire terminals. Ample clearance room 22 beneath the switch body is thus afforded for other wires should there be any necessity therefor.

The switch illustrated is of the four-point or pole changing type. Upon the depressed ledges 23 at the several corners of the upper face of the switch body, are mounted combined wire terminal and switch contact plates 24, 25, 26, and 27. Underlying the terminal plates 24 and 25 are associated contact plates 28 and 29, both plates being held in position by the securing screws 30 which pierce the end of the body and take into tapped holes in the plates 24 and 25. Switch contacts 31 and 32 of the plates 24 and 25 are offset therefrom and lie in the same vertical planes as the contacts 33 and 34 which are offset downward from the plates 28 and 29. It will be noted that the ledges upon which these terminal plates rest are depressed to a lower level than the ledges at the opposite end of the switch body—this extra depth being substantially the thickness of the plates 28 and 29 so that the plates 24 and 25 lie in the plane of the plates 26 and 27 at the opposite end of the switch body. The upper contacts at each end of the switch may thus be made of uniform construction.

At the opposite end of the switch chamber the plates 26 and 27 have upwardly offset contacts 35 and 36, counterpart to the contacts 31 and 32. The lower contacts 37 and 38, counterpart to the contacts 33 and 34, are integral with the shunt plates 39 and 40 extending transversely of the switch chamber. These plates are accommodated in a channel 41 let into the lower face of the base adjacent the boss 19 and communicating through apertures 42 and 43 with the switch chamber 20. The contact wings 37 and 38 are offset inward from and at right angles to the shunt straps 39 and 40 and project through these apertures 42 and 43 into proper position to engage the switch blades. The strap 39 has a foot piece 44 which extends into a bay 45 communicating with the channel 41. The strap 40 has a similar foot piece 46 which extends into a similar bay 47. The screw bolts 48 and 49 connect the respective shunt plates 39 and 40 with the terminal plates 27 and 26 for the contacts 36 and 35. This cross or shunt connection of the lower contacts at one end of the switch adapts the switch for four-point or pole-changing use as well understood in the art.

While the shunt straps 39 and 40 are received in the same channel 41, they are spaced apart by the offset 50 in the strap 39, while the offset 51 in the opposite direction in the same strap serves to locate the contact 37 transversely in register with the contact 38. The spacing between the straps afforded by the offset 50 is sufficient to main-

tain the parts properly insulated from each other; but this separation is further assured by flowing into the channel insulating material such as wax 52 (shown only in Fig. 3.) The wax also covers the heads of the screw bolts 48 and 49 and the screw bolts 53 which secure the terminal plates 26 and 27 in position.

The switch mechanism may be of any suitable type, for instance, of the general construction indicated in my copending application Ser. No. 509,242. I have shown a pair of push buttons 54 engaging the opposite ends of a pivoted rocker 55 which operates a toggle mechanism to throw the switch bar 56 to one or the other circuit closing position. When the switch bar 56 (Fig. 2) is in engagement with the contact 34, it establishes connection with contact 36 of terminal plate 27 at the opposite end of the switch chamber, whereas, when the blade is swung to its other position, its engagement with contact 38 shunts the circuit through strap 40 to terminal plate 26 at the opposite side of the chamber at this end of the switch. A like cross shunt at the same end of the chamber is effected by strap 39 when the switch blade 57 is swung from engagement with contact 35 to contact 37.

The switch mechanism is carried by a yoke 58 extending longitudinally of the switch chamber and having ring-like bays 59 for the accommodation of the push buttons 54 and intermediate offset wings 60 constituting parallel frame plates on which the switch mechanism is mounted. To prevent the entry of dust into the switch chamber, I provide a plate 61 of insulating fiber, paper or the like, which rests upon ledges 62 at opposite sides of the switch chamber. Its central area is apertured to accommodate the guide rings 59 and the wings 60 of the yoke, the portions of the plate between such recesses forming tongues 63 which are sprung beneath the yoke on opposite sides of the wings 60 and serve to maintain the cover plate in position. It will be noted that the portion of the yoke lying between the bays 59 and upwarly offset ends of the yoke, is slightly depressed to accommodate the plate 61, the upper surface of which is thus substantially flush with the upper face of the bays 59.

The throw of the push buttons 54, and therefore of the rocker 55, is preferably limited by the shoulders 64 formed at opposite ends of the insulating body. The frame is thus relieved from the shock of impact by the rocker. The impact of the switch bar carrier 65 against the legs of the frame 60 is cushioned to a certain extent by the engagement of the spring wings of the switch bar with the fixed contacts which they engage.

Various structural modifications will readily occur to those dealing with the problem which do not depart from what I claim as my invention.

I claim—

1. In an electric switch, an insulating body of generally rectangular shape having wire terminals on its upper surfaces at opposite sides of one end, switch contacts associated therewith, a transverse channel formed in the lower face of said base at said end, shunt straps overlying each other in said channel but insulated from each other, switch contacts associated with said shunt straps and lying in the planes of the switch contacts associated with the wire terminals on the upper face of the body, together with means for electrically connecting said shunt straps respectively with the said wire terminals, the contact of each strap lying in the plane of the contact of a wire terminal opposite that to which the strap is connected.

2. In an electric switch, a chambered insulating body transversely channelled on its lower face at one end and pierced to afford passages between the chamber and channel, switch contacts mounted on the upper face of the body and projecting into the chamber, shunt straps located in the channel and insulated form each other, said straps having contacts entering the chamber through said passages and respectively aligned with said first mentioned contacts on the upper face of the body, and means connecting each strap respectively with the upper contact opposite that with which the shunt contact is in alignment.

3. In an electric switch, a chambered insulating body channelled on its lower face and pierced to afford passages between the chamber and channel, switch contacts mounted on the upper face of the body and projecting into the chamber, shunt straps located in the channel and spaced apart to insulate the same from each other, said straps having contacts entering the chamber through said passages and respectively aligned with said first mentioned contacts on the upper face of the body, and means connecting each strap respectively with the upper contact opposite that with which the shunt contact is in alignment.

4. In an electric switch, a chambered insulating body channeled on its lower face and pierced to afford passages between the chamber and channel, switch contacts mounted on the upper face of the body and projecting into the chamber, shunt straps located in the channel, one of said straps being offset to space the same form the other strap, said straps having contacts entering the chamber through said passages and respectively aligned with said first mentioned contacts on the upper face of the body, and means connecting each strap respectively with the upper contact opposite

that with which the shunt contact is in alignment.

5. In an electric switch, a chambered body recessed in its lower face at one end of the chamber to afford a transverse channel and an offset bay at one end of the channel and pierced at the opposite end of the channel to afford a passsage between said channel and chamber, in combination with a shunt strap arranged in said channel and having a foot piece at one end to enter the bay and a switch contact at its other end entering the chamber through said passage.

6. In an electric switch, a chambered body recessed in its lower face to afford a channel and an offset bay and pierced to afford a passage betweeen said channel and chamber, in combination with a shunt strap arranged in said channel and having a foot piece at one end to enter the bay and a switch contact at its other end entering the chamber through said passage, the switch contact lying in a plane at right angles to the plane of the strap.

7. In an electric switch, a chambered body recessed in its lower face to afford a channel and an offset bay and pierced to afford a passage between said channel and chamber, in combination with a shunt strap arranged in said channel and having a foot piece at one end to enter the bay and a switch contact at its other end entering the chamber through said passage, the foot piece being offset from the strap and lying in another substantially parallel plane.

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

CARL ERIC ANDERSON.