C. J. KLEIN.

ELECTRIC SWITCH.

APPLICATION FILED NOV. 24, 1916.

1,353,124.

Patented Sept. 14, 1920.

Fig. 1.

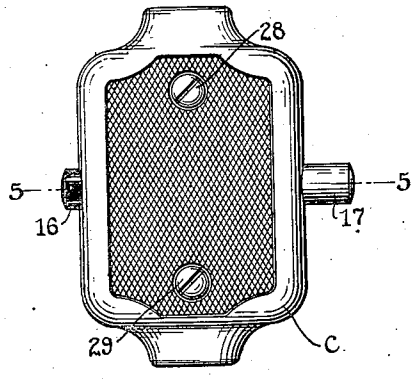


Fig. 2.

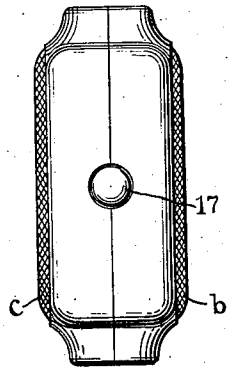


Fig. 5.

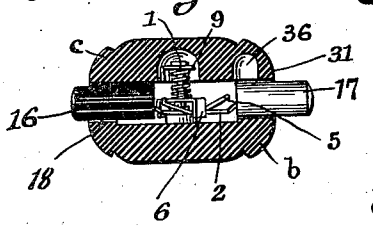


Fig. 3.

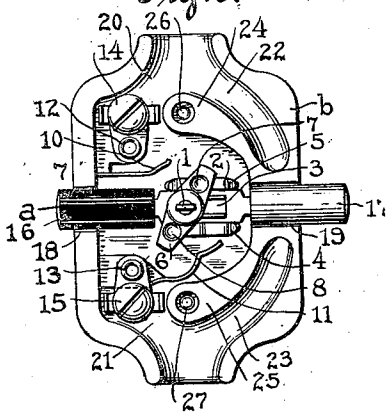
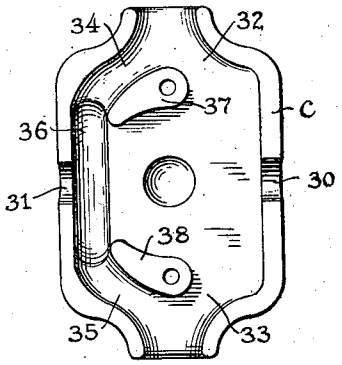


Fig. 4.



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ELECTRIC SWITCH.

1,353,124. Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed November 24, 1916. Serial No. 133,103.

To all whom it may concern:

Be it known that I, CHARLES J. KLEIN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Electric Switches, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to electric switches and more particularly to those of the "feed through" type.

The invention has among its objects to provide such a switch of simple and compact construction and one of such external dimensions and shape as to be conveniently handled and to be attractive in appearance.

In my prior patent No. 1162864, granted Dec. 7, 1915, there is disclosed a so-called "feed-through" switch for like uses wherein the switch mechanism is completely inclosed in a two-part insulating casing having end openings for circuit wires and a through passage for one circuit wire, said casing being divided along a plane whereby separation of its parts gives access to the contact terminals of the switch mechanism and opens the through wire passage lengthwise. Such a switch has been found to possess numerous important advantages over other switches proposed for like uses and the present invention has among its objects to provide a further improved switch of such character.

More specifically the invention has among its objects to provide a switch for the aforesaid and other uses wherein the switch parts and conductor passages are so arranged in the insulating casing as to facilitate manufacture, assembly, inspection and wiring.

Another object is to provide a switch for the aforesaid and other uses wherein the insulating casing is so divided and the switch parts and conductor passages so arranged as to permit of the use of various switch mechanisms and various formations of the casing while maintaining suitable external dimensions of the latter.

Another object is to provide a switch for the aforesaid and other uses wherein the switch parts and conductor passages are so arranged that the insulating casing may be flattened to rest in one or more given positions rendering the switch operating member or members readily accessible and conveniently operable.

Other objects will hereinafter appear.

In the accompanying drawing, wherein is illustrated an embodiment of the invention—

Figure 1 is a front elevational view of the switch;

Fig. 2 is a side elevation of the same;

Fig. 3 is an interior elevation of one section of the casing showing the switch mechanism;

Fig. 4 is a similar view of the other section of the casing; and,

Fig. 5 is a section of the switch mechanism and casing substantially on line 5—5 of Fig. 1.

Referring to the drawing, a switch mechanism *a* is inclosed within a casing comprising similar sections *b* and *c* which are recessed to receive the same and are preferably composed of insulating material. The specific switch mechanism shown in the drawing is to be considered as illustrative only, as many other kinds and types of switch mechanisms may be utilized and could be used for the same purpose by those skilled in the art without departing from the spirit and scope of the invention as set out in the appended claims.

The specific switch mechanism as shown in the drawings is of the push button type and in certain respects is similar to the hill and valley switch described and claimed in my Patent No. 1,184,104, dated May 23, 1916, which may be briefly described as follows:

A fixed stud 1 is permanently anchored at the center of the recessed portion of the casing section *b* and constitutes a support for the movable switch elements which include a reciprocating operating member and an oscillating contactor. The operating member 2 is provided with a slot 3 whereby the same is mounted for reciprocation upon the stud 1 while hill and valley cam members 4 and 5 project from opposite sides of said operating member for actuation of the contactor 6 which is pivoted upon the stud 1 and provided with downwardly projecting knobs 7, 8 for direct engagement with the respective cam surfaces 4, 5. A helical

spring 9 is coiled about the stud 1 and serves to maintain the contactor in permanent yielding engagement with the operating member whereby upon reciprocation of the latter the contactor is oscillated with a snap action to make and break circuit between fixed coöperating contacts 10, 11.

The said fixed contacts are attached to the casing section *b* by means of fixed studs 12, 13 anchored therewithin, said studs serving also to anchor conductor terminals 14, 15 and to connect the same with the respective fixed contacts. Suitable push buttons 16 and 17 are provided at the ends of the operating member 2 for actuating the same, said push buttons reciprocating in suitable grooves 18, 19 located on the edges of the section *b*. Other grooved channels 20, 21 lead from the respective terminals 14, 15 outwardly to the opposite ends of the casing section. Similar grooves 22, 23 lead inwardly from the ends of the casing section toward each other but on the opposite side of the switch mechanism from the terminals 14, 15. These last mentioned grooves terminate within a short distance of the transverse push button groove 19, above described and are provided with a slope or incline which gradually rises from the surface of the bottom of the conductor inlet at the end of the casing to the face of the casing. These grooves therefore serve to guide the conductor inserted in the grooves from the lowermost position of the conductor inlet to the face of the casing. Curved abutments 24, 25 having their faces flush with the face of the casing section closely surround the recessed portion of said section and serve to separate the various grooved channels above mentioned from said recessed portion and from each other, while screw sockets 26 and 27 are located within said abutments to be engaged by suitable screws 28, 29 for uniting the two sections of the casing.

Referring more particularly to Fig. 4, the section *c* is in most respects similar to the section *b* above described but is recessed through a larger portion of its extent. The said section furthermore is provided with push button grooves 30, 31 similar to those of the section *c* and with conductor grooves 32, 33 and 34, 35, registering with and corresponding to the similarly located grooves of the opposite section. The grooves 34, 35, however, do not terminate as do the corresponding grooves in the section first described, but, on the other hand, are connected at their inner ends by a deeper groove or channel 36 extending beyond and around the push button groove 31. The section *c* is furthermore provided with perforated flush abutments 37, 38 which register with the similar elements of the section *b* when the two sections are united.

The above described mechanism, as already stated, is adapted to serve as a feed through switch in conjunction with a double conductor. In wiring and assembling the said switch one of the conductors is cut and the two ends thereof are led through the grooves 20, 21 of section *b* for connection with terminals 14, 15 respectively. The other conductor is retained intact and is led within the inwardly extending grooves 22, 23 with its central portion extending above and around the push button 17. The casing section *c* is then inverted upon the section *b* whereupon the deep channel 36 registers with that portion of the intact conductor extending above and around the push button. The sections are then united by means of screws 28, 29.

Such an arrangement of switch parts and conductor passages is very advantageous in that it enables the casing to be made relatively thin and flat sided as shown, its flat sides being parallel to its plane of division. Thus the switch is adapted for support in positions rendering its operating member or members readily accessible and conveniently operable. Moreover, as will be apparent, the compactness of parts permits of considerable latitude in the shaping of the casing without unduly increasing the dimensions thereof.

The casing sections as so constructed may be readily molded and with slight modifications may be adapted for inclosure of various different switch mechanisms. Also, such construction of the casing facilitates mounting of the switch mechanism therein and inspection of said mechanism thereafter and all parts of the mechanism being fixed to one section of the casing with the switch terminals and through wire passage readily accessible the switch may be quickly and easily wired. As will be understood, the switch may be quickly installed in a connector cord by merely severing one wire of said cord, attaching the several ends of said wire to the terminals 14 and 15 whereupon the remaining wire may be laid in the through conductor passage and the two casing sections secured together without possibility of the through wire becoming entangled in the switch mechanism or contacting with the securing screws.

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

1. The combination with a snap switch, of a two part insulating casing in which said switch is mounted with its actuating member projecting therefrom between the parts thereof, said casing having conductor openings at opposite ends thereof, a conductor passage from each of said openings to said switch and a through conductor passage between said end openings which passes said switch adjacent to said actuating member, all of said passages being formed by the

parts of said casing jointly whereby said passages are opened lengthwise by separation of the parts of said casing.

2. The combination with a snap switch having opposed push buttons, of a two part insulating casing in which said switch is mounted with its push buttons projecting therefrom between the parts thereof, said casing having exterior flattened faces parallel to the plane of division thereof and end openings for circuit wires and said parts of said casing having adjacent portions formed to provide along the plane of division thereof a wire passage from each of said end openings to said switch and a through wire passage between said openings which passes said switch adjacent to one of its push buttons.

3. The combination with a switch comprising terminal contacts, a bridging contact therefor and axially alined push buttons for operating the same, of an insulating casing for said switch comprising recessed parts having abutting marginal portions notched to provide openings for the push buttons of said switch and openings for circuit wires and further having abutting interior portions to provide therein a compartment for the contacts of said switch with seats for said terminal contacts adjacent said wire openings, a passage from each of said wire openings to said switch and a through passage between said openings separated from said switch chamber.

4. The combination with a switch comprising terminal contacts, a bridging contact therefor and opposed push buttons for operating the same, of an insulating casing for said switch having openings in opposite ends thereof for circuit wires and comprising separable recessed parts to receive said switch therebetween with its terminal contacts adjacent to said openings, said casing parts having abutting marginal portions notched to receive the push buttons of said switch and to form said wire openings and also having abutting interior portions with grooves between the latter and said marginal portions to provide a wire passage between each of said terminal contacts and one of said openings and a through wire passage between said openings separated from said switch by said abutting interior portions.

5. A feed-through switch comprising a casing having separable recessed sections united along a common plane, a switch mechanism inclosed therein, an operating member for said switch mechanism disposed in said plane, said sections being provided with registering grooves to receive said switch mechanism, said sections also having registering grooves to receive a feed-through conductor, these conductor grooves being provided with lateral and upwardly extending slopes whereby said switch mechanism may be by-passed and the feed-through conductor may be passed over said operating member.

6. A feed-through switch comprising a two-part insulating casing, a snap switch mechanism mounted on one of said parts in a recess provided therefor, said switch mechanism projecting beyond the common plane of union of said parts into a recess provided therefor in the other part, an operating member for said switch mechanism projecting from said inclosing two-part casing in the plane of union of said parts, contact terminals adapted to receive the conductors connected to said switch mechanism, and an electrical conductor passage provided in one of the parts adapted to receive an electrically continuous conductor which by-passes the said switch mechanism.

7. A feed-through switch comprising, in combination, a casing having separable recessed sections united along a common plane, a snap switch mechanism inclosed therein, an operating member for said switch mechanism disposed in said plane, said sections being provided with registering grooves, one to receive said mechanism and the other to receive a feed-through conductor, said grooves extending in a direction tending to intersect, the conductor groove being deflected to by-pass said switch mechanism.

8. A feed-through switch comprising a casing having separable recessed sections united along a common plane, a snap switch mechanism inclosed therein, an operating member for said switch mechanism disposed in said plane, said sections being provided with registering grooves to receive said switch mechanism, said sections also having registering grooves to receive a feed-through conductor, said latter groove being deflected laterally to by-pass said switch mechanism and upwardly to guide the feed through conductor over said operating member.

In witness whereof, I have hereunto subscribed my name.

CHARLES J. KLEIN.