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F. C. DE REAMER ET AL

1,751,398

ELECTRIC SWITCH

Filed Dec. 29, 1927

Fig. 1.

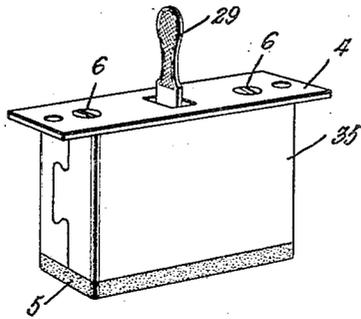


Fig. 2.

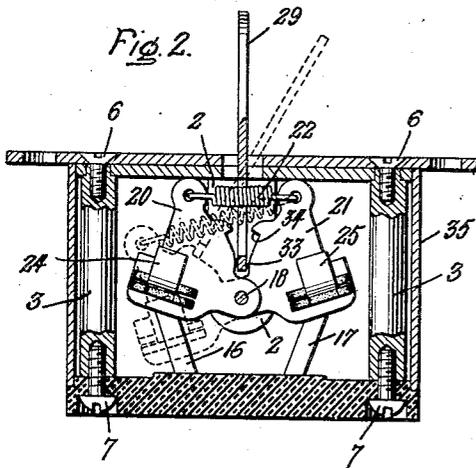


Fig. 3.

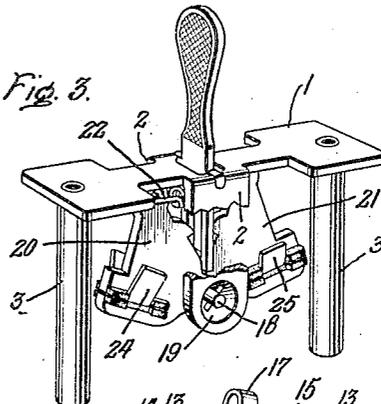


Fig. 4.

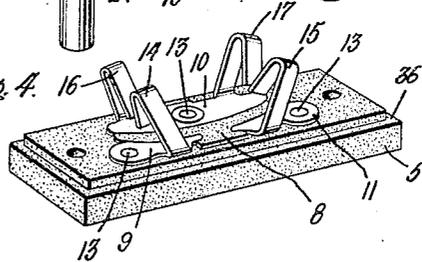


Fig. 5.

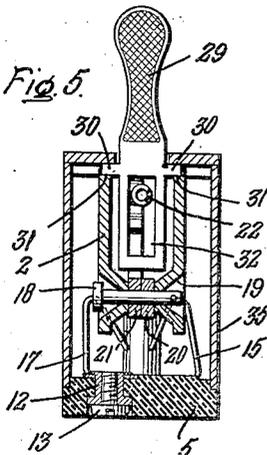
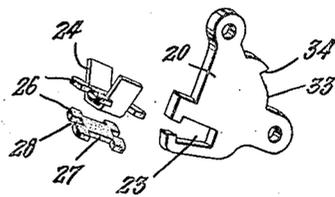


Fig. 6.



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# UNITED STATES PATENT OFFICE

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## ELECTRIC SWITCH

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The present invention relates to electric switches and has for its object the provision of an improved double-throw double-break oscillating switch which shall make and break either of two circuits, which shall withstand rough usage and which shall be composed of few simple parts and manufactured at low cost.

One embodiment of the invention is shown in the accompanying drawing, in which Fig. 1 is a perspective view of a complete switch; Fig. 2 is a longitudinal vertical section thereof; Fig. 3 is a perspective view of the operative mechanism and its supporting frame; Fig. 4 is a similar view of the base and stationary contacts; Fig. 5 is a central transverse section of the switch, and Fig. 6 is a perspective view showing a movable contact and the method of assembly thereof on an oscillating switch arm.

The switch frame consists of a sheet metal bridge piece 1 having shaft-supporting arms or brackets 2 bent down on opposite sides of its central portion and the ends of the bridge are apertured for fixedly receiving the ends of two posts 3 having tapped holes in the ends thereof whereby a face plate 4 and the base 5 may be attached by screws 6 and 7.

The base 5 is a rectangular slab of insulation with its central portion 8 slightly elevated to provide a marginal shoulder against which seat the several terminal plates 9, 10 and 11 held in place by internally threaded eyelets 12 (see Fig. 5), in which are located binding screws 13 for the ends of the respective line wires. The terminal plates 9 and 11 each has a single stationary spring contact 14 or 15 and plate 10 has two stationary spring contacts 16 and 17 disposed opposite contacts 14 and 15 respectively.

The side arms 2 of the bridge piece 1 have their free ends apertured for the reception of a cross shaft 18 and the metal adjacent the apertures is indented inward, as shown at 19 in Fig. 5, with the space between the indented portions 19 sufficient for the reception of the two oscillating switch arms 20 and 21 pivoted upon the shaft 18.

The switch arms 20 and 21 are alike in shape which is generally triangular with

their adjacent base ends apertured for mounting on the shaft 18 while their uppermost ends are apertured for the reception of the ends of a common helical spring 22 and the outermost ends are provided with rectangular apertures 23 (see Fig. 6) which have open mouths through the ends of the arms. These apertures 23 receive respectively the movable contacts 24 and 25 and the insulation thereof. Each movable contact consists of a U-shaped strip of phosphor bronze and its insulation, which is in the form of two rectangular slabs 26 of indurated fibre one at least of which is provided with side notches 27 for reception of the phosphor bronze strip and end notches 28 for the reception of the metal of the switch arm at the ends of the aperture. An insulating slab 26 is disposed on each side of the intermediate portion of the U-shaped contact and passed edgewise into the rectangular aperture 23 through the mouth thereto and the metal of the switch arm below the aperture bent upwardly to close the mouth and clamp the U-shaped contact and both insulating slabs 26 in fixed relation thereto and to each other.

The spring 22 tends to draw the upper ends of the switch arms 20 and 21 toward each other until they abut against the lower surface of the bridge piece 1, as indicated in Fig. 2.

The means for actuating the switch consists of a sheet metal lever 29 with pivot projections 30 extending out from its central edges and adapted to engage bearing notches 31 in the bridge piece. The lower portion of the lever has an elongated aperture 32 formed therein so that it may rock back and forth without interference with the spring 22 arranged to pass through such aperture. The adjacent edges of the switch arms 20 and 21 are provided with cams 33 and stop shoulders 34 so that upon the actuating lever 29 being thrown to the right, as indicated in dotted lines Fig. 2, its lower end will wipe over the cam 33 on arm 20 and force the latter down until its contact 24 engages with and bridges the stationary contacts 14 and 16 and the lever arrested in its swinging movement by the stop 34. The stop 34 is so

positioned that it arrests the lever 29 when in substantially tangential position to the arc through which the stop moves, and in consequence there is no tendency for the lever to slip backward, the opposite switch arm 21 meanwhile being held stationary by its abutting engagement with the bridge piece 1.

To break the circuit closed through the bridging of the stationary contacts 14 and 16, the actuating lever 29 is moved backwardly slightly from its dotted line position whereupon the switch arm 20 under the recoil of the spring 22 moves back with a snap to its original abutting position against the bridge piece and at the same time acts upon the lever 29 to throw it into its original vertical position. The operation of switch arm 21 is the same as that for arm 20 but serving to close the circuit through bridging of the contacts 15 and 17. The pairs of stationary contacts 14-16 and 15-17 are positioned to incline outwardly to properly align with the bridging contacts 24 or 25 when brought into engagement.

The switch mechanism is enclosed by a rectangular metal shell or box 35 adapted to fit about the ends of the bridge piece 1 and a marginal rebate 36 in the upper side of the base 5 so that when the latter and the face plate 4 are in place and the screws 6 and 7 turned home the box 35 is held fixedly between them.

While we have shown and described herein the best embodiment of the invention known to us, we do not desire to be restricted thereto.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. An electric switch comprising spaced stationary contacts, a bridge piece fixedly supported above said contacts, two oppositely disposed switch arms pivotally mounted at their lower ends upon said bridge piece, a spring yieldingly connecting the upper ends of said arms, and an actuating lever pivoted on said bridge piece transversely between said arms and adapted to engage and depress either of said switch arms into engagement with said stationary contacts.

2. An electric switch comprising a base with pairs of spaced stationary contacts mounted thereon, a bridge piece fixedly supported opposite said base, two oppositely disposed switch arms pivoted at their lower ends upon said bridge piece and normally abutting at their upper ends against the said bridge piece, a spring yieldingly connecting the upper ends of said switch arms, and an actuating lever transversely pivoted on said bridge piece between said arms and adapted to depress either of said arms into engagement with a pair of said stationary contacts.

3. An electric switch comprising spaced stationary contacts, a bridge piece supported above said contacts and provided with downturned side brackets, two oppositely disposed switch arms, the lower ends of which are piv-

oted at the lower ends of said brackets, a spring yieldably connecting the upper ends of said switch arms, and an actuating lever having an aperture for clearance of said spring and normally disposed between said switch arms whereby upon tilting the lever in either direction one or other of said arms is depressed against the tension of said spring into engagement with its stationary contacts.

4. In an electric switch, the combination of a switch arm of metal having an open-mouthed aperture therein, and a movable contact of U-shaped thin spring metal and with oppositely disposed slabs of insulation introduced into said aperture and clamped therein by compression of the metal of the arm thereupon.

5. In an electric switch, the combination of a switch arm of metal having an open-mouthed aperture therein, a U-shaped movable contact, two slabs of insulation, one at least having side notches to receive the arms of the U-shaped contact and end notches to receive portions of the switch arm at opposite ends of said aperture, said insulating slabs being disposed on opposite sides of the central portion of said contact and introduced into said aperture and clamped therein by springing the metal of said arm to close the mouth of said opening.

In witness whereof, we have hereunto set our hands this twenty third day of December, 1927.

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