April 1, 1924. 1,489,189

F. WODITSCH

SNAP SWITCH

Filed Jan. 29, 1923

Fig. 1.

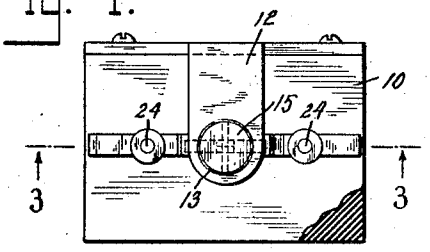


Fig. 6.

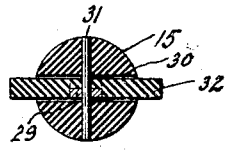


Fig. 2.

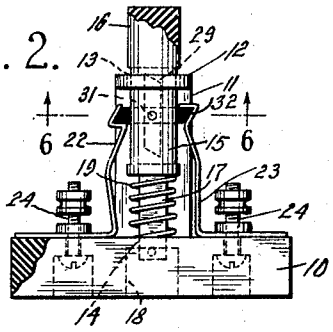


Fig. 3.

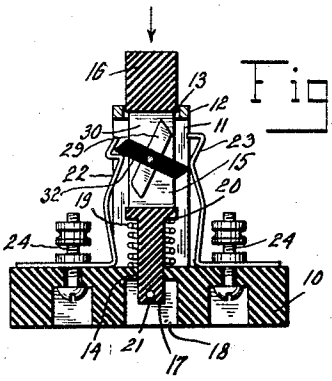


Fig. 4.

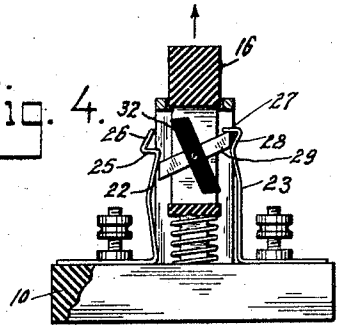
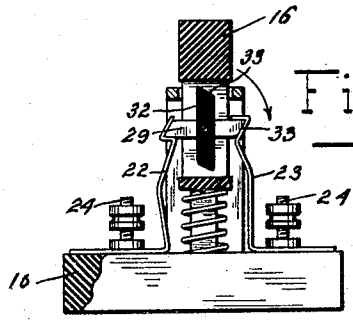


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK WODITSCH, OF DETROIT, MICHIGAN.

SNAP SWITCH.

Application filed January 29, 1923. Serial No. 615,610.

To all whom it may concern:

Be it known that I, FRANK WODITSCH, a citizen of Austria, and resident of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Snap Switches, of which the following is a specification.

The present invention relates to improvements in electrical switches, more particularly to that type which is known as snap-switches.

The main object of the invention is to provide a switch of the type mentioned, whereby a quick opening and, incidentally, a quick closing of the electrical circuit may be effected by a switch comprising a minimum number of parts, all of which are constructed with a view to economy in manufacture.

With these and other objects in view, which will more fully appear as the nature of the invention is better understood, the same consists in the combination, arrangement and construction of parts hereinafter described, pointed out in the appended claim and illustrated in the accompanying drawings, it being understood that many changes may be made in the size and proportion of the several parts and details of construction within the scope of the appended claim, without departing from the spirit or sacrificing any of the advantages of the invention.

One of the many possible embodiments of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a plan view of a switch constructed in accordance with the present invention; Fig. 2 is a front elevation thereof; Fig. 3 is a section taken on line 3—3 of Fig. 1, showing the elements in positions other than those shown in Fig. 2 of the drawings; Figs. 4 and 5 are similar sections showing the elements in still other positions; and Fig. 6 is a section taken on line 6—6 of Fig. 2, on a larger scale.

In the drawings, the numeral 10 indicates a base made of suitable insulating material. From this base rises a standard 11, having an inwardly bent horizontal portion 12, in which is provided an aperture 13. In alignment with this aperture there is formed in the base an aperture 14, that is, preferably, quadrangular in configuration and of a size substantially smaller than that of the aperture 13. A plunger 15 of insulating material extends slidably through the apertures 13 and 14, it projecting above the horizontal portion 12 of the standard 11, as clearly shown at 16, the portion 16 constituting the push button of the switch. The lower section 17 of the plunger, which is reduced in size, is of quadrangular cross section and fits the aperture 14, it projecting into a recess 18 in the underface of the base 10. Around the reduced portion 17 of the plunger is wound a spring 19, one of its ends bearing against the upper face of the base and its other end against a shoulder 20 on the plunger. In order to limit the upward movement of the plunger, there is a pin 21 extended through the lower portion thereof, said pin being disposed within the recess 18.

On the base 10 are mounted two substantially vertically extending brush contacts 22 and 23, each in the form of a blade spring and in electrical contact with binding posts 24, to which the electric wires, not shown, are connected. The brush contact 22 is provided adjacent its upper end with an outwardly extending horizontal portion 25, terminating in an upwardly and inwardly extending inclined portion 26. The brush contact 23, on the other hand, terminates in an inwardly extending horizontal portion 27, from which extends downwards and inwards an inclined section 28. With the brush contacts co-operates a bridge contact 29, mounted within a longitudinal slot 30 in the plunger 15, it being carried by a pivot pin 31, that extends through the said plunger. On the said pivot pin is furthermore mounted an insulating strip 32, that extends at right angles to the said bridge contact, which is also made in the form of a strip, the two strips being recessed, as clearly shown in Fig. 6 of the drawings and fitted one into another, so as to rotate together on the said pivot pin. The two strips constitute thus a cross having branches of equal length, their ends being wedge-shaped for co-operation with the ends of the brush contacts. The cross rotates, in the operation of the switch, in the direction of the arrow shown in Fig. 5 of the drawings, as will hereinafter appear and the wedges on the ends of each strip are so formed that their inclined edges 33 fit and extend in parallel relation to the inclined portions 26 and 28 of the brush contacts 22 and 23, respectively, when a strip extends horizontally on the plunger 15. As appears from the several figures of the drawings, the ends of the strips project beyond the plunger when extending horizontally, one of

the brush contacts being disposed on one side of the said plunger and the other one at a diametrically opposite point thereof. The distance, measured on the longitudinal axis of the plunger 15, between the horizontal portions 25 and 27 of the brush contacts 22 and 23, respectively, corresponds to the width of a branch of the cruciform body.

The operation of the switch is as follows: When the elements are in the positions shown in Fig. 2 of the drawings, the electric circuit is open, inasmuch as the bridge contact 29 does not establish a connection between the stationary brush contacts 22 and 23. In these positions of the elements, the insulating strip 32 abuts against the horizontal sections 25 and 27 of the brush contacts 22 and 23, respectively, the horizontal section 25 of the brush contact 22 being disposed below and the horizontal section 27 of the brush contact 23 being disposed above the said insulating strip. In closing the switch, the plunger 15 is forced downwards in the direction of the arrow shown in Fig. 3 of the drawings. The insulating strip 32 and the bridge contact 29 moving therewith. The horizontal section 25 of the brush contact 22 being in engagement with one end of the insulating strip 32, retards the movement of the said end, whereby the opposite end of the said insulating strip swings downwards, the elements being then in the positions shown in Fig. 3 of the drawings. In continuing the downward movement of the plunger, the said insulating strip swings further on its pivot carrying with it the bridge contact until the latter projects beyond the plunger. When now the plunger is released, the spring 19 causes the same to move in the opposite direction, whereby first one end of the bridge contact is brought to bear against the horizontal portion 27 of the brush contact 23 (Fig. 4), causing the other end of the said bridge contact, in the further upward movement of the plunger, to turn around the said horizontal portion 27 as a fulcrum, until it is brought into horizontal position at the end of the upward movement of the plunger (Fig. 5), thereby closing the circuit. During the latter part of the upward movement of the plunger that end of the bridge contact which is in contact with the brush contact 22 forces the latter outwards, it springing back into place as soon as the bridge contact has passed the junction point between the horizontal portion 25 thereof and its substantially vertical body portion.

In order to open the circuit, the plunger is forced downwards and then released, the bridge contact taking the place of the insulating strip 32 in the operation above described.

It is to be observed that the contact making bridge 29 is, due to the action of the spring 19 and the spring brush contacts 22 and 23, effectively prevented from resting in any halfway position and thus from establishing an arc. It is also to be noted that in the operation of the switch the contact is suddenly established and interrupted, whereby an instantaneous make and break is insured.

The elements of the switch may be enclosed in a casing, having an opening, through which the push button 16 projects.

It is to be noted that the brush contacts effectively lock the bridge contact in both of its extreme positions.

What I claim is:—

A snap-switch comprising a base, a plunger shiftably arranged thereon, a cruciform body pivoted to said plunger, the four branches of said cruciform body being of equal length and formed alternately of insulating material and of electric conducting material, the electricity conducting branches being in electric contact, two spaced brush contacts on said base in operative relation to said cruciform body, said brush contacts being in the form of blade springs and one of the same having its free end bent toward said plunger and the other one having a bend extending in parallel relation to said first mentioned bend below the latter at a distance which corresponds to the width of a branch of said cruciform member, the branches of said cruciform member being adapted to project beyond said plunger so as to contact with said bends when at right angles to the longitudinal axis of said plunger, and a spring co-operating with said plunger for returning the latter to its normal position after having been forced toward said base.

Signed at Detroit, in the county of Wayne, and State of Michigan, this 18th day of December, A. D. 1922.

FRANK WODITSCH.