Nov. 2, 1926. 1,605,681

G. J. MEUER

ELECTRIC SWITCH

Filed June 1, 1920

Fig. 1.

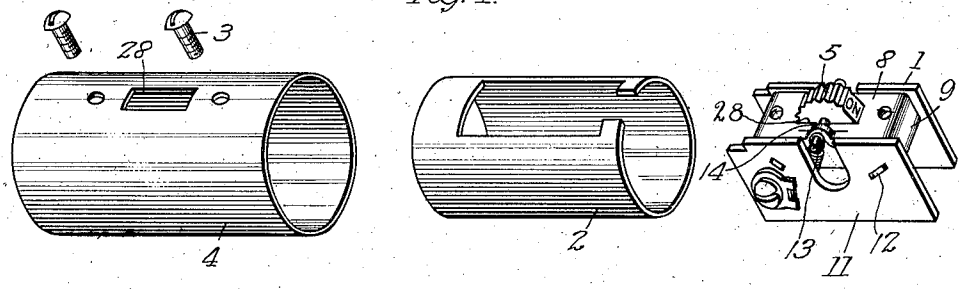


Fig. 2.

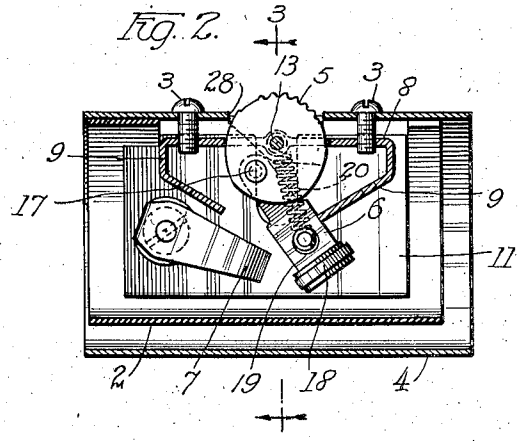


Fig. 3.

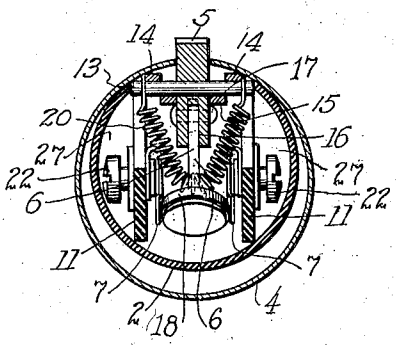


Fig. 4.

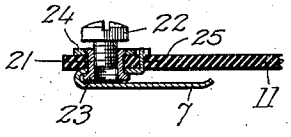


Fig. 5.

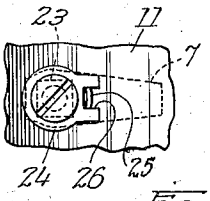


Fig. 6.

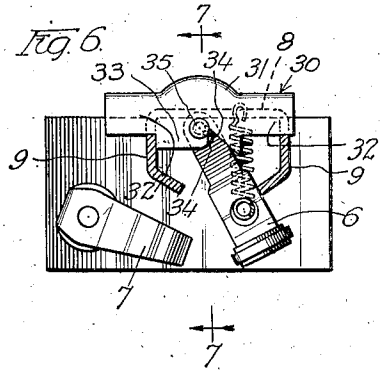
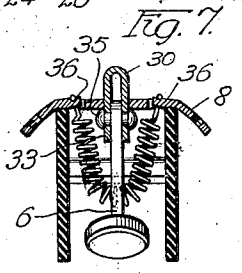


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

Application filed June 1, 1920. Serial No. 385,628.

This invention relates to improvements in electric snap switches.

An object of the invention is to provide a snap switch of simple, rugged and durable construction which may be advantageously used in various relations.

Another object is to provide a switch of the aforesaid character which is particularly adapted to installation in vacuum cleaner handles and the like.

Various other objects and advantages of the invention will hereinafter appear.

The accompanying drawing illustrates certain embodiments of the invention which will now be described it being understood that the embodiments illustrated are susceptible of various modifications without departing from the scope of the appended claims.

In the drawing:

Figure 1 is a perspective view showing a switch mechanism, an insulating sleeve therefor and a casing for concealed mounting thereof.

Fig. 2 is a longitudinal sectional view of the aforesaid elements in assembled relation.

Fig. 3 is a sectional view taken substantially on line 3—3 of Fig. 2.

Figs. 4 and 5 are detail fragmentary views of the stationary contacts shown in Figs. 2 and 3.

Fig. 6 is a longitudinal sectional view of a modified form of switch mechanism, and

Fig. 7 is a sectional view substantially on line 7—7 of Fig. 6.

Referring to the drawing the same shows a unitary snap switch mechanism 1 to be enclosed in an insulating sleeve 2 and to be secured by screws 3 within a tube 4 which may be assumed to comprise a section of a tool handle.

The switch mechanism shown in Figs. 1, 2 and 3 comprises a circular operating member 5, an oscillating contactor 6 and stationary contacts 7, said contactor 6 being supported on a frame 8 into which screws 3 are adapted to thread for securement of the switch mechanism within tube 4. The frame 8 has downwardly and inwardly projecting end extensions 9 and has secured to opposite sides thereof insulating plates 11 for supporting stationary contacts 7, said plates being secured to frame 8 by rivet lugs 12 provided on opposite sides of extensions 9.

The operating member 5 is pivotally mounted on a pin 13 and the upper wall of frame 8 is slotted to receive said member and is also provided with upwardly struck portions 14 and downwardly struck portions 15 to provide bearings for said pin. Operating member 5 is provided with a slot 16 to receive contactor 6 and said contactor comprises a flat stamping having its upper end pivotally secured to said operating member by a pin 17 at a point below pivot pin 13 and having its lower end provided with an insulated contact block 18. The contactor 6 is thus free to oscillate about its pivot 17 and such pivot is shiftable longitudinally of frame 8 by reciprocatory movement of operating member 5.

Contactor 6 is provided with an opening adjacent its lower end to receive a helical spring 20 and said spring has its extremities looped over opposite ends of pin 13. Thus it will be observed that spring 13 serves to effect oscillation of contactor 6 with a snap action upon shifting of the pivot of said contactor across the axis of said spring. In this connection it is to be noted that the extremities of extensions 9 form stops for the contactor and that in either extreme position of the contactor the spring 20 tends to move the operating member 5 to a corresponding extreme position such movement being limited by engagement of the bottom surface of slot 16 with the side of the contactor 6.

The stationary contacts 7 are mounted on the inner faces of insulating plates 11 and are arranged to be bridged by contact block 18. As best shown in Figs. 4 and 5 each of the contacts 7 comprises a reflexed leaf spring secured to its respective insulating plate 11 by a hollow rivet 21. The rivet 21 is internally threaded to receive a binding screw 22 and has a square head 23 on its inner end located between the reflexed ends of contact 7 and has its outer end riveted over on a terminal plate 24 located on the outer face of insulating plate 11. The square head 23 prevents rotation of rivet 21 relative to contact 7 and to prevent rotation of contact 7 relative to insulating plate 11, contact 7 is provided with an outwardly extending lug 25 passing through an opening in the insulating plate 11 and projecting into recess 26 in terminal plate 24.

The frame 8 being insulated from both the stationary and movable contacts renders

further insulation of the operating member 5 unnecessary and enables said frame to be secured to the tube or other support without insulation. Accordingly, the insulating sleeve 2 can be cut away as shown in Fig. 1 for exposure of the frame and the operating member to facilitate assembly of the switch mechanism within tube 4. It should be observed however that the insulating sleeve 2 cooperates with insulating plates 11 to provide insulated longitudinal passages 27 for accommodation of the lead wires connected to binding screws 22.

The tube 4 is provided with a slot 28 to receive the operating member 5 and the switch mechanism 1 and insulating lining 2 are of such dimensions that the same can readily be inserted into the end of tube 4 for assembly thereof. If desired, the periphery of the operating member 5 can be provided with "on" and "off" markings to be concealed selectively by the ends of slot 28 in opposite extreme positions of said member to indicate the position of contactor 6.

Figures 6 and 7 illustrate a modified form of switch mechanism including an operating member 30 which is slidably mounted on frame 8. The operating member 30 comprises a stamping which is U-shaped in cross section and is provided with a hump 31 on its upper edge to project through the aperture 28 in the tube 4. The upper face of frame 8 is slotted to receive the operating member 30 and the lower portion of said member is provided with end portions 32 to bear on end extensions 9 of said frame and with a downward projection 33 arranged to abut said extensions in extreme positions of the operating member. Projections 33 are slotted at 34 to receive a pivot pin 35 of contactor 6 and the extremities of spring 20 are secured to lugs 36 on frame 8. The pin 35 is provided with heads on opposite ends thereof to bear on the under side of the top wall of frame 8 and as shown in Fig. 6 the slots 34 are inclined towards the left to facilitate bending of the middle portion of projections 33 around pin 35, to hold the operating member 30 in place.

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

1. A unitary switch comprising a frame, a pair of insulating plates fixed to said frame in a substantially parallel relation, contacts mounted on the adjacent inner faces of said plates, terminals for said contacts having wiring elements accessible exteriorly of said plates and a contactor and spring actuating means therefor, supported by said frame between said plates, said contactor having its current carrying part insulated from said means and said frame and said means including a reciprocatory operating member projecting from said frame.

2. A unitary switch comprising a metallic frame, a pair of insulating plates fixed to said frame in a substantially parallel relation, contacts mounted on the adjacent inner faces of said plates, terminal screws for said contacts accessible exteriorly of said plates, a reciprocatory member mounted on said frame and projecting outwardly therefrom, a contactor oscillatably mounted on said member between said plates and having a current carrying part insulated from said member to bridge said contacts and a spring associated with said contactor for moving the same into and out of engagement with said contacts with a snap action upon reciprocation of said member.

3. The combination with a snap switch device having a projecting operating member, of an insulating sleeve surrounding said device and providing spaced conductor passages between the same and said device on opposite sides of the latter and a tubular casing for receiving said device and said sleeve therewithin in assembled relation, said casing having a slot therein for receiving said operating member.

4. The combination with a unitary snap switch having a metallic supporting frame and a reciprocatory operating member projecting from said frame, of an insulating sleeve surrounding said switch mechanism but exposing said operating member and a portion of said frame and a tubular enclosing casing for said switch having a longitudinally extending slot to receive the actuating member thereof and means to co-operate with that portion of the frame of said switch exposed by said insulating sleeve for securement of said switch within said casing.

5. The combination with a snap switch comprising a metallic supporting frame, a contactor and actuating means therefor carried by said frame, insulating plates fixed to said frame on opposite sides of said contactor, contacts carried by said plates on the adjacent inner faces thereof, terminals for said contacts carried by said plates and accessible exteriorly thereof, of an insulating sleeve surrounding said switch and forming with said insulating plates, conductor passages to said terminals.

6. The combination with a snap switch comprising a metallic frame, a contactor and operating means therefor carried by said frame, said means including a reciprocatory operating member projecting from said frame, insulating plates carried by said frame on opposite sides of said contactor, contacts mounted on the inner adjacent faces of said plates and having terminals accessible exteriorly of said plates, of an insulating sleeve surrounding said switch and forming with said plates conductor passages to said terminals, said sleeve having an opening through which said switch operating member projects and a tubular casing to

receive said switch and having a longitudinal slot to receive said switch operating member.

7. A unitary switch comprising a metallic frame, a pair of insulating plates fixed to said frame in a substantially parallel relation, contacts mounted on the adjacent inner faces of said plates, terminals for said contacts having wiring elements accessible exteriorly of said plates, a reciprocatory operating member mounted on said frame and projecting outwardly therefrom, a contactor having one end pivotally connected to said member and having at its opposite end an insulated current carrying part to bridge said contacts and a spring to effect oscillation of said contactor with a snap action upon reciprocation of said operating member, said spring passing through an opening in said contactor adjacent the contact end thereof and having its extremities fixed on opposite sides of said operating member.

8. A unitary snap switch comprising a metallic frame having end members, a pair of insulating plates fixed to the sides of said frame in a substantially parallel relation, contacts mounted on the inner faces of said plates, terminals for said contacts accessible exteriorly of said plates, a reciprocatory operating member mounted on said frame and projecting outwardly therefrom, a contactor having one end pivotally secured to said operating member and having at its opposite end an insulated current carrying part for bridging said contacts, and a helical spring passing through an opening in said contactor adjacent its contact end and having its extremities fixed on opposite sides of said member for oscillating said contactor with a snap action upon reciprocation of said operating member, movement of said contactor in opposite directions being limited by the end members of said frame.

9. A snap switch comprising a metallic frame, insulating material having inner parallel surfaces in fixed position with respect to said frame, contacts mounted on said inner surfaces and having terminals extending outwardly therefrom, a pivoted operating member mounted on said frame and projecting outwardly therefrom, a contactor having one end pivotally connected to said member and having at its opposite end an insulated current carrying part to bridge said contacts, and a spring to effect oscillation of said contactor with a snap action upon predetermined movement of said operating member, said spring passing through an opening in said contactor adjacent the contact end thereof and having its extremities fixed on opposite sides of said operating member.

In witness whereof, I have hereunto subscribed my name.

GEORGE J. MEUER.