May 10, 1938. G. A. JOHNSON 2,117,171

UNIT TYPE TUMBLER SWITCH

Filed May 17, 1935

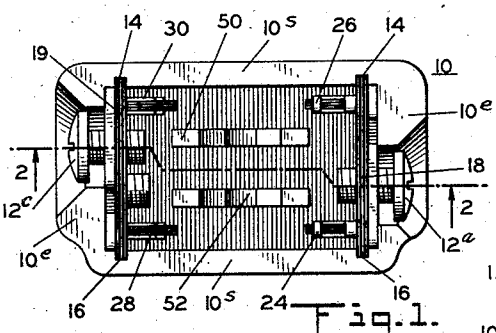


Fig. 1.

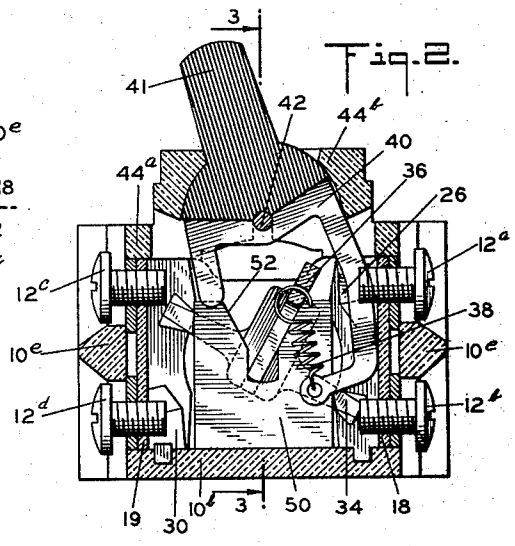


Fig. 2.

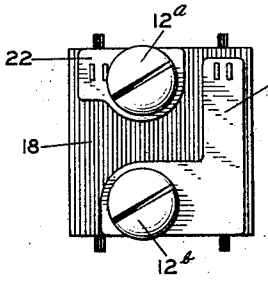


Fig. 4.

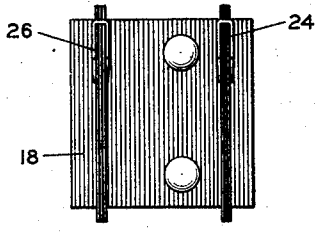


Fig. 5.

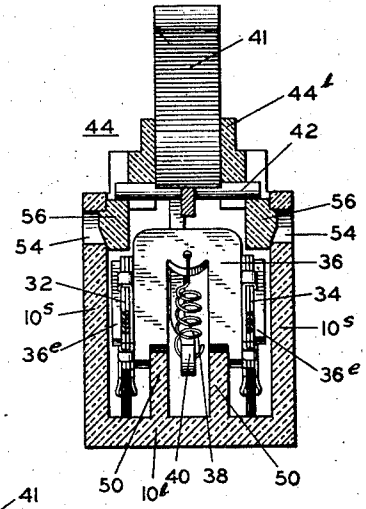
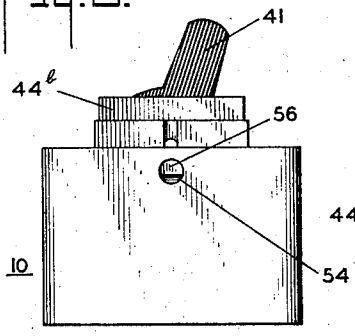


Fig. 3.

Fig. 6.



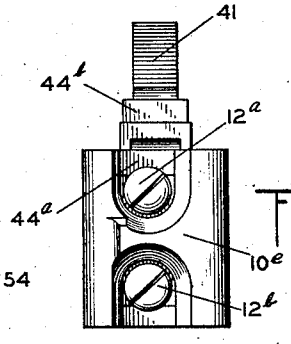


Fig. 7.

INVENTOR
GEORGE A. JOHNSON
BY HIS ATTORNEYS
Howson and Howson

Patented May 10, 1938 2,117,171

UNITED STATES PATENT OFFICE

2,117,171

UNIT TYPE TUMBLER SWITCH

George A. Johnson, Trumbull, Conn., assignor to The Bryant Electric Company, Bridgeport, Conn., a corporation of Connecticut

Application May 17, 1935, Serial No. 22,090

7 Claims. (Cl. 200—67)

This invention relates to electric switches. More particularly it relates to electric snap switches of the unit type. Switches of the type to which this invention relates are commonly used singly or in pairs or in threes in a single gang switch box behind a single gang flush or wall plate. The switches are mounted usually in openings upon a supporting bridge of length just sufficient to bridge across the opening of a single gang switch box. Heretofore switches of this type have had their mechanism inserted in the switch casing from the rear, and the mechanism has been held in place by a fibre or metal back plate which in turn is held by a metallic securing member engaging with the sides or top of the casing. These prior constructions have been disadvantageous for the reason that when undue pressure was exerted upon the switch handle there was likelihood that the back plate might be pushed away from the casing or might be loosened sufficiently to permit undesirable movement of the contacts or other parts and of the switch mechanism and in that way interfere with the proper operation of the switch.

It is an object of my invention to provide a unit type flush snap switch with a casing which has a solid back.

Another object of my invention is to provide a unit type flush snap switch with a solid back casing and a cover which engages with the casing and is held in position upon the casing without the use of screws, rivets or other metallic securing members.

Another object of my invention is to provide a snap switch of the above mentioned type in which the switch mechanism is held in the casing by engagement of the cover therewith.

Another object of my invention is to provide a snap switch of the above type with a switch mechanism that may quickly and easily be assembled in the casing by insertion from the front.

Another object of my invention is to provide a switch of the above type in which the switch mechanism and contacts are insertable in the front and are held in position by the engagement of the cover which in addition to its function of securing the switch parts in position also shields them from any metallic or current carrying part at the front of the switch.

Another object of my invention is to provide a snap switch of the above type in which the cover automatically secures itself to the base when the cover is seated in its assembled position.

Other objects and advantages of my invention will become apparent to those skilled in the art as my invention is described in connection with the accompanying drawing.

In the drawing:—

Figure 1 is a plan view looking into the interior of the switch casing with the stationary contacts in place but with the movable parts of the switch mechanism removed.

Figure 2 is a longitudinal section view of my invention with the section taken on line 2—2 of Figure 1.

Figure 3 is a transverse section view of my invention with the section taken on line 3—3 of Figure 2.

Figure 4 is a detail view in elevation of one of the stationary contact assembly plates.

Figure 5 is an elevation view of the opposite side of the plate shown in Figure 4.

Figure 6 is a side elevation view of my invention.

Figure 7 is an end elevation view of my invention.

Referring to the drawing it will be noted that the switch mechanism of my invention is housed within a one-piece-hollow casing 10 of insulating material which has plane side walls 10*s* and a solid back wall 10*b*, and end walls 10*e* which are each provided with lower and upper apertures for binding screws of wire terminals 12*a*, 12*b*, 12*c*, and 12*d*. In the side walls 10*s* adjacent the end walls there are provided pairs of opposed slots 14 and 16 into which may slide from the front of the casing stationary contact assembly plates 18, 19 of insulating material such as fibre. These assembly plates 18, 19 are or may be substantially alike for each end. The plate 18 has upper and lower metallic terminal plates 22 and 20 respectively, secured to one face thereof, with terminal screws 12*a* and 12*b* respectively screwed therein. Mounted on the insulating plate 18 are spaced stationary contacts 24 and 26 of U-shape with lateral extensions from their arms passing through the insulating plate 18 adjacent the top corners and into and through extensions or branches of the terminal plates 20 and 22 respectively. To secure these contacts to their respective terminal plates the ends of their extensions may be peened over. The stationary contact assembly plate 19, although of similar construction to the assembly 18, has the stationary contacts 28 and 30 at the bottom of the plate instead of at the top in order that the blades of the mutually insulated movable contact members 32, 34 may engage with contacts 26, 30, and 24, 28 respectively in closed circuit position of the switch.

These movable bridging contact members 32,

34 may be made up from thin sheet metal stampings so as to possess resilience and engage the stationary contacts with spring pressure. These movable bridging contacts are mounted upon lateral outward extensions 36e from the arms of a U-shaped switching member 36 which may be oscillated by a switch spring, 38 one end of which is engaged with the transverse portion of the switching member while the other end is engaged with a manually movable lever 40 of shape as shown in Fig. 2, which is pivotally mounted upon a transverse pin 42 passing through the cover 44 for the switch casing.

This cover may be made of insulating material and may have a portion 44a fitting within the top of the switch casing 10 to completely close the upper end of the casing except for an aperture provided for the insulating handle 41 of the manually movable lever 40. This handle and the cover form a completely closed front for the switch to prevent access of any tool through the cover to the switch mechanism or current carrying parts. Thus the cover and handle provide a "dead" front for the switch. The cover also has a central upstanding rectangular neck 44b which is adapted to fit in a complementary aperture in a conventional flush or wall plate (not shown).

For rockably supporting the switching member 36, there are formed in the bottom of the switch casing a pair of parallel platelike hearing members 50 which are provided with V notches 52 into which the legs of the switching member bear.

By reference to the drawing it will be noted that the lower end of the actuating lever 40 moves in the lower part of the switch casing. It may now be observed that by movement of the switch handle 41 and the actuating lever 40 about the pivot 42 of the handle and lever, the line of action of the switch spring 38 will be carried through the plane of the switching member 36 and thereby cause movement of the switching member from one side of its V notch bearings to the other, and corresponding movement of the movable switch contacts with a snap action.

One of the novel features of my invention is the means for securing the cover to the switch casing. This means will now be described. In the side walls 10s of the switch casing adjacent the top thereof and centrally positioned are coaxial apertures 54 which are adapted to receive coaxial lugs 56 formed integrally and extending laterally from the sides of the cover 44. These lugs or extensions may be substantially circular but beveled downwardly as illustrated in Figure 3. When applying the cover to the casing there is sufficient resiliency of the walls 10s to permit the beveled surfaces of the projections to act as wedges to force the walls apart until the lugs are seated in the apertures 54. Thus upon applying the cover to the casing, the cover will snap into place and be maintained there permanently or until special tools are used to permit the removal of the cover.

I have found that insulating materials such as condensation products of phenols and formaldehyde, and phenolic resins, although substantially rigid for most purposes possess sufficient resiliency for use in making the cover and the casing of my invention. Obviously any other insulating material possessing these characteristics could be used for making the casing and cover of my invention.

Many modifications within the scope of my invention will occur to those skilled in the art, therefore I do not limit myself to the specific form of the invention as disclosed in the accompanying drawing.

I claim:—

1. In a snap switch, an insulating casing, having integral bottom and side walls, a swinging U-shaped switching member, a pair of parallel plate-like formations of insulating material extending up from said bottom wall and providing bearings for the ends of the legs of said switching member and supporting said switch member in inverted position, a cover for said casing, an operating member pivotally mounted in said cover and extending therethrough, and snapping mechanism between the legs of said switch member for actuating said switching member.

2. In a snap switch, an insulating casing having integral bottom and side walls, stationary switch contacts at opposite ends of said casing having wire terminals with screws extending into said casing, a swinging switching member, a pair of parallel plate-like formations of insulating material extending up from said bottom wall and having V-notch bearings for said switching member, the edges of said formation being spaced from the ends of said casing to provide room for said screws, a cover for said casing, an operating member pivotally mounted in said cover and extending therethrough, and snapping mechanism for actuating said switching member.

3. In a snap switch, an insulating casing having integral bottom and side walls, a pair of spaced plate-like insulating members parallel to one side wall, a swinging U-shaped switching member supported in inverted position by the ends of its legs engaging in notches in said plate-like members, an insulating cover for said casing, snapping mechanism for actuating said contacts, and insulated operating means pivotally mounted in said cover and having a portion moving below said switching member, said cover and operating means forming a "dead" front for the switch.

4. In a snap switch, an insulating casing with integral back and side walls, a cover fitting within the front of said casing, operating means pivotally mounted in said cover, notched bearing members integrally formed with the bottom of said casing, a U-shaped swinging switching member supported by said bearings in inverted position by the ends of its legs engaging in said bearings, and a spring connected to said operating means and said switching member, the travel of said switching member under the influence of said spring being limited by its legs abutting the sides of said bearing notches.

5. In a snap switch, an insulating casing having integral back and side walls, a cover fitting within the front of said casing, switching mechanism within said casing, an operating member of said switching mechanism extending through said cover, notched bearing members formed integrally with the bottom of said casing, and a U-shaped switching member of said switching mechanism supported by said bearing members, the travel of said switching member under the influence of said spring being limited by its legs abutting the sides of said bearing notches, the edges of said bearing member being spaced from the ends of the casing to provide room for terminal screws extending in from the ends of said casing.

6. In a snap switch, an insulating casing having integral bottom and side walls, stationary switch contacts at opposite ends of said casing

having wire terminals with screws extending into said casing, a swinging switching member, a pair of parallel plate-like formations of insulating material extending up from said bottom wall and having V-notch bearings for said switching member, the edges of said formation being spaced from the ends of said casing to provide room for said screws, a cover for said casing, an operating member pivotally mounted in said cover and extending therethrough, snapping mechanism for actuating said switching member, and means on said cover and casing to automatically lock said casing and cover together when said cover is inserted in the front of said casing.

7. In a snap switch, an insulating casing with integral back and side walls, a cover fitting within the front of said casing, operating means pivotally mounted in said cover, notched bearing members integrally formed with the bottom of said casing, a U-shaped swinging switching member supported by said bearings in inverted position by the ends of its legs engaging in said bearings, a spring connected to said operating means and said switching member, the travel of said switching member under the influence of said springs being limited by its legs abutting the sides of said bearing notches, and means on said cover and casing to automatically lock said casing and cover together when said cover is inserted in the front of said casing.

GEORGE A. JOHNSON.