J. O. CADIEUX.

PUSH BUTTON SWITCH.

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1,303,634.

Patented May 13, 1919.

Fig. 1.

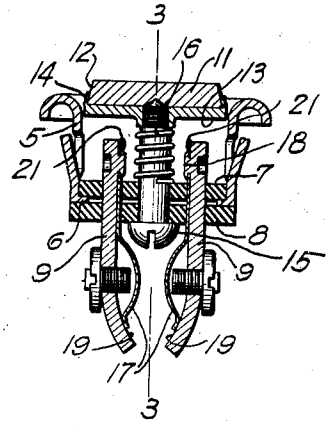


Fig. 2.

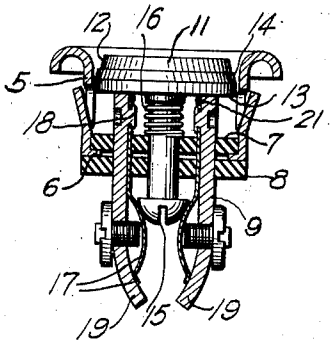


Fig. 3.

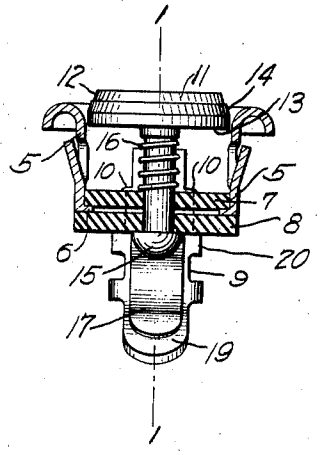
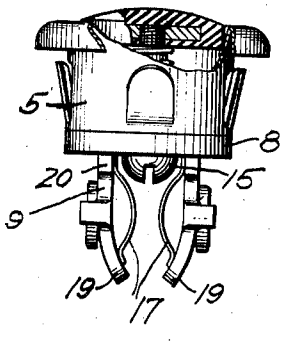


Fig. 4.



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PUSH-BUTTON SWITCH.

1,303,634. Specification of Letters Patent. Patented May 13, 1919.

Application filed December 27, 1918. Serial No. 268,520.

To all whom it may concern:

Be it known that I, JOSEPH O. CADIEUX, a citizen of the United States of America, residing at Meriden, Connecticut, have invented a new and useful Push-Button Switch, of which the following is a specification.

The present invention relates to what are commonly known as "push buttons" or push button switches and the general objects of the invention are to provide a switch of this character which will be of simple, inexpensive and easily assembled construction and which will be capable of withstanding the wear and usage to which such switches are ordinarily subjected.

Among the more specific objects of the invention are to insure good contact at all times, to prevent injury to the contact-making parts and to improve the button structure.

Accordingly the invention resides in the combination with the push button, of binding posts disposed beneath and arranged to serve as abutments limiting the movement of the push button, said binding posts serving also as supports for contact springs which are engaged by a contact-making head carried by the button. These binding posts furthermore, in the preferred construction, are utilized as the means for fastening the parts together and are formed as guards for protecting the contact springs.

Other features and details of construction will appear as the specification proceeds.

In the accompanying drawing I have illustrated the invention embodied in a practical and preferred form, but with the understanding that modifications and changes may be made without departure from the true spirit and scope of the invention.

In said drawing:—

Figure 1, is a central sectional view of the switch with the button standing in the normal extended position.

Fig. 2, is a similar view showing the button in the depressed contact-making position.

Fig. 3, is another sectional view taken on a plane at right angles to the plane of Fig. 1 and substantially on the plane of the line 3—3 of that figure.

Fig. 4, is a partial sectional view of a slightly modified form of the invention.

The base of the switch is shown as a cup-shaped member 5 having an inwardly extending flange 6 at the lower end thereof. Seated on this flange within the hollow base is a washer 7 of suitable insulating material and engaging the flange at the outside is a companion washer 8.

These insulating washers are secured together with the base flange clamped therebetween by means of the binding posts 9 which are projected up through the washers into the cavity within the hollow base and are there riveted over as indicated at 10 so as to permanently secure these parts firmly together.

The button structure consists in the disclosure of a button disk 11 of pearl or like material having a beveled flaring rim 12, said disk being held in a cupped disk 13 having the upstanding rim thereof beveled or "spun" over the flaring rim of the button disk as indicated at 14 so as to firmly hold the button disk thereto. This beveled securing rim preferably does not extend up as far as the face of the button disk and therefore is not in fact noticeably observable at the face of the button. Attached to the back of the button cup 13 is a screw stud as indicated at 15 which has a sliding bearing in a bore provided in the insulating washers between the oppositely disposed binding posts. The button is yieldingly supported by a spring 16 surrounding the upper portion of this screw stud and interposed between the upper insulating washer and the button cup.

When the button is depressed the circuit is closed across the binding posts by the engagement of the metallic under face of the button with the tops of the binding posts and the binding posts in this instance in addition to serving as a pair of switch contacts, also serve as abutments limiting the inward thrust of the button. The contact thus established is sufficient for ordinary purposes and so long as the button works straight up and down and the binding posts are both of the same height. To insure perfect contact at all times however, and irrespective of the engagement of the button with the binding posts I provide in my invention, a pair of contact springs 17 disposed longitudinally of the binding posts and secured thereto as by riveting 18, said springs having inwardly bowed portions below the head of the screw stud so as to be engaged by said head upon

the depression of the button (Fig. 2). Good contact is thus doubly insured, first by engagement of this contact-making head with the inwardly bowed portions of the springs, and secondly by engagement of the button itself with the tops of the binding posts. The limiting of button movement by the binding posts, it will be seen, prevents injurious strain on the contact springs which can be made of relatively light resilient material.

Injury to the contact springs is further guarded against by turning the lower ends of the binding posts inward as indicated at 19, the inner beveled surfaces of these bowed lower ends of the binding posts further serving as inclined supports with which the lower ends of the springs slidingly engage.

The device, it will be seen, is readily assembled by simply placing the insulating washers at opposite sides of the flange of the cupped base, inserting the binding posts therethrough and then "heading over" the upper ends of the posts to rivet the parts together. The binding posts, it may be mentioned, are provided with suitable shoulders such as indicated at 20 for engagement with the lower face of the lower insulating washer. These shoulders determine the distance the binding posts will project up into the hollow base. The double set of contact-making elements insure good electrical contact at all times. This electrical contact is improved by bowing out the upper ends of the contact springs, as indicated at 21 for engagement by the under surface of the button. This structure provides a set of spring contacts for engagement directly by the button in addition to the set of spring contacts engaged by the button-carried element 15.

The construction illustrated in Fig. 4 is the same as that previously described except that the lower face of the button is in this case made of insulating material so that the circuit is completed entirely by means of the engagement of the contact head of the button with the spring contacts of the binding posts.

I claim:—

1. A push button switch comprising a cup-shaped base, insulating washers inside and outside said base, binding posts projecting up through said washers into the cup-shaped base and fastening said washers together with the base clamped therebetween and a yielding push button working in the cup-shaped base and arranged to be depressed into engagement with the extended upper ends of the binding posts.

2. A push button switch, comprising a cup-shaped base, contacts within said base, a yielding push button working in the base and adapted to make engagement with said contacts, a second pair of contacts outside the base and a head on the push button outside the base and arranged to engage said second pair of contacts.

3. A push button switch, comprising a hollow base, contacts within said base, a push button working in said base and arranged to engage said contacts, a stem carried by said push button and projecting outside the base, a head carried by said stem and contacts outside the base but connected with the contacts within the base and positioned to be engaged by the head on the stem of the push button.

4. A push button switch, comprising in combination with rigid switch contacts and a button for engaging the same, yielding switch contacts connected with said rigid contacts and a contact making element carried by said button for engagement with said yielding switch contacts.

5. A push button switch comprising, a push button, binding posts having switch terminal portions disposed beneath the push button in position to be engaged thereby, yielding contacts carried by said binding posts and a member carried by said push button for engagement with said yielding contacts.

6. A push button switch comprising a cup-shaped base, contacts within said base, a yielding push button working in the base and adapted to make engagement with said contacts, a second pair of contacts carried by the base and a member carried by the push button and arranged to engage said second pair of contacts in the movement of the push button.

7. In combination, a push button, oppositely disposed binding posts beneath said push button and having their lower ends directed toward each other, spring contacts carried by said opposed binding posts and having contact portions bowed toward each other and bearing at their lower ends on the inwardly directed portions of the binding posts and a contact-making head carried by the push button for engagement with said inwardly bowed portions of the spring contacts.

8. In combination, a push button, oppositely disposed binding posts beneath said push button, spring contacts carried by said opposed binding posts and having yielding spring portions exposed at the upper ends of the binding posts for engagement by the push button, said spring contacts having inwardly bowed contact portions adjacent their lower ends and a contact head on the push button for engagement with said inwardly bowed portions of the spring contacts.

9. In combination, a base, a yielding push button mounted in said base, binding posts mounted in the base beneath the push button and having their lower ends directed toward

each other to form a guard structure, contact springs disposed behind said guard portions of the binding posts and a contact-making element carried by the push button for engagement with said contact springs.

10. In combination, a base, a yielding push button mounted in said base, binding posts mounted in the base having contact portions disposed beneath the push button and having extended ends bowed inwardly toward each other to form a guard structure, contact springs on the binding posts behind said guard portions of the binding posts and a contact-making element carried by the push button for engagement with said contact springs.

11. In a push button switch, a cup-shaped base having an internally flanged lower end, an insulating washer inside said base resting on said flange, an insulating washer outside the base and bearing on the flange, binding posts extended through said insulating washers and fastening said washers together with the flange of the base therebetween, a push button working in the cup-shaped base and contact portions on the binding posts for engagement by said push button.

12. In a push button switch, a cup-shaped base having an internally flanged lower end, an insulating washer inside said base resting on said flange, an insulating washer outside the base and bearing on the flange, binding posts extended through said insulating washer and fastening said washers together with the flange of the base therebetween, a push button working in the cup-shaped base and provided with a stem slidingly guided through the insulating washers, a head on the outer exposed end of said stem and spring contacts carried by the binding posts in position for engagement by said head.

13. A combination like that described in claim 12 wherein, the binding posts project up into the cup-shaped base and provide abutments limiting the thrust of the push button to prevent injurious pressure of the head on the spring contacts described.

14. In a push button switch, a push button having a metallic under face, binding posts disposed beneath said button, spring contacts carried by said binding posts and having their upper edges free for engagement by the under face of the button, said spring contacts having yielding contact portions below the upper edges of the binding posts and a contact-making head carried by the button for engaging said last mentioned spring contact portions.

JOSEPH O. CADIEUX.