

Sept. 11, 1951

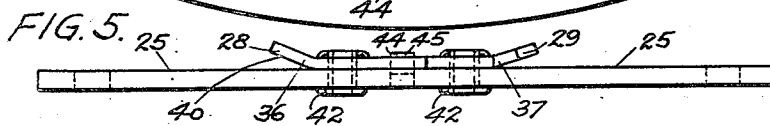
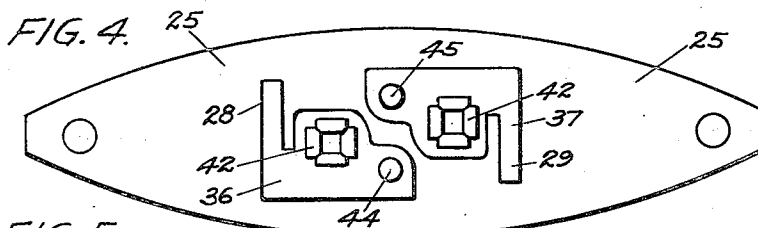
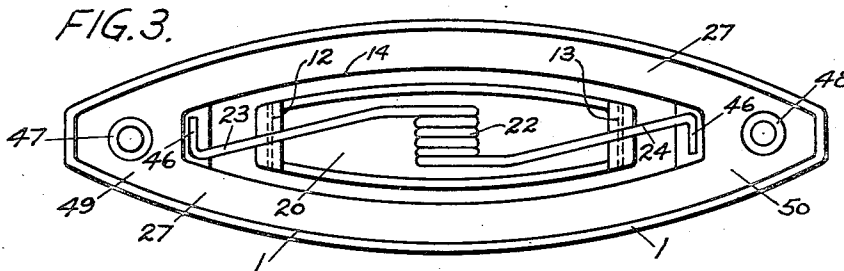
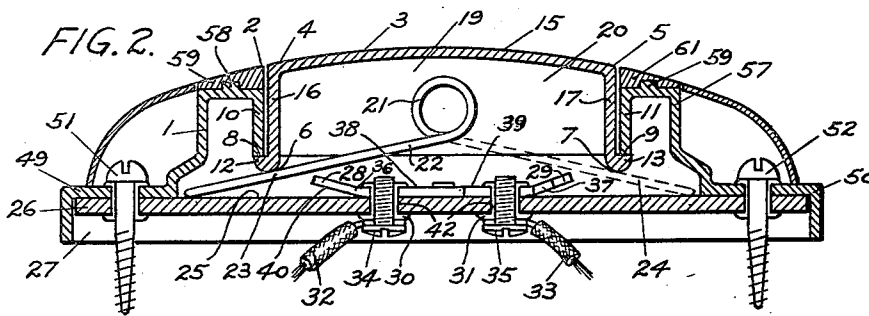
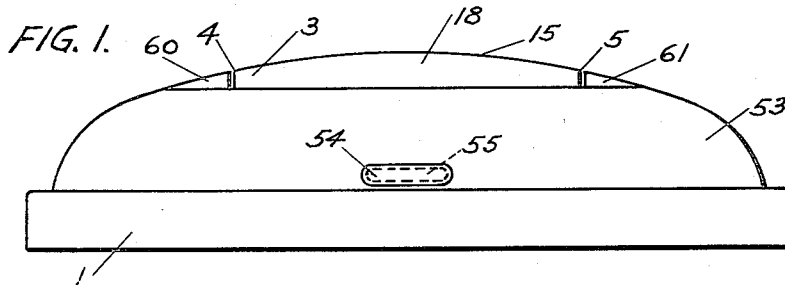
S. BRANTINGSON

2,567,421

PUSH-BUTTON SWITCH

Filed Jan. 30, 1947

2 Sheets-Sheet 1



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FIG. 6.

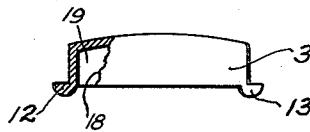


FIG. 7.

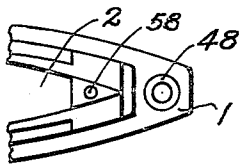


FIG. 8.

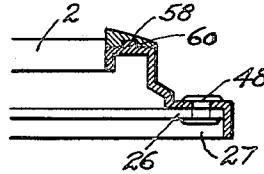
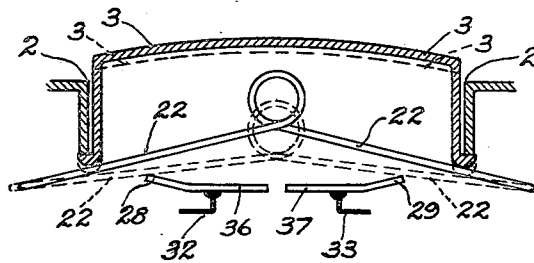


FIG. 9.



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2,567,421

PUSH-BUTTON SWITCH

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Application January 30, 1947, Serial No. 725,293

3 Claims. (Cl. 200—159)

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My invention relates to a push button switch which may be easily found and operated in dimly lighted places and where subdued lighting makes the push button switch difficult to locate. Among the objects and purposes are the following:

One object is to provide a raised push button having a relatively long contact surface for the operator as compared with the usual round button.

Another object is to provide an elongated housing of modern design having an elongated push operator which may be easily found and operated by pressure applied at any point throughout its length and which may be easily found in dimly lighted places, or in the dark.

Still another object is to provide a construction which is best suitable for mass production, thereby resulting in a high quality product at a moderate price.

An object also is to provide a substantially elongated push switch operator on which pressure may be applied at any point between the extremities yet without tilting or causing the operator to become jammed under bad operating conditions such as when heat and dust would cause friction or where dampness would cause rust, electrolysis, or corrosion to slidable parts.

An object is to provide an elongated operator which is so related to the spring for retracting it that each end of the operator travels substantially an equal distance even though not guided and when one end only of the operator is pressed. This object is co-related to another object in which a spring is capable of suspending the operator against its end stops and is also the means of contacting the terminals to complete an electric circuit through the spring.

Another object is to provide an attractive push operated switch for electric circuits securable from the outside, to the wall or the like, and which covers the wiring and securing screws without an escutcheon plate.

I accomplish these and other objects by the construction herein set forth and shown in the accompanying drawings which form a part of this, my disclosure.

In the drawings, the various views and figures are designated as follows:

Fig. 1 is a side elevational view of my device, 50 with the finishing covers in position.

Fig. 2 is a vertical section substantially at the center line.

Fig. 3 is a bottom plan view in which the contacts and cover plate are removed.

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Fig. 4 is a plan view of the contacts and cover plate.

Fig. 5 is a side elevational view of the contacts and cover plate.

Fig. 6 is a side elevation and partial section of the push switch operator.

Fig. 7 is a fragmentary plan view of one of the ends without the finishing cover.

Fig. 8 is a vertical sectional detail of the base 10 showing one of the luminous members attached.

Fig. 9 is a diagrammatic view of the luminous operator, the spring and the contacts, the normal position being shown by the heavy lines and the contact position being shown by the light 15 broken lines.

Push buttons, or push button electric switches are of many designs and sizes. I have herein described my spring retracted type having an elongated modern designed push operator, such as used in the home and office for chimes and cathedral gongs.

My push button or push operated switch has an elongated luminous operator, any part of which may be pressed to complete an electric circuit. It may be mounted at the side of a door or in a dimly lighted part of the structure, as both the housing and operator have luminous parts. My push operator switch is also used and in keeping with the elegant surroundings, of a parlor, for example, where an ordinary push button would be out of place.

The size and shape of the operator, as well as the mounting are convenient for easy operation without the necessity of finding the spot on which 25 to press the finger; any part of the hand may be used. If the finger is used, its touch at any part of the operator, even at either of its extreme ends, will not cause it to become jammed or cocked out of line, the action of which is important and is accomplished by simple means as will be better understood after a study of the construction more particularly set forth in the specifications.

In the specifications and in the drawings to which reference is made, I have shown a preferred embodiment in precise detail so that the construction may be better understood by one skilled in the art to which my invention pertains.

The preciseness of the drawings and the preciseness of the specifications are not intended to limit the scope of my invention as set forth in the appended claims. It is expected that after a study of this, my disclosure, modifications may suggest themselves and may be made without departing from the principles which underline 55 my invention. The construction of my preferred

embodiment may be followed in the specifications.

Referring to the drawings, similar reference characters refer to similar parts throughout the several views and in these specifications. My press operated switch or push button for completing electric circuits comprises a frame or housing 1 which is provided with the elongated outer opening 2 for the operator 3 which is free to move when pressed until stopped by making contact and completing the electrical circuit.

The opening and the conforming operator are substantially longer in shape along the longitudinal axis or between the ends 4 and 5 than at any other point transversely between the ends. Each end of the operator is provided with a spring bearing at 6 and 7 which extends beyond the end of the opening to provide end stops 8 and 9 which engage the end walls 10 and 11 of the opening 2 at 12 and 13 and which, together with the side walls 14 of the opening, are formed by flanging the material of the housing inwardly around the opening.

The operator is normally held so that its face 15 is disposed slightly above the housing and is provided with the end walls 16 and 17 beyond which the spring bearings and stops extend and the side walls 18 and 19, which provide the spring compartment 20 which receives and houses the center portion 21 of the spring 22.

The end portions 23 and 24 of the spring extend out of and beyond the compartment 20 and beyond the spring bearings at 6 and 7 to rest normally on the inner face 25 of the base or cover plate 26 which conforms to and is secured within the bottom recess 27 of the housing.

The base plate is provided with the contacts 28 and 29 which are electrically connected to the terminals 30 and 31 to which the wires 32 and 33 connect the source of electric current to the device it operates. The source of electric current may be a battery or generator and a bell or signal of many well known types, such as are commonly used in connection with push operated switches or push buttons or for any other purpose where a switch of this type is suitable. The electric wires attached to the terminals and the parts of the switch may vary in size to suit the current whether alternating current or direct current. The particular circuit which is completed by the use of my switch is not believed to be of interest here since most any circuit may be employed.

The recess 27 in the bottom of the housing is of sufficient depth to not only receive the base plate but also to provide room for the wires and terminal screws 34 and 35 which secure them.

The contacts are preferably formed by bending a portion of the flexible contact plates 36 and 37 upward from their top faces 38 and 39. The bottom face 40 of each contact plate is held firmly against the inner face of the base plate by the hollow square rivets 42, the body of which engages a corresponding square aperture in the base plate and is flared and pressed to secure the contact plate to the base plate. The square internal hole through each hollow square rivet is tapped to receive the terminal screws which form a part of the terminal and receive the ends of the wires to the switch.

The top surface or inner face of the base plate is preferably provided with two upwardly projecting studs 44 and 45, one engaging a conforming aperture in the contact plate 36 and the other engaging a conforming aperture in the contact plate 37.

The spring 22 is so constructed that the end

portions 23 and 24 which extend from the ends of the center coil portion are so disposed that engagement is made with the contacts 28 and 29 upon depressing the operator downwardly toward said contacts. The ends 46 of each end portion are formed into rubbing yielding contacts to provide a rest for the spring and to prevent the spring from tipping over as it is in continuous contact with the spring bearing at substantially the centerline of the operator; the ends and the rest being substantially equally spaced at each side of the vertical longitudinal centerline of both the operator and also of the housing and other parts, such as the base plate.

The disposition of the spring in substantially balancing the operator so that it may freely move in the sides of the opening of the housing is important because of eliminating friction against the sides which thus serve only as a keeper or limit to the action of the hand when not evenly pressed against the operator. The sides of the operator and the sides of the loosely conforming opening in the housing are not to be regarded as a guide for the operator which is perfectly balanced on the end portions of the spring.

The operator is also not dependent on any guide surface to prevent it from teetering even though pressure is applied on the extreme end of the surface exposed for pressure by the hand or finger of the person operating the switch; the bearing being still further out beyond the end of the operator and the spring rest much further away from a transverse centerline than either the bearing or the end of the exposed face of the operator.

Parallelism in motion with regard to the housing in which the operator travels is thus obtained without friction or guidance and cannot therefore become jammed or stuck even when my device is installed in hot, dry, or dusty places.

The base plate is preferably secured to the housing by the hollow rivets 47 and 48 which pass through and are clinched over the upper surface of the housing end tables 49 and 50. The hollow centers provide a passage for the attaching screws 51 and 52 which may attach my device to the wall or other surface when installed.

The heads of the screws 51 and 52 are covered by the finishing cover 53 which is snapped over the housing and secured by the detents 54 which engage the depressions 55 in the sides of the housing.

At each end of the operator and projecting above the top tables 56 and 57, I have provided the studs 58 and 59 which engage the conforming apertures in the luminous pieces 60 and 61 which are not covered by the finishing cover and thus provide a continuation or luminous extension beyond the luminous push operator which may be seen in the dark.

The contact plates are not only secured to base plate by the hollow rivets but also by the upwardly projecting studs spaced apart to prevent the parts from being loosened or separated by very rough usage.

The size of the parts and the details of construction may be modified in many respects without departing from the principles underlying my invention.

Having thus described a preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent is set forth in the following claims.

I claim:

1. In a switch having an elongated housing

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and a base plate having a pair of contacts connected by said switch and terminals electrically connected to said contacts and an elongated operator conforming loosely to and movable in an opening in said housing, a spring contact having its extreme ends extending beyond the ends of said elongated operator and said operator having bearings extending beyond the portion of said operator in said opening to engage and press said spring contact simultaneously against each of said pair of contacts, said bearings being spaced apart a greater distance than the length of said opening and said extreme ends of said spring contact being spaced apart a greater length than the distance between said bearings and seated beyond the ends of the opening in said housing.

2. In a switch having an elongated housing and a base plate having a pair of contacts connected by said switch and terminals electrically connected to said contacts and an elongated operator loosely to conform to and movable in an opening in said housing, spring bearings disposed to project beyond the ends of said operator and beyond the ends of said opening, a spring having its end portions extending along the major axis of and beyond the ends of said operator and beyond said spring bearings and its contact portions between said ends, electrically connecting said pair of contacts when pressed by said operator, whereby said spring engages said contacts simultaneously and said operator is forced to move in parallelism by said spring bearings in one direction and by pressure

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on said operator, anywhere between its ends in the opposite direction.

3. In a switch having an elongated housing and a base plate having a pair of electric contacts connected by said switch and terminals electrically connected to said contacts and an elongated operator conforming to and freely movable in an opening in said housing and having spring bearings extending beyond said opening and a spring having ends seated away from its center beyond said bearings, said spring engaging said bearings between its ends and at points beyond the ends of said opening to cause simultaneous contact between said contact portion of said spring and said pair of contacts, said bearings engaging said housing to stop said operator from outward movement.

SIGURD BRANTINGSON.

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