

1

2,936,356

PUSH BUTTON SWITCHES

Seymour Napolin, Westbury, and Mark H. Harwood, Syosset, N.Y.; said Harwood assignor to Granco Products Inc., Long Island City, N.Y., a corporation of New York

Application June 29, 1959, Serial No. 823,528

8 Claims. (Cl. 200—153)

This invention relates to push button type switches and, more specifically, to a mechanism for operating a simple slide switch as a push button or lever actuated switch.

One of the objects of the invention is to couple a pair of elongated pushing members through an elongated spring controlling the slide switch in a direction substantially perpendicular to the movement of the pushing members.

Another object of the invention is to support parallel pushing bolts or buttons on the opposite ends of a longitudinal spring, an intermediate portion of which is coupled to a contact operating slider so as to move the slider in one or another direction dependent upon the operation of the one or the other of the pushing bolts or buttons.

A more specific object of the invention is to support pushing bolts or buttons on the opposite ends of a flat polygonally bent spring selectively supported on different adjoining sides of the polygon in different operative portions under control of push button movements and thereby moving a switch controlling element coupled to that spring from one position into another.

These and other objects of the invention will be more fully understood from the drawings annexed herewith in which—

Figs. 1, 2 and 3 in front, side and top views respectively, Fig. 1 in cross section, represent a preferred embodiment of the invention.

Fig. 4 represents the arrangement of Fig. 1 in another position of the device.

Figs. 5 and 6 represent respectively separate parts of the device shown in Figs. 1 to 4.

In Figs. 1, 2 and 3, a sliding switch assembly 1 of otherwise well known construction and provided with pairs of terminals 2, 3 on one side thereof and with a slide knob 4 on the other side thereof, is shown to be attached on the outside of a housing 5 enclosing the entire switch assembly.

Slide knob 4 extends into housing 5 through an opening 6. Housing 5, in turn, is attached in a manner not shown to a base plate or panel 7.

Inside housing 5 there is supported a preferably polygonally shaped, flat spring of the form indicated in Figs. 1, 4 and 5 at 8, having relatively long end legs 9, 10, bearing with notch 11 against inner notches 12, 13 of longitudinal pushing rods or bolts 14, 15, one of which, 14, is shown separately in Fig. 6.

Spring 8 is supported alternately, depending on the position of push buttons or rods 14, 15, on one of its two shorter sides, 16, 17 respectively, bearing in each supporting position against the inner surface of housing 5.

Thus, for example, in the position shown in Fig. 1, spring 8 under control of pushing rod 14, is supported on its short side 16 while at the same time urging through end leg 10 against notch 13 of rod 15, thus pushing that rod 15 upward until its further movement is prevented by an outer stop notch 17 bearing against the edge of opening 18 in panel 7.

Conversely, as shown in Fig. 4, a down movement of the other rod 15 will move the first rod 14 upward until its outer notch 19 comes to bear against the edge of opening 20 in panel 7 while in this position of rods 14,

2

15 spring 9 will be supported on the short side 17 of spring element 8.

In this way, the alternating movements of rods 14, 15, respectively, will cause spring element 8 to rock and thereby move laterally by predetermined amounts in the direction of arrows 21, 22 respectively.

These lateral movements, in accordance with the invention, are exploited to control the lateral movement of slide knob 4 which fits into and slidingly extends through a slot 23 in spring 8 (Fig. 5).

On the other hand, spring element 8, as indicated in Fig. 5, is wide enough to be supported in its rocking movement on the inner surface of housing 5.

The alternate movements of rods 13, 14 may be controlled by a rocking lever 24 pivotally supported on shaft 25 which, in turn, is mounted on brackets 26, 27 attached to the top of panel 7.

The invention is not limited to the particular shape and structure of the slide switch shown and described, but may be applied to any type of slide switch or sliding member, or movement without departing from the scope of this disclosure.

Nor is the invention limited to shape and structure of the pushing elements or spring member, but may be used generally to transform a longitudinal movement of a pair of alternate pushing members into a perpendicular movement which, in turn, may be used to control a switch controlling element, all this without departing from the scope of this disclosure.

It is claimed:

1. In a push button switch, a contact operating member slidable from one position to another, a pair of elongated pushing members arranged parallelly, alternately slidable in directions substantially perpendicular to that of said contact operating member, and a longitudinal spring member coupled at its ends to said pushing members and coupled at an intermediate portion to said contact operating member, respectively, so as to move under control of at least one of said pushing members, the other pushing member simultaneously with said contact operating member.

2. A switch according to claim 1 wherein spring member is curved.

3. A switch according to claim 1 wherein said spring member is of symmetrical polygonal shape.

4. A switch according to claim 3 wherein said polygonal shape consists of two relatively long end sides, each followed by a relatively short side joining at the centre of the spring, the angles between said long and short sides and between said short sides themselves being substantially equal and larger than 90 degrees.

5. Switch according to claim 4 wherein in one position of said contact operating member one of said short sides is supported in a position substantially parallel to the sliding direction of said contact operating member, and in another position of said contact operating member the adjoining short side of said spring is supported in a position substantially parallel to the sliding direction of said contact operating member.

6. Switch according to claim 1 wherein said pushing members consist of bolts having notches engaging said spring ends.

7. Switch, according to claim 1 wherein said spring member is a flat spring having a centre slot for receiving said contact operating member.

8. Switch according to claim 1, wherein said pushing members consist of bolts each having at least two notches perpendicular to its extension; one notch serving to bear against the spring end and the other notch acting as a stop to limit the movement of said bolt against the force of said spring member.

No references cited.