

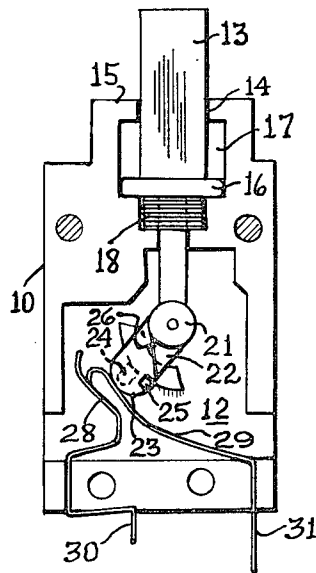
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 [21] Appl. No. **852,747**  
 [22] Filed **Aug. 25, 1969**  
 [45] Patented **Mar. 2, 1971**  
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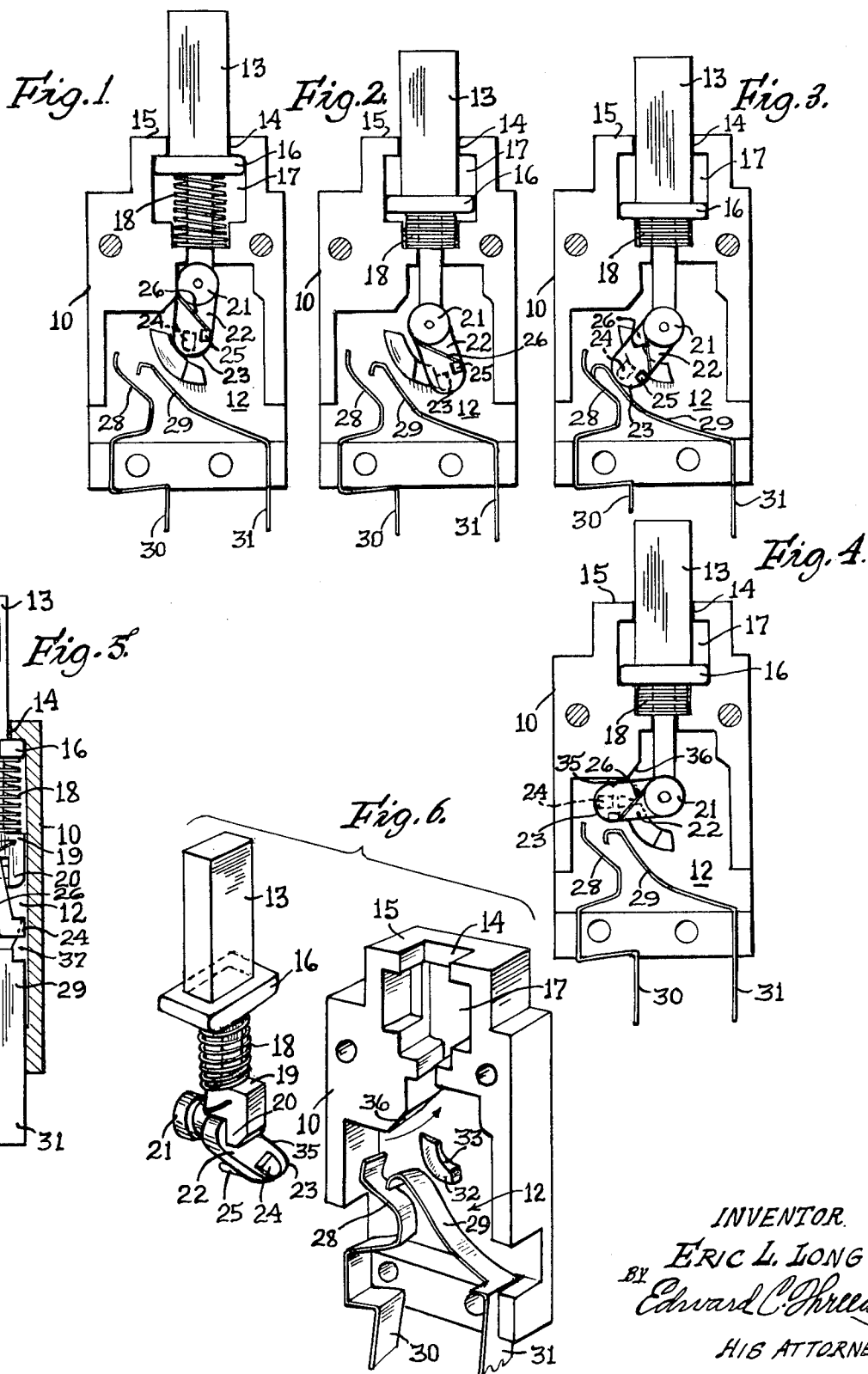
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[54] **MOMENTARY PUSHBUTTON SWITCH WITH  
 SPRING-BIASED PIVOTED ACTUATING MEANS  
 MOMENTARILY ACTUATING CONTACTS AFTER  
 COMPLETE DEPRESSION OF BUTTON**  
 6 Claims, 6 Drawing Figs.

[52] U.S. Cl..... 200/160  
 [51] Int. Cl..... H01h 13/50,  
 H01h 13/22  
 [50] Field of Search..... 200/160.  
 153.9 (Cursory); 74/100 (Cursory)

**ABSTRACT:** An electrical switch having a two-part actuator, the first part of which has a guided path of movement that is substantially linear and the second part being pivotally attached to one end of the first part of the actuator and having an independent pivotal movement in one direction under spring tension during which it closes the switch contacts disposed in its path to momentarily pulse the switch irrespective of any directional movement of the first part of the actuator after the same has moved a predetermined distance.





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# **MOMENTARY PUSHBUTTON SWITCH WITH SPRING-BIASED PIVOTED ACTUATING MEANS MOMENTARILY ACTUATING CONTACTS AFTER COMPLETE DEPRESSION OF BUTTON**

## **SUMMARY OF THE INVENTION**

The principal object of this invention is to provide a switch that is momentarily actuated by a spring-urged independent pivotal lever carried by an actuator that has a substantially linear movement, with the lever movable through a guided path defined by a ramp that intercepts and directs the pivotal lever through a predetermined path until such lever is free to be independently pivoted by its spring into and through contact with the switch contact members.

By being spring loaded the pivotal lever has a switch-actuating movement that is completely independent of the substantial linear movement of the actuator, and as such is positively pivoted through a switch actuating position and returned to its initial starting position after the actuator has been moved a predetermined distance.

## **GENERAL DESCRIPTION**

The objects of this invention are readily accomplished by the structure shown in the drawings which illustrate a preferred form of construction and in which:

FIG. 1 is a side elevational view of the switch in its rest position with the side cover removed;

FIG. 2 is a side elevational view similar to FIG. 1 but showing the switch actuator and pivotal lever in an intermediate actuated position;

FIG. 3 is a side elevational view similar to FIG. 2 and showing the parts thereof in a further related position;

FIG. 4 is a side elevational view similar to FIG. 3 and showing the parts thereof in their completed actuated position;

FIG. 5 is a side elevational detailed view showing the switch and its components in their rest position; and

FIG. 6 is a perspective view of the switch and actuator in an exploded relation.

The independent pulse switch of this invention is contained in a housing 10 that includes a removable side cover 11. Within the housing 10 there is provided a cavity 12 in which are positioned the components of the switch structure.

As illustrated in the drawings the switch consists of a plunger-type actuator 13, a portion of which projects out of an opening 14 formed in the top wall 15 of the housing 10. The actuator 13 includes intermediate its ends an enlarged collar 16, which is movably positioned within an upper chamber 17 of the cavity 12. Seated within a reduced portion of the upper chamber 17 and coiled about a portion of the actuator 13 beneath the collar 16 is a spring 18 that normally retains the actuator in its original or rest position as shown in FIG. 1.

The actuator 13 terminates into a thickened base 19 which provides an offset axially extending leg 20. A headed stud 21 is press-fitted into an opening formed in the leg 20 and pivotally connects thereto a switch actuating means in the form of a lever 22. On one face of the lever 22 adjacent its free end 23 is a guide lug 24. On the opposite face of the lever 22 and extending perpendicularly thereto is a pin 25. One end of a spring 26 is attached to the pin 25 with its remaining portion coiled about the stud 21 and with its free end projected into an opening 27 formed in the sidewall of the thickened base 19 of the actuator 13. This spring 26 normally urges the lever 22 in a clockwise direction relative to the stud 21 as viewed in FIGS. 1 through 4. Within the cavity 12 project the yieldable contact ends 28 and 29 of electrical conductive terminals 30 and 31, respectively, the latter of which project out of the base of the housing 10 as shown.

Mounted on the inner face of the rear wall of the housing 10 within the cavity 12 is a guide member 32. This guide member is arcuated and defines a segment of the periphery path of movement of the lever 22 as it is urged in its clockwise pivotal movement relative to the one end of the actuator 13. The

member 32 provides a wall surface 33 that lies in the path of movement of the guide lug 24 and which finds the highest part thereof positioned in the lowermost portion of its arcuated length, which is also the terminating point of travel of the free end of the lever 22 under its initial movement of the actuator 13. This guide member 32 is selectively positioned in relation to the linear path of movement of the actuator 13, this for a purpose which will be hereinafter made apparent.

When the switch is at rest or unactuated condition, the components thereof, as well as of its actuator are in the position shown in FIG. 1.

When an external force is applied to the actuator 13 it moves against the spring 18 in a substantial linear path through the housing 10 as shown in FIG. 2. The pivoted lever 22 will have its guide lug 24 moved into contact with one arcuated edge of the guide member 32 so as to be pivoted in a slight anticlockwise direction relative to its connection to the actuator 13, against the tension of the spring 26, as seen in FIG. 2.

Upon complete linear movement of the plunger 13 into the position shown in FIG. 3 the guide lug 24 will have passed beyond the high point of the ramp member 32 such that continuing independent pivotal movement of the lever 22 commences under the tension of the spring 26. This independent pivotal movement of the lever 22 will cause its free end to engage the switch contact 29 and depress the same into contact with the remaining contact 28 to complete a circuit therethrough.

The completion of the circuit through the contacts 28 and 29 during the pivotal movement of the lever 22 is momentary by reason of the fact that the spring 26 will continue to pivot the lever 22 until it engages the wall surface 34 which defines a portion of the cavity 12 as seen in FIG. 4.

Upon the release of the external force from the exposed end of the actuator 13 the spring 18 thereof will restore the same to its original position. As the actuator 13 moves reciprocally through its linear path of movement the one side edge 35 of the lever 22 is brought into contact with the chamfered surface 36 of the wall 34 so that such lever 22 is pivoted against the tension of the spring 26 causing the guide lug 24 carried thereby to move on to and over the inclined ramp portion 33 of the guide member 32 until it again assumes its original position as seen in FIG. 1.

It should be noted that by the specific end connections of the spring 26 a force component is created adjacent the free end of the lever 22 in the direction of the base wall of the cavity 12 such that when the guide lug 24 of the lever 22 is moved over the inclined ramp portion 33 of the ramp 32 such movement of the lever 22 out of its normal plane is against the force component of the spring 26 positively establishing the return of the guide lug 24 to the one side of the ramp member 32 and against the rear wall of the cavity 12 as shown.

Notwithstanding the force components created upon the lever 22 by the spring 26 the actuator 13 is retained in its substantial linear path by having the thickened base 19 thereof in sliding contact with the rear wall 37 of the housing 10 while the headed stud 21 is retained in sliding contact with the inner face of the cover 11 as seen in FIG. 5.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

I claim:

1. A pulse switch having a hollow housing containing the switch components including a switch contact member and a self-restoring actuator having a substantial linear reciprocal path of movement within the housing wherein the improvement comprises:

a. an actuating means within said housing connected to and extending longitudinally of one end of the actuator and

movable therewith and having an independent pivotal movement relative thereto into momentary contact with the switch contact member so as to complete a circuit therethrough;

- b. means connecting said actuating means pivotally to one end of the actuator;
- c. guide means within the housing in the path of movement of said actuating means and in contact therewith as it is initially moved by the actuator for resisting said actuating means independent pivotal movement until it and the actuator have moved a predetermined distance within the switch housing; and
- d. means connected to said actuating means for independently pivoting the same relative to its pivotal connection to the actuator and into momentary contact with the switch contact member after said actuating means has been moved by said actuator out of contact with said guide means.

2. A pulse switch as defined by claim 1 wherein said means connected to said actuating means for independently pivoting the same comprises a spring connected between the actuator and said actuating means normally urging the pivotal movement of said actuating means about its connection to the actuator.

3. A pulse switch as defined by claim 1 wherein said guide means consists of a ramp member having a raised guide wall

disposed in the path of movement of one end of said actuating means during its initial movement by the actuator and around and over which said actuating means moves during its independent pivotal movement relative to the actuator and into momentary contact with the switch contact member and return to its original position longitudinally of the actuator.

4. A pulse switch as defined by claim 2 wherein said guide means is an arcuated ramplike member having a raised guide wall disposed in the path of one end of said actuating means during its initial movement by the actuator and around and over which said actuating means is moved by said spring as it is independently pivoted relative to the actuator and into momentary contact with the switch contact member and returned to its original position longitudinally of the actuator.

5. A pulse switch as defined by claim 1 wherein said actuating means comprises an elongated lever providing on one face thereof adjacent one end a laterally extending guide lug for engaging said guide means during initial movement of said lever by said actuator.

6. A pulse switch as defined by claim 3 wherein said actuating means comprises an elongated lever providing on one face thereof adjacent one end a laterally extending guide lug that engages the raised guide wall of said ramp member during initial movement of said lever by said actuator.

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