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SNAP-ACTION SWITCH

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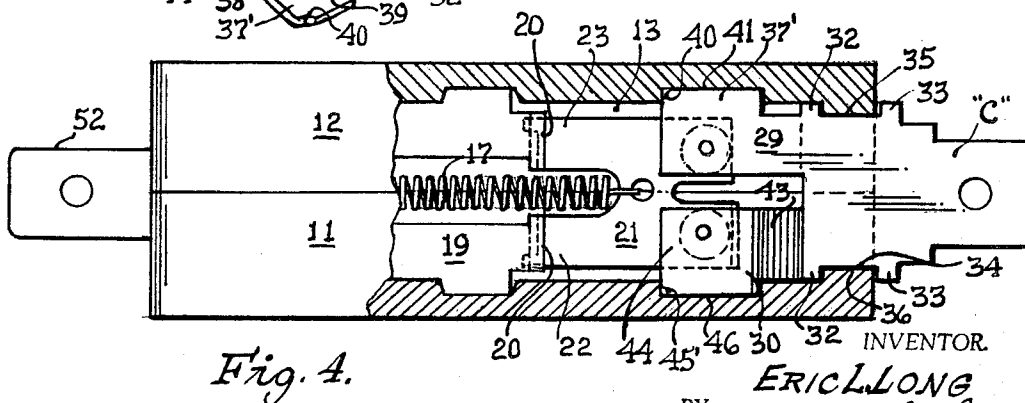
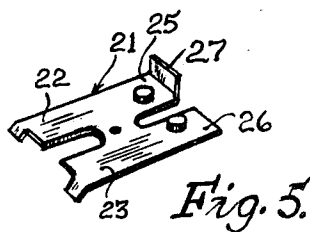
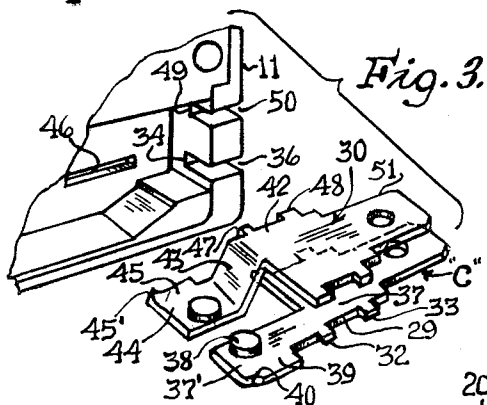
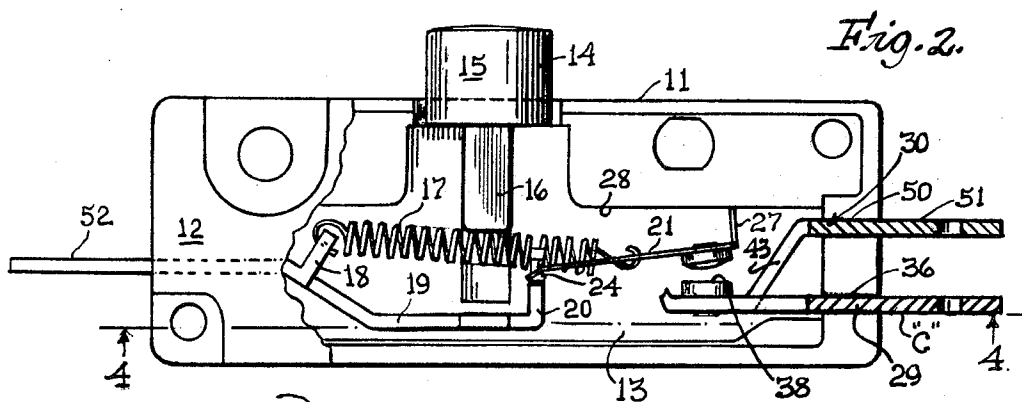
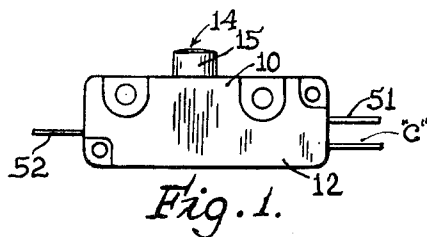


Fig. 4.

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3,400,234

SNAP-ACTION SWITCH

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ABSTRACT OF THE DISCLOSURE

A switch of the snap action character wherein a free end of a switch blade is moved into contact with independent fixed terminals that provide within the switch housing spaced apart horizontally aligned contact bearing head portions. The fixed terminals have a construction that permits a maximum current conductivity therethrough, and one which requires the placement of the contact bearing head portions in a common horizontal plane within the switch housing and with the connector ends of the terminals retaining their full size and lying in a spaced apart horizontally disposed vertically aligned arrangement.

A switch made in accordance with this invention comprises components which permit more than one electrical circuit to be established upon actuation of a single switch blade.

A principal object of this invention is in the provision, in a switch of this character, of an arrangement of independent fixed contact terminals engageable by a single movable switch blade to effect a separate and complete electrical circuit through each of the fixed contact terminals independent of each other.

A further object of this invention is to provide in a switch of this character, a switch blade having a plurality of contacts thereon for engaging a pair of independent fixed contact terminals arranged in a common plane in the path of movement of the switch blade.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

FIG. 1 is a side elevational view of the improved snap-action switch;

FIG. 2 is a fragmentary enlarged side elevational view with a portion broken away to disclose the improved components of the snap-action switch;

FIG. 3 is a fragmentary perspective view of certain components of the improved switch;

FIG. 4 is a bottom plan view of the switch taken on line 4—4 of FIG. 2; and

FIG. 5 is a perspective view of the pivotal switch blade associated with this invention.

The snap-action switch structure embodying the invention includes a switch housing 10 composed of complementary casing sections 11 and 12 mated to provide therebetween an interior cavity 13.

An actuator 14 has an exposed head 15 and an enlarged actuating portion 16 positioned within the cavity 13 and adapted to rest upon a coil spring 17. The coil spring 17 has one end thereof connected to a lug 18 struck from a fixed terminal 19. The fixed terminal 19 provides a pair of spaced apart pivotal posts 20 between which the coil spring 17 extends in order that its opposite end may be hooked onto a switch blades 21 pivotally supported by the posts 20. The actuator 14, coil spring 17, and fixed terminal 19 may be of the type shown and

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described in the United States Letters Patent 3,073,923 assigned to Cherry Electrical Products Corporation.

The switch blade 21 employed in this invention is substantially H-shaped and as such provides a pair of legs 22 and 23 extending from one end thereof with the free ends of such legs pivotally seated in suitable notches 24 formed in the pivot posts 20 in the manner and for the purpose shown and described in the aforementioned patent.

Extending horizontally from the opposite end of the switch blade 21 are contact bearing free ends 25 and 26. One contact bearing end 25 is provided with a flange 27 formed perpendicular to the longitudinal length of the blade 21. This flange provides a stop which, when the blade 21 is pivotally connected in the notches 24 of the pivot posts 20 under tension of the coil spring 17, will engage a wall surface 28 provided by the casing section 11 for correctly positioning the switch blade 21 in its inoperative position.

Associated with the H-shaped switch blade 21 is a pair of independent fixed contact terminals 29 and 30. These terminals are formed from a highly conductive strip and, as shown in FIG. 3, the terminal 29 is substantially flat and provides an enlarged medial portion 31 which has its opposite side edges formed to provide laterally extending positioning lugs 32 and 33. These lugs 32 and 33 will embrace wall abutments 34 and 35 formed in the base of a slot 36 cut in the mating rear wall portions of the casing sections 11 and 12.

The interior end of the terminal 29 is formed into a reduced extension member 37' which extends longitudinally of the terminal 29 and offset with respect to a center line thereof. This extension member 37' carries a contact 38 which is adapted to lie beneath and in vertical alignment with the contact bearing end 26 of the switch blade 21. To support this relatively free end of the extension member 37' within the cavity 13 of the switch housing 10 and in proper relation to the contact bearing end 26 of the switch blade 21, one side edge thereof extends laterally to provide a supporting shoulder 39. One exterior corner of the shoulder 39 is in turn bent out of its normal plane so as to provide a stabilizing lug 40 forcibly inserted into a slot 41 in the inner wall surface of the casing section 12, as seen in FIG. 4. The opposite end of the terminal 29 provides an exposed connector C to which an electrical conduit may be fastened.

The other independent terminal 30 provides a medial portion 42 and a lateral offset extension member 43 at one end thereof, similar to that formed on the terminal 29, except that a portion of the offset extension member 43 is angularly disposed with respect to the longitudinal plane of the terminal 30.

The extension member 43 terminates into a contact bearing head 44, which by reason of the angular portion of the extension member 43 lies in the horizontal plane of and to one side of the terminal 29, when both terminals 29 and 30 are mounted within the cavity 13, as seen in FIG. 2. The contact bearing head 44 of the terminal 30 is provided with a laterally extending supporting shoulder 45 which also has an exterior corner formed to provide a stabilizing lug 45; adapted to be projected into a supporting slot 46 formed in the inner side wall surface of the casing section 11 in horizontal alignment with respect to the supporting slot 41 formed in the inner wall surface of the casing section 12. The medial portion 42 of the terminal 30 has its side edges formed so as to provide positioning lugs 47 and 48 which embrace a wall abutment 49 formed in the base of a positioning slot 50 formed in the mating rear wall portions of the casing sections 11 and 12, in vertical alignment with respect to the slot 36 hereinbefore described. The terminal 30 also provides an external portion 51 which lies in a spaced parallel relation to the connector C of the terminal 29, as is seen in FIGS.

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1 and 2, and to which a suitable electrical conduit may be fastened.

As seen in FIGS. 1, 2, and 4, the fixed terminal 19 provides an exterior connector portion 52 to which a common lead-in wire may be readily attached.

Upon actuation of the overcentering mechanism of the switch, the coil spring 17 will effect pivotal movement of the switch blade 21 so that the contacts contained on each of the contact bearing ends 25 and 26 thereof will independently engage corresponding contacts carried by the interior end of the extension members 37' and 44 of the terminals 29 and 30 respectively to establish through each of such terminals an independent electrical circuit.

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.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A snap action switch, including a housing providing a center cavity in which is positioned an overcentering mechanism consisting of a coil spring, one end of which is connected to a fixed terminal plate, and the opposite end connected to one end of a movable switch blade wherein the improvement comprises:

- (a) a pair of elongated terminals, each having a contact bearing head of a width less than the width of the center cavity and being offset laterally with respect to the longitudinal length of its terminal so as to lie in a spaced apart common horizontal plane beneath one end of the switch blade,
- (b) said terminals providing connector ends extending exteriorly of the switch housing in spaced horizontal and vertical alignment,

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(c) each of said terminals having enlarged medial portions, the opposite side edges of which embrace wall abutments formed in an end wall of the housing and which define vertically aligned openings through which the connector ends of the terminals project,

(d) one of said medial portions providing a downwardly and inwardly inclined leg supporting at its free end one of the offset contact bearing heads for positioning it in a spaced horizontal relation with respect to the offset contact bearing head of the other of said terminal, and

(e) stabilizing tabs provided by each of said offset heads cooperating with the opposite side edges of said medial portions of said terminals for connecting said offset heads to an adjacent inner side wall surface of the housing in spaced horizontal relation beneath the switch blade.

2. A snap action switch as defined by claim 1 wherein said stabilizing tabs comprise corners bent out of the normal plane of each of the contact bearing heads of each of the terminals with said corners adapted to be forcibly inserted into recesses formed in the opposite side walls of the housing which define therebetween the center cavity.

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