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ELECTRIC SWITCH WITH WIRE TERMINALS INSERTABLE
AS SWITCH CONTACTS
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3,209,109

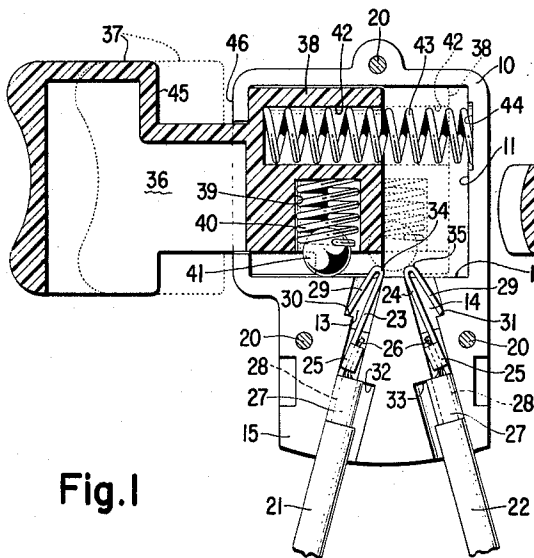


Fig. 1

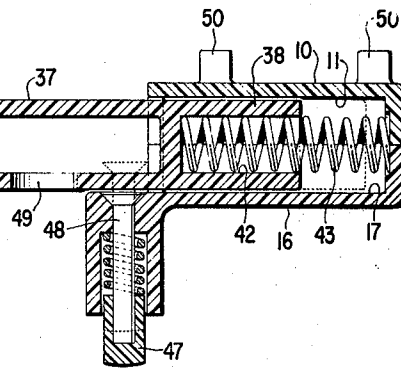


Fig. 3

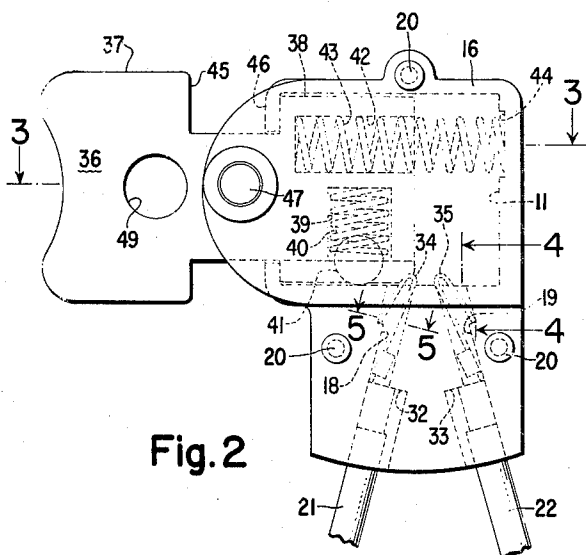


Fig. 2

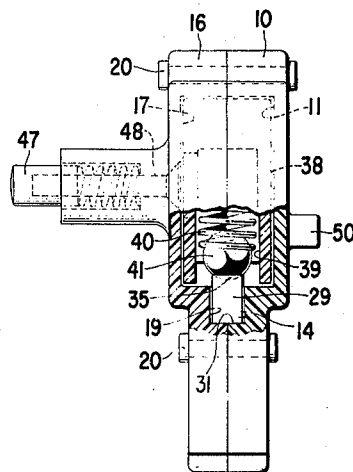


Fig. 4

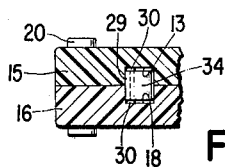


Fig. 5

WITNESS

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ELECTRIC SWITCH WITH WIRE TERMINALS INSERTABLE AS SWITCH CONTACTS

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This invention relates to electric switches.

More specifically, the invention relates to manually-operated, trigger type snap-action switches adapted for use in portable electric tools.

It is an object of this invention to provide novel and simplified structure for an electrical switch.

It is a further object of this invention to provide a switch which, in assembled form, has no conventional stationary contacts.

It is a still further object of this invention to provide a switch for a tool in which the stationary switch contacts are supplied during assembly of the tool by insertion of connective leads with terminals into the body of the switch from the exterior thereof.

With the above and other objects in view, as will herein-after appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawing, FIG. 1 is a longitudinal view, partly in section, of a switch embodying the invention, with the cover removed.

FIG. 2 is a longitudinal elevational view of the switch of FIG. 1 with the cover in place.

FIG. 3 is a sectional view taken substantially on line 3—3 of FIG. 2.

FIG. 4 is an end elevational view with a partial section taken on line 4—4 of FIG. 2, but with the switch in closed position.

FIG. 5 is a transverse sectional view taken on line 5—5 of FIG. 2.

Referring now to FIG. 1, a body portion 10, made preferably by molding from phenolic insulating material such as "Bakelite" or other suitable electrical insulating material, is formed with a cavity 11 having a walled portion 12. Recesses 13 and 14 formed in a depending portion 15 of the body portion provided access to the cavity 11 through the walled portion 12 to the exterior.

A cover 16, formed with a cavity 17 which matches the cavity 11 and with recesses 18 and 19 is secured to the body portion 10 by means of rivets 20 as seen best in FIGS. 3 and 4. With the cover 16 in place, the respective recesses 13, 14 and 18, 19 are in superposed alignment to form access holes for receiving wire leads 21, 22 having terminals 23, 24. These terminals may be of any suitable form and are shown in the present embodiment as of the crimped solderless type having a portion 25 crimped to grip a conducting portion 26 and a portion 27 crimped to grip an insulating portion 28 of the wire leads 21, 22.

Terminals 23, 24 are bent to form flat, springing end portions 29 adapted to spring outwardly to seat against shoulders 30, 31 formed in the recesses 13, 14, 18 and 19 to prevent withdrawal of the wire leads 21, 22 after insertion. Shoulders 32, 33, also formed on the recesses

13, 14, 18 and 19, form abutments for receiving the portions 27 of the terminals 23, 24 to prevent further intrusion of the leads 21, 22. It will be seen that the above cooperative engagements of terminals 23, 24 with the shoulders 30, 31, 32, 33 retain said terminals in position so that end portions 34, 35 preject a predetermined fixed distance inwardly of the walled portion 12 and, as will be evident subsequently, form the stationary contacts for the switch.

An insulated carrier 36 is formed with a hollow trigger portion 37 and a portion 38 adapted to slide within the enclosure formed by the mating cavities 11 and 17. A first pocket 39 receives a spring 40 which carries a conducting ball 41 biased outwardly to ride on the walled portion 12 during sliding movements of the carrier 36. A second pocket 42 formed in portion 38 receives a spring 43 which bears against a walled portion 44 to normally maintain the carrier in the position shown in FIG. 1. In this position the contacts formed by 34 and 35 are unbridged and this is the open position of the switch.

As the carrier 36 is moved to the right, as viewed in FIG. 1, by pressing in on the trigger portion 37, the ball 41 rides on the walled portion 12, the spring 40 yielding to permit it to ride up and over the intruding end portion 34 of the terminal 23 to snap into the position shown dotted in FIG. 1, in which position, the ball 41 rests in a stable position in contact with the end portions 34 and 35 and serves as a conducting bridge between wire leads 21 and 22. This is the closed position of the switch.

The inward movement of the carrier 36 is limited by abutting contact between the wall 45 of the trigger portion 37 and the common wall 46 of the body portion 10 and cover 16. This position is slightly beyond the position shown dotted in FIG. 1 but movement of the carrier 36 to this position will not dislodge the ball from the bridging position shown because of lateral clearance between the spring 40 and the pocket 39. Thus, the trigger 37 may be held in by hand to maintain the closed position of the switch.

The switch may be locked selectively into this closed position by pushing inwardly on a lock-button 47 which forces a flange-ended plunger 48 into an aperture 49 in the trigger portion 37.

Suitable mounting lugs 50 are molded into the body portion 10.

It will be understood from the foregoing description that the switch provided by this invention has, in its assembled form, no conventional stationary contacts. This greatly simplifies the structure and assembly of the switch itself. The contacts are supplied during installation of the switch in the tool with which it is to be used by the simple insertion of the leads 21, 22 (which are part of the tool circuitry) into the access holes as far as they will go. The terminals 23 and 24, which have been previously applied to the leads 21 and 22, are locked into fixed, predetermined position within the holes to serve as stationary contacts for the switch and cooperate with the conducting ball 41 to provide the switching function.

Having thus set forth the nature of this invention, what I claim herein is:

In an electrical switch, an insulated body containing a walled cavity, an insulated carrier movable within said cavity, a conducting member carried by said carrier and spring biased to ride on an inner wall of said cavity during

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selective movement of said carrier, spaced access holes formed in said wall and communicating with the exterior of said insulated body, locating shoulders formed in said access holes, insulated wire leads, conducting terminals fixed to the ends of said leads said terminals accommodated in said access holes and retained entirely therein by cooperative engagement of portions of said terminals with said locating shoulders in a predetermined fixed position, said terminals projecting inwardly of said wall to form stationary contacts which are bridged and unbridged by the movable conducting member to provide a switching function.

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References Cited by the Examiner

UNITED STATES PATENTS

1,841,736	1/32	Jones	200—166
1,886,517	11/32	Batcheller	200—154
2,431,366	11/47	Buell	200—166
2,682,038	6/54	Johnson	200—166
2,891,103	6/59	Swengel	339—217
2,988,724	6/61	Larkin	200—157

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