

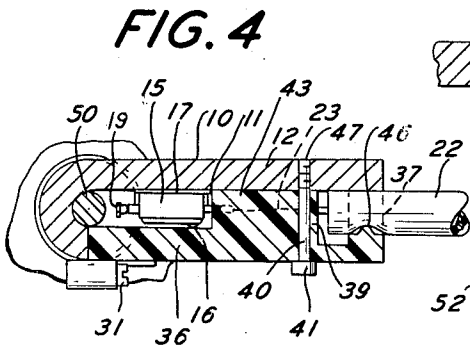
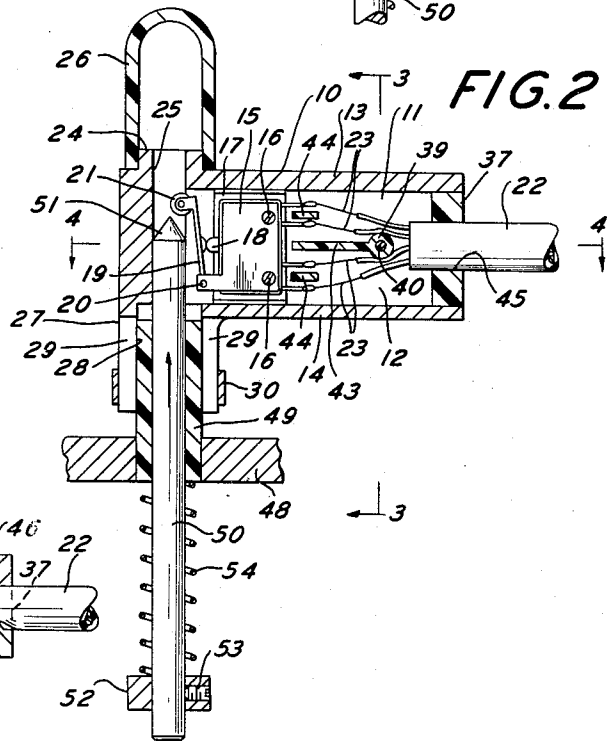
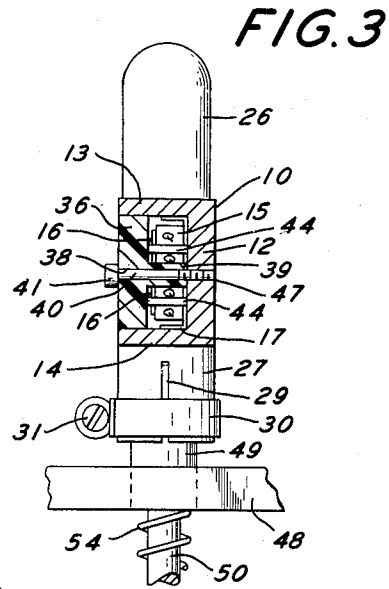
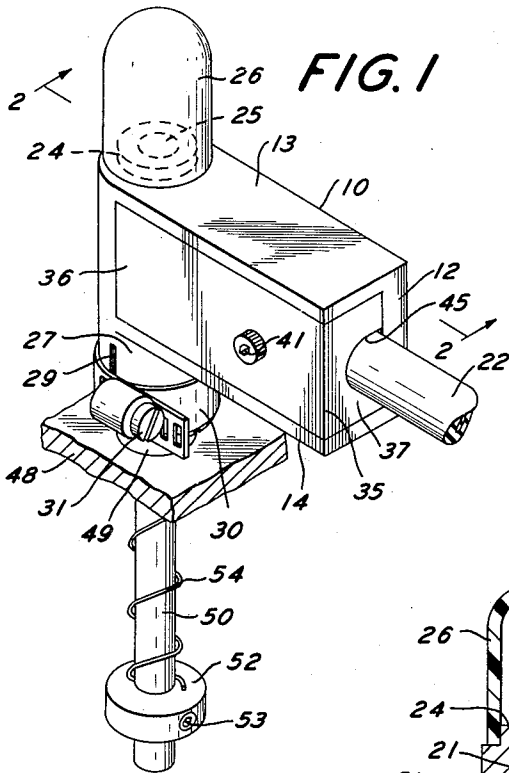
Aug. 11, 1964

W. KIWI

3,144,537

OPERATOR FOR MICROSWITCHES

Filed April 2, 1962



INVENTOR.  
WALTER KIWI  
BY  
*B. T. Wobensmith*  
ATTORNEY

1

3,144,537

**OPERATOR FOR MICROSWITCHES**

Walter Kiwi, Torredale Manor, Pa., assignor to R. H. Hood Company, Philadelphia, Pa., a corporation of Pennsylvania

Filed Apr. 2, 1962, Ser. No. 184,321

6 Claims. (Cl. 200-153)

2

is open at one end and has an elongated wall 12 and parallel side walls 13 and 14. Within the compartment 11, a microswitch 15, of conventional type, is mounted and held in position in any desired manner such as by screws 16, which extend into the housing wall 11. An insulating strip or pad 17 can be interposed, if desired, between the microswitch 15 and the walls 12, 13 and 14.

The microswitch 15 preferably includes a switch operator finger 18 which is normally urged outwardly in any desired manner, such as by a spring (not shown), and a flexible lever 19 pivotally mounted at one end on a pivot pin 20 and having at the opposite end thereof a roller 21. The microswitch 15 has interiorly disposed contacts (not shown) which can be opened or closed, as desired, by the movement of the operator finger 18.

A suitable conductor 22 can be provided having separate electrical conducting leads 23 connected as desired to the contacts (not shown).

The housing 10 preferably has extending from one side thereof an extension 24 with a bore 25 formed therein, preferably by a drilling operation, the bore 25 extending along one margin of the compartment 11. The bore 25 extends beyond the side wall 13 to accommodate the overtravel of the switch operator. A cap 26 of rubber or the like frictionally carried on the extension 24 can be provided to serve as a dust cap.

Extending from the opposite side of the housing 10 from that on which the extension 24 is located an integral clamping boss 27 is provided having an enlarged interior clamping bore 28, with which the bore 25 is coaxial, and pairs of radial slots 29. The boss 27, in surrounding relation thereto, is provided with a clamping strap 30 of well known type having an operating screw 31.

A cover plate 35 is provided for the housing 10 preferably of transparent synthetic plastic material, such as an acrylic resin, a main plate portion 36 which extends along the compartment 11, and has an end plate portion 37 for closing the end of the compartment 11 and engaging the wall 12 between the side walls 13 and 14. The main plate portion 36 has an opening 38 surrounded by a boss 39 for insertion of a cover plate mounting and holding screw 40 having a head 41. The screw 40 engages in an internally threaded opening 47 in the plate portion 36.

The inner face 42 of the main plate portion 36 has a central rib 43 extending therealong for aiding in supporting the cover plate 35 in mounted position and also for separating the inner two leads 23 and side ribs 44 parallel to the central rib 43 for separating the outer two of the leads 23.

The end plate portion 37 has an opening 45 for the reception of the conductor 22 and a projection 46 can be provided which engages and holds the conductor 22 and prevents separation thereof during use.

A mounting or carrying plate 48 is provided having a tube 49 therein of any desired insulating material, and preferably a friction resistant material, such as nylon or the like.

The tube 49 is secured, in any desired manner, in the plate 48 and extends into the clamping bore 28. The housing 10 is relatively adjustable longitudinally of the tube 49 for purposes of adjustment of the operating point of the microswitch 15.

An operating pin 50 is provided, slidable within the tube 49 and the bore 25 and has an inner end portion 51, preferably of conical shape, for engagement with the roller 21 to depress the lever 19 and move the switch operator finger 18 for microswitch actuation.

A collar 52 can be provided, adjustably mounted on the pin 50 and held in adjusted position by a set screw 53, and a compression spring 54 can be provided on the pin 50 abutting against the collar 52 and the outer end of the tube 49 for retracting the pin 50.

This invention relates to operators for microswitches. Considerable difficulty has been encountered with the microswitches and their operators which have heretofore been available because of the lack of provision for overtravel, and because of the difficulty of adjustment of the microswitches for operation at a particular operating point.

It is the principal object of the present invention to provide an operator for microswitches which has a wide range of adaptability, which has provisions for a large amount of overtravel, and which at the same time can be readily adjusted for operation at a closely set operating point.

It is a further object of the present invention to provide an operator for microswitches which can be readily connected to and operated by any desired actuating equipment, such as a mechanical element for hydraulic valve control, a diaphragm, a moving part of an automatic machine where close control of movement is required, or by other devices.

It is a further object of the present invention to provide an adjustable operator for microswitches in which a simple but effective arrangement is provide for adjustment of the precise point of actuation of the microswitch.

It is a further object of the present invention to provide an adjustable operator for microswitches in which a relatively few parts are employed and which requires a minimum of machining operations for completion.

It is a further object of the present invention to provide an adjustable operator for microswitches having a transparent wall so that the interior portions of the switch operator are visible to facilitate adjustment of the position thereof.

It is a further object of the present invention to provide an adjustable operator for microswitches in which a transparent cover is employed which cover is readily applied and removed and which retains the conductors in spaced and fixed relation.

Other objects and advantageous features of the invention will be apparent from the description and claims.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming a part thereof, in which:

FIGURE 1 is a view in perspective of an operator for microswitches in accordance with the present invention;

FIG. 2 is a central longitudinal sectional view taken approximately on the line 2-2 of FIG. 1;

FIG. 3 is a sectional view taken approximately on the line 3-3 of FIG. 1; and

FIG. 4 is a fragmentary sectional view taken approximately on the line 4-4 of FIG. 2.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

Referring now more particularly to the drawings, in which a preferred embodiment of the invention is illustrated, a housing 10 is provided of any suitable material and is advantageously made as a one piece casting of aluminum or other light weight metal. The housing 10 has formed therein a switch receiving compartment 11 which

The pin 50 can, of course, be actuated in any desired manner, determined by the particular apparatus with which the operator of the present invention is employed.

The mode of use will now be pointed out.

With the mounting plate 48 at a desired location on the machine, or other apparatus, where the microswitch 15 is to be employed, the operating pin 50 can be positioned as desired, and the collar 52 adjusted to provide the desired retracting force on the pin 50.

The housing 10 can also be adjusted relative to the mounting plate 48.

The clamping strap 30 is tightened by the screw 31 with the housing 10 positioned at the desired location relative to the mounting plate 48. In this manner by the positioning of the mounting plate 48 and the operating pin 50, the end portion 51 of the operating pin 50 can be adjusted to move the operator finger 18 to actuate the microswitch 15 at a closely set operating point, and be readily accessible to manual adjustment.

Overtravel of the operating pin 50 is accommodated in the bore 25, so that injury to the microswitch 15 and its components is avoided.

The housing 10, as previously indicated can be made as a casting so that the only machine operations required will be the boring of the bore 25, the provision of the holes for the screws 16 and the threaded hole 47.

The cover 35 can be quickly and easily clamped in position by the bolt 40 and will be held by the bolt head 41 in assembled relation. The cover 35 will retain the conductor 22 in place and retain the leads 23 in separated relation. The cover 35, in clamped in place position will have its end plate portion 37 in engagement with the wall 12, and will be supported by the central rib 43 in engagement with the wall 12 and with the inner face 42 in engagement with the heads of the screws 16.

Removal of the bolt 40 provides immediate removability of the cover 35 and access to the compartment 12.

This application is a continuation-in-part of my prior application filed March 2, 1961, Serial No. 92,923, now abandoned.

I claim:

1. Microswitch operating mechanism comprising a mounting member, a unitary housing member having an interior compartment, a removable cover member for said compartment, a microswitch in said compartment having a movable operating portion, said housing member having a bore extending along said compartment into which said operating portion extends, said bore extending to and beyond said operating portion, an operating rod movable along said bore and having an end portion engageable with said operating portion, and means adjustably mounting said housing member with respect to

said mounting member thereby to control the actuation comprising a tube carried by said mounting member having a passageway for said operating rod in alignment with said bore, said means including a clamping device for said tube.

2. Microswitch operating mechanism as defined in claim 1 in which said cover member is held in place by a bolt extending therethrough and into engagement with said housing member.

3. Microswitch operating mechanism as defined in claim 1 in which said microswitch has a conductor extending therefrom and said cover has a portion in holding relation to said conductor.

4. Microswitch operating mechanism as defined in claim 1 in which said cover member is held in place by a bolt extending therethrough and into engagement with said housing member and is positioned by an end wall closing an end of said compartment and an internal rib.

5. Microswitch operating mechanism as defined in claim 1 in which said microswitch has a plurality of leads extending therefrom and said cover member has portions in spacing relation to said leads.

6. Microswitch operating mechanism comprising a mounting member, a unitary housing member having an interior compartment bounded by an elongated wall and parallel side walls extending from said elongated wall, said compartment being open at one end thereof, a microswitch in said housing member having a movable operating portion, said housing member having a bore extending along said compartment at the opposite end thereof from said open end into which said operating portion extends, said bore extending to and beyond said operating portion, an operating rod movable along said bore and directly engageable with said operating portion, a conductor having a plurality of leads extending from said microswitch, a cover member for said compartment having a portion closing said open end and extending in clamping engagement with respect to said conductor, a retaining bolt for said cover extending through said cover and into said elongated wall, said cover member having a plurality of spacers for said leads, means including a clamping member adjustably mounting said housing member with respect to said mounting member thereby to control actuation of said operating portion, an abutment on said rod exteriorly of said housing member, and a resilient member on said rod in engagement with said abutment and urging said rod in a predetermined axial direction.

#### References Cited in the file of this patent

#### UNITED STATES PATENTS

2,904,652 Crane et al. ----- Sept. 15, 1959