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C. F. BROSS

3,290,475

MICROSWITCH HOLDER-ASSEMBLY

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FIG. 1

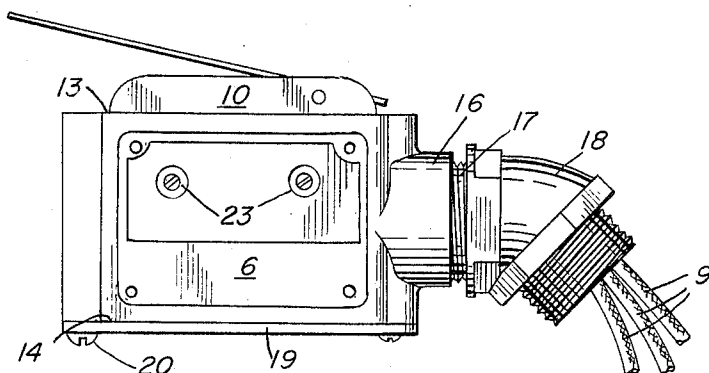


FIG. 2

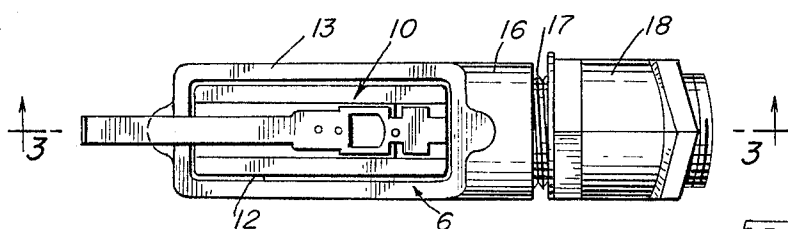


FIG. 4

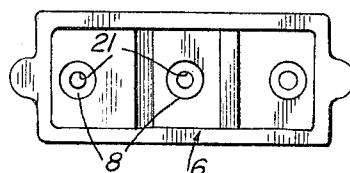


FIG. 3

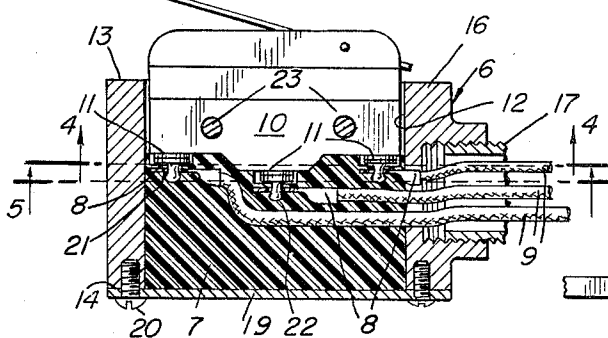
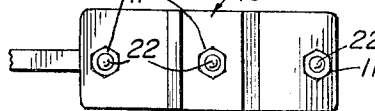


FIG. 5



Charles F. Bross INVENTOR.

BY

Summer and Snow
ATTYS.

1

3,290,475

MICROSWITCH HOLDER-ASSEMBLY

Charles F. Bross, Chicago, Ill., assignor, by mesne assignments, to Merrill Machinery Company, Chicago, Ill., a corporation of Illinois

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2 Claims. (Cl. 200—168)

This invention relates to improvements in microswitch mounting assemblies.

One of the specific and serious problems in using microswitches is the lack of guarantee of the number of pulses that a microswitch will provide. In equipment where such switches are used, finding a faulty microswitch might create a shut down of machinery for some time until found and replaced. Present day microswitches and their housing require a great deal of lost time in removing and replacing, as will hereinafter be explained. All this lost time due to shut down of machinery is costly to a manufacturer. It was to overcome this defect that the present invention was conceived.

The main objects of this invention are, therefore, to provide an improved microswitch mounting assembly of the type employed for effecting the recurring impulses of electrical circuits; to provide an improved structuring of an open-end supporting holder having an insulating core embedding the ends of lead-in conductors with their terminal contacts exposed on the inner face of the insulation core for circuit-closing engagement by the terminal contacts of a removable-insertable microswitch; to provide an improved form of the microswitch terminals for engagement with the conductor contact terminals; and to provide an improved microswitch assembly of this kind of such simple construction as to make very economical its manufacture and very facile the replacement of deficient microswitches with a minimum time loss in the operation of the equipment controlled by any one of a number of microswitches.

One specific embodiment of this invention is shown in the accompanying drawings; in which:

FIG. 1 is a side elevation of an improved microswitch assembly constructed in accordance with this invention;

FIG. 2 is a plan view of the same;

FIG. 3 is a partial section elevational view taken on the plane of the line 3—3 of FIG. 2;

FIG. 4 is a top plan view of the terminal holder with the microswitch removed, taken on the plane of the line 4—4 of FIG. 3; and

FIG. 5 is a plan view of the under face of the microswitch taken on the plane of the line 5—5 of FIG. 3.

The essential concept of this invention involves an open-ended block partially filled with an insulation core wherein is embedded lead-in conductors with the terminal contacts thereof exposed on the inner face of the insulation core subject to current-closing engagement by the exposed terminal contacts of a microswitch inserted into the block opening.

A microswitch mounting assembly embodying the foregoing concept comprises a holder 6 partially filled with an insulating core 7 embedding exposed contact terminals 8 for lead-in conductors 9 and a microswitch 10 with contact terminals 11 especially structured for snap engagement with the complementary conductor contact terminals 8.

The holder 6, as herein shown, is a conventional structure provided for the insertion of a conventional microswitch 10. The holder 6 is a rectangular-shaped block of material—metal or plastic—with a bore 12 extending through from one face 13 to the other face 14. One end has an internally-threaded hub 16 integrated therewith for the reception of a nipple 17 for the attachment of a fitting 18 to connect with a conventional conduit (not

2

shown) for the lead-in conductors 9. A plate 19 is secured by fasteners 20 to the face 14 of the holder 6 to close that end of the bore 12.

The insulating core 7 may be any non-conductive substance which, in a semi-fluid state, can be poured into the bore 12 of the holder 6 to embed the conductor terminal contacts 8 and adhere to the walls of the holder 6.

The conductor terminal contacts 8 are flat pieces of metal having apertures 21 in one end with the other end bonded to the end of conductors 9 after they are stripped of their insulation. The embedding of these terminal contacts 8, in the core 7, is such as to have the upper faces of them exposed, preferably in slight depressions in the interior face of the core 7 (FIG. 3). Also there are voids in the area directly below each of the apertures 21.

The contact terminals 11 for a microswitch 10 of this assembly are in the form of knobs 22 (FIGS. 3 and 5). These knob-shaped contact terminals 11 are so dimensioned as to permit the most facile snap insertion thereof into the respective apertures 21 of the conductor terminal contacts 8, and removal therefrom. Such a knob formation of these contact terminals 11 permits a very facile replacement of a defective microswitch by a new one. This is accomplished by merely pulling the microswitch body 10 upwardly out of the apertures 21. If the switch 10 is bolted to the housing 6, as by bolts 23, where the machine employing these microswitches is liable to vibrate the switch loose, then the fasteners 23 are removed to permit the defective microswitch 10 to be lifted out. Then, by merely inserting a new microswitch which obviously requires but seconds of time, the machine using this invention is again immediately ready for operation. One of the features of this invention is that no bolts 23 are actually required because of the snap engagement of the knobs 22 into the apertures 21 of the terminals 8, where they are substantially releasably locked to the terminals 8.

The heretofore conventional microswitch mounting assemblies involve a holder 6 such as described above. However, no such insulation core 7, as above explained, occupies the space between the plate 19 and the terminal contacts of the microswitch 10. In such conventional assemblies this space is vacant except for the terminal ends of the conductors. Moreover, the terminal contacts on the conventional microswitches involve the usual brass screws threaded into the base of the microswitch. The microswitch is held in position by the bolts 23. This is necessary.

Thus, with such conventional microswitch assemblies, the replacement of a defective microswitch has required these several operations. First the bolts 23 are removed. Second, it is necessary to remove the plate 19 in order to have access to the connections of the conductor terminal contacts with the terminal contacts of the microswitch. Then, it became necessary either to insert a screw driver into the open end of the holder to release the screw terminals on the microswitch, or to pull the microswitch out of the holder, with the conductor contacts still intact, in order to have access to the terminal screws. Once these screws are removed then the replacement microswitch has to have the conductor contact terminals attached to the microswitch by reinserting the screws. Thereupon, the replaced microswitch may be set into the holder and the retaining fasteners 23 replaced. Obviously, all of this consumes a great deal of time, during which much equipment remains idle.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. A microswitch assembly comprising,

3

- (a) a rectangular shaped hollow housing having four walls defining two opposed open faces;
 - (b) a plate secured to one of said faces of said housing to close the opening;
 - (c) an insulation core filling substantially half of said housing above said plate and having in its upper exposed surface a central recess; 5
 - (d) a plurality of conductors each attached to an aperture terminal contact and fixedly embedded in the insulation core with the terminal contacts seated exposed in depressions in the upper face of said insulation core; 10
 - (e) a microswitch dimensioned to sit in said housing above the insulation core and having a central downward projection on its bottom surface complementing said recess in the upper surface of said insulation core, said projection to be snugly received in said recess to preclude lateral movement of the microswitch with respect to said core; and 15
 - (f) knob shaped terminal contacts fixed on the face of the microswitch opposed to the insulation core and dimensioned to snap into and out of said respective apertured conductor terminal contacts when the microswitch is seated into or removed from said housing. 20
2. A microswitch assembly comprising,
- (a) a rectangular shaped hollow housing having four walls defining two opposed open faces;
 - (b) a plate secured to one of said faces of said housing to close the opening; 25

4

- (c) an insulation core filling substantially half of said housing above said plate and having in its upper exposed surface a central recess;
- (d) a plurality of conductors embedded in said insulation core with terminal contacts exposed on the upper surface thereof;
- (e) a microswitch dimensioned to sit in said housing above said insulation core and having a central downward projection on its bottom surface complementing said recess in the upper surface of said insulation core, said projection to be snugly received in said recess to preclude lateral movement of the microswitch with respect to said core; and
- (f) a corresponding plurality of exposed contact terminals on the bottom surface of said microswitch for circuit-closing engagement with said terminal contacts of said insulation core.

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ROBERT K. SCHAEFER, *Primary Examiner.*KATHLEEN H. CLAFFY, *Examiner.*H. O. JONES, *Assistant Examiner.*