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T. F. OSIKA

3,482,064

ELECTRICAL SWITCH HAVING PRESSURE CONTACTS

Filed Dec. 6, 1967

FIG. 1

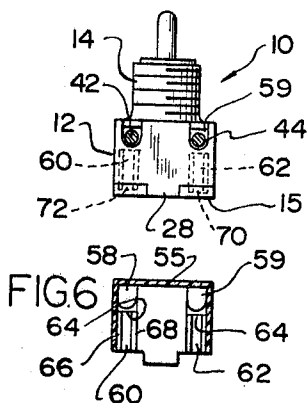


FIG. 2

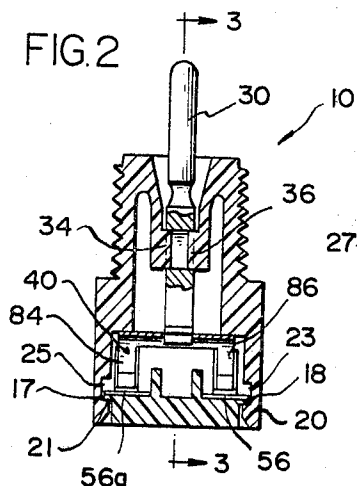


FIG. 5

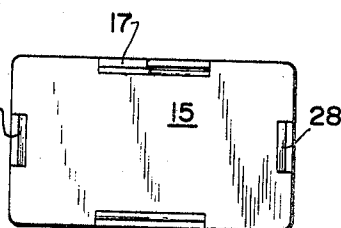


FIG. 3

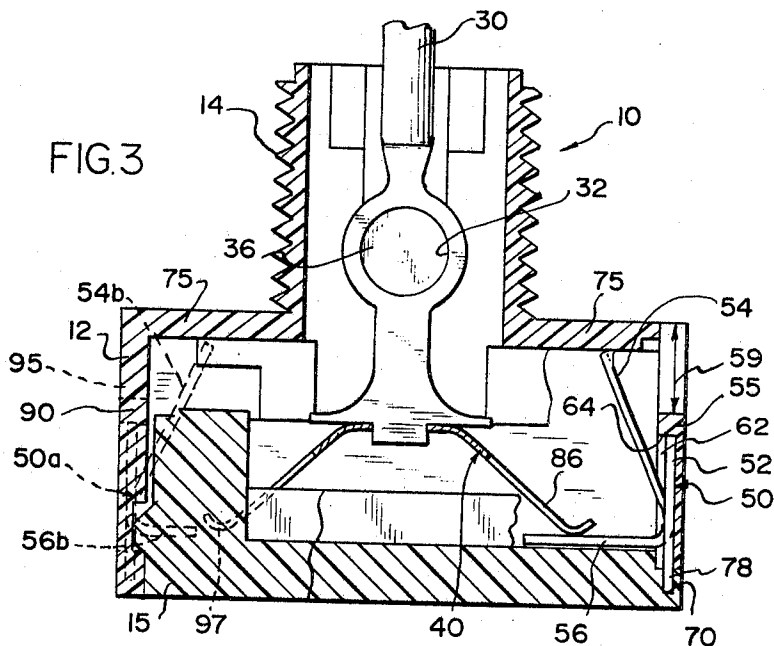


FIG. 4

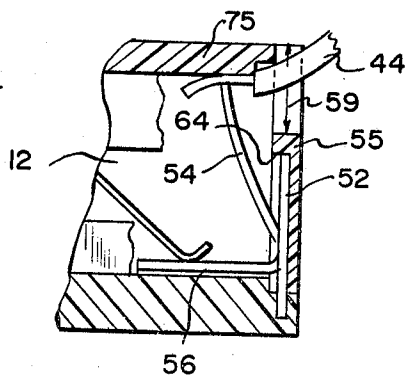
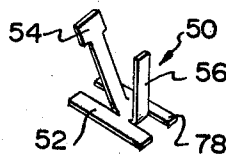


FIG. 7



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ELECTRICAL SWITCH HAVING PRESSURE CONTACTS

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5 Claims

ABSTRACT OF THE DISCLOSURE

The pressure contacts of this switch include a rectangular base portion from which are formed first and second resilient arms. The base portion is mounted in a groove on one wall of the switch housing and a part of it rests in a groove in the housing base so the body is restricted against longitudinal movement. One of the arm portions extends from the base portion and is compressed by a wall adjacent to the wall on which the base is mounted. The other arm portion extends from the body portion in a spaced relation to the housing base. A conductor extends into the housing between the adjacent wall and the arm portion.

Background of the invention

Electrical switches incorporating pressure contacts in the past have generally utilized contacts formed from more than one piece, or have required intricate molding of the switch housing to include additional partitions or walls within the housing in order to provide adequate mounting for the contacts.

Summary of the invention

It is an object of this invention to provide a pressure contact for an electrical switch which is relatively simple and easy to assemble in a switch housing.

It is another object of this invention to provide a pressure contact for an electrical switch which eliminates the need for an intricate partitioning scheme within the switch housing thereby reducing the time and cost required in molding the housing.

In one embodiment of this switch, first and second pressure contacts are used to secure conductors within the housing. Each of the contacts includes a body portion which has first and second resilient arms extending therefrom. The body portion is mounted in a groove on one wall of the housing and rests in an aligned groove in the housing base so that it is restricted against longitudinal movement. The first arm is compressed by a wall of the housing parallel to the base and adjacent to the wall on which the body is mounted. A conductor to be secured within the housing is inserted through an opening in the same wall on which the body is mounted and passes between the arm portion and the wall with which it is engaged. The conductor compresses the arm; however, because the base is restricted against longitudinal movement, the resiliency of the arm reacts to firmly wedge the conductor between the arm portion and the wall. The second arm portion extends in a spaced relation parallel to the base and is selectively engaged by the switch contact device to close the circuit.

Description of the drawing

FIG. 1 is a front elevation view of an electrical switch in accordance with this invention;

FIG. 2 is an enlarged front elevation view in cross-section;

FIG. 3 is a side elevation view in cross-section taken along the line 3—3 of FIG. 2;

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FIG. 4 is a portion of the side elevation view in cross-section of FIG. 3;

FIG. 5 is an enlarged bottom plan view of the switch of FIG. 1;

FIG. 6 is a cross-sectional view in elevation of the end wall of the housing of the switch of FIG. 1 looking from inside the housing outwardly therefrom; and

FIG. 7 is a perspective view of a contact used with the switch shown in FIG. 1 in accordance with this invention.

Detailed description

Referring to the figures of the drawing, FIG. 1 illustrates a toggle-type, electrical switch 10. The switch includes a rectangular shaped housing 12, which has a bushing 14 integral therewith. A base 15 is easily and rapidly assembled to the housing 12 by snapping the ridge portions 17 and 18 (FIG. 2) past the deformable portions 20 and 21 and into the grooves 23 and 25 of the housing. The deformable end portions 27 and 28 of the housing 12 snap into grooves over ridges in the ends of the base 15, as shown in FIG. 5.

The bat 30 which forms the operating lever for the switch mechanism has a circular opening 32 (FIG. 3) integrally molded therein. When the bat 30 is inserted into the bushing 14, it forces integrally molded deformable portions 34 and 36 (FIG. 2) of the bushing 14 apart until they are aligned with the hole 32. At this point the deformable portions snap into the hole and rotatably secure the bat in the bushing.

The bat 30 extends into a contact device 40 (FIG. 3) that is moved by the bat lever to bridge the contacts in the switch for completing an electrical circuit as will be described subsequently.

For ease of reliably assembling the electrical conductors 42 and 44 (FIG. 1) into the housing 12, the switch 10 is provided with a unique set of pressure contacts. FIG. 7 illustrates a typical contact used in accordance with this invention. Contact 50 is an integral piece made of a material that is resilient and a good electrical conductor. First and second resilient arm portions 54 and 56 are formed out of and extend from a body portion 52.

For mounting the contact into the housing, the wall 55 of the housing 12 (FIG. 6) includes integrally molded slots 60 and 62. Each slot is defined by a base 64 and first and second walls 66 and 68. The base portion 15 of the switch 10 (FIG. 3) has slots 70 and 72 therein which are aligned with the slots 62 and 60, respectively, when the base 15 is snapped onto the housing 12.

The following description of the assembly of a typical switch using the pressure contacts of this invention, illustrates the ease with which this is accomplished. Although the description is limited to positioning contact 50 into the aligned slots 62 and 70 in wall 55 of the housing 12, it should be understood that the other contacts in the switch housing are assembled in the same manner.

The housing 12 with the bat operating lever 30 assembled therein is inverted, and contact device 40 is mounted on the end of the bat. Subsequently, body portion 52 of contact 50 is slid into the slot 62 until the body 52 rests against the bottom 64 of the slot (FIG. 3). In this position, the arm portion 54 of the contact 50 extends in an interference fit with the wall 75, which is adjacent and normal to wall 55. Because the body 52 is longer than the slot 62, a part 78 of the body 52 extends from the wall 55. Base 15 is snapped onto the housing 12, and the slot 70 in the base 15 receives the portion 78, resulting in the body 52 being restricted in longitudinal movement between the base 64 of slot 62 and engagement with base 15 in the slot 70. With the base 15 snapped onto the housing, the arm portion 56 of the contact 50 extends in a spaced relation parallel to the base.

Subsequently, conductor 44 is inserted through the aperture 59 located in the wall 55 and engages the arm portion 54 (FIG. 4) compressing that arm towards the arm portion 56. However, because the base portion 52 is restricted against longitudinal movement the resiliency of the arm 54 reacts to wedge the conductor 44 between the arm 54 and the wall 75 of the housing 12. In order to further secure the conductor 44 within the housing 12, a force is applied to the conductor 44 in a direction to withdraw the conductor from the aperture 59. This acts to move the arm 54 closer to the wall 75 to complete the wedging action thereby positively fixing the conductor 44 within the housing 12.

Utilizing the pressure contacts of this switch, it is possible to arrange the contacts within the switch housing in various combinations. For instance, two contacts 50 can be mounted on the wall 55 in the slots 60 and 62 and used to secure the wire conductors 42 and 44 within the housing. With the pressure contacts located in this position, and the bat position so that the contact device 40 is located as shown in FIG. 3, the legs 84 and 86 (FIG. 2) of contact device 40 will bridge the arms 56 and 56a of two pressure contacts 50 positioned in slots 60 and 62 to complete the connection for energizing an electrical circuit through the conductors 42 and 44. Moving the bat 30 in a manner to slide the contact device 40 toward the wall 90 of the housing 12 will act to disengage the leg 84 from the arm 56a of the pressure contact 50 in slot 60 to open that circuit.

A single pole double throw arrangement of the pressure contacts 50 is provided by positioning another contact 50a in the wall 90. Another conductor (not shown) is inserted through hole 95 in the wall 90 of housing 12 and is secured by arm portion 54b to wall 75 of housing 12. When the contact device 40 is moved towards wall 90 to open circuit the conductors 42 and 44, the leg 86 of contact 40 still engages arm portion 56 of contact 50 positioned in slot 62 because it is longer than the similar arm portion 56a of contact 50 located in slot 60 in wall 55, and the leg 97 engages arm portion 56b of contact 50a to bridge these two contacts and complete a different electrical circuit.

What has been described, therefore, is a unique, simple and easy to assemble pressure contact electrical switch, which eliminates the need for molding intricate partitions in the switch housing.

I claim:

1. In a switch having a walled housing and a contact device operable by the switch mechanism to couple together first and second conductors extending into the switch housing for selectively energizing an electrical circuit, the combination including, first and second pressure contact means securing the conductors within the housing, each of said contact means including a body portion having first and second resilient arms extending therefrom, means for mounting said body portion on one wall of the housing in engagement with an adjacent wall normal to the one wall, said first resilient arm extending from

said body portion and engaging a wall of the housing parallel to the adjacent wall and being compressed thereby, said second resilient arm extending from said body portion in a spaced relation to the adjacent wall, said first resilient arm engaging one of the first and second conductors and wedging the same between said arm and the wall parallel to the adjacent wall to secure the conductor within the housing, and said second resilient arm being selectively engaged by the contact device to energize the electrical circuit.

2. The switch of claim 1 wherein said body portions of said first and second pressure contact means are mounted on the same wall of the housing.

3. The switch of claim 1 wherein said body portions of said first and second contact means are mounted on opposite walls of said housing.

4. In an electrical device having a hollow housing, an opening therein receiving a conductor into the housing, and a contact positioned in said housing and being connected to the conductor, the combination including, said contact having a body portion and first and second resilient arm portions extending therefrom, said body portion being positioned on one wall of the housing and having a part thereof engaging the wall of the housing adjacent said one wall, said first arm portion of said body portion extending in an interference fit with said adjacent wall, and said second arm portion thereof extending in a spaced relation to the wall of the housing parallel to said adjacent wall, said first arm portion being engaged by the conductor with the same being inserted in the housing and being compressed thereby to press said part of said body portion against said adjacent wall such that the conductor is wedged between said first arm portion and said adjacent wall.

5. The electrical device of claim 1 wherein said one wall includes a slot having a depth less than the length of said body portion, said parallel wall has a slot therein aligned with said slot in said one wall, and said body portion is mounted in a space formed by said slots and extends into said one wall and said parallel wall and is restricted from longitudinal movement within the slot by said parallel wall, with said first arm portion being compressed by the conductor.

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200—166; 339—164