United States Patent [19]

Reynolds

[11] **3,713,670**

[45] **Jan. 30, 1973**

[54] **WATERPROOF ROCKER ARM SWITCH ASSEMBLY**

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[73] Assignee: **AMP Incorporated**

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[52] **U.S. Cl.**.....**200/168 G,** 200/159 R, 200/61.62

[51] **Int. Cl.**.....**H01h 9/04**

[58] **Field of Search**.....200/168 G, 159 R, 61.62

[56] **References Cited**

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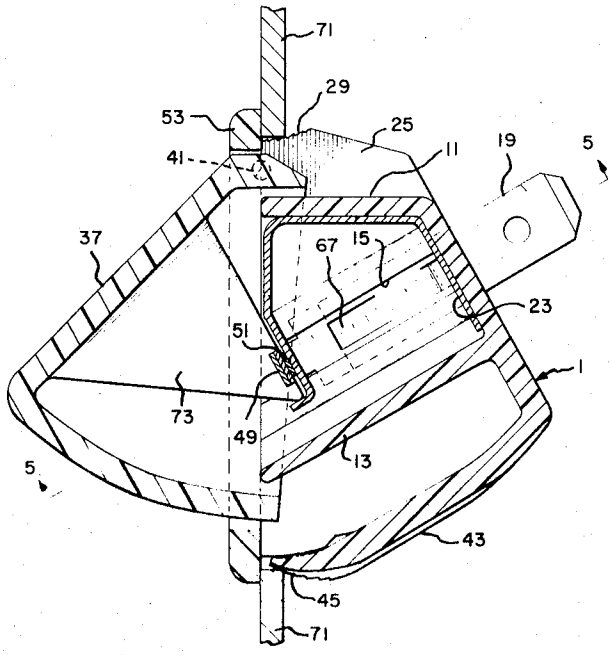
Primary Examiner—H. O. Jones

Attorney—William J. Keating et al.

[57] **ABSTRACT**

A rocker arm switch, for use in appliances and the like such as a refrigerator, being normally biased in the on condition and being waterproof to the extent that it is capable of being placed in locations having a great deal of moisture and wherein the moisture will be required to travel uphill in order to short circuit a pair of conductors positioned in the switch or provide a current path out of the switch interior.

10 Claims, 10 Drawing Figures



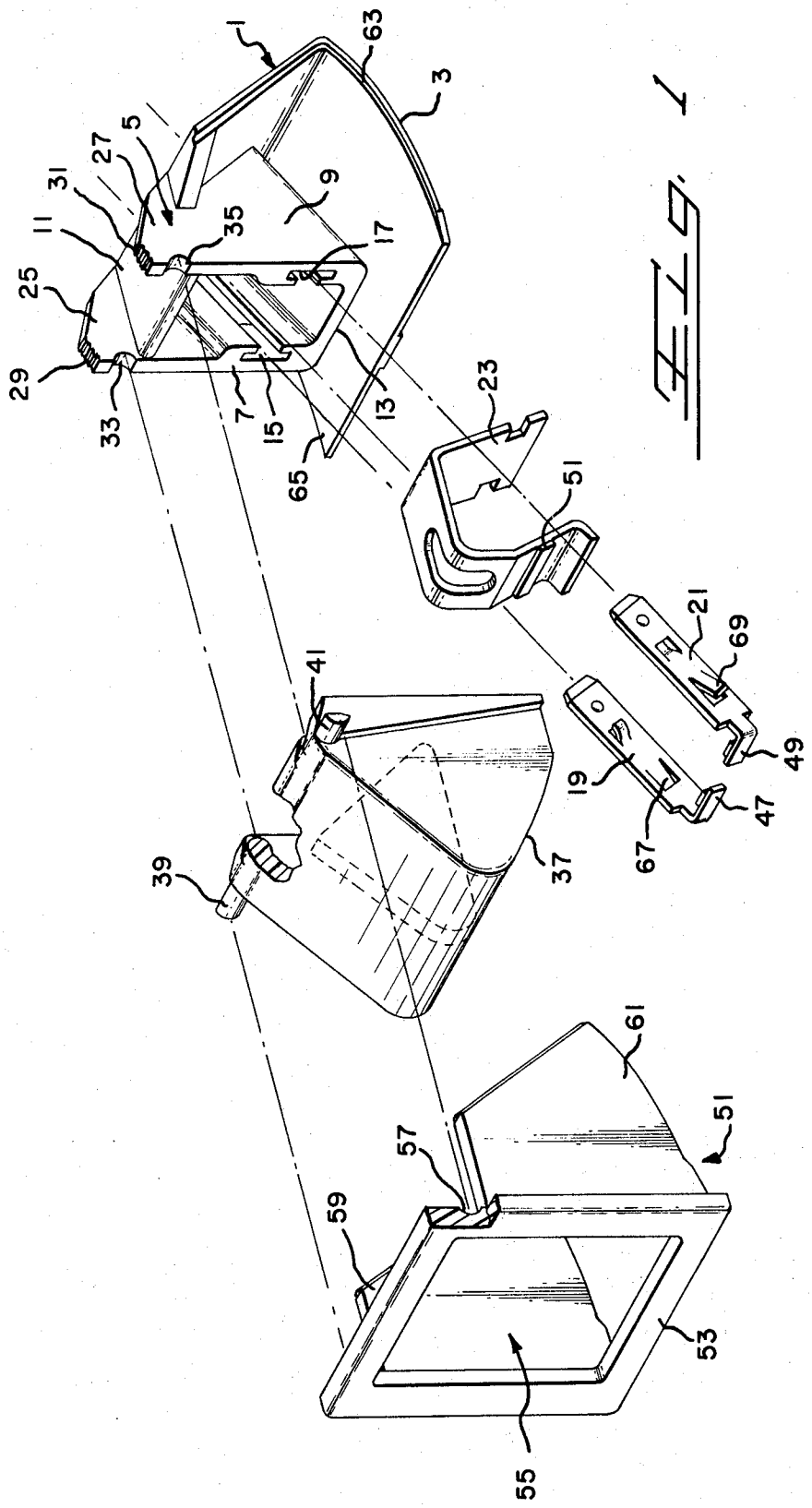

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FIG. 1

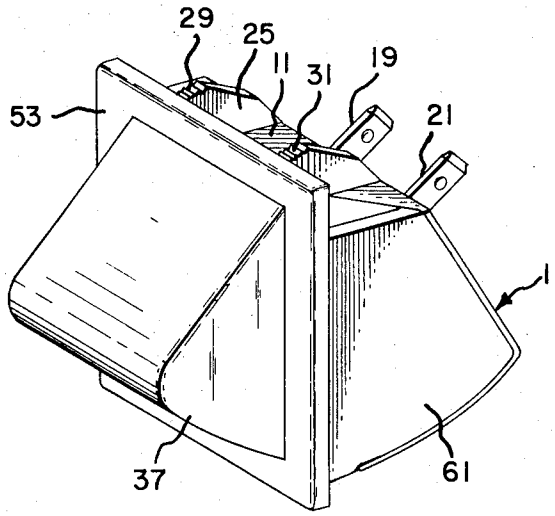

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Fig. 2

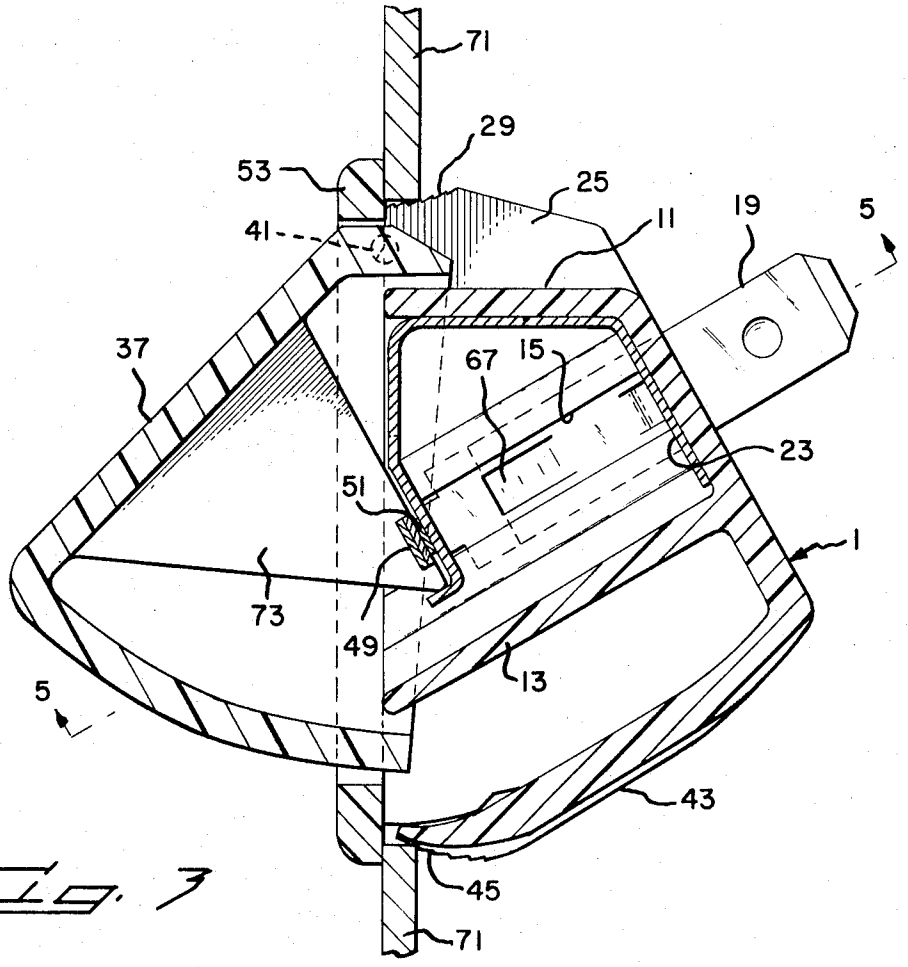

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Fig. 3

Fig. 4

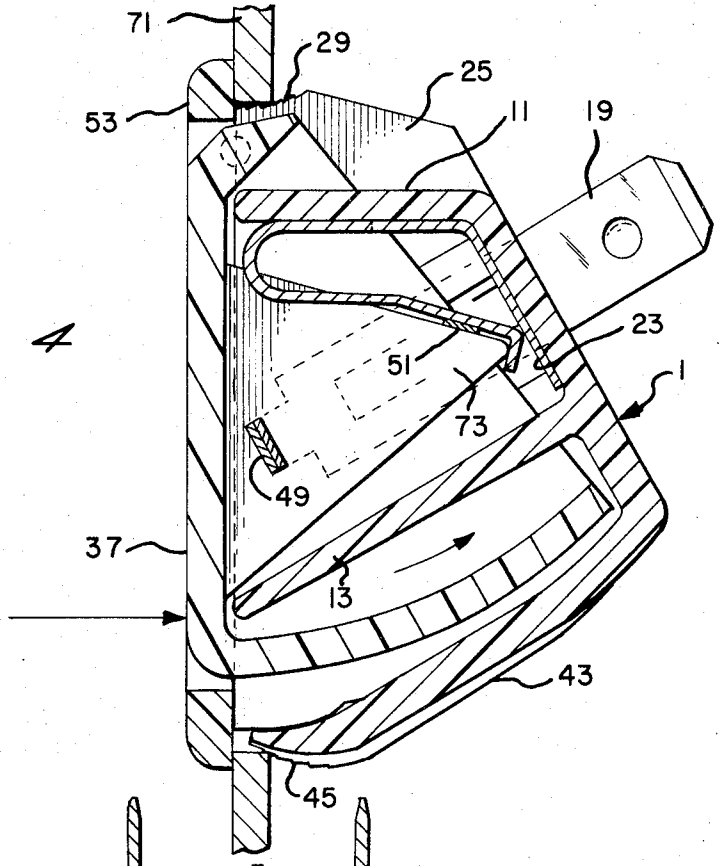
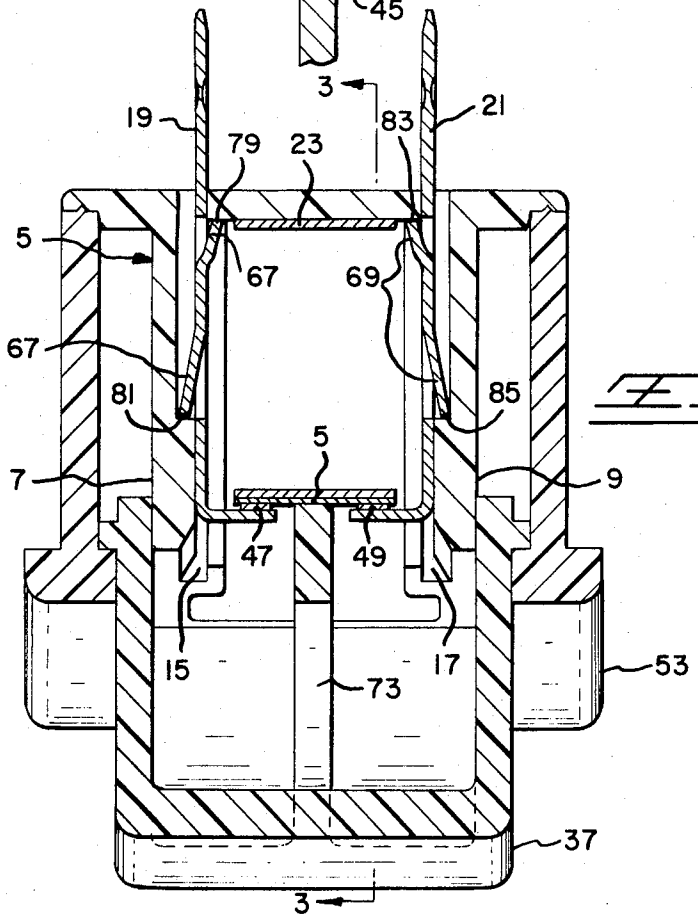

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Fig. 5


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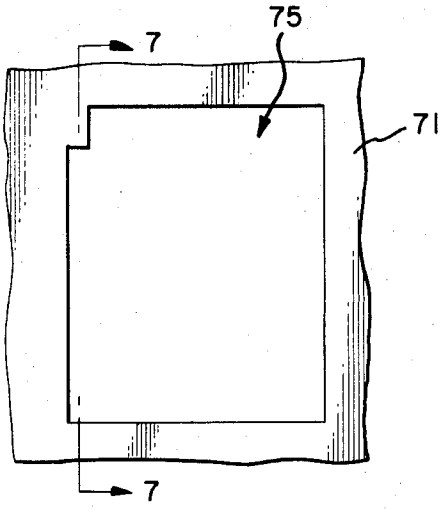


Fig. 6

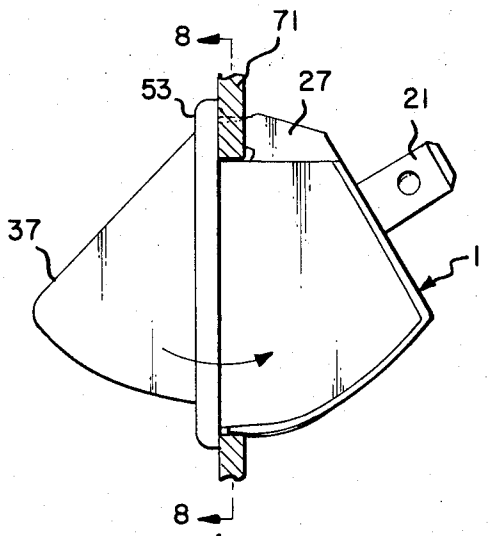


Fig. 7

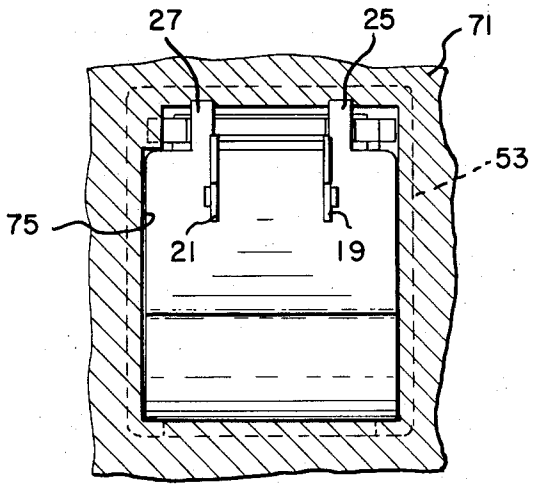


Fig. 8

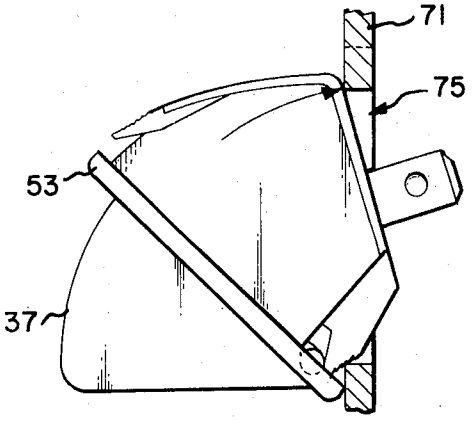


Fig. 9

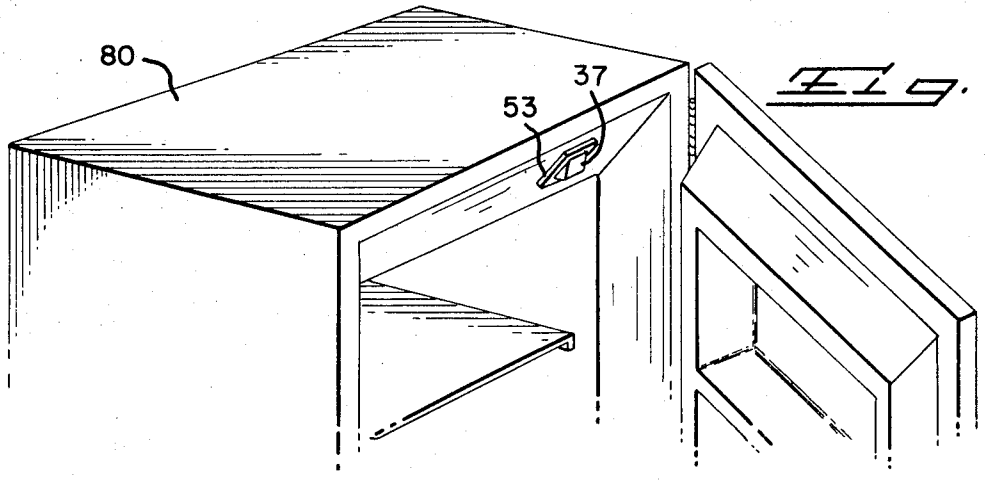


Fig. 10

WATERPROOF ROCKER ARM SWITCH ASSEMBLY

This invention relates to a rocker arm switch and, more specifically, to a normally biased on switch for use in appliances wherein moisture is required to travel uphill in the switch in order to short circuit conductors within the switch, thereby substantially eliminating the hazards of shock to an operator which can ensue.

The use of switches in appliances, such as refrigerators, which, when the door of the appliance is opened are automatically turned on and are closed by closure of the door are well known in the art. It is always desired that such switches be provided in a most economical manner and it is also required that these switches be safe in that they are able to pas the well known "wet sponge" test. It has been found that, often, when a housewife is cleaning a refrigerator with a wet sponge or the like, the moisture from the sponge will enter into the switch, complete the circuit therein and cause a shock to the housewife by the current flowing from the switch through the housewife to ground or through some other path.

In accordance with the present invention, this problem is overcome by positioning of the electrodes within the housing of the switch in such a way that moisture cannot normally travel up to the conductors therein since the path to the conductors is uphill. Accordingly, moisture entering the switch will drop downwardly and out and never come in contact with the electrical conductors therein.

It is therefore an object of this invention to provide a rocker arm switch for use in applicances and the like which is economical to produce relative to prior art switches.

It is a further object of this invention to provide a rocker arm switch which is capable of meeting the requirements of the "wet sponge" test.

It is a yet further object of this invention to provide a switch for use in appliances and the like which is relatively simple and easy to install.

The above objects and still further objects of this invention will immediately become apparent to those skilled in the art after consideration of the following preferred embodiments thereof which is provided by way of example and not by way of limitation wherein;

FIG. 1 is an exploded view of a rocker arm switch in accordance with the present invention;

FIG. 2 is an elevational view of the assembled rocker arm switch in accordance with the present invention;

FIG. 3 is a cross sectional view of the rocker arm switch of the present invention with the switch in the closed or current carrying position;

FIG. 4 is a view of the same as FIG. 3 but with the switch in the open or non current carrying position;

FIG. 5 is a view taken along the lines 5—5 of FIG. 3;

FIG. 6 is a front view of the rocker arm switch in accordance with the present invention when installed within an appliance such as a refrigerator;

FIG. 7. is a view taken along the lines 7—7 of FIG. 6;

FIG. 8 is a view taken along the lines 8—8 of FIG. 7;

FIG. 9 is a view showing the installation of the rocker arm switch of the present invention into an appliance; and

FIG. 10 shows a rocker arm switch in accordance with the present invention installed in a refrigerator.

Referring first to FIG. 1, there is shown an exploded view of the rocker arm switch in accordance with the present invention. The switch includes a rear housing 1 having a web 3 and a secondary housing portion 5 having sides 7 and 9, top 11 and bottom 13. The sides 7 and 9 include grooves 15 and 17 therein for receiving the terminal members 19 and 21 as will be explained in more detail hereinblow. The rear housing 1 also receives the bus member 23 in a manner which will be described in more detail hereinbelow. The side walls 7 and 9 include upwardly extending flange portions 25 and 27, each of these flange portions including serrations 29 and 31 at the uppermost portion thereof. The flanges 25 and 27 also include grooves 33 and 35 for receiving the button 37 at the pivots 39 and 41 thereof. The button 37 is pivoted about the pivots 39 and 41 within the grooves 33 and 35 and the bottom portion of the button 37 is movable inwardly between the web 3 and the lower wall 13 of the secondary housing member 5. The rear housing 1 also has a flange 43 beneath the web 3 thereof with serrations 45 at the forward end of the flange as best shown in FIG. 3.

The terminals 19 and 21 each have contact portions 47 and 49 thereon for mating with a terminal strip 51 on the bus member 23. The bus member 23 is a resilient spring member.

The front housing 51 includes a rectangular front portion 53 having an aperture 55 therein through which the button 37 can pass and also includes a pair of grooves 57 (only one shown) which align with the grooves 33 and 35 of the rear housing portion 1 and support the pivots 39 and 41 of the button 37. The front housing 51 also includes the pair of flanges 59 and 61 which extend beyond the button 37 and rest in grooves 63 and 65 of the rear housing 1 for bonding therein as will be described in more detail hereinbelow.

Referring now to FIG. 5, there is shown a cross section of the rocker arm switch in accordance with the present invention in the assembled condition. It can be seen that the terminals 19 and 21 include locking lances 67 and 69 which lock the terminals in place within the inner housing portion 5 at the seat portions 79, 81, 83 and 85. The bus member 23 is positioned against the inner wall surface of the inner compartment 5 and is friction locked therein as shown in FIG. 3. The bus bar 23 is a spring member and is normally biased so that the contact bar 51 thereof impinges against the contact portions 47 and 49 of the terminals 19 and 21 as shown in FIGS. 3 and 5. When in the completely assembled state the components of FIG. 1 would mate in the manner shown in elevation in FIG. 2 and in section in FIGS. 3 and 5.

Referring now to FIG. 3, there is shown a cross section of the switch in accordance with the present invention as mounted within a panel 71 of an appliance or the like. It can be seen that the switch is held in place by means of the serrations 29, 31 at the top thereof and the serrations 45 on the flange 43 at the bottom thereof. The switch is in the closed or current carrying condition with the bus bar 23 in contact with the terminals 19 and 21. When the switch is opened by the counterclockwise rotation of the button 37, as shown in FIG. 4, the finger 73 (best shown in FIG 5) moves inwardly against the contact portion 51 of the bus bar 23 to drive the contact portion 51 inwardly of the switch

as best shown in FIG. 4 and thereby open up the circuit between the contact portion 51 and the contact portions 47 and 49. It can be seen from the views of FIGS. 3 and 4 that any moisture entering into the rear housing 1 has only downwardly extending paths from the front surface and therefore any moisture cannot reasonably be expected to move upwardly to short circuit the bus bar 23 and the terminals 19 and 21 or to provide a current path between one of the terminals 19 and 21 and ground through a human being.

Referring now to FIGS. 6, 7 and 8, there are shown front, rear and side views of the rocker arm switch as mounted in an appliance similar to the view as shown in FIG. 4 but in elevation.

Referring now to FIG. 9, there is shown a view in elevation of the method of mounting rocker arm switch in accordance with the present invention into an appliance. It can be seen that an aperture 75 is provided in the appliance for receipt of the rocker arm switch. The switch is secured within the aperture 75 by first placing the serrated portion 45 thereof onto the panel 71 and then rotating the switch in a clockwise direction so that the upper portion of the panel 71 rests against the serrated portions 29 and 31 to secure the switch in position as shown in FIGS. 3, 4 and 7. The properly positioned rocker arm switch installed in an appliance 80 is shown in elevation in FIG. 10.

The front housing portion 51 and the rear housing 1 are secured together by either ultra sonic welding, cement or any other well known bonding procedure or bonding of plastic members at the junctions of flanges 57 and 59 and grooves 63 and 65. It should further be noted that the rocker arm switch member is formed from an insulating material, the only electrically conducted materials being the terminals 19 and 21 and the bus bar 23.

Although the invention has been described with respect to a specific preferred embodiment thereof, many variations and modifications will become apparent to those skilled in the art. It is therefore the intention that the appended claims be interpreted as broadly as possible in view of the prior art to include all such variations and modifications.

What is claimed is:

1. A rocker arm switch which includes a housing, an electrical terminal means secured in said housing and extending outwardly through said housing, an electrically conductive spring member secured in said housing normally out of contact with said terminal means, said housing including a secondary housing portion having a bottom surface, said bottom surface extending in an upward direction toward the rear of said housing and button means mounted in said housing for positioning said spring member relative to said terminal means.

2. A rocker arm switch as set forth in claim 1 wherein said spring member is normally in contact with said terminal means.

3. A rocker arm switch as set forth in claim 1 wherein said housing includes a web portion positioned below said bottom surface to form a space therebetween, said button means being movable into said space.

4. A rocker arm switch as set forth in claim 2 wherein said housing includes a web portion positioned below said bottom surface to form a space therebetween, said button means being movable into said space.

5. A rocker arm switch as set forth in claim 1 wherein said secondary housing includes groove means formed therein, said terminal means being positioned in said groove means, said spring member being frictionally secured with said secondary housing.

6. A rocker arm switch as set forth in claim 3 wherein said secondary housing includes groove means formed therein, said terminal means being positioned in said groove means, said spring member being frictionally secured with said secondary housing.

7. A rocker arm switch as set forth in claim 3 wherein said housing includes a front portion extending beyond at least a pair of opposite sides of the top of said secondary housing and said web, said top and said web each having an inwardly extending portion adjacent said front portion, said inwardly extending portions each having a serrated portion.

8. A rocker arm switch as set forth in claim 4 wherein said housing includes a front portion extending beyond at least a pair of opposite sides of the top of said secondary housing and said web, said top and said web each having an inwardly extending portion adjacent said front portion, said inwardly extending portions each having a serrated portion.

9. A rocker arm switch as set forth in claim 5 wherein said housing includes a front portion extending beyond at least a pair of opposite sides of the top of said secondary housing and said web, said top and said web each having an inwardly extending portion adjacent said front portion, said inwardly extending portions each having a serrated portion.

10. A rocker arm switch as set forth in claim 6 wherein said housing includes a front portion extending beyond at least a pair of opposite sides of the top of said secondary housing and said web, said top and said web each having an inwardly extending portion adjacent said front portion, said inwardly extending portions each having a serrated portion.

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