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J. C. STEARNS

2,400,849

WATERPROOF ELECTRIC SWITCH

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Fig. 1

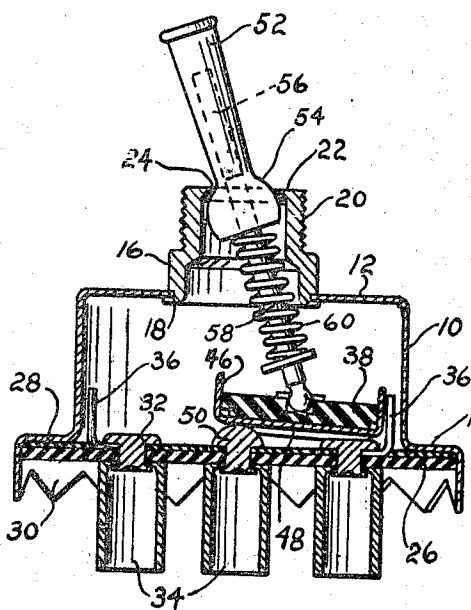
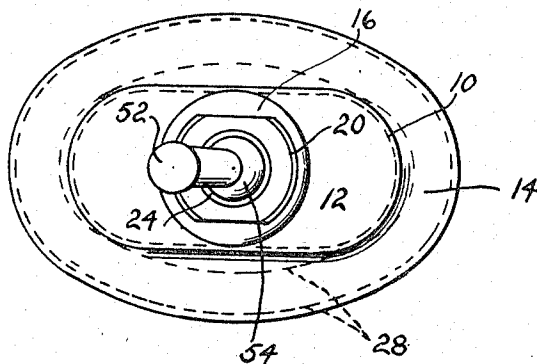


Fig. 2

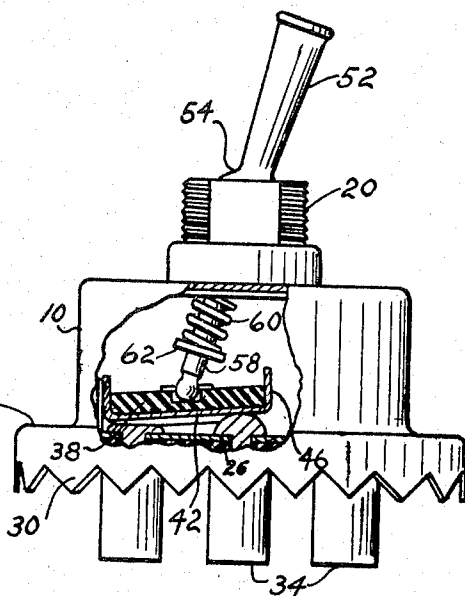


Fig. 3

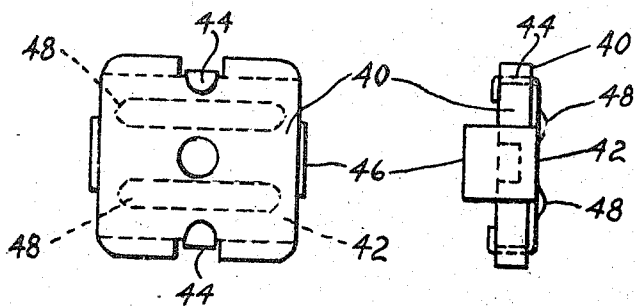


Fig. 4

Fig. 5

INVENTOR.
JASON C. STEARNS
BY
Charles R. Fay
att'y

UNITED STATES PATENT OFFICE

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WATERPROOF ELECTRIC SWITCH

Jason C. Stearns, Worcester, Mass.

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7 Claims. (Cl. 200—67)

This invention relates to a waterproof electric switch which embodies several additional features of novelty.

Objects of the invention include the provision of a waterproof switch comprising a continuous housing which is open at one side and has a central aperture in an opposite side, the open side being closed by an insulating panel mounting contacts, and this panel is provided with a gasket interposed between itself and a flange on the housing; the central aperture is also provided with a gasket which acts as a bearing as well as a watertight closure for a pivoted bridge-moving arm thereon, the arm comprising two axially movable parts having a spring interposed so that one part is constantly urged against the gasket maintaining the same in tight connection therewith and also urging another part into engagement with the bridge for forcing it against the contacts.

Further objects of the invention include the provision of a bridge having a curved channel made of electricity conducting material adapted to engage a rounded contact for not only guiding the bridge during its movement but also providing an extra surface of contact; in combination with another contact or contacts comprising an angular element of electricity conducting material one of the arms of which forms a base for connection to an exterior lead receiving element and the other arm of which forms an abutment whereby the bridge will contact both the abutment as well as the contact itself resulting in a three point support for the bridge and providing for positive engagement of the bridge with the contact at at least two points so that in the operation of the switch the contact is kept cleaner due to reduced arcing and also providing for reduced possibility of failure in contact.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, in which

Fig. 1 is a top plan view of a switch according to the present invention;

Fig. 2 is a vertical cross section through the switch;

Fig. 3 is a view in elevation of the switch, parts being in section;

Fig. 4 is a top plan view of the bridge; and

Fig. 5 is a view in side elevation of the bridge.

As shown in the drawing the present invention comprises a generally cup-shaped continuous housing 10 having a bottom wall 12 and an open side defined by a continuous flange 14. As

shown in the drawing the bottom wall 12 is provided with an aperture into which is tightly connected a fitting 16, by means of a central groove receiving the edges of the aperture in the bottom 12, the material of the fitting being peened over or rolled as at 18 to firmly secure the fitting to the wall 12 in watertight relation thereto. The fitting 16 could be made integral with the cup but it is preferred that the part should be separate for ease in manufacture especially since the fitting is threaded as at 20 for the reception of a securing nut, not shown, but for the purpose of securing the switch as a unit to a switch panel.

The fitting 16 is provided with a central opening defined by a small flange 22, see Fig. 2, on the interior side of which is positioned a gasket 24 closely fitting the opening.

The flange 14 receives an insulating panel 26 conforming to the shape thereof and interposed between the insulating panel and flange 14 there is another gasket 28 the shape of which is shown in dotted lines in Fig. 1. Tabs 30 are adapted to be pressed down so as to compress the gasket 28 against the flange and to thereby render this side of the housing watertight. Rivets 32 are adapted to secure lead receiving elements 34 to the insulating panel 26 and the rivets are of a material which will conduit electricity from the lead receiving elements to the interior of the housing so that the rivets act as contacts.

There are provided on certain of the rivets or contacts 32 angular elements 36 each of which has an arm secured by the rivet to the insulating panel and another arm extending at right angles thereto forming abutments the functions of which will be described hereinafter.

A bridge 38 is provided, this bridge being shown as comprising an insulating panel 40 having secured to the bottom surface thereof an electricity conducting plate 42, the latter having tabs 44 received in slots in the insulating panel to secure plate 42 thereto. At each end of the plate 42 there are provided upstanding flanges 46 which are adapted for contact with abutments 36 as shown in Figs. 2 and 3 and on the bottom surface of plate 42 there are provided spaced longitudinal rounded ridges or projections 48 which conform in shape to the contact 50, the latter being rounded; i. e., the ridges conform to the rounded contact 50 at the contacting areas of these parts. It will be seen that the ridges 48 are guided by contact 50 in the sliding movement of the bridge and also that a wider area of contact is provided by this curved construction.

A swinging or pivoted bridge actuating arm is provided and this arm comprises a handle 52 extending exteriorly of the housing and terminating in a ball-like element 54 which is rockably and slidably arranged on the gasket 24 as a bearing. The handle is provided with an axial channel 55 in which is slidable a rod 58 surrounded by a spring 60 and having an abutment against a pin or plate 62 fast to the rod 58, so that the rod and the handle are continuously urged apart, whereby the ball-like element 54 is continuously engaged in sliding contact with gasket 24 and also the rod 58 is maintained in engagement with the bridge 38 and forces it against the contacts as clearly shown in the drawing.

The switch described above will be seen to be absolutely watertight inasmuch as the gasket at 28 seals the insulating panel opening and the ball-like element 54 of the bridge actuating arm is always maintained against the gasket 24 which acts as a bearing and is thereby sealed against the entry of water. In addition to the above, an improved contact is maintained between abutments 36 and 46 and plate 42 contacts 32 while at the same time the bridge is guided by the central contact 50 as above described, and therefore a three point support is always maintained insofar as the bridge is concerned as long as a contact 32 is bridged to contact 50. The abutment construction described results in positive contact between the bridge and the contacts 32 and also provides for reduced arcing and consequently longer life of the switch.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A waterproof electric switch comprising a housing, a swingingly movable switch contact arm mounted thereon, a gasket mounted in the housing and surrounding the arm at the area of contact therewith, an insulating panel forming a wall of the housing, a gasket between the sides of the housing and said panel, the housing being completely closed otherwise, contacts in the panel, and a bridge moved by the movable arm in cooperation with the contacts.

2. A waterproof electric switch comprising a housing, an open side thereon, and an aperture in the opposite side thereof, said housing being otherwise continuous and closed, an insulat-

ing panel closing the open side, a gasket between the panel and housing, a gasket surrounding the aperture, a swingingly movable switch arm mounted to move on the gasket as a bearing, contacts in the housing, and a bridge, said switch arm bearing on the bridge and moving the same to connect or selectively disconnect said contacts.

3. A waterproof electric switch comprising a housing, said housing being completely closed except for an aperture in a side thereof, a gasket surrounding said aperture, a swinging arm mounted to move on the gasket as a bearing, contacts in the housing, a bridge therefor, said arm being engaged with the bridge to move the same, and a spring acting to maintain the arm in close contact with the gasket.

4. An electric switch as recited in claim 3 wherein the arm is provided with a ball-like element and the gasket is circular, the spring maintaining the element in swinging contact with the gasket.

5. A waterproof electric switch comprising a housing having an open side and an opposite side having an aperture therein, an insulating panel closing the open side, a gasket between the panel and housing, means compressing the panel and housing against the housing, a circular gasket surrounding the aperture, an arm pivoted on the gasket as a bearing, contacts in the housing, a bridge, said arm being in two axially movable parts, a spring interposed between the parts to constantly urge one part into close engagement with the circular gasket and the other part into engagement with the bridge.

6. In a switch of the class described, a housing, a rounded contact therein, and a movable bridge, said bridge having a portion shaped to correspond to the contact and movable with respect thereto, whereby the contact area between bridge and contact is increased and the contact guides the bridge in the movement of the latter.

7. In a switch of the class described, a housing, a contact therein, said contact being L-shaped to form an angle, and a movable bridge, said bridge having an electricity conducting portion in the form of an angle for contacting both legs of the contact whereby the latter acts as an abutment for the bridge and the bridge is provided with at least two contact points with the contact.

JASON C. STEARNS.