

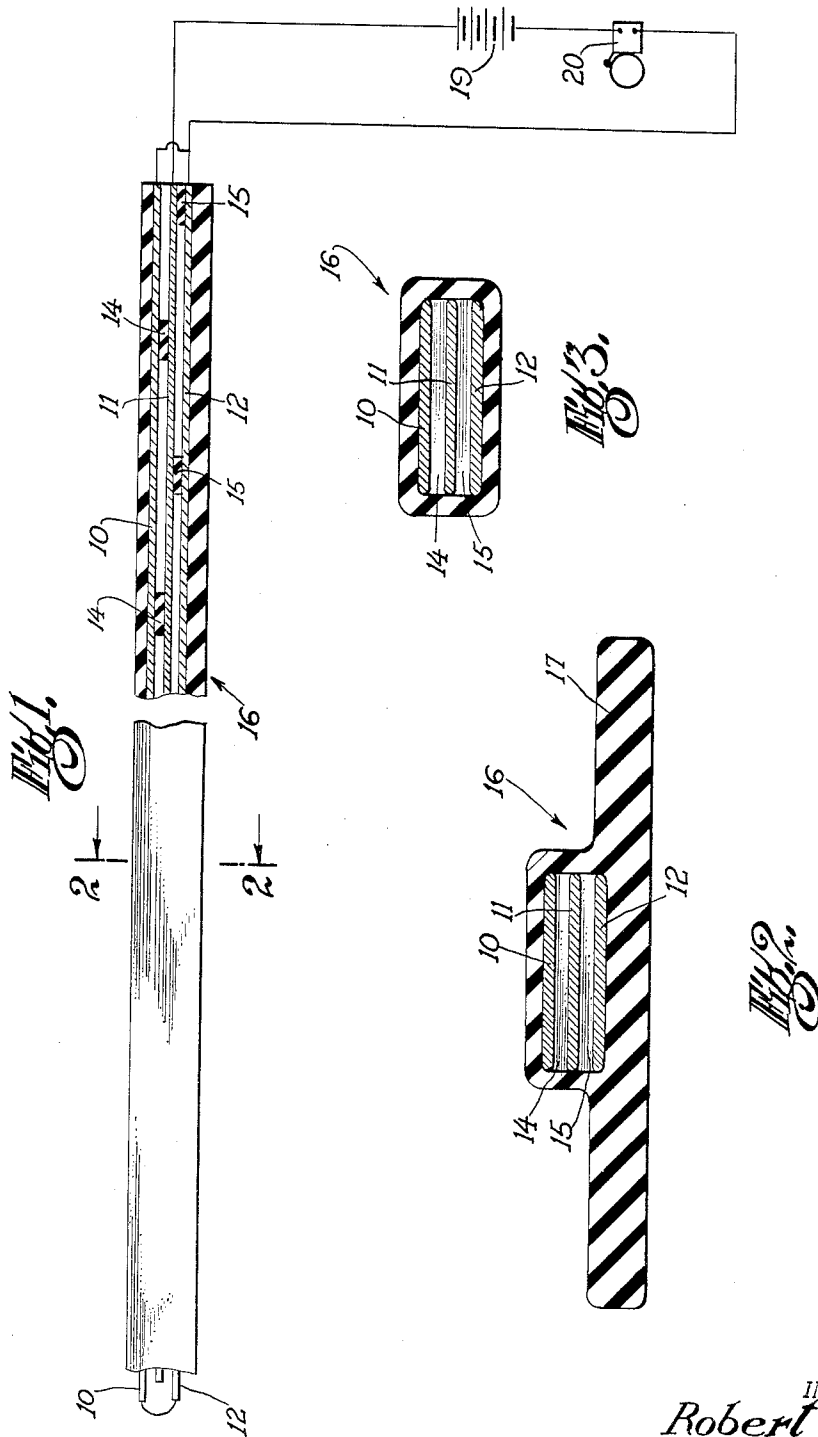
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DEFORMABLE SWITCH

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DEFORMABLE SWITCH

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6 Claims. (Cl. 200—86)

The present invention relates to electrical circuit makers, and, more particularly, to a deformable switch which is operable by being compressed at any point along its length.

Such switches generally comprise two superimposed relatively thin, flexible, electrically conductive strips; a series of short lengthwise spaced pad-like insulating elements for normally holding the strips out of contact with each other; and a tubular, deformable, non-conductive housing for the strips. It is intended to operate the switches to make an electrical circuit by compressing the housing in a direction to move the strips into contact with each other. This is accomplished if the pressure is applied at points intermediate the insulating elements. However, should the pressure be applied directly at points where the insulating elements are located, the strips will not be moved into contact with each other to make a circuit. Consequently, such switches contain many dead spots which render them unreliable, particularly in cases where deformation of the housing over a very short lengthwise section is intended to make the circuit.

Accordingly, an object of the present invention is to provide a switch of the general character indicated which has no dead spots and therefore is operable at any point along its length.

Another object is to provide such a switch which is simple and practical in construction and is economical to manufacture.

A further object is to provide such a switch which can be used advantageously for a great variety of purposes where accuracy and reliability are of considerable importance and quick making of a circuit in response to compression of short lengthwise sections is an important factor.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

In accordance with the present invention, the foregoing objects are accomplished by providing a switch assembly which comprises first, second and third elongate, superimposed, flexible, electrically conductive strips; a series of lengthwise spaced insulating elements for normally holding the first and second strips out of contact with each other; a second series of lengthwise spaced insulating elements for normally holding the second and third strips out of contact with each other, the elements of the first and second series being staggered lengthwise with respect to each other; and a tubular, deformable, nonconductive housing for the strips.

A preferred embodiment of the invention has been chosen for purposes of illustration and description, and is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is a fragmentary side elevational view, partly in

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section, illustrating a switch assembly, in accordance with the invention, connected in an alarm circuit.

Fig. 2 is a sectional view taken along the line 2—2 on Fig. 1.

Fig. 3 is a sectional view similar to Fig. 2, but illustrating another form of housing.

Referring to the drawing in detail and more particularly to Figs. 1 and 2 thereof, there is shown a switch assembly generally comprising three superimposed metallic strips 10, 11 and 12, a series of elements 14 for normally holding the strips 10 and 11 out of contact with each other, a second series of elements 15 for normally holding the strips 11 and 12 out of contact with each other, and a tubular housing 16 for the strips.

The strips 10, 11 and 12 are formed of electrically conductive material, such as copper or the like, and are relatively thin and flexible. For example, these strips may have a width of about three eighths of an inch and a thickness of about ten thousandths of an inch.

The elements 14 and 15 may be small pads of suitable insulating material, such as rubber. These pads extend from one side edge to the other of the strips, and, for example, may have a length of about one quarter of an inch and a thickness of about one sixteenth of an inch.

In accordance with the invention, the pads 14 are spaced lengthwise equidistantly with their midpoints about one inch apart, and the pads 15 are identically spaced but are staggered equidistantly lengthwise with respect to the pads 14. In this manner the switch assembly has no dead spots, and contact can be established between the middle strip 11 and either the strip 10 or the strip 12 at any point along the length upon compression of the switch assembly. For example, if the assembly is compressed at a point where a pad 14 holds the strips 10 and 11 out of contact, the strip 12 will be moved into contact with the strip 11.

The pads preferably are held in place by adhesively securing them to one or both of the strips which they hold apart. For example, to facilitate assembling the strips in the housing, the pads 14 and 15 are attached respectively to the sides of the strip 11.

The housing 16, as shown, has a rectangular bore for snugly receiving the strips and the pads positioned therebetween. The housing may have side flanges 17 (Fig. 2) to facilitate securement of the assembly in its position of use, or may be substantially rectangular in cross-section (Fig. 3). Preferably, the housing is formed of rubber or some other readily deformable material which provides a watertight seal about the strips and is weather resistant at temperatures between about -65° F. and about 160° F.

The switch assembly is adapted to be used in an alarm circuit, including a source of electrical energy 19 and alarm means, such as a bell 20. In this circuit, the strips 10 and 12 may be connected to each other at one end thereof or both ends thereof (as shown) and these strips are connected to one terminal of the bell, the strip 11 is connected to one pole of the source, and the other terminal of the bell is connected to the other pole of the source, so that, upon establishing contact between the strip 11 and the strip 10 and/or the strip 12, the circuit is closed and the bell is energized to sound an alarm.

From the foregoing description, it will be seen that the present invention provides a new and improved cable-like switch assembly which is practical and reliable and is readily adapted for many uses.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in any limiting sense.

I claim:

1. A switch assembly comprising first, second and third superimposed, flexible, electrically conductive strips of indefinite, continuous length; a series of lengthwise spaced insulating elements for normally holding said first and second strips out of contact with each other; a second series of lengthwise spaced insulating elements for normally holding said second and third strips out of contact with each other, said elements of said first and second series being staggered lengthwise with respect to each other and extending from one side edge to the other side edge of said strips; and a tubular, deformable, nonconductive housing of indefinite, continuous length for said strips and confining the side edges of said strips and said elements.

2. A switch assembly according to claim 1, wherein said insulating elements are resilient pads positioned between said strips.

3. A switch assembly according to claim 1, wherein said insulating elements are each secured to at least one of said strips.

4. A switch assembly according to claim 1, wherein said insulating elements are secured to both of said strips held apart thereby.

5. A switch assembly according to claim 1, wherein

said first and third strips are electrically connected to each other.

6. A switch assembly of the class described comprising first, second and third superimposed, flexible, electrically conductive strips of indefinite, continuous length; a series of lengthwise spaced insulating pads between said first and second strips for normally holding the same out of contact with each other and attached to at least one of said strips; a second series of lengthwise spaced insulating pads between said second and third strips for normally holding the same out of contact with each other and attached to at least one of said strips, said pads of said first and second series being staggered lengthwise with respect to each other and extending from one side edge to the other side edge of said strips and said first and third strips being electrically connected to each other; and a tubular, deformable, nonconductive housing of indefinite, continuous length for said strips and confining the side edges of said strips and said pads.

References Cited in the file of this patent

UNITED STATES PATENTS

2,611,049 Roby _____ Sept. 16, 1952