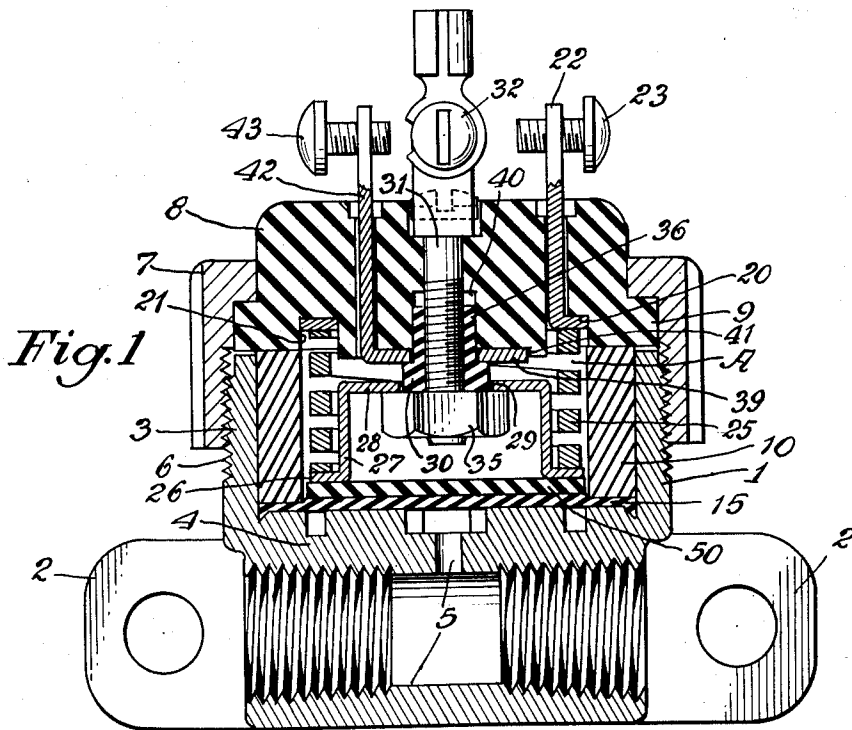
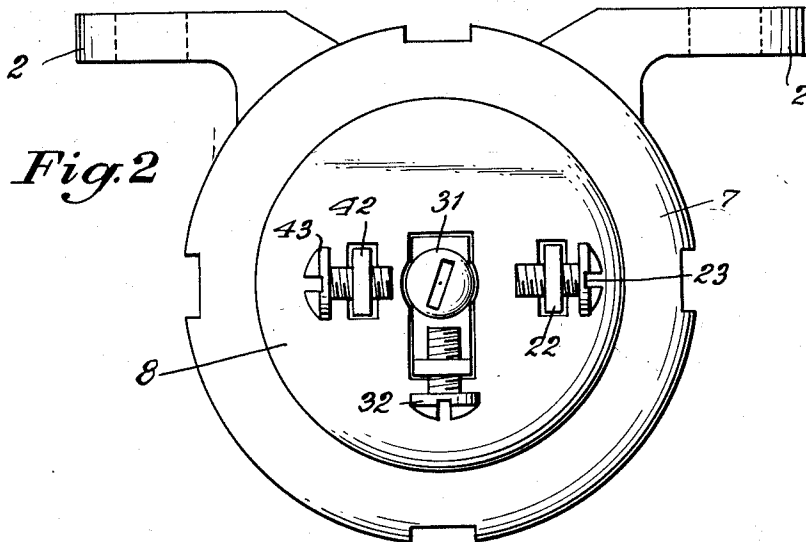


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DOUBLE THROW SWITCH  
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## DOUBLE THROW SWITCH

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2 Claims. (Cl. 200—83)

This invention relates to switches and has particular relation to an air operated switch.

One purpose of my invention is to provide a double throw, air operated electrical switch of maximum simplicity in manufacture and construction and reliability in operation.

Another purpose is to provide an air operated double throw switch having a particular diaphragm construction and supporting structure therefor.

Other purposes will appear from time to time during the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings wherein:

Figure 1 is a side view in cross-section and

Figure 2 is an end view.

Like parts are indicated by like numerals throughout the specification and drawings.

Referring now to the drawings, particularly to Figure 1, a first switch housing or body part is shown at 1. The part 1 may carry attaching lugs or bracket portions 2. The major segment of the portion 1 is generally cup shaped, having a circumferential wall part 3 and an end or bottom wall 4 through which an air passage 5 extends, the purpose of which will appear hereinafter. The outer surface of the circumferential wall part 3 may be threaded as indicated at 6 to rotatably receive a spanner nut 7 effective to clamp to the part 1 a second switch body or housing part 8 which may conveniently be formed of insulating material. The part 8 carries the outwardly extending annular flange 9, which may be clamped against the end edge of the portion 3 by the spanner nut 7 to complete the switch housing and to form therewithin a chamber A. A spacer lining or ring 10 of insulating material may similarly be clamped within the housing portion 1 by the closure 8 and may serve to clamp or secure against a peripheral portion of the inner surface of the wall 4 a flexible diaphragm member 15 about its annular edge, it being understood that the diaphragm 15 effectively divides the housing of the switch of my invention with the chamber A on one side of the diaphragm 15 and the passage 5 on the opposite side thereof.

A first, continuously energized contact ring 20 is positioned within the cover 8 and specifically within an annular groove 21 formed in the inner end surface thereof. An integral terminal portion 22 extends through and outwardly from the cover 8 from the ring 20 and carries the connector element 23 adjacent its outer end. A spring 25 is positioned within the chamber A and has one of its ends in contact with the inner annular surface of the contact ring 20 and its opposite end in contact with an outwardly extending flange 26 of a generally cup-shaped movable contact member 27.

The movable contact 27 has an end or bottom wall 28 generally centrally apertured as at 29. An insulating sleeve 30 is carried by a fixed terminal or post contact member 31. Member 31 extends through the switch housing part 8 and carries at its outer end a connector device 32. The inner end of the member 31 carries with-

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in the cup-shaped movable contact 27 a contact element 35 which may take the form, as shown, of a nut threaded on the inner end of the post or member 31. It will be observed that the nut 35 is of a diameter greater than the aperture 29 in the wall 28 of the movable contact 27 and that the spring 25 is therefore effective normally to urge the movable contact 27 into electrical energy-transmitting contact with the element 35, and therefore with the terminal post 31 and connector 32.

The insulated sleeve 30 has a reduced cylindrical portion seated within a generally central well 40 formed in the inner annular face of the cover part 8. A second contact ring member 39 surrounds the reduced portion 36 of the sleeve 30 and is held within an annular seat 41 in the inner face of the member 8 by the larger segment of the sleeve 30 and through it by the nut or contact element 35. The second contact ring 39 has secured thereto and extending through the cover part 8, a terminal or contact portion 42 which carries at its outer end a connector member 43.

Positioned between the annular flange 26 of the member 27 and the inner surface of the diaphragm 15 or that surface within the chamber A is an insulating and diaphragm-supporting disc 50 formed of relatively rigid insulating material.

Whereas I have described and claimed a practical and operative device, nevertheless, many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as, in a broad sense, illustrative or diagrammatic, rather than as limiting me to my precise showing.

The use and operation of my invention are as follows:

It will be understood that the terminal 22 has connected thereto a source of electrical energy. With the switch parts in the position illustrated in Figure 1, the circuit would therefore run through the terminal 22, spring 25, movable switch part 27, element 35 and post 31 to the connector 32. When air pressure is directed against the diaphragm 15 through the passage 5 to a level predetermined by the strength or resistance of the spring 25, the diaphragm 15, insulating and supporting disc 50 and movable switch part 27 is moved, against the action of the spring 25, to separate the wall 28 of the part 27 from the contact 35, thus breaking said circuit. Delivery of an increased air pressure through passage 5 is effective to move the contact 27 toward and eventually into contact with the second contact ring 39 and thus to direct the circuit through the terminal 22, spring 25, movable contact 27, ring 39 and terminal 42 to the connector 43.

Thus is provided a double throw switch which may for example be employed in connection with air systems such as those utilized in the brake systems of truck trailers and the like. A normal circuit exists through terminals 22 and 31. Upon the presence of air pressure of a given predetermined amount in such system and the resultant delivery thereof to one face of the diaphragm 15, the normal circuit is broken and upon increase of said pressure to a predetermined level, the electrical circuit is created from the terminal 22 to the terminal 42. Upon reduction of the said air pressure below a predetermined level, the latter circuit is broken and upon further reduction to the point sufficient to permit the spring 25 to return the contact 27 into contact with the element 35, the normal circuit is re-established from the terminal 22 through the terminal 31.

I claim:

1. A switch comprising a housing, a flexible diaphragm dividing said housing, an air passage in a wall of said housing effective to deliver air under pressure to one side of said diaphragm a chamber in said housing on the opposite side of said diaphragm, a movable contact element

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 held against said diaphragm by one end of a spring, a first contact ring in contact with the opposite end of said spring and having a terminal portion extending through said housing, a second terminal element extending through said housing and having a contact portion therewithin positioned to be contacted by said movable contact element in response to urging of said spring, a third terminal member extending through said housing and secured to a second contact ring located within said housing in position to be contacted by said movable contact element in response to movement of said diaphragm under the influence of said air pressure said movable contact element, spring, contact ring and contact portion being positioned within said chamber, said spring having an outside diameter substantially equal to the inside diameter of said chamber, said movable contact element having a major diameter substantially equal to that of said spring said movable contact element comprising a cup-shaped member having an apertured bottom wall, said second terminal element extending through the aperture in said bottom wall and carrying said contact portion within said cup-shaped member in position to be contacted by the inner surface of said bottom wall, said second contact ring being positioned on the opposite side of said bottom wall in position to be contacted by the outer surface of said bottom wall.

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 2. A switch comprising a housing, a flexible diaphragm dividing said housing, an air passage in a wall of said housing positioned to deliver air under pressure to one side of said diaphragm, a chamber in said housing on 30

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 the opposite side of said diaphragm, a movable contact element in said chamber, a spring positioned in said chamber and having one of its ends in engagement with said element to hold said element against said diaphragm, a first contact ring positioned in said chamber and in contact with the opposite end of said spring, said first contact ring having a terminal portion extending through said housing, said movable contact element having an apertured wall, a contact member extending through said apertured wall and having a contact portion positioned to be contacted by one surface of said apertured wall of said movable contact element in response to the urging of said spring, said contact member having a terminal portion extending through said housing, a second contact ring positioned in said chamber and having a terminal portion extending through said housing said second contact ring being positioned to be contacted by the opposite surface of said apertured wall of said movable contact element in response to movement of said diaphragm away from said air passage.

References Cited in the file of this patent

UNITED STATES PATENTS

872,039	Adams	Nov. 26, 1907
1,963,930	Beltz	June 19, 1934
2,418,536	Wood	Apr. 8, 1947
2,466,111	Katcher et al.	Apr. 5, 1949
2,783,324	Brown et al.	Feb. 26, 1957
2,813,945	Courtot	Nov. 19, 1957