

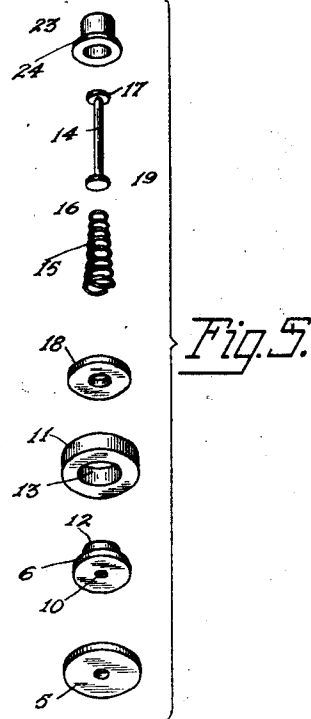
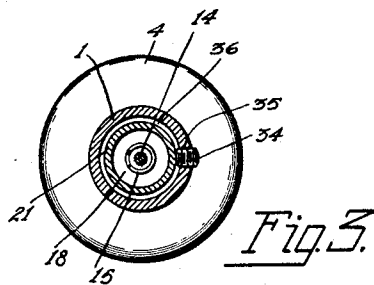
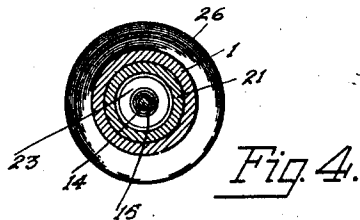
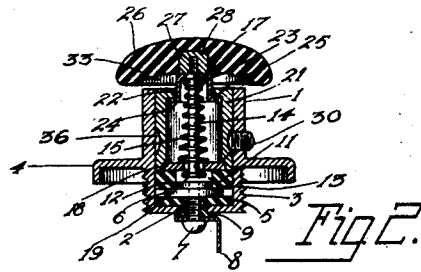
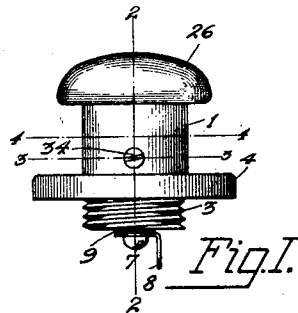
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G. A. YANOCHOWSKI

SWITCH

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UNITED STATES PATENT OFFICE.

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SWITCH.

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My invention relates to switches or to circuit closing devices, and more particularly to switches used for closing the circuit of motor horns or the like, more commonly referred to as horn buttons in the automobile and motor boat art.

A feature of my invention is the provision of a switch of the above type, which is provided with a movable contact rod in combination with another member, which is secured to the push button of my switch and disposed in my switch in operative association with said contact rod, so that when pressure is exerted upon said push button the said member will move to cause the contact rod to always move in a vertical or rectilinear direction, regardless of the point at which pressure is applied to said push button, to make contact with a stationary contact secured in said switch to close the circuit controlled by my switch.

Another feature of my invention is the provision of simple means for restoring and for normally maintaining the movable contact rod of my invention out of contact with the stationary contact, and to also maintain the push button of my switch in its normal position when the same is free from pressure.

The above features, as well as others, will be more specifically set forth in the ensuing specification and appended claims, and for a clearer understanding of my invention, reference may be had to the accompanying drawings, in which drawings like reference characters in the several views denote like parts.

Referring to the drawings,

Fig. 1 is a plan view in elevation of the switch of my invention;

Fig. 2 is a sectional view of the switch of my invention along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view along the line 3—3 of Fig. 1;

Fig. 4 is a sectional view along the line 4—4 of Fig. 1; and

Fig. 5 is a perspective view of different parts of the switch of my invention in the order in which the same are assembled and disposed in my switch.

Referring now in detail to my invention, as illustrated in the drawings, 1 is a casing containing the different parts of my switch, said casing having its closed end provided

with an opening 2, and also with circumferential threads 3. A circumferential flange 4 is provided and integrally formed with the casing 1, which flange 4 in combination with the threads 3 serve to secure my switch in operative position upon the end of the steering post supporting the steering wheel of the automobile, or any other suitable place.

An insulation disk 5 is inserted into the casing 1 and brought into engagement with the closed end of the casing 1, and a stationary contact member 6 is provided which is inserted into the casing 1 and rests upon the insulation disk 5. To secure the contact member 6 in fixed position within the casing 1, a screw 7 is provided, which extends through an opening in a terminal member 8, and through an insulation bushing 9 which insulates said screw 7 and terminal member 8 from the casing 1, said screw then extending through a suitable opening in the disk 5 and having screw-threaded engagement with a suitably tapped orifice 10 in the contact member 6. A cylindrical member 11 of insulation material is provided which fits within the casing 1 and rests upon the contact member 6 while the reduced portion 12 of the contact member 6 extends into the central opening 13 of the said member 11.

A movable contact rod 14 is provided which is inserted into a coil spring 15 so that the small end 16 of said spring 15 engages the head 17 of the contact rod 14, and after the contact rod 14 is inserted into the coil spring 15, a plate 18 is fitted over the other end of the contact rod 14, and said other end is then formed to form a flat head 19 of a size to prevent the removal of the coil spring 15 and the plate 18 from the contact rod 14, or a contact 19 may be connected to the rod 14.

An inverted metallic cup 21 is provided which has an opening 22 for receiving a cylindrical metallic member 23, so that the circumferential flange 24, integrally formed with the said cylindrical member 23, engages the internal circumferential face 25 of the cup 21. The circumferential flange 24 is slightly smaller in size than the diameter of the central opening in the cup 21, and the opening 22 is slightly larger in diameter than the diameter of the cylindrical member 23 for purposes to be pointed out later. The

cylindrical member 23 is secured to a button 26, formed of suitable insulating material, such as bakelite or the like, by means of a screw 27 which extends through a suitable opening in the closed end of the member 23 and then has screw-threaded engagement with a suitably tapped orifice in a metal insert 28 secured in the button 26 during the formation of said button 26, or the cylindrical member 23 may have an extended portion threaded and adapted to fit into the tapped insert 28. The central opening in the member 23 is such as to permit the head of the screw 27 to be flush with the interior end surface of the said member 23.

The contact rod 14 and the coil spring 15 with the plate 18 are inserted into the cup member 21 as a single unit, so that the head 17 of the contact rod 14 engages and rests in the closed end of the cylindrical member 23, and the plate 18 engages a circumferential shoulder 30 formed in the inverted cup member 21, whereupon the inner edge of the end of the cup member 21 is staked over to secure said plate 18 to the cup member 21. The coil spring 15 engaging the plate 18 and the head 17 of the contact rod 14 spring presses the said contact rod 14 upwardly so that the head 17 normally remains in contact with the closed end of the cylindrical member 23, and the flange 24 of the said member 23 will normally remain in engagement with the closed end of the cup member 21 due to the spring effect of the coil spring 15. The end of the head 17 of the contact rod 14 is flat and of such a size that there is no liability of the button 26 and member 23 tilting when the button 26 is free from pressure whereby the button 26 and member 23 will normally assume the position shown in Fig. 2.

It will be obvious that when the member 23, plate 18, rod 14, button 26 etc., are assembled, as just described, that a single mountable unit is effected. This unit is now inserted into the enclosing casing 1, so that the open end of the cup member 21 and the plate 18 will rest upon the insulation member 11, and the end 19 of the movable contact member will be in the opening 13 of member 11 and opposite the reduced portion 12 of the stationary or fixed contact member 6 but normally out of contact with engagement therewith. When the cup member 21 is engaging the casing 1, the closed end of said cup member 21 will be flush with the open end of said casing 1, and the button 26 will have its cut away portion 33 directly over the open end of said casing 1. To secure the cup member 21 within the casing 1 against removal and rotary movement, a screw threaded member 34 is provided which extends through and has screw-threaded engagement with a suitably tapped orifice 35 in the casing 1 and has its end adapted to

engage a circumferential channel or groove 36 in the said cup member 21.

Having described the construction and the manner in which the different parts of my invention are assembled, I will now describe how my switch operates in controlling the circuit controlled by the same.

It will be remembered that Fig. 2 illustrates my switch in its normally inoperated position. Assuming now that pressure is applied directly on the center of the top of the button 26 by the operator or driver, the button 26 will move downwardly in a vertical direction, thereby causing the contact rod 14 to move downwardly against the spring tension of the coil spring 15 whereby the head 19 of said contact rod 14 will make contact with the portion 12 of the fixed contact member 6 which will prevent further movement of the contact rod 14 downwardly and which will also close the circuit controlled by my switch. The contact rod 14 will make contact with the fixed contact member 6 so long as pressure is exerted upon the button 26, thereby maintaining the circuit closed through the switch. The circuit may be traced through my switch as follows: terminal member 8, which receives an external conductor, screw 7, fixed contact member 6, movable contact rod 14, coil spring 15, plate 18, cup member 21 and casing 1 to the other side of the circuit. When pressure is exerted upon the button 26 at any point other than at the top center point, the said button 26 will tilt as the cylindrical member 23 being secured to the button 26 will also tilt in the same direction with the button 26 due to the engagement of the circumferential flange 24, of said member 23 with the closed end of the cup member 21 at the face 25, which engagement provides a fulcrum for the said member 23. The member 23 rocking about its fulcrum and engaging the head 17 of the contact rod 14, will move the said movable contact rod 14 in a downwardly vertical direction against the spring tension of the coil spring 15 whereby the contact rod 14 will make contact with the fixed contact member 6 to close the circuit controlled by my switch. The circuit through my switch when pressure is applied as just described will also extend through the movable contact rod 14, member 23 through the point of fulcrum of said member 23, cup member 21 to the casing 1 and other side of the circuit. When pressure is no longer applied to the button 26, the same will automatically restore to normal together with the movable contact rod 14 due to the spring tension of the coil spring 15, whereby the circuit through my switch is opened. It will be obvious that the circumferential flange 24 of the member 23 engaging the closed end of the cup member 21, will always provide a fulcrum no matter at what point pressure is applied to the but-

ton 26 except when pressure is applied to the center point of the top of said button 26 as described above. It will further be seen that the contact rod 14 will always move in a vertical or rectilinear direction. The opening in the plate 18 is slightly larger than the thickness of the rod 14 and the opening 22 in the cup member 21 is slightly larger than the diameter of the member 23 to avoid any possibility of a binding effect and to also provide a complete fulcrum for the member 23. The plate 18 and the spring 15 cooperate to prevent movement of the contact 14 in any direction other than in the prescribed path. Due to the thickness of the plate 18 and the tension of said spring 15 when an angular movement is imparted to the cup shaped member 21 the contact end 17 will disengage a portion of the bottom of the cup 21 so that only one edge of the end 17 will engage the cup 21. The cup shaped member 21 will thus be tipped upon the end 17 of the contact 14 which will be moved downwardly in the prescribed path.

From the foregoing it will be appreciated that I have provided a circuit closing switch, simple in construction and which is provided with a movable contact which will always move in a vertical or rectilinear direction to make and break contact with a stationary or fixed contact in closing and opening the circuit controlled by my switch.

While I have shown and described a preferred embodiment of my invention it is to be understood that I do not wish to be limited to the exact structure, as shown and described, but that I intend to cover all that which may come within the spirit and scope of the appended claims.

Having described my invention what I claim as new and desire to secure by United States Letters Patent is:

1. A device of the class described including a casing, a fixed contact element secured in said casing but insulated therefrom, an inverted cup-shaped member secured in said casing, a movable contact element supported in said cup-shaped member in operative association with said fixed contact element, a control member adapted to move said movable contact when pressure is applied thereto, means provided with a flange for fulcruming said means in said cup-shaped member for effecting rectilinear movement always in the same path of said movable contact element should said control member be either tilted or moved perpendicularly when pressure is applied thereto to cause the same to contact with said fixed contact element to close a circuit through said device, and means comprising a coiled spring adapted to maintain said movable contact in association with said flanged means.

2. A device of the class described includ-

ing a casing, a fixed contact element secured in said casing but insulated therefrom, an inverted cup-shaped member secured in said casing, a movable contact element supported in said cup-shaped member in operative association with said fixed contact element, a control member adapted to move said movable contact when pressure is applied thereto, means provided with a flange for fulcruming said means in said cup-shaped member for effecting rectilinear movement of said movable contact element always in the same path should said control member be either tilted or moved perpendicularly when pressure is applied thereto to cause the same to contact with said fixed contact element to close a circuit through said device, and means including a coiled spring adapted to maintain said movable contact in association with said flanged means and for restoring and yieldingly holding said movable contact element in its normal position to open the circuit of said device.

3. A device of the class described including a casing, a contact secured in said casing, a cylindrical member secured in said casing, a push button, a cylindrical member secured to said push button, a base for said first cylindrical member and an orifice therein through which said second cylindrical member extends, a movable contact element, means for supporting said movable contact element, a coiled spring adapted to maintain said movable contact in association with said second cylindrical member, and means integrally formed with said second cylindrical member engaging said base of said first cylindrical member to form a fulcrum for said second cylindrical member so that when pressure is applied to said push button said second cylindrical member will move about its fulcrum and effect rectilinear movement of said movable contact element always in the same path should said push button be either tilted or moved perpendicularly when pressure is applied thereto to close a circuit through said device.

4. A device of the class described including a casing, a contact secured in said casing, a cylindrical member secured in said casing, a push button, a cylindrical member secured to said push button, a base for said first cylinder member and an orifice therein through which said second cylindrical member extends, a movable contact element, means for supporting said movable contact element including a coiled spring adapted to maintain said movable contact element in association with said second cylindrical member, means integrally formed with said second cylindrical member engaging said base of said first cylindrical member to form a fulcrum for said second cylindrical member so that when pressure is applied to said

push button said second cylindrical member will move about its fulcrum and effect rectilinear movement of said movable contact element always in the same path should said push button be either tilted or moved perpendicularly when pressure is applied thereto to close a circuit through said device, and yielding means for restoring said movable contact element and said second cylindrical member when pressure is released from said push button to open the circuit through said device.

5. A device of the class described including a casing, a fixed contact element secured in said casing, a pair of cylindrical members, one of said pair of cylindrical members projecting through said other of said pair of cylindrical members, said projecting member being fulcrumed on the other of said members, a non-conducting member secured to said one member, a second contact element, means for supporting said second contact element including a coiled spring adapted to maintain one end of said second contact element in engagement with the closed end of said projecting cylindrical member, said projecting cylindrical member adapted to move about its fulcrum when pressure is applied at any point off center of said non-conducting member to effect longitudinal movement of said second contact element always in the same path regardless of where the pressure is applied to said non-conducting member, to close a circuit through said contact elements.

6. A device of the class described including a casing, a fixed contact element secured in said casing, a pair of cylindrical members, one of said pair of cylindrical members projecting through said other of said pair of cylindrical members, said projecting member being fulcrumed on the other of said members, a non-conducting member secured to said one member, a second contact element, means for supporting said second contact element, said projecting cylindrical member adapted to move about its fulcrum when pressure is applied at any point off center of said non-conducting member to effect longitudinal movement of said second contact element to close a circuit through said contact elements, said longitudinal movement being always in the same path should said non-conducting member be tilted in any direction by the pressure applied thereto, and means for automatically restoring said second contact element through the same path of travel and to also restore and yieldingly hold said non-conducting member and said one cylindrical member in normal position to open the circuit through said contact elements, said means also adapted to maintain said second contact element in association with one of said cylindrical members.

7. A device of the class described including a casing, a conducting element secured in said casing but insulated therefrom, a pair of cylindrical members, a second conducting element extending thru both of said cylindrical members, spring means adapted to maintain one end of said second conducting member in engagement with the closed end of one of said cylindrical members, a control member secured to one of said cylindrical members adapted to operate said one cylindrical member, when pressure is applied thereto, to cause said second conducting element to always move in the same path of travel to close a circuit through said conducting elements should said control member be either tilted or moved perpendicularly when pressure is applied to said control member.

8. A device of the class described including a casing, a conducting element secured in said casing but insulated therefrom, a pair of cylindrical members, a second conducting element, a control member secured to one of said members and adapted to operate said one member, when pressure is applied thereto, to cause said second conducting element to always move in the same path of travel to close a circuit through said conducting elements should said control member be either tilted or moved perpendicularly when pressure is applied to said control member, and means including a coiled spring for maintaining said second conducting element in engagement with the closed end of one of said cylindrical members and for restoring said second conducting element in a retrograde direction.

9. A device of the class described including a fixed contact element, a pair of cup-shaped members, one of said pair of cup shaped members projecting through said other of said pair of cup shaped members, an individual flange for each one of said cup shaped members adapted to engage each other to provide a fulcrum for one of said cup shaped members, a movable contact element operatively associated with said pair of cup shaped members and in operative relation with said fixed contact element, means for rocking said one cup shaped member about its fulcrum to effect endwise movement of said movable contact element to effect contact engagement of said conducting elements.

10. A device of the character described including a casing, a stationary contact in said casing, an inverted cup extending into said casing, an operating member fulcrumed on said inverted cup, a rectilinearly movable contact, a coiled spring surrounding said movable contact and resting against one end of said contact adapted to maintain said contact in position against the closed end of said inverted cup, said movable contact hold-

ing said operating member in normal position, and adapted to be moved always in the same path into engagement with said stationary contact when pressure is applied to said operating member to tilt or move the said actuating member perpendicularly.

11. A device of the character described including a casing, a stationary contact secured in said casing, a disc in said casing, a rectilinearly movable contact supported by said disc, a push button adapted to operate said movable contact when pressure is applied thereto, a cup-shaped member for securing said disc in position, and a movable cup shaped controlling member extending through said first said cup shaped member and fulcrumed on said first cup-shaped member for moving said movable contact into engagement with said fixed contact, said movable contact adapted to always move in the same path should said push button be either tilted or moved perpendicularly when pressure is applied thereto.

12. A device of the character described including a casing, a stationary contact in said casing, a pair of cup-shaped members, one of said pair of cup shaped members extending through the other of said cup shaped members, said one of said cup shaped member fulcrumed on the other of said members,

a control member secured to said one of said cup-shaped members, a rectilinearly movable contact supported by said other member held in position by said cup-shaped members, said movable contact operating to hold said one of said cup shaped members in normal position, and said control member adapted to move said movable contact into engagement with said stationary contact.

13. A device of the character described including a casing, a stationary contact in said casing, a pair of cup-shaped members, one member fulcrumed on the other of said members, a control member secured to one of said cup-shaped members, a rectilinearly movable contact supported by a member held in position by one of said cup-shaped members, said movable contact operating to hold the other of said cup-shaped members in normal position, said cup-shaped members so co-operating as to permit said movable contact member to move in rectilinear direction should said control member be either tilted or moved perpendicularly when pressure is applied to said controlling member.

Signed by me at Chicago, in the county of Cook and State of Illinois, this 28th day of May, 1924.

GEORGE A. YANOCHOWSKI.