

April 9, 1929.

G. A. YANOCHOWSKI

1,708,039

SWITCH

Filed April 24, 1924

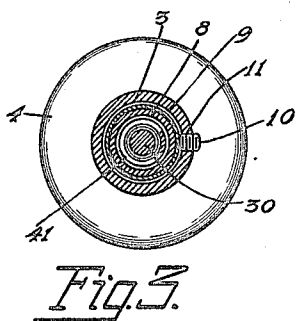
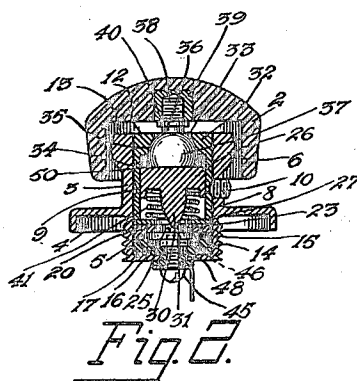
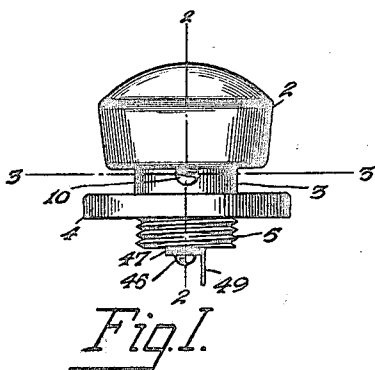
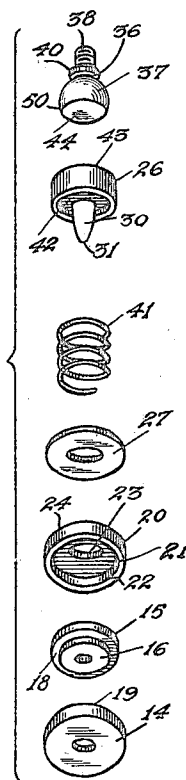


Fig. 4.



Inventor:
George A. Yanochowski
By Cutler & Camp
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE A. YANOCHOWSKI, OF LA GRANGE, ILLINOIS, ASSIGNOR TO KELLOGG SWITCH-BOARD & SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SWITCH.

Application filed April 24, 1924. Serial No. 708,614.

My invention relates to electrical switches or circuit closers for use in completing electrical circuits, and has to do more particularly with actuating buttons for use on automobiles or the like for controlling signalling circuits for electrically actuated horns or warning devices, and an object of my invention is to provide a simple, compact arrangement of parts which are easily assembled to produce an electrical switch which is most efficient in its operation.

A feature of my invention is to provide a device of the above class that may be operated by an actuating force applied from various angles, that is, the actuating member need not be operated from a perpendicularly applied force, but may be given a slanting blow and operated to close the circuit of the warning device.

Another feature of my invention is the provision of an actuating member in association with a ball and socket joint which permits the actuation of the actuating member by a force applied vertically or from various angles to actuate means which will move vertically to close the circuit of the warning signal regardless of the angle at which the force is applied to the actuating member.

The above feature as well as others will be more fully described in the ensuing specification, and for a more complete understanding of my invention, reference may be had to the accompanying drawing in which like reference characters in the several views denote like parts, and in which

Fig. 1 is an elevation view of my device;

Fig. 2 is a sectional view of Fig. 1 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 disassembled perspective view of the parts of the switch of my invention.

Referring now more in detail to my invention as illustrated in the accompanying drawing, the switch comprises an actuating member or button 2 moulded of suitable insulating material such as bakelite, and a hollow cylindrical member 3 into which fits the circuit closing mechanism of my invention. The member 3 is mounted on the upper portion of the steering shaft of an automobile and is provided with an integrally formed flange 4 and a threaded portion 5 which has screw-threaded engagement with a portion of the steering shaft or control levers. The mem-

ber 3 is also provided with an annular semi-circular outwardly extended portion 6.

The circuit closing mechanism includes an inverted cylindrical cup or cover member 8 adapted to fit into the housing 3, and an annular groove 9 in the circumferential face of the cup member 8 is adapted to receive the end of a set screw 10, which has screw-threaded engagement with a suitable tapped orifice 11 in the housing 3. This set screw 10 secures the cup member 8 in position in the housing 3 with its bottom face 12 flush with the annular end face 13 of the member 3. A disk 14 of suitable insulation material is of a size to just fit snugly in the housing 2 and rests against the bottom of the hollow member 3. A disk 15 of suitable conducting material, such as copper, is provided with a reduced concentric portion 16 which rests in a concentric counterbore 17 in the insulation disk 14, the bottom face 18 of the disk 15 engaging the face 19 of the insulation disk 14 when the said portion 16 of the disk 15 is positioned as just described. An insulation disk 20 of a size to just fit snugly in the member 3 is provided with a counter-bore 21 of a size to receive the disk 15 and of a depth equal to the thickness of the disk 15 so that when the disk 20 is in position with the disk 15 resting in the counter bore 21 the annular face 22 of the disk 20 seats itself against the face 19 of the disk 14. The disk 20 is provided with a central orifice 23 in its face 24 to permit a portion of the face 25 of the disk 15 to be exposed so that this exposed portion of the face 25 may be engaged by a circuit closing member 26, for purposes as will presently be described. The insulating disks 14 and 20 enclose the disk member 15 and insulate it from the housing 3 and a metal washer 27 rests upon the disk 20, and the cup member 8 rests against this washer 27 when the said inverted cup member 8 is secured in the housing 3 by the set screw 10 to hold the washer 27 and disks 14 and 20 in position against movement in the bottom of the member 3.

I provide a circuit closing member 26 cylindrical in shape, which is slightly smaller in diameter than the bore of the cup member 8 to permit the same to partake of sliding movement in the cap or cover member 8 when resting therein. The circuit closing member 26 is provided with a depending member 30 the end 31 of which extends partially in the orifice 23 in the disk 20, and is adapted to engage the exposed face 25 of the disk 15 as will

presently be described. The bottom 32 of the inverted cup member 8 is of considerable thickness, and is provided with a central orifice 33. The inner bottom face 34 is provided with an annular concave formed portion 35 which forms a bearing for the manually tiltable stud 36. The stud 36 is provided at its one extremity with a hemispherically shaped member 37 which rests in the annular concave portion 35 in the bottom face 34 of the cover member 8. The other extremity 38 of the stud 36 is threaded and is adapted to have screw-threaded engagement with a threaded insert 39 in the button 2 and as the button is moulded of suitable insulation such as bakelite, the insert 39 may be placed therein during the moulding of the button 2. This end 38 of the stud 36 is also provided with a collar 40 against which the button 2 rests when secured in position on the threaded end 38 of the stud 36.

A coil spring 41 is provided and encircles the depending member 30 of the member 26 one end of the spring 41 resting in a counter-bore 42 in the member 26, the other end of the spring 41 resting on the washer 27. The tension of the spring 41 is such as to force the member 26 upward and cause the face 43 of the member 26 to seat itself against the face 44 of the hemispherical portion 37 of the stud 36 and force the hemispherical portion 37 into the annular concave portion 35 in the bottom 34 of the member 8, and maintain the member 26 in its normal position with the end 31 of its depending member 30 out of engagement with the exposed portion of the face 25 of the disk 15. The hemispherical portion 37 of the stud 36 and the annular concave portion 35 of the cup member 8 in which the said hemispherical portion 37 rests, under the tension of the spring 41, form a ball and socket joint of the usual type for purposes as will presently be described. The conducting disk 15 is connected to an external circuit by means of a screw 45 which has screw-threaded engagement with a suitable tapped orifice 46 in the disk 15, the said screw 45 passing through an insulation bushing 47 which rests in a suitable orifice 48 in the bottom of the member 3 to insulate the said screw 45 from the member 3. A terminal 49 rests between the screw 45 and the insulation bushing 47 and permits the external circuit connection to be secured thereto.

Having described in detail the parts which comprise the switch of my invention, I will now describe its use and mode of operation.

If a force is applied to the button 2 as by the hand of the operator driving the car, the said button 2 is forced downward against the normal tension of the spring 41 which tends to hold the button 2 and its supporting stud 36 in their normal position. As before described, the normal tension of the spring 41 is such as to force the member 26

upward with its face 43 seated against the flat face 44 of the hemispherical shaped portion of the stud 36. Now when the force above referred to is applied to the button 2, the stud 36 is also forced downward and as the face 44 of the stud 36 is seated against the face 43 of the member 26, the said member 26 is forced down in the inverted cover member 8 against the normal tension of the spring 41. The downward movement of the member 26 causes the end 31 of its depending member 30 to engage the exposed face portion 25 of the disk 15 through the central orifice 23 in the insulation disk 20. The engagement of the end 31 of the integrally formed depending member 30 of the member 26 with the face 25 of the disk 15 closes the circuit of the warning device or electrically actuated horn.

Now should the actuating force be applied near the periphery of the button 2 by the hand of the operator driving the car, the stud 36 will tilt in the direction toward the side at which the force is applied. The annular concave portion 35 in the bottom 34 of the inverted cup member 8 serves as a bearing in which the hemispherical portion 37 of the stud 36 rests and may be termed a ball and socket joint which permits the free tilting of the stud 36 in any direction. The tilting of the stud 36 causes a portion of the circumferential edge 50 of the flat face 44 of the hemispherical portion 37 of the stud 36 on the side where the force is applied to move downward. As the faces 43 and 44 of the member 26 and stud 36 are seated when the switch is in its normal position, this downward movement of the edge 50 of stud 36, due to the tilting of the said stud 36, when force is applied near the periphery of the button 2 forces the member 26 down in the inverted cup member 8 against the normal tension of the spring 41 causing the end 31 of its integrally formed depending member 30 to engage the exposed face 25 of the disk 15 to close the circuit of the warning signal.

From the foregoing description it is readily apparent that no matter how the button 2 is actuated, the end 31 of the depending member 30 of the member 26 will always engage the exposed face 25 of the disk 15 in a perpendicular direction. It is also apparent that the stud 36 moves vertically or is tilted when a force is applied vertically or near the periphery of the button 2, this tilting of the stud 36 being permitted by the ball and socket arrangement between the hemispherical portion 37 of the stud 36 and the concave annular portion 35 in the bottom 34 of the cover member 8.

In illustrating my invention I have chosen a preferred form, but it is to be understood that many changes and modifications will readily suggest themselves, and I, therefore, do not desire to be limited to the exact structure as shown, but aim to cover all such

changes and modifications as come within the spirit and scope of the appended claims.

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

1. A device of the character described including a housing member, an inverted cover member fitting within said housing member, a stationary contact supported within said housing member, and a slidable contact member within said inverted cover member, an actuating element having a hemispherical portion resting within said inverted member, a button member for operating said actuating member, and a spring for yieldingly holding said actuating member in a vertical position, for maintaining said button in its normal position and for holding said slidable contact member against said portion of said actuating member resting within said inverted member so it does not touch said stationary contact.

2. A device of the character described including a housing member, an inverted cover member fitting within said housing member and means for securing it therein, a stationary contact supported in the bottom of said housing member, a slidable contact member supported within said inverted member, an actuating element comprising a button portion and having a hemispherical portion resting within said inverted member, and a spring for yieldingly holding said hemispherical portion in a vertical position, for yieldingly holding said button portion in its normal position and for holding said slidable contact member so it does not engage said stationary contact.

3. A device of the character described including a housing member, an inverted cup member fitting within said housing member and means for securing it therein, a stationary contact supported within said inverted cup member, a slidable contact member resting within said inverted cup member, an actuating element having a portion resting within said cup member, a button member adapted to operate said actuating member, a spring for yieldingly holding said actuating member in a vertical position, for yieldingly holding said button in its normal position and for holding said slidable contact member seated against said portion of said actuating member within said inverted cup member, and means for actuating said actuating member to move said slidable contact into engagement with said stationary contact.

4. A device of the character described including a housing member, an inverted cup member fitting within said housing member and means for securing it therein, a stationary contact member insulatingly supported in the base of said housing, a slidable contact member resting within said inverted cup member, a central orifice in the bottom of said

inverted cup member, an actuating element provided with a hemispherical portion resting within said cup member, the other portion of said actuating element extending through said orifice, a button secured to said extending member adapted to operate said actuating member, a spring for yieldingly holding said actuating element in a vertical position for yieldingly holding said button in its normal position, for returning it to normal after it has been operated and for holding said slidable contact element so it does not engage said stationary contact, and means for closing contact between said contacts.

5. A device of the character described including a housing member, an inverted cup member fitting within said housing member, a stationary contact member supported in the base of said housing, a slidable contact member resting in said inverted cup member, a central orifice in the base of said inverted cup member, an annular concave bearing in the base of said inverted cup member, a central orifice in the base of said cup member, an actuating element provided with a hemispherical portion resting within said cup member, and in said annular bearing, the other portion of said actuating element extending through said orifice, a button member secured to said extending portion and adapted to operate said actuating member, a spring for yieldingly holding said hemispherical portion of said actuating member in said annular bearing, for yieldingly holding said button member in its normal position and for holding said contact member seated against said hemispherical portion of said actuating member within said cup member.

6. A device of the character described including a housing member, an inverted cup member fitting within said housing member, a stationary contact member supported in the base of said housing, a slidable contact member resting in said inverted cup member, a central orifice in the base of said inverted cup member, an annular concave bearing in the base of said inverted cup member, a central orifice in the base of said cup member, an actuating element provided with a hemispherical portion resting within said cup member and in said annular bearing, the other portion of said actuating element extending through said orifice, a button member secured to said extending portion and adapted to operate said actuating member, a spring for yieldingly holding said hemispherical portion of said actuating member in said annular bearing, for yieldingly holding said button member in its normal unoperated position and for holding said contact member seated against said hemispherical portion of said actuating member within said cup member, and in position so the same does not engage said stationary contact.

7. A device of the character described in-

cluding a housing member, an inverted cup member fitting within said housing member, a stationary contact insulatively supported in the base of said housing by insulation disks, a member extending through said housing for securing said cup member in said housing, the edge of inverted cup member resting against one of said disks of insulation to prevent longitudinal movement of said insulation disks and stationary contact in said housing, a slidable contact resting within said cup member, an actuating element having a portion resting within said cup member, a button member secured to an extending portion of said actuating element adapted to operate said actuating element when any portion of said button is moved in a downward direction, a spring for yieldingly holding said actuating member in a vertical position, for yieldingly holding said button in its normal position and for returning the same to its normal position after it has been operated and for holding said contact member seated against said portion of said actuating member within said cup member and in position so that the same does not engage said stationary contact.

8. A device of the character described including a housing member, an inverted cup member fitting within said housing member, a stationary contact member supported in the base of said housing, a slidable contact member resting in said inverted cup member, a central orifice in the base of said inverted cup member, an annular concave bearing in the base of said inverted cup member, a central orifice in the base of said cup member, an actuating element provided with a hemispherical portion resting within said cup member and in said annular bearing, the other portion of said actuating element extending through said orifice, an actuating button connected to the portion of said actuating member extending through said central orifice, a spring for yieldingly holding said hemispherical portion of said actuating member in said annular bearing and for holding said contact member seated against said hemispherical portion of said actuating member and in position so the same does not engage said stationary contact, said actuating button adapted when moved vertically to cause said hemispherical portion of said actuating element to force said slidable contact member downward in contact with said stationary contact, said spring adapted to return said button to normal and yieldingly hold it in its normal position.

9. A device of the character described including a housing member, an inverted cup member fitting within said housing member, a stationary contact member supported in the base of said housing, a slidable contact member resting in said inverted cup member, a central orifice in the base of said invert-

ed cup member, an annular concave bearing in the base of said inverted cup member, a central orifice in the base of said cup member, an actuating element provided with a hemispherical portion resting within said cup member and in said annular bearing, the other portion of said element extending through said orifice, an actuating button connected to the portion of said actuating member extending through said central orifice, a spring for yieldingly holding said hemispherical portion of said actuating member in said annular bearing and for holding said contact member seated against said hemispherical portion of said actuating member and in position so that same does not engage said stationary contact, said actuating button adapted when moved laterally to cause said hemispherical portion of said actuating element to rock in said annular bearing in said cup member and cause the peripheral edge of said hemispherical portion of said actuating member to engage said slidable contact and move the same in downward vertical direction into engagement with said stationary contact, said spring adapted to return said button to normal and yieldingly hold it in its normal position.

10. A device of the character described including a housing member, a stationary contact in said member, a movable contact adapted to be moved perpendicularly into engagement with said stationary contact, an actuating member adapted to move said contact, a hemispherical member secured to said actuating member to provide tiltable and rectilinear movement for said actuating member for moving said movable contact perpendicularly, and a spring adapted to return said movable contact, said hemispherical member and said actuating member to normal.

11. A device of the character described including a housing member, a stationary contact and a movable contact within said housing member, an actuating member, a hemispherical member secured to said actuating member to permit the same to be either tilted or moved perpendicularly, and said hemispherical member connecting said actuating member with said movable contact so that the same may be moved perpendicularly into engagement with said stationary contact should said actuating member be either tilted or moved perpendicularly and a spring adapted to return said actuating member to normal.

12. A device of the character described including a housing member, an inverted cover member fitted into said housing, a movable and a stationary contact within said housing, a tiltable or perpendicularly movable actuating member, and a hemispherical member secured to said actuating member for permitting said tiltable and perpendicular

movements, a spring adapted to return said actuating member to its normal position, and means permitting the said movable contact to be moved perpendicularly into engagement with said stationary contact should said actuating member be either tilted or moved perpendicularly.

13. A device of the character described including a containing member, a cover for said containing member, a movable and a stationary contact within said containing member, said movable contact having perpendicular movement only, an actuating button, a hemispherical member secured to said actuating member to permit the same to be either tilted or moved perpendicularly for moving said movable contact into engagement with said stationary contact, and a spring adapted to return said movable contact and said actuating button to normal.

14. A device of the character described including a containing member, a cover for said member, a stationary contact within said containing member, a movable contact adapted to be moved perpendicularly into engagement with said stationary contact, and an actuating button and a hemispherical member secured thereto to permit the same to have both tiltable movement and rectilinear movement for moving said movable contact into engagement with said stationary contact, and a spring adapted to return said movable contact and said actuating button to normal.

15. A device of the character described including a containing member, an inverted cover cup fitting in said member, a stationary contact within said containing member, a movable contact adapted to be moved perpendicularly into engagement with said stationary contact, actuating means having both tiltable movement and rectilinear movement for moving said movable contact into engagement with said stationary contact, said actuating means including an actuating button and a member having a spherical shaped por-

tion fitting into a socket in said cover cup, and a spring adapted to return said movable contact and said actuating button to normal.

16. A device of the character described including a containing member, a cover for said member, a stationary contact within said containing member, a movable contact adapted to be moved perpendicularly into engagement with said stationary contact, an actuating button, a hemispherical member secured to said actuating button and extending within said containing member, an opening in said cover engaged by said hemispherical member to form a ball and socket joint to permit both tiltable and perpendicular movement of said button for moving said movable contact, and a spring adapted to yieldingly hold said movable contact and said actuating button in their normal positions and for returning them to said normal positions after they have been operated.

17. A device of the character described including a containing member, a stationary contact and a movable contact within said containing member, an actuating button member, a hemispherical member secured to said actuating member and extending within said containing member, an opening in said cover engaged by said hemispherical member to form a ball and socket joint to permit both tiltable and perpendicular movement of said button, said hemispherical member connecting said actuating member with said movable contact so that the same may be moved perpendicularly into engagement with said stationary contact should the said actuating member be either tilted or moved perpendicularly, and a spring adapted to return said movable contact and said actuating button to normal when the same has been operated.

Signed by me at Chicago, in the county of Cook and State of Illinois, this 22d day of April, 1924.

GEORGE A. YANOCHOWSKI.