W. J. NEWTON.

SURFACE TOGGLE SWITCH.

APPLICATION FILED AUG. 11, 1917.

1,275,726.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 1.

Fig. 1

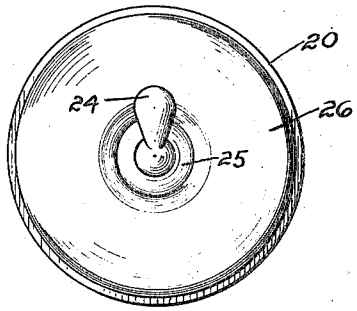



Fig. 2

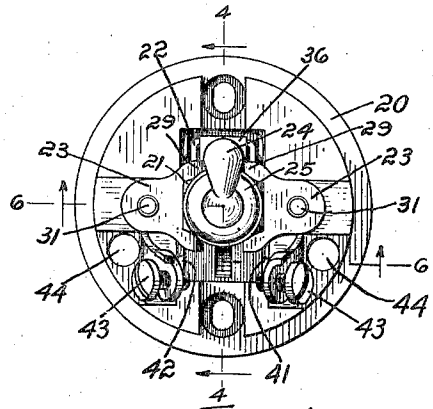



Fig. 3

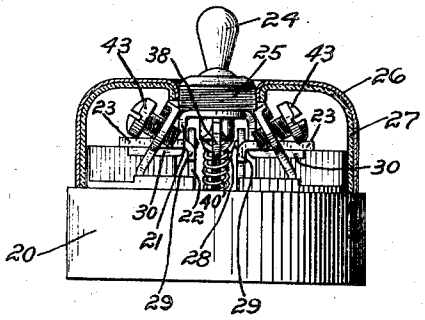



Fig. 4

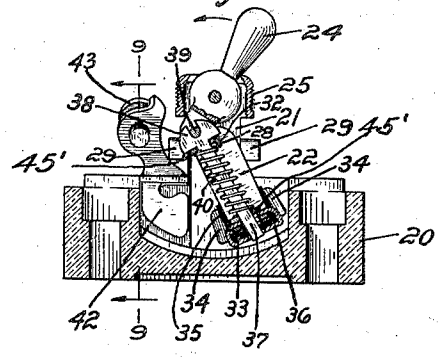



Fig. 5

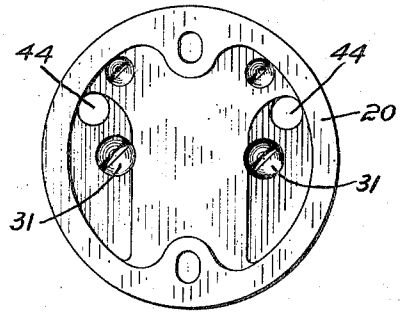
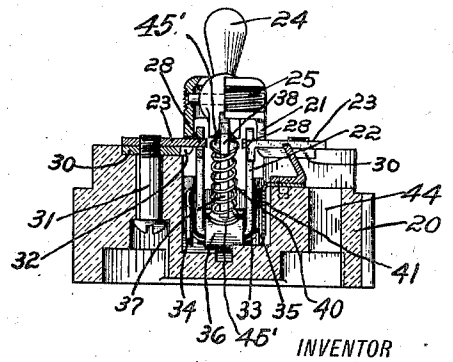



Fig. 6




INVENTOR

William J. Newton

BY

A. Wilbrooker

ATTORNEY

W. J. NEWTON.

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2 SHEETS—SHEET 2.

Fig. 7

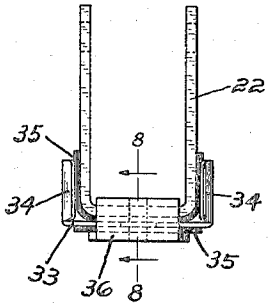



Fig. 8

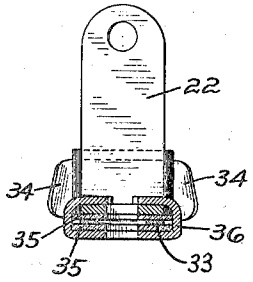



Fig. 9

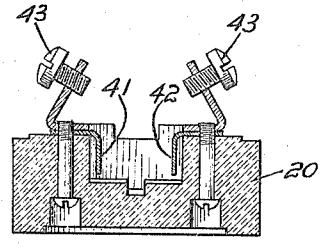



Fig. 10

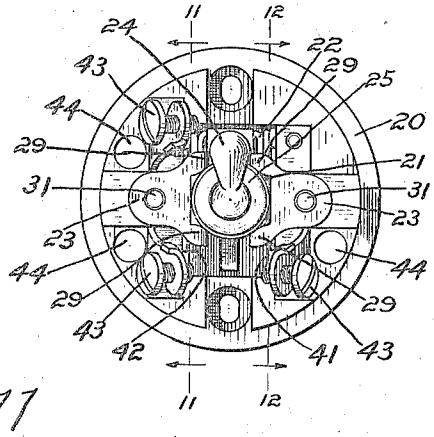



Fig. 11

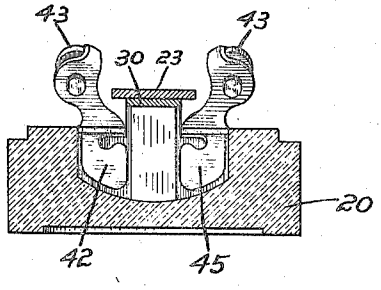
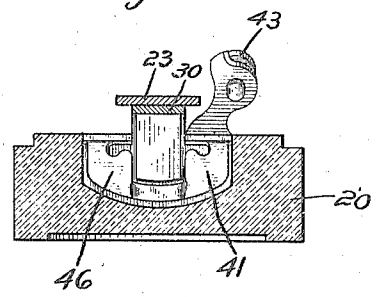



Fig. 12




INVENTOR

William J. Newton

BY

A. W. Wooster

ATTORNEY

# UNITED STATES PATENT OFFICE.

WILLIAM J. NEWTON, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO HARVEY HUBBELL, INCORPORATED, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

## SURFACE TOGGLE-SWITCH.

1,275,726. Specification of Letters Patent. **Patented Aug. 13, 1918.**

Application filed August 11, 1917. Serial No. 185,721.

*To all whom it may concern:*

Be it known that I, WILLIAM J. NEWTON, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Surface Toggle-Switches, of which the following is a specification.

This invention has for its object to improve the construction and mode of operation of surface toggle switches and with these objects in view I have devised the novel structure which will be hereinafter described and then pointed out in the claims hereunto appended.

In the accompanying drawings forming a portion of this specification,

Figure 1 is a plan view of my novel switch as in use;

Fig. 2 a similar view with the cap removed;

Fig. 3 an elevation looking toward the top of the sheet, the cap being in section;

Fig. 4 a section on the line 4—4 in Fig. 2 looking in the direction of the arrows;

Fig. 5 an inverted plan view of the base;

Fig. 6 a section on the line 6—6 in Fig. 2, looking in the direction of the arrows;

Fig. 7 an elevation on an enlarged scale of the contact arm detached;

Fig. 8 a section on the line 8—8 in Fig. 7, looking in the direction of the arrows;

Fig. 9 a section on the line 9—9 in Fig. 4, looking in the direction of the arrows;

Fig. 10 a view corresponding with Fig. 2, showing the application of the invention to a three-way switch;

Fig. 11 a section on the line 11—11 in Fig. 10, looking in the direction of the arrows, and

Fig. 12 is a section on the line 12—12 in Fig. 10, looking in the direction of the arrows.

20 denotes the base, 21 the frame, 22 the contact arm, 23 pivot members on which the contact arm swings, 24 the operating lever which is pivoted in a hub 25 on the frame and 26 the cap which is provided with an insulating lining 27 and the edge of which engages the base. The cap is retained in place by means of a central inturned sleeve having threaded engagement with the hub. The contact arm comprises a strip of metal bent to U-shape and the branches of which are pivoted on lugs 28 of the pivot members. These members are also provided on opposite sides of the pivot lugs with stop lugs 29 which are engaged by the contact arm to limit its movement in opposite directions. The frame is provided with attaching lugs 30 and the frame and pivot members are secured to the base by means of screws 31. It should be noted that the pivot members lie above the attaching lugs, that the pivot lugs of these members pass through holes 32 in the frame and that the pairs of stop lugs lie on opposite sides of the frame. The special advantage of this construction is that it enables me to make the pivot members of steel as said members are not subjected to a drawing operation. I thus reduce the cost of production and greatly improve the operation and increase the durability of the switch.

Another important feature of the invention is the special construction of the contact carried by the contact arm. 33 denotes a contact strip which extends from side to side of the contact arm and is provided with wings 34 bent at approximately right angles thereto and lying contiguous to the branches of the contact arm. 35 denotes insulating material which is placed between the contact strip, including the wings, and the contact arm and also between the contact strip and a metallic clamp 36 which incloses the cross piece of the swinging arm, the contact strip and the insulation, and rigidly secures the contact strip and its insulation to the contact arm.

The toggle consists of the inner arm of the operating lever and an arm 37 which is provided with a head 38 having a notch to receive a cross pin 39 in a slot in the inner end of the operating lever. The other end of arm 37 passes through corresponding holes in the cross piece of the contact arm, the contact strip, its insulation and the clamp, arm 37 being effectually insulated from the contact strip as the hole through the latter is relatively large, see Fig. 8. 40 denotes a relatively strong coil spring which surrounds arm 37 and bears respectively against the head of said arm and against the contact arm, washers 45 being interposed between the ends of the spring, and the head of arm 37 and the clamp on the cross piece of the contact arm.

41 and 42 denote base contacts which

are provided with binding screws 43 to which wires, not shown, passing through holes 44 are attached.

The operation will be perfectly clear from the description already given. In all of the views the contact upon the contact arm is shown in the open circuit position, in which position the contact arm is stopped by engagement with one pair of the stop lugs 29. Movement of the operating lever from the position shown to the reverse position will move arm 37 outward against the power of the spring, the outer end of the arm sliding through the corresponding holes in the cross piece of the operating arm, the contact strip and the insulation. This movement will continue until arm 37, cross pin 39 and the pivot of the operating lever are in alinement. An instant later the compression of the spring will act to swing the contact arm to the other extreme of its movement and open the circuit, the contact arm being stopped in this position by engagement with the other pair of stop lugs. In practice, the contact arm will remain in either the open circuit or closed circuit position until the toggle swings past its dead center, when the expansion of the spring will instantly throw the toggle to the reverse position with a snap. It will of course be understood that in the circuit closing position the current will pass from one base contact to the other through the contact strip on the contact arm.

The form illustrated in Figs. 10, 11 and 12 is a simple form of three-way switch and differs from the other form only in that an additional base contact 45 is provided and base contact 41 is provided with an extension 46 lying opposite to contact 45 so that in one position of the contact arm, contact strip 33 will close the circuit between base contacts 41 and 42 as before, and in the opposite position of the contact arm, the contact strip, which is always in the circuit, will close the circuit between itself and base contact 45. Switches of this type are used, for example, to shift automobile head lights from full light to the dimmed light and vice versa.

Having thus described my invention, I claim:—

1. In a switch of the character described, the combination with a base having contacts and a frame secured to the base, of a swinging arm, a contact carried thereby and comprising a strip having wings adapted to engage the base contacts, insulation on opposite sides of the strip, and a clamp securing the strip and the insulation to the swinging arm, and a spring controlled toggle by which the swinging arm is operated, one arm of said toggle passing through the contact on the swinging arm.

2. In a switch of the character described, the combination with a base, and a frame and pivot members secured to the base, said frame having holes and said pivot members having lugs passing through the holes, of a contact arm comprising branches pivoted on said lugs, and a cross piece, and a spring controlled toggle by which the swinging arm is operated, one arm of said toggle passing through the cross piece of the swinging arm.

3. In a switch of the character described, the combination with a base having contacts and a frame secured to the base, of a swinging arm and a contact carried thereby, said contact comprising a strip having wings adapted to engage the base contacts, insulation on opposite sides of the strip, and a clamp securing the strip and the insulation to the swinging arm, and a spring controlled toggle by which the swinging arm is operated, one arm of said toggle passing through the contact strip and insulation on the swinging arm.

4. In a switch of the character described, the combination with a base, and a frame and pivot members secured to the base, said frame having holes, and said pivot members having lugs passing through said holes, and stop lugs, of a contact arm comprising branches pivoted on said lugs and engaging the stop lugs to limit its movement in either direction.

In testimony whereof I affix my signature.

WILLIAM J. NEWTON.