March 10, 1942. W. L. DIETRICH ET AL 2,275,510

DIRECTIONAL OPERATING MEANS FOR ELECTRIC SWITCHES

Filed Sept. 6, 1940

FIG. 1.

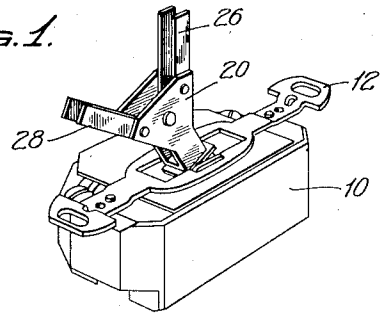


FIG. 2.

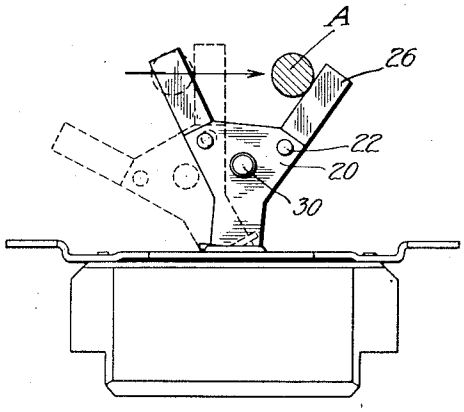


FIG. 3.

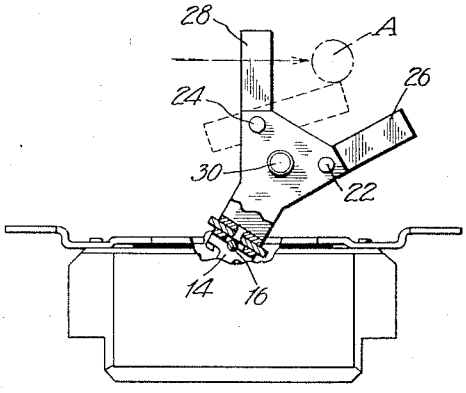


FIG. 4.

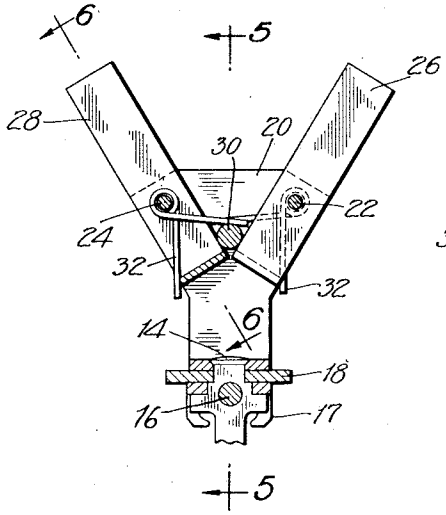


FIG. 5.

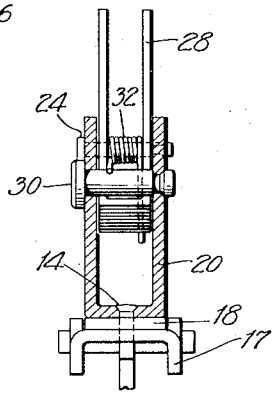
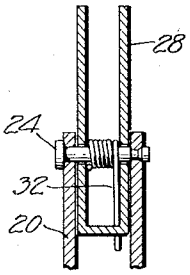


FIG. 6.



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DIRECTIONAL OPERATING MEANS FOR ELECTRIC SWITCHES

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3 Claims. (Cl. 200—153)

This invention relates to operating means for electric switches. More particularly it relates to operating means which can be operated in only one direction when the switch is in one position and only in the other direction when the switch is in the other position. The invention is particularly adapted for use in connection with machines where the work or a part of the machine strikes the operating means to operate the electric switch.

One object of our invention is to provide means for operating an electric switch wherein one or another of two arms is presented for engagement to cause switch movement from one position to another and wherein the arms are adapted to cause operation of the switch in opposite directions to each other but neither can operate the switch in the same direction as the other can.

Another object is to provide a directional operating device of the above type which can be readily applied to a conventional toggle switch mechanism.

Another object of our invention is to provide an improved form of directional operating means for electric switches which can be made up of few easily-fabricated and assembled parts.

Other objects and advantages of our invention will become apparent as it is described in connection with the accompanying drawing.

In the drawing—

Fig. 1 is a perspective view of a switch and directional operating means embodying the principles of our invention;

Fig. 2 is a side elevation view of the invention of Fig. 1, with the parts in an intermediate transitory position;

Fig. 3 is a side elevation view partly broken away, with the parts in one permanent position;

Fig. 4 is a side elevation view of the operating means apart from the switch base;

Fig. 5 is an end elevation view, partly in section, of the parts shown in Fig. 4, the second being taken on line 5—5 of Fig. 4;

Fig. 6 is a detail section view of the parts shown in Fig. 4, with the section being taken along line 6—6 of Fig. 4.

In the drawing, the invention is shown as applied to a conventional electric toggle switch having an insulating base 10 and a metallic mounting bridge 12 for mounting the switch in a switch box, or the like. The mechanism within the base 10 is of the conventional toggle-type and need not be described in detail. The switch mechanism is operated by oscillation of a lever 14 about a transverse pivot pin 16.

The switch has a U-shaped saddle 17 straddling the operating lever 14 and pivotally mounted upon the pivot pin 16. This saddle is centrally open to permit passage of an upwardly-projecting portion of the operating lever 14. Upon the saddle is seated a flat plate 18 upon which the directional operating means is mounted. The plate has an aperture in its center through which the upper end of the operating lever 14 extends.

The directional operating means comprises a sheet metal member 20 bent into U-shape with enlarged end portions. The member has an aperture in its transverse portion receiving the upper end of the switch operating lever 14, which is then upset to secure the member 20 rigidly to the operating lever 14. Thus the lever 14 and member 20 are rockable as a unit about the pivot 16. Between the sides of the rockable member 20 are a pair of arms 26, 28 formed by bending narrow strips of sheet metal into narrow U-shape. These arms 26, 28 are pivotally mounted upon pins 22, 24 which pass transversely through the central portions thereof and have their ends mounted in opposite sides of the rockable member 20. There is provided a stop pin 30 passing transversely through the center of the enlarged portion of the rockable member 20 is position so that the inner edges of the U-bent arms 26 and 28 will abut the stop pin when the arm 26 moves in clockwise direction, or the arm 28 moves in counter-clockwise direction (referring to Figs. 1-4). In order to normally maintain the arms 26 and 28 abutting the stop pin 30, springs 32 are coiled about the pivot pins 22 and 24. One end of each of the springs presses upon the top surface of the stop pin 30, while the other ends of these springs press against the outer edges of the transverse portions of the arms 26 and 28.

From the foregoing, the operation of the invention may be understood. Assuming the parts to be in the dotted line position of Fig. 2, if a piece of work, a moving part of a machine or other actuating thing, A, whatever it may be, moves from left to right, it will strike against the arm 26 and will move the switch to the position of Fig. 3, due to the fact that the arm 26 was in engagement with the stop pin 30 and thus its movement caused the member 20 and the switch to move when the arm 26 moved clockwise. If, however, the switch happened to be in the position of Fig. 3 and the actuating thing A started moving from left to right, it would strike the operating arm 28, causing that arm to pivot

about its pivot pin **24** idly and not affect the switch. Thus, any attempt by the part A moving from left to right to move the switch while it is in the position of Fig. 3 will not result in harm to the switch.

If the part A be moved to the left from the position of Fig. 3, it will strike against the inside surface of the operating lever **28** and will cause the switch to move back into the dotted line position of Fig. 2. Here in Fig. 2 again, if any part of the machine or the work should strike the arm **26** while moving from right to left, the arm **26** would rotate idly about its pivot pin **22**, leaving the switch unoperated.

It, thus, is apparent that we have provided a directional operating device that can only move the switch into its other position when the actuating thing is moving in the correct direction with relation to whichever of the arms (**26** or **28**) is in the path of movement of the actuating thing, i. e. if arm **26** is upright the switch can only be moved by the actuating thing A moving to the right; likewise, if arm **28** is upright, the switch can only be operated if the actuating thing is moving to the left. Thus rightward movement is the correct movement with relation to arm **26**, in the first case, and leftward movement is the correct movement in relation to arm **28**, in the second case.

The foregoing description of the operation is given by way of example and is in no sense a limitation of the invention to the particular use described. It is obvious that in many machines and under many conditions parts of machines or pieces of work may have many varied combinations of movements, but that the switch can only be operated when a certain piece of work strikes the inner side of the operating arms **26** and **28** when either arm is in upright position and in the path of that piece of work or machine part which is meant to operate the switch.

Many modifications within the scope of our invention will occur to those skilled in the art. Therefore, we do not limit it to the specific embodiment herein described and illustrated.

We claim:

1. Operating mechanism for an electric switch comprising a rockable operating member formed of sheet metal bent into U-shape, a pair of projecting arms pivotally mounted between the sides of said U-shaped operating member, stop means on said member between said arms limiting the pivotal movement of said arms in opposite directions, individual spring means each anchored at one end by said stop means and pressing said arms in opposite directions, whereby one arm will operate said switch when said arm is moved in one direction but not when moved in the other, and the other arm will operate said switch when moved in said other direction but not when moved in said one direction.

2. In combination with an electric switch mechanism which is movable into two positions, a directional operating device comprising a rockable member rigidly connected with said switch mechanism for operating said mechanism, a pair of U-shaped sheet metal operating arms pivotally mounted on said rockable member, individual spring means located between the side portions of said U-shaped arms urging said arms in opposite directions, stop means between the pivots of said U-shaped arms and extending perpendicular to said rockable member to limit the movement of said arms in said directions, whereby one arm will operate said switch when said arm is moved in one direction but will pivot idly when moved in the other direction, and the other arm will operate said switch when said other arm is moved in said other direction but will pivot idly when moved in said one direction.

3. In combination with a switch mechanism which is movable into two positions, a directional operating device comprising a rockable operating member formed of sheet metal bent into U-shape, means securing the transverse portion of said operating member to said switch mechanism to cause operation thereof, an arm pivotally mounted between the side portions of said rockable member, spring means coiled about the pivot of said arm urging said arm in one direction, a second arm pivotally mounted between the side portions of said rockable member, spring means coiled about the pivot of said second arm urging said second arm in the opposite direction, stop means extending between the side portions of said operating member for limiting the movement of said arms by said spring means, said arms being arranged to extend alternately as the switch occupies its two positions into the zone of movement of whatever thing is to engage and actuate said directional operating device, whereby said switch can be operated to its other position only when said actuating thing is moving in the correct direction with relation to whichever arm is, at the moment, in the path of movement of said actuating thing.

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