Nov. 16, 1926. 1,607,270

A. E. SMITH

MULTIPLE CIRCUIT CONTROL INTERLOCKING SWITCH

Original Filed Nov. 10, 1924

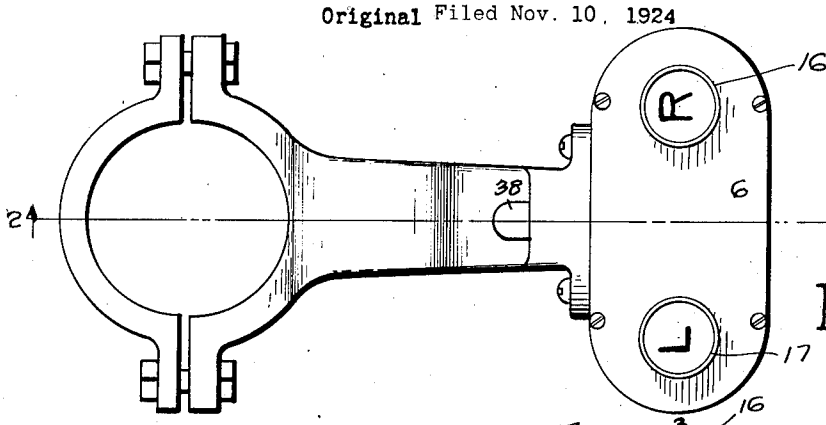


FIG. 1.

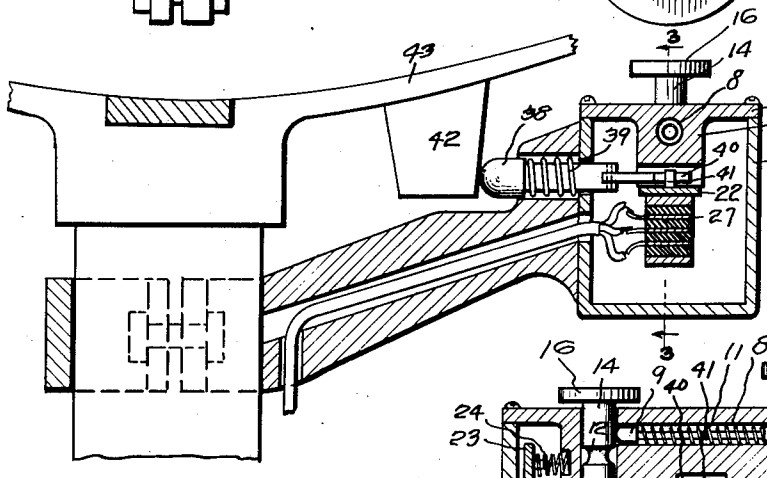


FIG. 2.

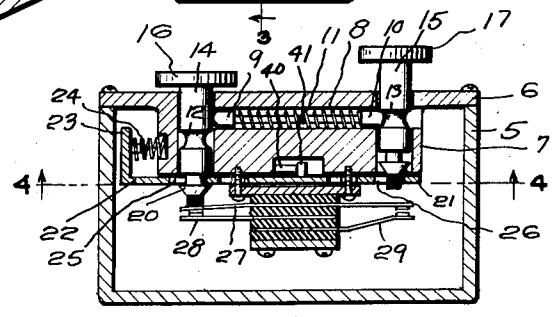


FIG. 3.

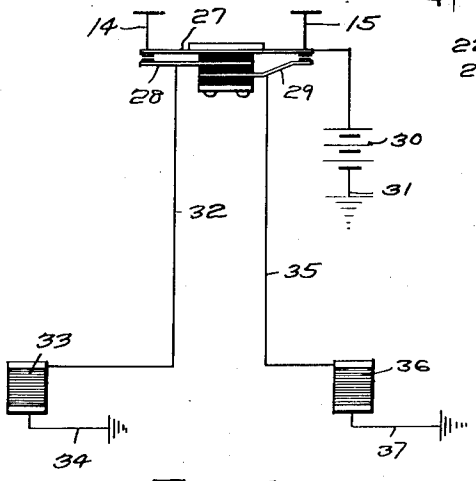


FIG. 5.

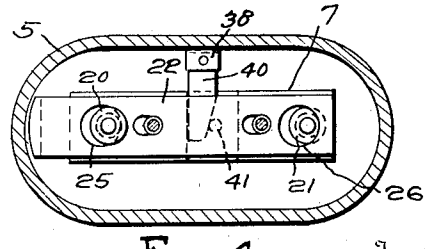


FIG. 4.

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UNITED STATES PATENT OFFICE.

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MULTIPLE-CIRCUIT-CONTROL INTERLOCKING SWITCH.

Application filed November 10, 1924, Serial No. 748,916. Renewed September 23, 1926.

This invention relates to an electric switch adapted to control two circuits, the object of the invention being to provide an interlocking switch of such nature that it will not be possible to close both of said circuits simultaneously.

The switch of the present invention is of general application, having utility in many relations. It is of particular advantage in conjunction with the signaling systems of automobiles, where direction indicating signals are utilized and where it is important that means be provided to prevent both of the signals being energized at the same time, and thereby causing confusion in said signals.

In my co-pending application Serial Number 748,917 filed on the 10th day of November 1924, I have disclosed a signaling system employing a switch of the character herein shown and described. The present application is intended to cover the switch per se irrespective of the particular nature of the circuits with which it is employed.

In the accompanying drawings:

Figure 1 is a plan view of a switch constructed in accordance with the invention.

Figure 2 is a sectional view therethrough, upon line 2—2 of Figure 1.

Figure 3 is a sectional view upon line 3—3 of Figure 2.

Figure 4 is a horizontal sectional view upon line 4—4 of Figure 3, and

Figure 5 is a diagrammatic view illustrating one application of the switch.

Like numerals designate corresponding parts in all of the figures of the drawings.

The switch of the present invention comprises a casing 5, carrying a cover 6. A block 7 depends from this cover, and is bored to form a transverse channel 8. In the channel 8, I mount two pins 9 and 10, the stems of which are encircled by a spring 11. These pins 9 and 10 are adapted to engage the annular grooves 12 and 13 formed in the shanks of plungers 14 and 15. These plungers have button like heads 16 and 17 and are provided with beveled collars 20 and 21. A locking plate 22 is slidably mounted upon the under face of the block 7 and an extension 23 of said plate acts as a point of thrust for a spring 24 which bears between said extension and one end of the block 7. The spring 24 tends to move the plate 22 to the left in Figure 3. Plate 22 is provided with circular openings 25 and 26 and when the plungers are thrust downwardly the beveled collars act against the edges of the openings 25 and 26 and shift the plate 22 endwise, against the tension of spring 24 to permit the said collars to pass below the plate, after which the spring 24 acts to move the plate to the left or to the position illustrated in Figures 3 and 4, and since the openings 25 and 26 are thereby moved out of alinement with the upper faces of the collars 20 and 21, it follows that the plungers will be held in their depressed position.

When the plunger 14 is depressed, its lower end presses the contact strip 27 into engagement with a contact strip 28 and when the plunger 15 is depressed its lower end presses the end of the contact strip 27 into contact with a strip 29. A battery or other source of electrical energy, is indicated at 30 in the diagrammatic view, the negative side of the battery being grounded at 31 and the positive side being connected to contact strip 27. When the strip 27 is connected to strip 28, a circuit is completed from the battery through strip 27, strip 28, conductors 32 to a magnet 33 or other electrical unit to be energized and thence to the ground at 34. When the contact is between the strip 27 and the strip 29 the circuit is completed through a conductor 35 to a magnet 36 or other electrical unit to be energized and thence to the ground at 37. These circuits are illustrated merely to make clear the nature of the invention. The switch may be used to control any two independent circuits irrespective of the nature of the electrical units included therein.

When the plunger 14 is depressed the pin 9 is forced toward the right in Figure 3 and the pin 10 is thereby wedged firmly into the annular groove 13 of the plunger 15. Thus the plunger 15 can not, then, be forced downwardly but upon the contrary is held locked against any movement until the plunger 14 is again elevated to bring annular groove 12 into line with the pin 9. If the plunger 15 is forced downwardly, the pins 9 and 10 will be moved and the pin 9 will be engaged in the annular groove 12, to prevent downward movement of the plunger 14. If it is desired to release the locked plunger, the plate 22 is moved to the right enough to bring the corresponding opening, 25 or 26, in alinement with the collar 20 or 21. The resiliency of strip 27

is such as to effect an initial upward movement of the plunger. Continued upward movement of the plunger is effected by the action of the edges of the openings 25 and 26 against the beveled face of the collar as the plate 22 is returned to its position at the left under the influence of spring 24. This continued upward movement is enough to bring the annular groove 12 or 13, as the case may be, partially into alinement with the pins 9 and 10 and the tendency of these pins to spring into said grooves under the influence of spring 11, further aids in elevating the plungers to their initial position. The movement of the plate to the left may be effected in many ways. According to the present embodiment of the invention this is effected by a plunger 38 which may be pressed inwardly against the tension of the spring 39 to cause a cam extension 40 of said plunger to act against a pin 41 of the plate 22. When this plunger is forced inwardly, the plate is moved toward the right against the tension of the spring 24 as hereinbefore set forth.

The movement of the plunger inwardly may be manually effected or it may be mechanically brought about by the movement of an associated element, such for example as lug 42 which is mounted upon a spoke 43 of a steering wheel, of an automobile. Thus if the device be used in conjunction with the indicating signals of automobiles, the movement of the steering wheel may be utilized to effect the resetting of the switch. When used for this purpose the buttons 16 and 17 preferably bear the letters "L" and "R" indicating "left" and "right". However, it is manifest that the invention is not limited to any particular use since there are many instances where it is desired to control two electrical circuits by means of interlocking mechanism which will prevent both of said circuits from being closed simultaneously.

It is to be understood that the invention is not limited to the precise construction set forth but that it includes within its purview whatever changes fairly come within either the terms or the spirit of the appended claims.

Having described my invention what I claim is:

1. A device of the character described comprising a pair of independently movable plungers, recesses formed therein, spring pressed pins tending to enter said recesses and of such complemental length that when one of the plungers is moved downwardly, to force its pin out of said recess the other of said pins is forced into the other of said recesses.

2. A structure as recited in claim 1, in combination with a slidable locking plate, openings in said plate and beveled collars upon the plungers cooperating with said plate.

3. A structure as recited in claim 1 in combination with spring means for moving said plate in one direction and cam means for moving said plate in another direction.

4. A device of the character described comprising a block, a pair of plungers movable therein and having annular grooves formed therearound, abutting pins inserted in a channel formed in said block, a spring tending to force said pins apart, a plate slidable on the under face of the block, a spring tending to move said plate in one direction, a spring pressed plunger, a cam carried thereby, a pin on the plate against which said cam acts, beveled collars upon the lower ends of said plungers, there being openings formed in said plate cooperating with said beveled collars and contact strips disposed below and moved by said plungers and constituting parts of separate circuits.

In testimony whereof I hereunto affix my signature.

ARTHUR ERVIN SMITH.