March 29, 1932. F. L. HARRIS 1,851,358

TWO-WAY ELECTRIC SWITCH

Filed April 4, 1929

Fig. 1

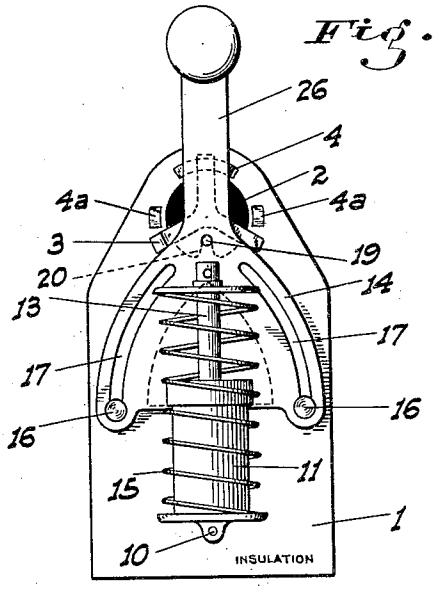



Fig. 2

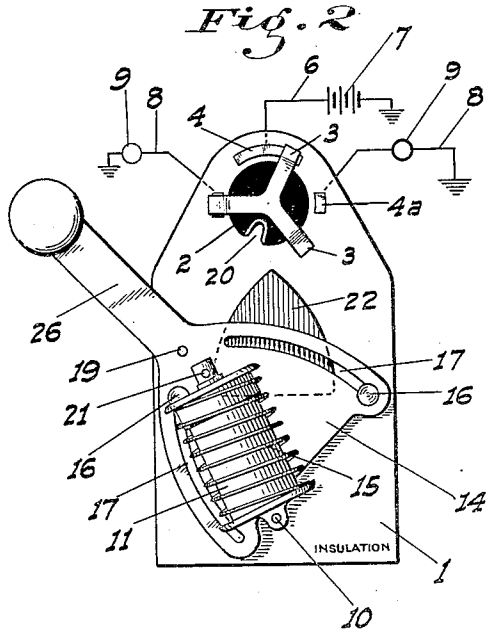



Fig. 3

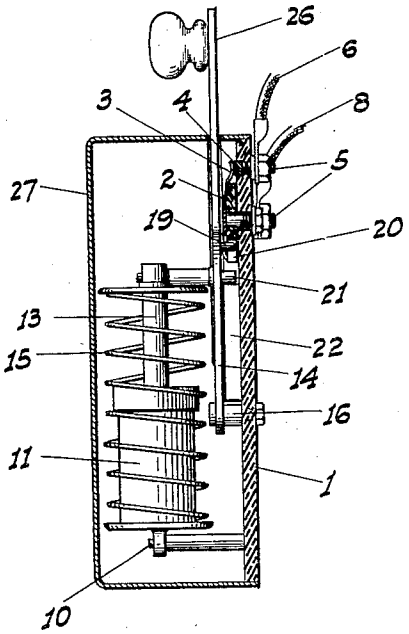
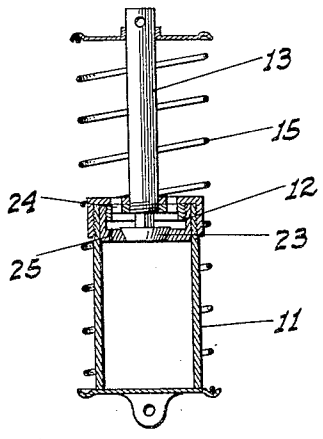



Fig. 4

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# UNITED STATES PATENT OFFICE

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## TWO-WAY ELECTRIC SWITCH

Application filed April 4, 1929. Serial No. 352,385.

This invention relates to electric switches, and particularly to one to be used in connection with an illuminated type of automobile direction signal, such as that shown in my Patent No. 1,686,086 dated October 2nd, 1928.

In giving such signals it is essential or at least highly desirable that the sign be given continuously for a certain length of time before the turn is actually made. With a switch or ordinary construction this can only be done by manually closing the switch and similarly opening the same. This requires two distinct operations on the part of the driver, the latter one of which he frequently fails to perform at the time the need for the signal has passed.

The principal object of my present invention is to provide a switch for the purpose so constructed that this double operation is avoided and the switch when once closed will remain closed for a predetermined length of time and will then be automatically opened.

A further object of the invention is to provide a switch of the two-way type, so as to selectively control the closing of the circuits to the two lamps of the signal device, in which the automatic circuit holding and breaking feature is arranged to act equally well with the use of only one movable switch arm, whether the latter is moved to one circuit closing position or the other.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a face view of my improved switch shown in its neutral or open position.

Fig. 2 is a similar view showing the switch arm moved to close one circuit.

Fig. 3 is a vertical transverse section of the switch.

Fig. 4 is a sectional elevation of a dashpot or retarding unit detached.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes the back supporting panel of the switch on which adjacent the top a disc 2 of insulation material is turnably mounted. Projecting radially from the disc in spaced relation to each other at the periphery, but unitarily connected to each other, within the body portion of the disc, are three spring contact fingers 3. These fingers are adapted to separately engage separated contact strips 4 and 4*a* mounted in the panel in insulated relation to each other and concentric with the disc. These contact strips are associated with binding posts 5 on the back of the panel, by means of which the contact 4 may be connected by a wire 6 to a battery 7; and the contacts 4*a* by separate wires 8 to the individual lamps 9 of the signal device. The contact strips are of such length and are so disposed relative to the fingers that when one of the fingers engages the contact 4 centrally of its length, the other fingers will be disengaged from the contacts 4*a*; and when the disc is turned a certain amount in either direction, said one finger will remain engaged with the battery contact 4 and one only of the other fingers will then be engaged with the corresponding one of the other contacts 4*a*. In this manner it will be obvious that the fingers selectively bridge cooperating contacts to close a circuit through either one or the other of the signal lights.

The disc is thus moved from its neutral position to either circuit closing position and maintained in such position for a predetermined length of time by the following actuating means:

Fixed in the panel adjacent its lower end and vertically alined with the axis of the disc is a pin 10 on which a cylinder 11 is turnably mounted at its base. A hollow piston 12 is slidable in the cylinder, having a stem 13 which at its outer end is pivoted on the plate 14; a spring 15 about the stem and cylinder acting to force the piston to the top of the cylinder.

Transversely spaced pins 16 spaced equal distances on both sides of a line between the pin 10 and the disc axis, and arranged in a

plane at right angles to said line, are fixed in the panel and project through slots 17 formed in the plate 14, which slots are respectively concentric with the opposite pins 16. The pins 16 are normally held at the lower end of the slots by the spring 15, the piston being then at the top of the cylinder. When in this position the cylinder and piston stem are axially alined with the axial line between the pin 10 and the disc. Another pin 19 mounted in the plate 14 and projecting toward the panel then fully engages a radial notch 20 cut in the periphery of the disc 2. When the parts are thus positioned one of the fingers 3 engages the contact 4 centrally of its length and both light circuits are open. The plate 14 also has another pin 21 projecting therefrom toward the panel and disposed on a line with and between the pins 19 and 10. This pin is adapted to engage either side of a track block 22 mounted on the panel and whose sides are concentric with the opposite pins 16. This pin 21 is disposed at the apex or top junction of the track surfaces when the plate is in the above stated neutral or switch opening position.

The piston is provided with a common form of self-closing valve 23 therein which is arranged to open upon the depression of the piston in the cylinder and to close with the upward movement of the piston. When the valve thus opens the air in the cylinder can quickly escape past the valve and through openings 24 in the piston above the valve or through the piston stem if the latter is hollow. When the valve is closed however air can only enter the cylinder through a small bleed passage 25 disposed in the bottom portion of the piston to one side of the valve.

A handle lever 26 is formed with and projects from the plate 14 to a point beyond the top of the panel so that the plate may be easily swung or reciprocated from one side to the other; the parts on the panel being preferably enclosed by a cover 27 slotted to permit of the handle projecting therethrough and having the necessary range of reciprocating movement.

In operation with the swinging of the plate to one side the pin 16 on the opposite side becomes the pivot of swinging movement of the plate, the engagement of the pin 21 with the track maintaining said pivot pin at the bottom of its slot 17, while permitting the other pin to relatively advance along its slot. With the initial swinging movement of the plate through a relatively short arc the pin 19 moves out of the notch 20, turning the disc somewhat in the same manner as is the case with the well known Geneva movement. The depth of the notch is proportioned so that such movement of the disc is sufficient to cause the finger 3 on the same side as that to which the plate is swung to engage the corresponding contact 4*a* and close the circuit through the corresponding signal lamp.

The spring pressure of the signals against the contact strips holds the disc in the position to which it has been thus moved while the plate 14 is swung still further to one side or until the relatively moving pin 16 engages the top of its slot 17. With this position of the parts the piston is fully depressed in the cylinder, since the stem of the pin is then a considerable distance to one side of the temporary pivot of the plate and substantially on the same level as said pivot. The pressure on the handle may then be released and since the valve 23 is then closed a tendency to vacuum is obtained in the cylinder which acts against the spring action, and which can only be relieved by the entrance of air into the cylinder. Since this can only take place very slowly through the bleed passage 25 the return movement of the piston and plate to their normal or neutral positions is correspondingly slow. It will therefore be seen that until the pin 19 again enters the notch 20 and retracts the disc to its normal position the switch will remain closed and the signal will be continuously actuated. This operation takes place whether the lever is turned in one direction or the other, since all parts are symmetrically disposed relative to the normal plane of setting of the actuating plate.

It is to be understood that the important feature of my invention lies in the construction and arrangement of the swinging plate and its retarding control mechanism; and that while I have shown and described a certain specific type of contact means actuated by the movement of the plate, such contact means may be in a number of different forms while still employing the same swinging plate and its peculiar mounting and movements.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. An electric switch including a plurality of fixed contacts, a contact-finger unit turnable about a fixed axis in opposite directions from a neutral position to engage separate ones of the fixed contacts in bridging relationship, said unit having a peripheral notch, an actuating member mounted for reciprocating movement about an axis parallel to but spaced from that of the unit, a pin projecting from said member between said axes

and arranged to engage the notch when said member and unit are in a neutral position whereby turning movement of said member in either direction from said neutral position will turn the unit until the pin leaves the notch, means acting automatically to return said member to its neutral position, and dashpot means associated with said member to retard such return movement thereof.

2. An electric switch comprising a panel, a disc turnably mounted thereon, fixed contacts on the panel grouped in spaced relation about the disc, contact fingers on the disc to bridge different contacts when the disc is turned in either direction from a neutral position, a member separate from the disc mounted on the panel for reciprocating movement in a plane parallel to the disc, the latter having a peripheral notch therein, a pin projecting from the member and engaging the notch when said member and disc are in a neutral position, and during only a short arcuate extent of movement of the member in either direction from such position, spring means acting to return the member to said position, and dashpot means between said member and the panel acting to resist the spring.

3. An electric switch comprising a panel, a disc turnably mounted thereon, fixed contacts on the panel grouped in spaced relation about the disc, contact fingers on the disc to bridge different contacts when the disc is turned in either direction from a neutral position, a member separate from the disc mounted on the panel for reciprocating movement in a plane parallel to the disc, and through a certain arc in either direction from a neutral position, means between said member and the disc for causing the latter to be rotated to a contact bridging position with only a relatively short arcuate movement of the member in one direction or the other, means acting to return said member to its neutral position, and means acting to retard such return movement.

4. An electric switch including a pair of fixed contacts, a contact-finger unit turnable from a certain position to then engage the contacts in bridging relation, an actuating member movable a certain distance from a neutral position, means between said member and the unit for moving the latter to or from its contact bridging position with a relatively short portion of the total possible movement of said member and for then leaving said unit stationary during any further movement of said member, means acting to return said member to its neutral position, and means acting to retard such return movement.

In testimony whereof I affix my signature.

FRANK L. HARRIS.