

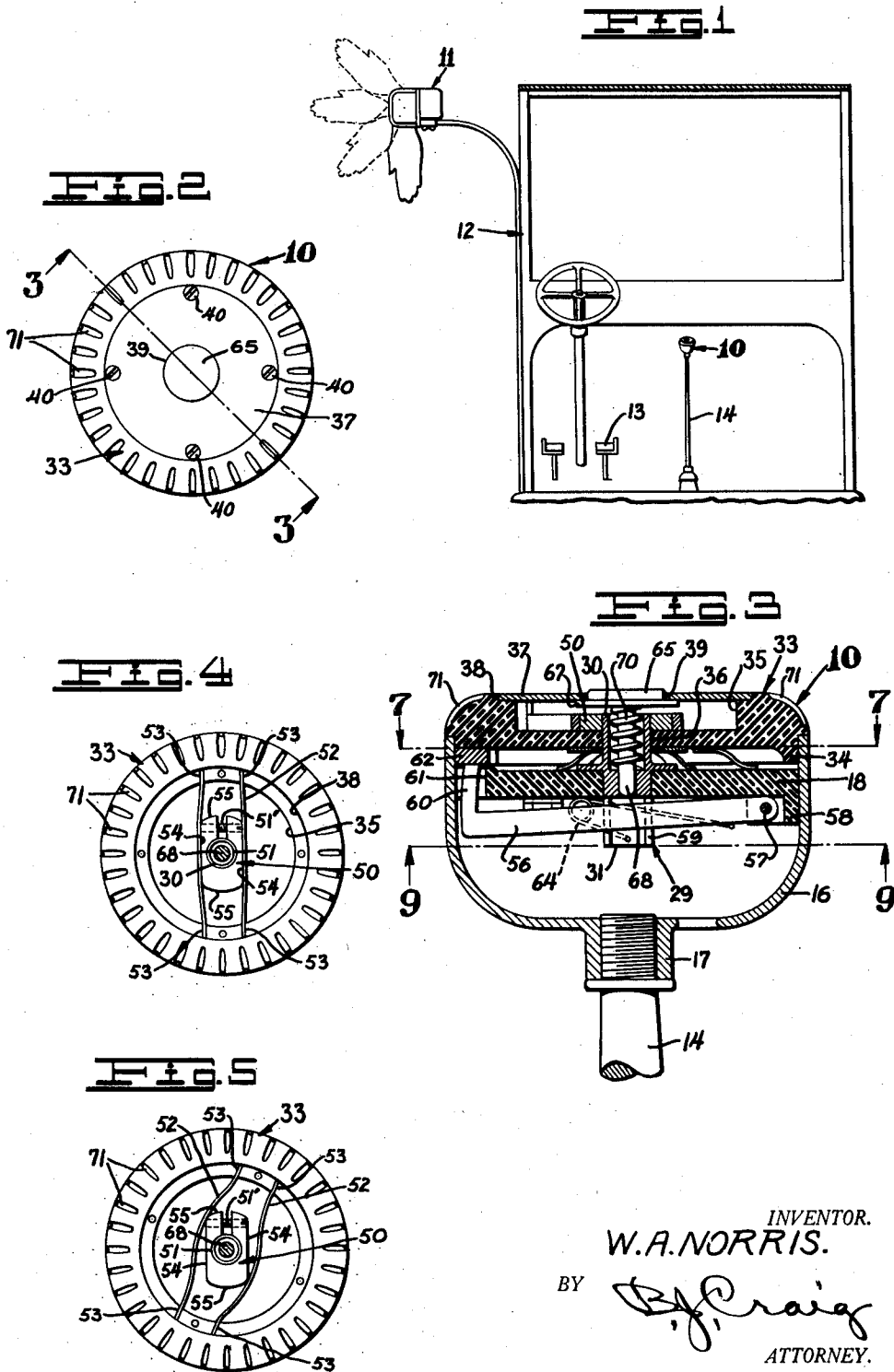
Dec. 22, 1931.

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1,837,281

ELECTRICAL SWITCH DEVICE

Original Filed Oct. 30, 1929 2 Sheets-Sheet 1



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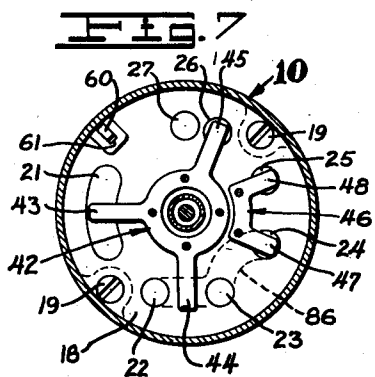
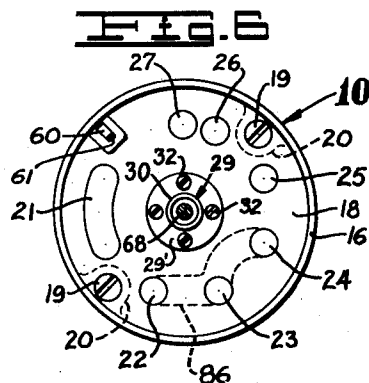
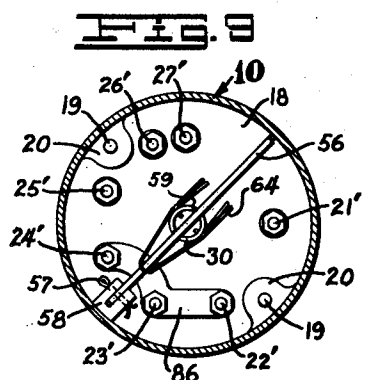
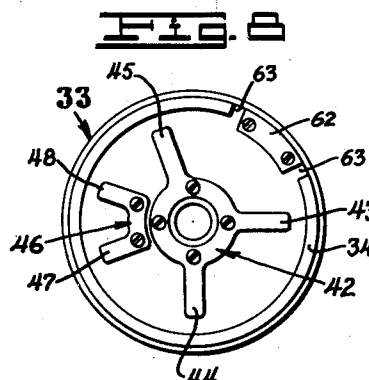
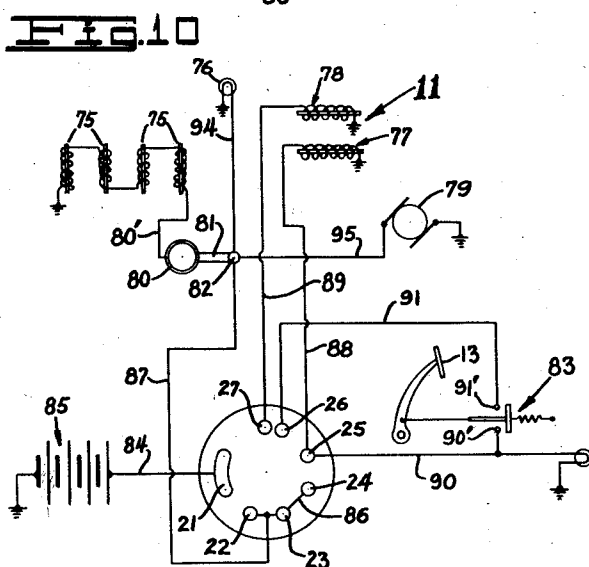
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UNITED STATES PATENT OFFICE

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ELECTRICAL SWITCH DEVICE

Original application filed October 30, 1929, Serial No. 403,143. Divided and this application filed December 23, 1929. Serial No. 415,887.

This invention relates to electrical switch devices.

The general object of my invention is to provide an improved control switch which is especially adapted for use in connection with a direction signal for vehicles.

A further object of the invention is to provide a switch which is adapted to be manually moved to a plurality of operating positions wherein it is retained until manually released whereupon it will automatically return to its normal position.

Another object of the invention is to provide an improved switch for an automobile direction signal which is adapted to be mounted on the gear shift lever of the automobile.

Other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a fragmentary view of a truck showing my improved control switch operatively positioned on the gear shift lever and showing a direction signal which it is adapted to operate.

Fig. 2 is a top plan view of the control switch.

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 2.

Fig. 4 is a top plan view of the control switch with the cover plate removed.

Fig. 5 is a view similar to Fig. 4 showing the switch moved to one operative position.

Fig. 6 is a top plan view with the rotatable cap removed to show the various contacts.

Fig. 7 is a section taken on line 7—7 of Fig. 3 on a reduced scale.

Fig. 8 is a bottom plan view of the movable cap of the control switch.

Fig. 9 is a section taken on line 9—9 of Fig. 3, on a reduced scale, and

Fig. 10 is a diagrammatic view showing the method of wiring the device to a direction signal.

This application is a continuation in part of my copending application Serial No. 364,297, filed March 24, 1928, and a division of my copending application Serial No. 403,143, filed October 30, 1929.

Referring to the drawings by reference characters I have indicated my improved switch generally at 10. In Fig. 1 I have shown a direction signal 11 as operatively positioned on a vehicle 12 which includes a foot brake pedal 13 and a gear shift lever 14 on which the control switch 10 is adapted to be mounted. As shown the signal 11 includes a signal arm 15 which is adapted to be moved to indicate right and left turns and stop.

As shown the control switch 10 includes a casing 16 having a reduced internally threaded boss 17 thereon for securing it to the gear shift lever 14. Within the casing 16 I provide a base plate 18 made of an insulation material and secured by screws 19 (Fig. 6) to lugs 20 integral with the casing. Embedded in the top surface of the base plate 18 I provide an elongated contact 21, a portion of which extends through the base plate and forms a terminal 21' on the opposite side thereof and a plurality of other contacts 22, 23, 24, 25, 26, and 27 which include portions extending through the base plate to form terminals 22', 23', 24', 25', 26', and 27 respectively on the opposite side thereof.

Secured to the base 18 at the center thereof I provide a spindle 29 having a flange 29' and which includes an upwardly extending hollow tube portion 30 and a downwardly extending portion 31, and which is secured to the base by a plurality of screws 32.

Rotatably mounted on the casing 16 I provide a cap 33 which includes a flanged reduced portion 34 positioned within the casing and is provided with a recess 35 and a central aperture 36 in which the upper portion 30 of the spindle 29 is positioned. A cover 37 is provided for the recess 35 and is positioned in a countersunk recess 38 so that it is flush with the top of the cap. The cover 37 includes a central aperture 39 and is shown as secured to the cap by a plurality of screws 40 (Fig. 2).

Secured to the underside of the cap 33 I provide an electrical contact member 42 which includes spring fingers 43, 44 and 45 which are adapted to engage the upper surface of the base plate 18. Also secured to the underside of the cap 33 I provide a sec-

ond electrical contact member 46 which is spaced from the contact member 42 and includes spring fingers 47 and 48 which are adapted to engage the upper surface of the base plate 18.

For retaining the cap 33 in position on the casing 16 I provide a split cam block 50 (Figs. 4 and 5) which is provided with a central aperture 51 in which the upper portion 30 of the spindle 29 is positioned and the block 50 is adapted to be clamped on the spindle by a set screw 51' (see Fig. 11).

For retaining the cap 33 in a correct initial position and for returning it thereto when rotated I provide a pair of resilient members 52 which are positioned one on each side of the cam block 50 and in engagement therewith. The opposite ends of the resilient members 52 are positioned in recesses 53 provided in the side walls of the recess 35 of the cap. The recesses 53 are spaced a less distance apart than the width of the cam block 50 so that the resilient members 52 tightly engage the sides of the cam block and are under tension at all times. The cam block 50 is oblong in shape and includes elongated sides 54 and arcuate ends 55.

The cap 33 is arranged to turn through an angle preferably of less than 45 degrees to each side of its initial position and upon movement of the cap to either side the resilient members 52 will be spread by the cam block 50 as shown in Fig. 5 and put under a greater tension, which tension when the cap is released will automatically return the cap to its initial position.

For retaining the cap 33 in the position to which it has been rotated I provide a lever 56 (see Figs. 3 and 9) adjacent the underside of the base plate 18. This lever is pivoted adjacent one end as at 57 to a boss 58 integral with the base 18 and is positioned in a slot 59 in the lower end of the spindle portion 31. The opposite end of the lever 56 includes an upwardly extending finger 60 which is positioned in an aperture 61 provided in the base plate 18. The upper end of the finger 60 is adapted to normally rest on a metal plate 62 secured to the cap 33 and upon turning of the cap to either of its two extreme positions to be positioned in recesses 63 provided in the reduced portion 34 of the cap. For resiliently urging the lever 56 upwardly I provide a looped spring member 64 having its two ends anchored to the lower portion 31 of the spindle 29 and having its intermediate portion looped under the lever 56 as clearly shown in Figs. 3 and 9.

For moving the lever 56 downward to release the cap 33 when it has been turned I provide a button 65 which is positioned in the central aperture 39 in the cover 37. This button includes an enlarged flange 67 which normally abuts the under surface of the cover 37 and a reduced shank 68 which is posi-

tioned in the tubular upper portion 30 of the spindle 29 with its lower end adapted to engage the lever 56. Positioned around the shank 68 within the tubular portion 30 of the spindle 29 I provide a coiled spring 70 which is adapted to resiliently retain the button 65 in a raised position.

When the cap 33 has been turned to either side of its initial position and the finger 60 of the lever 56 is positioned in one of the recesses 63 of the cap, to return the cap to its initial position it is only necessary to press on the button 65 whereupon the shank 68 thereof will move the lever 56 and finger 60 downward out of the recess 63 thus allowing the resilient members 52 to return the cap to its normal position.

To provide a better grip on the cap for manually turning the same I preferably provide knurling on the outer periphery of the cap as indicated at 71.

As shown diagrammatically in Fig. 10 the direction signal 11 includes a magnet clutch which includes a plurality of magnets 75 which are wired in series, an electric light bulb 76, a magnet 77 which is adapted to be actuated to cause the signal to indicate a stop, a magnet 78 which is adapted to be actuated to cause the signal to indicate a left turn and an electric motor 79 which is adapted through the medium of the magnetic clutch to operate the signal arm 15 to the various positions.

For supplying electric current to the windings of the magnet 75 the signal 11 includes a collector ring 80 which is connected by a wire 80' to one of the magnets and the collector ring 80 receives electric current through a brush 81 from a contact 82 provided in the signal.

As the construction of the conventional stop light switch is well known I have not shown it in describing my improved control switch other than diagrammatically in Fig. 10 where it is indicated generally at 83.

As shown in Fig. 10 the elongated contact 21 is connected by a wire 84 to one side of a source of electrical energy which is shown as a battery 85, the opposite side of which is grounded. The terminals 22', 23' and 24' of the contacts 22, 23 and 24 are electrically connected by a member 86 and one of the terminals of this group is connected by a wire 87 to the terminal 82 of the signal 11. The switch terminal 25 is connected by a wire 88 to the magnet 77 and the switch terminal 27 is connected by a wire 89 to the magnet 78. The switch contact 25 is also connected by a wire 90 to one terminal 90' of the stop light switch 83 and the contact 26 is connected by a wire 91 to the other terminal 91' of the stop light switch 83.

When the cap 33 of the control switch 11 is in a normal or initial position as shown in Fig. 7, the finger 45 of the contact member

42 engages the contact 26, the finger 44 is positioned between and out of engagement with the contacts 22 and 23 and the finger 43 engages the elongated contact 21 which it does in every position of the cap, thus directing the electric current from the battery through the wire 84 to the contact 21 thence through the contact member 42 to the contact 26. Furthermore when the cap 33 is in an initial position the finger 47 of the contact member 46 engages the contact 24 and the finger 45 engages the contact 25, thus bridging the contacts 24 and 25.

From the foregoing it will be seen that when the control switch is in its initial position and the brake pedal 13 is actuated to operate the stop light switch 83 and the two terminals thereof are bridged the electric current will flow from the contact 26 through the wire 91 to one terminal of the stop light switch 83 and from the other terminal thereof through the wire 90 to the contact 25 from whence it passes through the wire 88 to the signal magnet 77, thereupon energizing the magnet 77 and actuating it to cause the signal arm 15 to be stopped to indicate a stop signal.

At the same time the current passes through the contact member 46 from the contact 25 to the contact 24, thence through the connecting member 86 to the wire 87 through which it flows to the terminal 82 of the signal 11. From the terminal 82 the current passes through a wire 94 to the lamp 76 and through the brush 81 to the collector ring 80 and thence through the wire 81 to the magnets 75 thereby energizing the magnets which when the motor 79 is operated will actuate the signal arm 15. At the same time the current passes from the terminal 80 through a wire 95 to the motor 79 thereby operating the motor which then operates the magnetic clutch and the signal arm 15 to indicate a stop signal. The motor 79 continues to operate so long as the terminals of the stop light switch are bridged and retains the signal arm 15 in the stop position until the brake pedal is released and the contact between the two stop light switch terminals is broken, whereupon the signal arm 15 returns to its initial position.

When it is desired to signal a left turn the cap 33 of the control switch 10 is turned to the left as far as it will go, which is until the finger 60 of the lever 56 enters the proper recess 63 of the cap. When the cap is in this position the finger 48 of the contact member 46 moves out of engagement with the contact 25 and the finger 45 of the contact member 42 moves out of engagement with the contact 26 thereby breaking the circuit from the battery 85 to the stop light switch 83 and from the stop light switch back to the signal 11. Thus even though the brake pedal 13 is actuated to bridge the two terminals

of the stop light switch 83 the signal 11 will not be actuated to indicate a stop.

When the cap 33 of the control switch is in this last mentioned position the finger 45 of the contact member 42 engages the contact 27 and the finger 44 engages the contact 23. Thus the electric current is directed from the battery 85 through the wire 84 to the contact 21 thence through the contact member 42 and finger 45 to the contact 27 from whence it passes through the wire 89 to the signal magnet 78 thereby energizing the magnet 78 which when the motor 79 is operated will cause the signal arm to stop to indicate a left turn.

At the same time the current passes through the finger 44 to the contact 23 whence it passes through the wire 87 to the signal terminal 82 thereupon energizing the clutch magnets 75, lighting the lamp 76 and operating the motor 79 as previously described. The motor 79 then operates the signal arm 15 to a position to indicate a left turn. The motor continues to operate and retains the signal arm 15 in this position until the operator frees the control switch 10 by pressing the button 65 whereupon the cap 33 will return to its initial position as previously described and break the circuit to the signal 11 whereupon the signal arm 15 will return to its initial position.

When it is desired to signal a right turn the cap 33 of the control switch 10 is turned to the right as far as it will go, in which position it is retained by the finger 60 of the lever 56 as previously described in connection with the left turn description. In this position the engagement of the contact member 46 with the contacts 24 and 25 is also broken as described in connection with the left turn and the finger 45 of the contact member 42 moves out of engagement with the contact 26.

When the cap 33 is in a position to signal a right turn the finger 44 of the contact member 42 engages the contact 22 thereby directing the electric current from the battery 85 to the contact 22 from whence it passes through the wire 87 to the terminal 82 of the signal 11 thereby lighting the lamp 76, energizing the clutch magnets 75 and operating the motor 79 as previously described. The motor then actuates the signal arm 15 to indicate a right turn and retains the signal arm in this position until the cap 33 of the control switch is released and returned to its normal or initial position as previously described.

Although I have shown and described my improved switch in connection with a direction signal for vehicles it will be understood that it may be used in connection with other devices for which it may be adapted without departing from the spirit of the invention.

From the foregoing description it will be apparent that I have provided a novel switch which can be economically manufactured and which is simple in construction and highly efficient in operation.

Having thus described my invention, I claim:

1. For use with a gear shift lever of an automobile, a switch, said switch comprising a body part adapted to be fixed on said lever and a top part mounted to rotate on said body part, means to limit the rotation in either direction and means to releasably hold the top part at either of its limits of movement.

2. For use with an indicating device, a switch comprising a body part and a top part mounted to rotate on said body part, said top part having an aperture therein and means in said aperture for controlling movement of said top part.

3. For use with the gear shift lever of an automobile, a switch, said switch comprising a body part adapted to be fixed on said lever and a top part mounted to rotate on said body part, said body including a circuit closer movable to operative position when said top part is turned.

4. For use with an indicating device, a switch comprising a body part and a top part mounted to rotate on said body part, said body including a contact support, a plurality of contacts on said support, said contacts including a pair of spaced independent contacts, a pair of spaced electrically connected contacts and a third elongated contact, a circuit closing member mounted to rotate with said top part and including a contact movable to simultaneously engage either of said independent contacts, one of said electrically connected contacts and said third contact.

In testimony whereof, I hereunto affix my signature.

WILLIAM A. NORRIS.

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