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ELECTRIC SWITCH

Filed Sept. 9, 1925

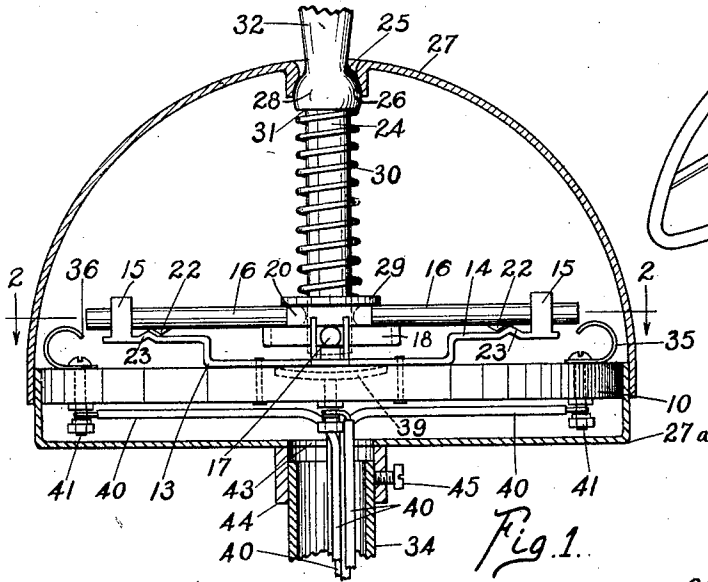


Fig. 1.

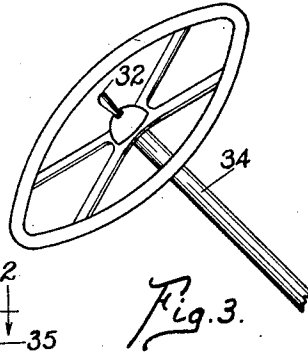


Fig. 3.

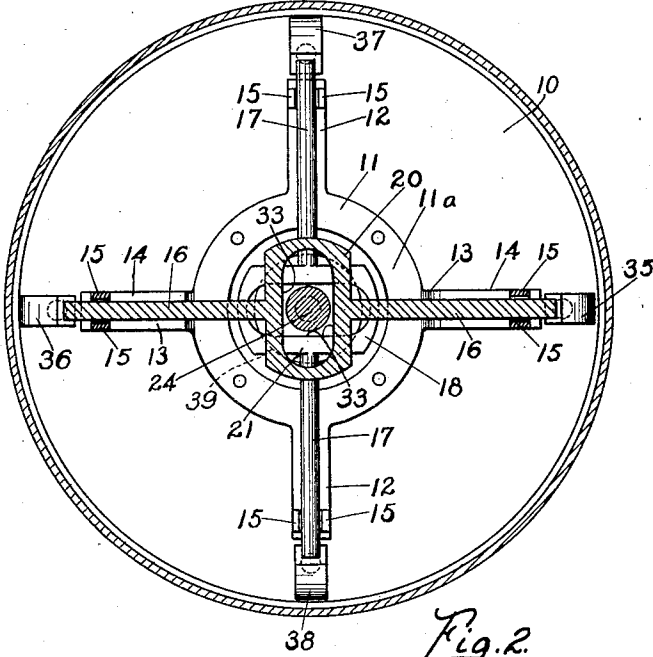


Fig. 2.

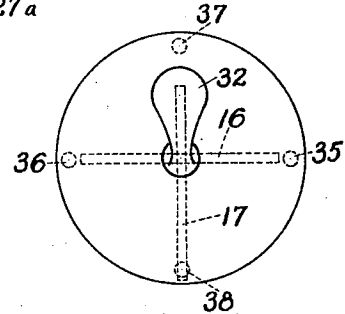


Fig. 4.

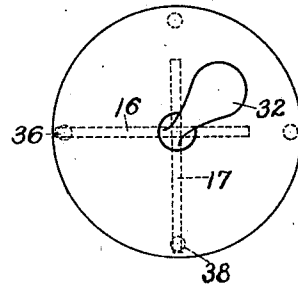


Fig. 5.

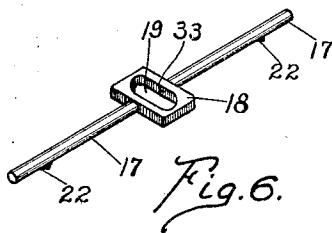


Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## ELECTRIC SWITCH.

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An object of my invention is to provide a universal switch which is particularly adapted to use on automobiles.

Another object is to provide a switch of this type by means of which the head lights, direction lights and horn may all be controlled through a single instrumentality.

Another object is to provide a switch of this type which may be conveniently mounted on the head of the steering column so that a driver may dim his head lights, operate direction signals and sound a horn all from the one convenient position, and at the same time.

These and other objects are attained by the means described herein and disclosed in the accompanying drawings, in which:

Fig. 1 is a side elevation of a device embodying my invention, the cover and casing being shown in cross section.

Fig. 2 is a view taken on line 2—2 of Fig. 1.

Fig. 3 is a perspective view of an automobile steering wheel and column having embodied therein a device of my invention.

Fig. 4 is a diagrammatic plan view showing the device of my invention in a position to close a single circuit.

Fig. 5 is a similar view showing the device in position for simultaneously closing two circuits.

Fig. 6 is a perspective view of a part forming a detail of my invention.

In the embodiment shown herein the device of my invention comprises a single and simply operated switch adapted to be conveniently mounted on the steering column of an automobile so that a driver may selectively control five of most important electric circuits requiring constant attention. These circuits comprise the ones controlling the bright and dim head lights, right and left turn direction signals and the horn. The switch is operated by means of a handle which may take the form of an elongated push button capable of both reciprocating and swivel movement so that a horn may be operated by the usual depression of the button while at the same time either one or two of four other circuits may be permanently closed.

By providing a single button or handle control a driver is encouraged in dimming his headlights at the proper time. This control also makes possible the convenient op-

eration of direction indicating devices since a driver controls all of the aforementioned circuits with the same means usually employed for the horn.

The device of my invention comprises a suitable base member 10 upon which is secured a ground contact support member 11. The member 11 may take the form of a ring like member 11<sup>a</sup> having arms 12 extending from opposite sides thereof in substantially the same plane as the body of the ring 11<sup>a</sup>. A second pair of integral arms 13 are turned so as to dispose the major portion 14 thereof in a plane parallel to and lying above the plane of the arms 12. The arms 12 and 13 are provided adjacent their ends with a pair of spaced upwardly struck guide lugs 15, which serve as a guide for rods 16 and 17 of the movable contact mechanism. The rods 17 are preferably made integral with a plate 18 having an elongated aperture 19 extending therethrough and having its major diameter extending transversely to the direction of rods 17. The rods 16 are likewise formed integral with a plate 20 having an elongated aperture 21 disposed in the same relation to the rods 16 as aperture 19 bears to rods 17. The structures just described are identical and are shown in perspective in Fig. 6. The rods 16 and 17 may be provided with lugs 22 positioned at a distance from the outer ends thereof. The arms 12 and 13 are each provided with upwardly extending bosses 23. By reference to Fig. 1, it will be apparent that when rods 16 are disposed between opposite pairs of guide lugs 15, said rods will normally assume a position with lugs 22 positioned against adjacent sides of bosses 23, and that said rods may be reciprocated longitudinally so that one of said lugs 22 may ride over the boss 23 to the opposite side thereof. A plunger rod 24 extends through the elongated perforations 19 and 21 in the plates 18 and 20 respectively and may be moved about the swivel bearing 25 provided by a rounded seat 26 in cover cap 27 and a ball member 28 on plunger rod 24. A suitable washer 29 surrounds the plunger rod 24 and serves as an abutment for one end of the spring 30 which has its opposite end in abutment with a shoulder 31 on ball member 28. A handle member 32 is provided on ball member 28 and extends through the casing for providing a convenient operating

means for the switch. From the foregoing, it will be apparent that the plunger rod 24 may be reciprocated vertically against the resistance of spring 30 and that it may also be moved radially about its swivel mounting to engage the end walls 33 of the apertures in plates 18 and 20 for effecting longitudinal movement of rods 16 or 17 in either direction. For example, as shown in the diagram in Fig. 4, if the handle 32 be moved from the vertical to the position shown, one of the rods 17 would be moved longitudinally until lug 22 thereon moved over boss 23 beneath it, overcoming the resistance of spring 30 on the plunger rod. After the lug 22 passes over the boss 23, the action of spring 30 will retain the rod 17 and arm 12 beneath it in their relative positions until the handle 32 is again moved to return the rod to another position. By reference to Fig. 5, it will be apparent that if the handle 32 be moved to a position of substantially 45 degrees from the position shown in Fig. 4, that one of the rods 16 and one of the rods 17 will each be projected forwardly so that the lugs thereon will ride over the complementary bosses and the switch will be in a position closing two selected circuits. It will also be apparent that regardless of what position the handle 32 may assume, it may also be pressed downwardly against spring 30 for completing another circuit. This last mentioned circuit will be maintained only so long as the handle 32 is held in a depressed position and is used for sounding a horn. The rods 16 and 17, plates 18 and 20, plunger rod 24 and casing 27, all being made of metal, may be conveniently grounded to a steering column 34 of an automobile so that the parts mentioned are simply connected with one pole of a source of electrical energy such as a battery or generator. These parts together comprise a movable contact device. The various circuits to be controlled are then electrically connected to fixed contacts 35, 36, 37, 38 and 39. Each of the last mentioned contacts are provided with individual conductor wires 40 by means of suitable connectors 41 conveniently secured beneath the base member 10 so that conductor wires 40 may be brought through a suitable aperture such as 43 in the lower portion 27<sup>a</sup> of the casing from whence they may be carried through the hollow interior of the steering column 34. One pair of oppositely positioned contacts, for example 37 and 38, would be employed to control the bright and dim circuits for the head lights of a machine. Another pair of contacts 35 and 36 would be connected to control the right and left turn direction signal mechanism while the contact 39 would be used for the horn circuit. The switch may be conveniently mounted at the head of the steering column

through the instrumentality of an annular flange 44 and set screw 45.

It will be noted from Figs. 1 and 2, that rods 16 are reciprocable in opposite directions to effect electrical contact with fixed contacts 35 or 36 and that the rods 17 are reciprocable at right angles to rods 16 in order to effect electrical contact with either of fixed contacts 37 and 38. The fixed contacts just mentioned may be resilient in order to insure good contact with the rods. Lines extending through contacts 35—36 and contacts 37—38 are positioned on intersecting diameters, the intersection of which passes substantially over the center of central fixed contact 39.

The operation of the device is as follows:

Assuming that the switch is mounted upon a steering column as shown in Fig. 3, and the conductor wire 40 having been passed through the steering column, the various wires would be connected to the lights or mechanisms to be controlled in the following manner. Since movement of the handle 32 horizontally toward the right would cause rod 16 to form a contact with fixed contact 36, said contact would be employed to control a right hand turn direction signal. In the same manner, a circuit controlled by contact 35 would be completed by moving the handle 32 about its swivel mounting toward the left so that contact 35 would be employed to control a left hand signal device. Movement of the handle 32 transversely to the horizontal would effect completion of a circuit embracing either contact 37 or 38 so that these two fixed contacts would be employed to control bright and dim head lights. During the day time, a driver would have occasion to use only the horn signal and the left and right turn direction signal. To sound a horn, he would merely depress handle 32 by tapping downwardly upon it as is customary in sounding electrically controlled horns. Should the driver wish to signal for a right hand turn, he would push handle 32 horizontally to the right thereby projecting the rod 16 to the left effecting a contact with fixed contact 36. As the spring 30 exerts constant downward pressure upon both rods 16 and 17, the said rod 16 would be retained in its position upon contact 36; the lug 22 and boss 23 serving to preclude accidental separation. Should the driver wish to indicate a left hand turn, he would push the handle 32 in the opposite direction so that the contact 35 would be engaged by the opposite rod 16. It should be noted that when driving at night, a driver would be called upon to have either the bright or dim head lights turned on at all times. Assuming that the fixed contact 37 controls the bright head lights, the driver would move the handle directly toward him for closing the desired circuit and whenever

he desires to dim his head lights, he would push the handle 32 directly away from him thereby breaking the bright circuit and completing the dim circuit. If now, the driver should have the dim head lights turned on, the handle would be in the position shown in Fig. 4. If he should desire to signal for a right hand turn while the dim head lights were turned on, he would move the handle to a position shown in Fig. 5, where-  
 10 he would have completed the two circuits controlled by fixed contacts 36 and 38. By manipulating the handle to any of the eight possible positions, a driver may control  
 15 either bright or dim head lights, left or right hand turn direction signals, or any combination of head light intensity and direction signal. At the same time, the driver is also able to sound the horn by depressing the  
 20 handle without moving the handle from its given position.

What I claim is:

1. In a device of the class described the combination with a base, of a fixed contact  
 25 mounted centrally of the base, of aligned fixed contacts mounted on the base equidistant from the central fixed contact, a casing for the base, a plunger rod mounted for swivel and reciprocating movement in the  
 30 casing, a movable contact support mounted on the base and having an enlarged perforation in the center thereof, integral arms on the support extending in alignment with the fixed contacts, guide means on the arms, rods  
 35 mounted reciprocally on the support means and extending between the guide means thereon, and yielding means operatively associating the plunger rod and reciprocating rods whereby reciprocating movement of the  
 40 plunger rod may effect contact between said plunger rod and the central fixed contact and whereby movement of the plunger rod about its swivel mounting may serve to move the  
 45 reciprocating rods to effect contact between said reciprocating rods and the other fixed contacts.

2. In a device of the class described the combination with a base, of four fixed con-  
 50 tacts disposed at equal distances about a circumference on the base, a fifth contact disposed at the center of said circumference, a movable contact support comprising an annular body surrounding the central fixed con-  
 55 tact, integral arms on the annular body extending in alignment with the circumferentially disposed fixed contacts, movable contact rods disposed one upon the other and at right angles to each other and adapted to ride upon the arms of the contact support,  
 60 said rods having elongated apertures extending transversely to the length of said rods, a casing for the base and movable contact members, a plunger rod mounted for swivel and reciprocating movement upon the  
 65 casing and extending through the apertures

in the reciprocating rods, and spring means for yieldingly retaining the plunger rod in position in the apertures in the reciprocating rods.

3. In a device of the class described the  
 70 combination with fixed contacts disposed equidistant about a circumference, of a central fixed contact disposed at the center of the circumference, a casing serving to enclose  
 75 the contacts, a plunger rod having reciprocating and swivel movement in the casing, and a movable contact device associated with the plunger rod, swivel movement of the  
 80 plunger rod in certain given directions serving to effect contact between the movable contact device and given ones of the fixed contacts, swivel movement of the plunger rod in directions intermediate said certain given  
 85 directions serving to effect contact between the movable contact device and predetermined pairs of the fixed contacts, and longitudinal reciprocation of the plunger rod serving to effect contact between the movable  
 90 contact device and the central fixed contact independently of the first mentioned fixed contact.

4. In a device of the class described, the combination of a plurality of fixed contacts,  
 each embracing a separate electrical circuit, a movable contact device serving as a com-  
 95 mon return contact for each of the first mentioned circuits, means for shifting the contact device for effecting joint and several contacts between selected, fixed contacts and  
 100 the movable contact device, and means for yieldingly retaining the shifting means in spaced relation to a given one of the fixed contacts, whereby to permit making and  
 105 breaking of a circuit through the said given one of the fixed contacts independently of the position of the movable contacts with the remaining fixed contacts.

5. In a device of the class described the combination with a central fixed contact,  
 110 pairs of fixed contacts mounted in spaced relation about said central contact, reciprocable rods adapted to be moved into electrical contact with the fixed contacts, and a plunger rod adapted to abut the central  
 115 contact and mounted for swivel movement for moving the reciprocable rods to contact selected ones and selected pairs of the fixed contacts.

6. In a device of the class described the combination with fixed contacts of a mov-  
 120 able contact device and a handle mounted for swivel and reciprocating movement and adapted to be moved to one position for effecting contact between the movable contact device and one of the fixed contacts, to  
 125 other positions for effecting contact between the movable contact device and a selected one of the remaining fixed contacts and to other positions for effecting contact between the movable contact device and predeter-  
 130

mined pairs of said remaining fixed contacts.

7. In a switch mechanism, the combination of a base having a plurality of spaced, fixed contacts, a movable contact having arms normally disposed in spaced relation to the fixed contacts, and a swivel handle means for selectively projecting a single bar of the movable contact into electrical contact with a given fixed contact, said handle means be-

ing also adapted for movement intermediate the first mentioned, given directions, whereby to selectively move a pair of adjacent arms of the movable contact into electrical contact with a pair of the fixed contacts. 15

In testimony whereof, I have hereunto subscribed my name this 2nd day of September, 1925.

LUCIEN F. FORSEILLE.