Dec. 21, 1926. 1,611,460

J. F. KLISH

ELECTRIC SWITCH

Filed Oct. 11, 1921

Fig. 1

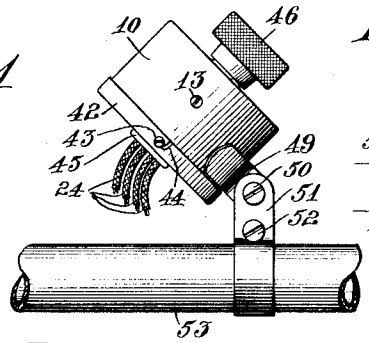


Fig. 3

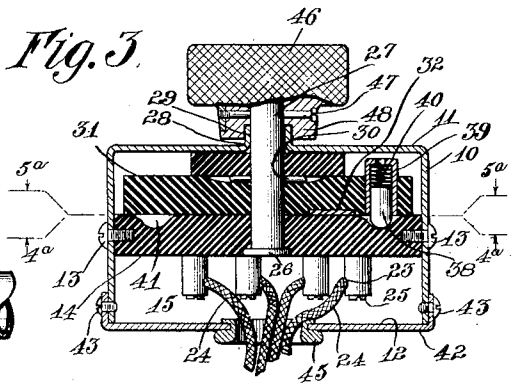


Fig. 2

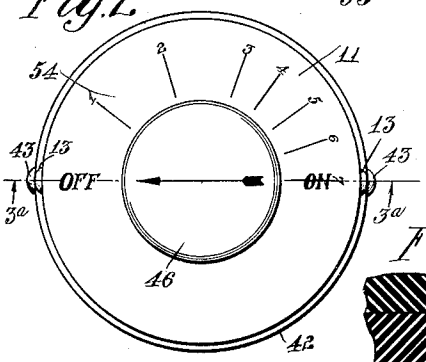


Fig. 5

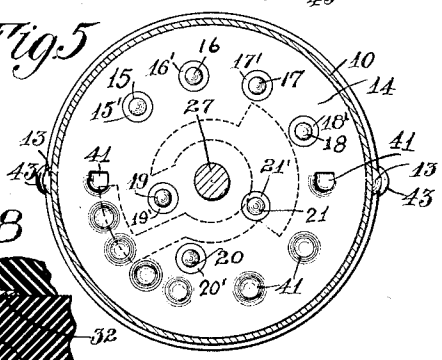


Fig. 8

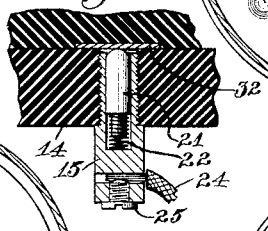


Fig. 4

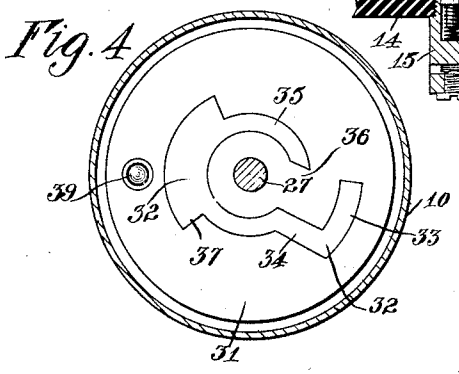


Fig. 7

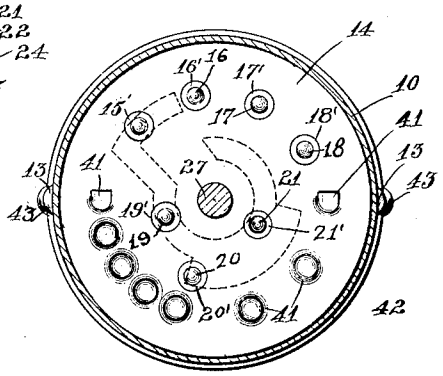
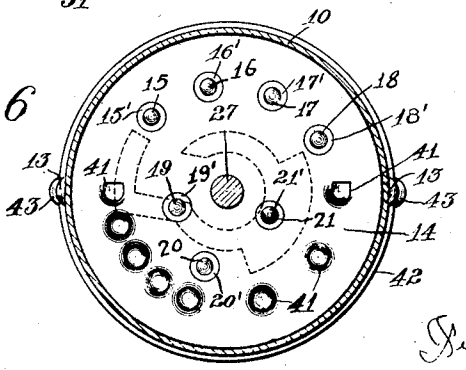


Fig. 6



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ELECTRIC SWITCH.

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This invention has to do with electric switches and more particularly with those adapted for controlling a plurality of circuits, such, for example, as the lighting or other circuits of a motor vehicle, one object of the invention being to provide a simple, inexpensive and practical switch of the above character adapted for selectively and conveniently controlling a relatively large number of different circuits.

Another object is to provide such a switch with a construction and arrangement of working parts affording a wide and convenient range of possible combinations of energized circuits, with a minimum of interruption of established circuits when changing from one combination to another. A further object is to provide a switch of the above character in compact form having a single handle convenient to operate for controlling the various circuits and which is readily applicable to a variety of uses and is effectively protected from dust and moisture. To these and other ends the invention resides in certain improvements and combinations of parts all as will hereinafter be more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a side elevation of a switch embodying the present invention and illustrating the application of the same to use with a motorcycle.

Figure 2 is an enlarged top view of the switch detached.

Figure 3 is a sectional view on the line 3^a—3^a of Figure 2.

Figure 4 is a sectional view on the line 4^a—4^a of Figure 3.

Figures 5, 6 and 7 are sectional views on the line 5^a—5^a of Figure 3 illustrating the parts in different working positions; and

Figure 8 is a sectional view illustrating the details of construction of one of the contact members.

Similar reference numerals throughout the several views indicate the same parts.

This embodiment of the invention which has been selected for the purposes of the present disclosure to illustrate the principles involved and a preferred practical application of the same, comprises a modification particularly adapted for use with a motorcycle, although it will be apparent that by slight variations in the details, it may be rendered suitable for various other uses. Referring more particularly to the drawings the present embodiment comprises, preferably, a cylindrical or cup shape casing 10 economically formed of sheet metal, having a closed end 11, Figure 3, with the opposite end left open as at 12 thru which the working parts are inserted and accessible in the casing which effectively houses and protects the same.

Secured within the housing substantially at the center of its side walls, as by means of screws 13, is a disk 14 of any suitable insulating material having formed therein a plurality of bores in which are fixed a series of tubular binding posts 15′ to 21′ inclusive. These binding posts extend substantially flush with the upper side of disk 14 at which end they slidably support contact members in the form of bevelled pins 21 urged outwardly by springs 22 for engagement with a complementary contact element or plate hereafter described. The other ends of the binding posts project below disk 14 and have formed therein lateral openings 23 for the insertion of connecting wires 24 secured to the binding posts as by means of screws 25. As shown in Figures 5, 6 there are thus provided a series of contact elements 15 to 18 inclusive arranged in spaced relation substantially on an arc of a circle having its center at the center of disk 14. In addition there are provided contact members as 19 and 21 spaced from each other on an arc of a circle smaller than, but concentric with, the circle on which the contacts 15 to 18 inclusive are arranged. Also the contact 20 may be said to be located on an arc of a circle concentric with the circles already referred to but intermediate the latter. It is preferred in the present instance to connect the plurality of contacts 15 to 20 inclusive with a plurality of corresponding circuits to be controlled so that these contacts may be designated as distributing contacts, while contact 21 is connected with a suitable source of power such as a storage battery or a generator and is therefore referred to as the supply contact. It is to be understood of course that in the present instance the other terminal of the source of power is grounded and the contacts 15 to 20 inclusive connected with one side of the respective circuits to be controlled the other sides of which are also

grounded, as well understood in the art. In operation the supply contact 21 is selectively connected with the distributing contacts 15 to 20, individually or in selected groups, by means which will now be described.

Rotatably supported in disk 14 at its center is the headed lower end 26 of an operating spindle 27, journalled adjacent its upper end in an opening 28 in the end 11 of the casing, which opening is provided with an outwardly extending flange 29, affording substantial bearing surface for the spindle. The latter is fixed as by means of a key 30 of any suitable construction to a body 31 of insulating material preferably in the shape of a disk of somewhat less diameter than the stationary disk 14. As shown in the drawings body 31 is placed above disk 14 with the adjacent surfaces in proximity or resting upon the other, and may be rotated by turning spindle 27. The lower surface of body 31 carries a plate 32 fixed to and preferably embedded in the body, which plate forms a common contact element for cooperation with the series of contact members 15 to 21 previously described.

As best shown in Figure 4 plate 32 comprises a plurality of arcuate portions or surfaces concentric with spindle 27 or in other words with the circular arcs on which the contact members 15 to 21 are arranged. Thus the plate comprises an arcuate portion 33 arranged for selective engagement with contact members 15 to 18 inclusive during the rotation of the plate with body 31. Arcuate portion 33 is connected by means of a substantially radial portion 34 with an inner arcuate portion 35 extending over the major portion of a complete circle with a gap left as at 36. At 37 is another and intermediate arcuate portion for engagement with contact member 20. Plate 32 is composed of course of conducting material being preferably of the integral form shown.

It is obvious from the above construction that when plate 32 is in the "off" or starting position illustrated in Figure 5, the supply contact 21 is in engagement with the relatively long inner arcuate portion 35 so that the plate is supplied with power but is in this position out of engagement with all of the distributing contacts so that none of the latter are energized. When the plate is rotated however in a clockwise direction to the position illustrated in Figure 6, arcuate portion 35 engages, in addition to the supply contact 21, the contact 19 which in the present instance is connected with the tail light circuit of the vehicle. In this position therefore the tail light alone is turned on, as convenient in parking a vehicle. When the plate is rotated to its next succeeding position as illustrated in Figure 7, contact member 15 also is engaged which is preferably connected for producing a relatively dim illumination by the headlights. In this position therefore the latter and the tail light are both energized. In addition this latter position brings arcuate portion 37 into engagement with contact member 20 which is preferably connected with the light on the motorcycle side-car, so that three circuits in all are energized, being circuits commonly employed at night while running. The next position of the plate brings arcuate portion 33 into engagement with contact member 16 alone while contacts 19 and 20 continue to be engaged. Contact 16 may be connected for producing a relatively bright head light illumination, thus providing another convenient combination of circuits. It is to be noted that the supply contact 21 continues in engagement with its corresponding arcuate portion 35 of the plate so that the latter is continuously supplied with voltage. Similarly contact 17 may be connected with the circuit of a fixed spot light and the plate may be moved so that its portion 33 engages contacts 16 and 17 simultaneously in which event the spot light is added to the combination of the previous position. The next position of the switch disconnects the contact 16, leaving the tail, spot and side-car lights energized. The remaining contact member 18 may be connected with the circuit of a portable spot light and portion 33 of the contact plate may be moved into engagement with contact members 17 and 18 both, in which case the tail light, both spot lights and side-car light are illuminated. Finally portion 33 may be moved to position for engagement with contact 18 alone in which position the tail light and portable spot light only are energized. There are thus provided in the present instance seven possible combinations in addition to the off position described as illustrated by any suitable indicia on the casing end 11.

Detent means are preferably provided for accentuating the different positions and adjustment of the switch comprising in the present instance a bevelled pin 38, Figure 3, slidably carried in a tubular member 39 fixed in the body 31, the pin being pressed outwardly by spring 40 for engagement with a series of recesses 41 in disk 14. These recesses have gradually inclined sides so that the pin slides into and out of the same and over the surface of the disk, the end recesses having abrupt outer sides however for limiting the adjustment of the switch to its half circle of movement.

The lower end of casing 10 is preferably provided with a movable closure plate or cap 42 carrying screws 43 engageable in bayonet slots 44 in casing 10, Figure 1, so that by loosening the screws the closure or cap may be conveniently removed and replaced, after which it may be again securely fastened in position by tightening the screws. The cap

is formed centrally with an opening finished with an eyelet 45 preferably of insulating material thru which the various wires 24 are passed from the binding posts of the contact members to the respective connections. The caps 42 and disk 14 effectively prevent the access of dust or moisture through the lower end of the casing to the working parts.

The upper end of spindle 27 is provided with a knurled fingerpiece 46 removably fixed to the spindle as by means of a bolt 47 passing thru the fingerpiece and thru the spindle. The fingerpiece is preferably formed with a flange like portion 48 enclosing the upper end of the outwardly extending flange 29 of the casing, to afford complete closure of the latter and protection against the entrance of dust and moisture.

For conveniently attaching the switch to the frame of a motorcycle the present embodiment has a bracket 49, Figure 1, fixed on casing 10 and pivotally connected as by means of a bolt 50 with a clamping device 51 of any suitable construction provided with a screw 52 for clamping the same to the frame 53. By loosening screw 50 the switch may be disposed at the angle most convenient for operation and securely fixed in such a position. The end 11 of the casing may be marked with suitable indicia as illustrated in Figure 2 for denoting the "off" and various operating positions, the handle 46 being provided with a pointer for cooperation with such markings.

The operation of the device has already been described in connection with the explanation of its construction. As indicated it may be conveniently attached to the frame of a motorcycle within convenient reach of the operator so that by the simple turning of the single finger piece or handle 46 anyone of the various combinations of lighting circuits may be energized and it is to be noted that the construction and arrangement of the working parts is such that the change from one to another of the comparatively wide range of circuit combinations provided, is effected without unnecessary interruption of established circuits in passing from one position to another. In other words, where one or more of the same circuits are energized in each of two succeeding positions, these circuits are not broken in moving from one of these positions to the other, thus avoiding objectionable flickering of the head, spot or other lights. As apparent from the drawings the device comprises but few parts which are simple and compact in construction and arrangement and easily reached for cleaning or repair. The working parts furthermore are effectively housed in a comparatively tight casing being thus protected from dust and the weather.

I claim as my invention:

1. A switch for controlling a plurality of electric circuits comprising a casing, oppositely disposed members mounted within the casing, one of which is fixed and the other rotatable relative thereto and having a contact plate insulated from the casing, a series of contacts disposed upon said fixed member at a predetermined distance from the axis of said rotatable member, a second series of contacts mounted upon said fixed member, certain of which are disposed at a different distance from said axis than the first mentioned series, and one of which forms a supply contact, said plate being adapted to simultaneously establish connection between said supply contact and a plurality of the contacts of one of said series and a single contact of the other series, and means for manually operating said rotatable member.

2. A switch for controlling a plurality of electric circuits comprising a casing, oppositely disposed members mounted within the casing, one of which is fixed and the other rotatable relative thereto and having a contact plate insulated from the casing, a series of contacts disposed upon said fixed member at a predetermined distance from the axis of said rotatable member, a second series of contacts mounted upon said fixed member, certain of which are disposed at a different distance from said axis than the first mentioned series, and one of which forms a supply contact, said plate being adapted to simultaneously establish connection between said supply contact and one of the contacts of each of said series, means for operating said rotatable member and means for yieldably holding it in its various positions of adjustment.

3. In a control switch for a plurality of electric circuits the combination of a body of insulating material, a plurality of distributing contacts on said body spaced from one another on an arc of a circle, additional distributing contacts and a supply contact on said body on arcs of circles concentric with said first circle, a second body of insulating material supported for rotation about the center of said circles, and a plate of conducting material on said second body comprising a plurality of arcuate portions one of which is arranged for continuous engagement with said supply contact and the remaining portions for selective engagement with said distributing contacts during the rotation of said second body.

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