

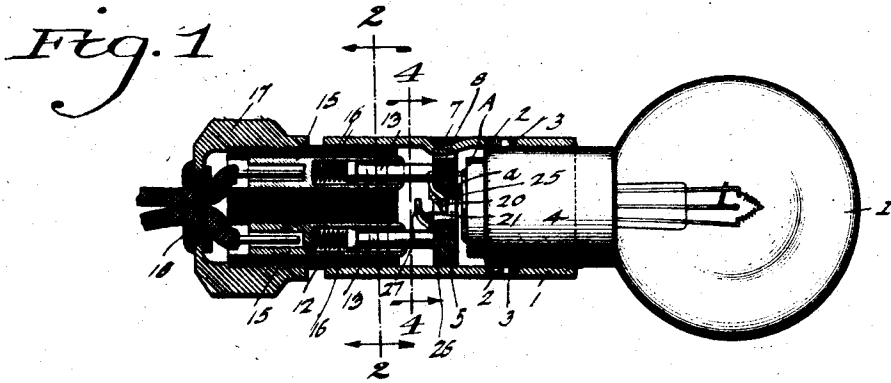
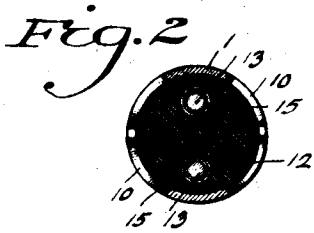
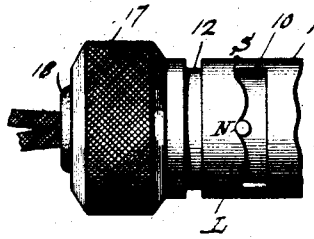
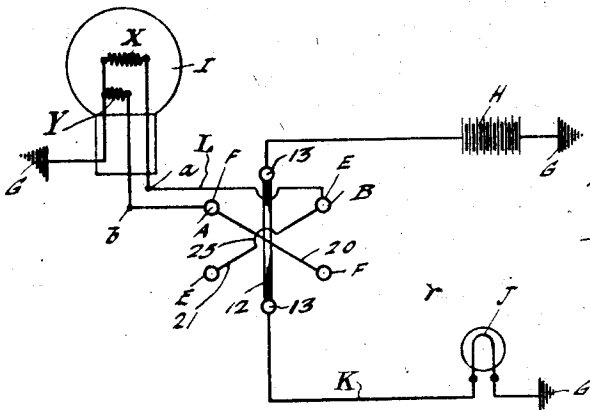
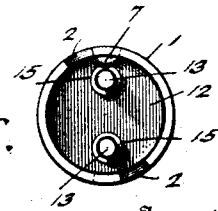
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C. D. RYDER

ELECTRIC SWITCH

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Inventor
Charles D. Ryder.

By *Wood & Wood*

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES D. RYDER, OF COVINGTON, KENTUCKY, ASSIGNOR TO THE CINCINNATI
VICTOR COMPANY, A CORPORATION OF OHIO.

ELECTRIC SWITCH.

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This invention relates to a plural way electric circuit controlling lamp socket switch primarily for the control of low voltage circuits as for automobile lighting service, in the control of a plural or double filament head light bulb in conjunction with a tail light bulb wherein the tail light circuit is always complete or closed while the circuit is complete or closed to either of the filaments of the head light.

The object of my invention is to provide a switch for selective circuit control said switch being of compact structure and having mounted therein a removable multiple contact plate.

A more specific object is to provide a lamp socket and switch adapted for mounting an incandescent bulb, and for separately controlling each of two circuits of an incandescent light of the two-filament type, as well as for simultaneously controlling the circuit of a separately mounted third light or a plurality of such lights, to cause the circuit to the latter to be closed or opened when either of the circuits to the other two is closed or opened, whereby the third light or circuit is operated in proper correspondence to the others.

The invention herein is applied for controlling circuits to the two-filament light or bulb such as is used on automobile headlights, in which the dimmer and bright light are combined in a single bulb, and the separate circuits for each filament provided, the terminals of which filaments are connected through an improved switch in such manner as to control a tail light circuit, whereby that circuit is active or inactive in correspondence to either of the first mentioned circuits.

Another object is to provide a switch or contact disk of insulating material as an intermediate connector element adapted for electrically connecting the terminals of the two-filament incandescent lamp to a pair of adjustable switch elements in such manner that the filament can be separately energized, and an auxiliary circuit correspondingly energized simultaneously therewith.

Another object is to provide means for removably securing the bulb at one side of and in contact with the switch or contact disk and to further provide means for mounting a contact carrying plug of insulating material as a finger piece at the opposite side

of the disk for limited step by step rotation in predetermined degree relative to certain contacts of the disk, said plug having yieldable contact pins adapted for simultaneously engaging the contact at that side of the disk.

Other objects and certain advantages and features will be disclosed in the description of the drawings forming a part of this specification, in which drawings:

Figure 1 is a longitudinal section showing my improved switch and lamp socket with a lamp associated therewith.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a fragmentary elevation illustrating the manner of connecting the stationary and rotatable member of the device for relative limited movement in predetermined degree.

Figure 4 is a section on line 4—4 of Figure 1, showing the non-rotatable translatable switch or contact block in elevation.

Figure 5 is a detailed section of the block on line 5—5 of Figure 4.

Figure 6 is an end view of the sleeve with a lamp removed.

Figure 7 is a diagrammatic view showing a scheme of electrical connections in conjunction with my improved device.

The switch socket herein comprises three main separable parts, to wit: a metallic sleeve suitably non-rotatably mounted, a switch block of insulating material non-rotatably translatable disposed within the sleeve at an intermediate point, and a cylindrical plug also of insulating material rotatable in the sleeve at one end and having yieldable insulated contacts adapted for engaging the terminals of certain conducting elements of the switch block.

The sleeve or tube 1 has diametrically disposed longitudinally extending bayonet slots 2 at one end into which diametrical projections 3 of the lamp base 4 are adapted to be inserted and the lamp rotated at the limit of insertion to engage the lugs with the lateral portion of the slots in the usual manner. This operation disposes the bulb in position with its terminals or contacts *a, b*, engaged with the corresponding contacts or terminals *A, B* of an improved switch block 5 non-rotatably but slidably mounted within the socket, which socket is provided with an inwardly directed longitudinal projection 7,

as a punched-in portion, for engagement with the corresponding notch 8 formed in the periphery of the block whereby the block is non-rotatably and slidably mounted. The sleeve is stationarily attached, for example centrally of and projecting within a head light reflector, within and at the focal point of which the light is preferably disposed. The sleeve is further provided at that end opposite the bayonet slots with diametrically related circumferential slots 10, adapted for limiting the degree of movement of a hand-operable rotatable contact carrying plug 12 which plug has diametrically related pins projecting outwardly therefrom and into the slots. Each slot on one edge is curved as shown in Figure 3, to provide in this instance a central notch N corresponding to a neutral position of the switch and two lateral notches S, L, at opposite sides thereof respectively corresponding in this instance to positions for dimmer and bright light operation.

The rotatable cylindrical plug has two longitudinally diametrically disposed bores spaced equidistant at opposite sides of the longitudinal axis of the plug, and immovably mounted within each bore is a conducting tubular member 15 in which is slidably disposed the contact pin 13 headed at the inner end for engagement by a coil spring 16 mounted within the tube, which spring acts to force the pin outwardly for yielding engagement with the cross strips of the switch block as hereinafter fully described.

The outer end of each tube is crimped over, to center guide the pin, and form a shoulder to prevent its disengagement when the plug is removed. Each tubular member is partitioned to form an abutment for the spring and each has a suitable binding screw, not known, traversing the plug and the wall of the tube at its outer end portion to secure the terminals of a conductor. The outer projecting end of the plug is threaded exteriorly and engaged therewith is an exteriorly knurled thumb-piece and cover cap 17 in the outer wall of which is mounted a ring 18 of insulating material through which the wire conductors pass.

My improved multiple contact plate or disk 5 is formed of insulating material and has mounted thereon at one side in crossed relation flat conducting strips 20, 21 each strip having two terminal cylindrical right-angularly extending lugs, one of which extends through the disk and projects at the opposite side thereof, forming the terminals A, B, and the other extending partially through the disk as at C, and therefore not projecting at the opposite side. Each conductor has the form of a flat metallic strip, the lower being crimped centrally as at 25 and extended into a central opening of the disk, while the upper is crimped centrally in

the opposite direction as at 27 to bridge the lower strip. (See Figures 4 and 5.) The strips are thus insulated from one another and two contacts A, B, are provided at the opposite side of the disk, each of which is engageable by corresponding filament terminal of a two-filament lamp, these two contacts being formed, one each at adjacently disposed ends of the strips. The projections are of greater diameter than the width of the strips, thus providing four raised contact portions in pairs respectively E, F, at one side of the disk and two at the opposite side.

The contact disk of insulating material is thus provided having on one face conducting strips of substantially equal length crossing substantially centrally of the disk and insulated from one another. Thus two unconnected sets of contacts of three each are provided each set having two contacts on one side and two on the other.

As shown in Figure 4, the pins are in a neutral position in which both pins 13 are disengaged. Upon turning the plug in a clockwise direction as viewed in Figure 4, the two pins will come in contact with the strip 21 and in the present arrangement will cause the large filament X to be energized, and if turned in the opposite direction sufficiently, cause the smaller filament Y to be energized.

The electrical connections are shown in Figure 7, in which K is a suitable source of electrical energy such as a battery; J indicates a small light for example a tail light of an automobile, or a series of such lights which are to be operated when either of the filaments is energized; and I indicates an incandescent light provided with the great and small filaments respectively X and Y. A terminal of each of the filaments is grounded as at G while the battery is also grounded. The battery is connected with one of the contact pins 13 and the other contact pin is connected with one terminal of the lamp J, the other terminal being grounded as shown. When the plug is turned to the right and engaged with the contact E, current from the battery passes through L to the large filament of the lamp and through K to the small lamp J. When the plug is rotated in the opposite direction and its contacts engage with F, the small filament is energized as well as the lamp J. Thus the switch controls three circuits in such manner that two of the circuits can be alternately and separately operated and the third simultaneously operated in correspondence to either.

Although the invention has been shown and described as applied to automobile lighting, it is obvious that the switch and socket may be used for any purpose for which it is fitted by nature.

The structure of the rotatable plug may be modified providing that the proper number and arrangement of contact pins are provided to establish the circuit. Moreover, the incandescent lamp can be of any preferred construction and may be attached to the sleeve in any other preferred manner. If desirable a terminal plug may be substituted therefor. Other means can also be provided for securing the contact disk in proper position within the sleeve.

Having described my invention, I claim:

1. A rotary switch for controlling two selective and one simultaneous circuit, comprising a hollow member having selective circuit terminals mounted non-rotatively in one end thereof, battery and simultaneous circuit terminals mounted rotatively in the other end thereof and having interposed between said terminals a non-rotatable multiple contact plate providing two battery circuit contacts insulated from each other, each battery circuit contact having connected therewith a simultaneous circuit contact on the same side of the disc and a selective circuit contact on the opposite side of the disc.

2. A switch comprising two sets of contacts, said sets rotatably and engageably mounted with respect to each other, the first set being provided with two contacts and the second set with four contacts connected in pairs and so disposed that by rotation of one set, both contacts of the first set are adapted to be engaged selectively by both contacts of either connected pair of contacts of the second set.

3. A contact disk of insulating material having crossed conducting elements on one face insulated from one another, one end of each strip extended through and projected beyond the disk at the opposite side.

4. A contact disk of insulating material having crossed conducting elements on one face insulated from one another, one end of each strip extended through the disk and beyond the opposite face thereof, whereby each strip at one side is adapted for simultaneous engagement by pairs of diametrically arranged contact elements and whereby each strip can be engaged by and electrically connected with a terminal conductor at the opposite side.

5. A contact disk of insulating material having crossed conducting strips on one face, insulated from one another, each strip having one terminal extended through the disk to provide, circularly adjacent contacts equidistant from the disk center.

6. A contact disk of insulating material having crossed conducting strips on one face, of equal length, crossing substantially centrally thereof and of one another and insulated from one another, each strip having one terminal extending through the disk

to provide two circularly adjacent contacts equidistantly spaced from the disk center.

7. A contact disk of insulating material having crossed conducting strips on one face of equal length crossing substantially centrally thereof and insulated from one another, each strip having one terminal extended through the disk to provide two substantially adjacent contacts equidistant from the disk center, whereby each terminal of a two-filament lamp can be engaged by and electrically connected to one terminal of a strip at one side of the disk, and whereby each strip at the opposite side is adapted for simultaneous engagement by pairs of insulated diametrically arranged contact elements.

8. In a device of the class described, a tubular conducting element as a socket having an inwardly directed projection, and a disk of insulating material slidable within said tube having a peripheral notch slidably engaged with said projection for preventing disk rotation, said disk having crossed conducting elements on one face insulated from one another, one end of each strip extended through and projecting beyond the disk at the opposite side, whereby electrical elements are adapted to be supported at opposite sides of the disk and electrically connected through the disk contacts.

9. A lamp socket and switch comprising a tubular conducting element, a plug of insulating material rotatably non-translatably mounted at one end of the tube, rotatably adjustable in limited degree, having two yieldable conducting elements projecting inwardly therefrom, a disk of insulating material mounted within the tube having crossed conducting elements on one face adapted for separate and simultaneous engagement by the two yieldable conducting elements, each cross element at one end extending through and projecting beyond the disk at the opposite side to provide two contacts for engagement with respective terminals of a two filament incandescent lamp, said tubular element having means for holding the lamp against the contacts.

10. A lamp socket and switch comprising a tubular conducting element, a finger piece as a plug of insulating material, rotatably non-translatably mounted at one end of the tube rotatably adjustable in limited degree having two yieldable conducting elements projecting inwardly therefrom, a disk of insulating material mounted within the tube having crossed conducting elements on one face adapted for separate and simultaneous engagement by the two yieldable conducting elements, each cross element at one end extending through and projecting beyond the disk at the opposite side to provide two contacts for engagement with respective terminals of a two-filament incandescent lamp,

said tubular element having means for holding the lamp against the contacts.

11. A lamp socket and switch comprising a tubular conducting element having means
5 for securing an incandescent light bulb therein at one end and having an inwardly directed projection at an intermediate point, and further having diametrically disposed circumferential slots at the opposite end
10 with that circumferential wall of each slot adjacent the end notched to form stop depressions, a plug of insulating material rotatable within the tubular conducting element having projections engaged with said
15 circumferential slots and depressions for limiting rotation thereof in predetermined degree, said plug having yieldable diametrically related contacting elements projecting inwardly therefrom, and a contact disk
20 of insulating material having a notch slidably engaged with the projection of the tubular element, and further having crossed conducting strips on one face insulated from one another, each strip having one terminal
25 extending through the disk to provide two contacts at the element receiving end of the tubular element whereby each terminal of a two-filament lamp can be electrically connected to the corresponding terminal of the
30 corresponding strip at one side of the disk, and whereby each strip at the opposite side is adapted for separate engagement by the diametrically related contact elements of the plug when the same is rotated.

12. A lamp socket and switch comprising a tubular conducting element having means
35 at one end for securing an incandescent light bulb therein, and having an inwardly directed projection at an intermediate point, a plug of insulating material rotatably non-translatably secured within said tubular
40 conducting element for limited rotation, said plug having yieldable diametrically related contact elements, and a contact disk
45 of insulating material having a notch slidably engaged with the projection of said tu-

bular element and having crossed conducting strips on one face insulated from one another, each strip having one terminal extending through the disk to provide two
50 contacts at the lamp receiving end of the tubular element, whereby each strip at one side of the disk is adapted for separate simultaneous engagement by the diametrically related contact element of the plug
55 when the same is rotated.

13. A lamp socket and switch comprising a tubular conducting element having diametrically disposed longitudinally extending bayonet slots at one end for securing
60 an incandescent light bulb therein, and having an inwardly directed projection at an intermediate point and further having diametrically disposed circumferential slots at its opposite end, a finger piece as a plug
65 of insulating material rotatable within said tubular conducting element, having projections engaged with said circumferential slots for limiting rotation thereof, said plug
70 having yielding diametrically related contact elements projecting inwardly therefrom, and a contact disk of insulating material having a notch slidably engaged with said projection of the conducting element
75 and having crossed conducting strips on one face insulated from one another, each strip having one terminal extending through the disk to provide two contacts at the lamp receiving end of the tubular element, whereby
80 each terminal of a two-filament lamp can be electrically connected to one terminal of a strip at one side of the disk, whereby each strip at the opposite side is adapted for simultaneous engagement by the diametrically related contact elements of the
85 plug when the same is rotated, and means for electrically connecting each yieldable contact element in a circuit.

In witness whereof, I hereunto subscribe my name.

CHARLES D. RYDER.