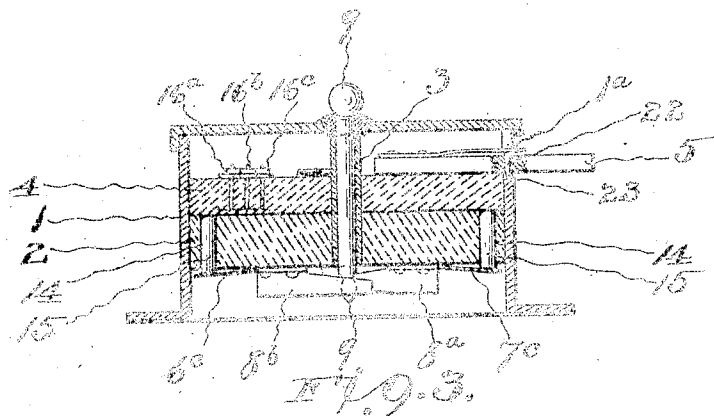
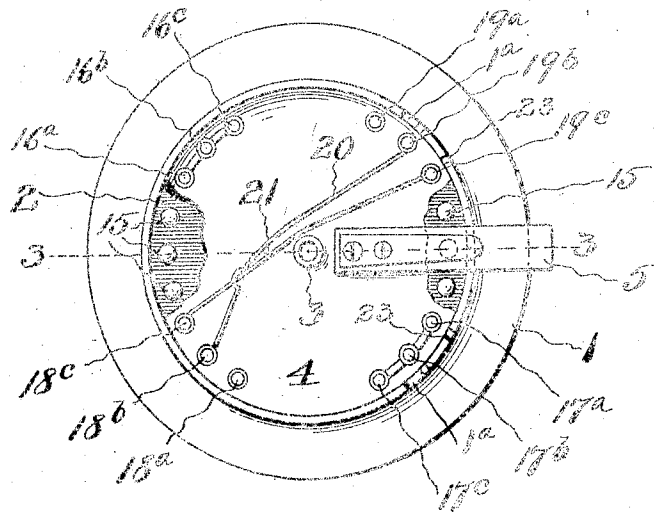


1,010,666.

Patented Dec. 5, 1911.

4 SHEETS—SHEET 1.

FIG. 1.



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COMMUTATOR SWITCH.
APPLICATION FILED SEPT. 23, 1910

1,010,666.

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4 SHEETS-SHEET 3.

FIG. 4.

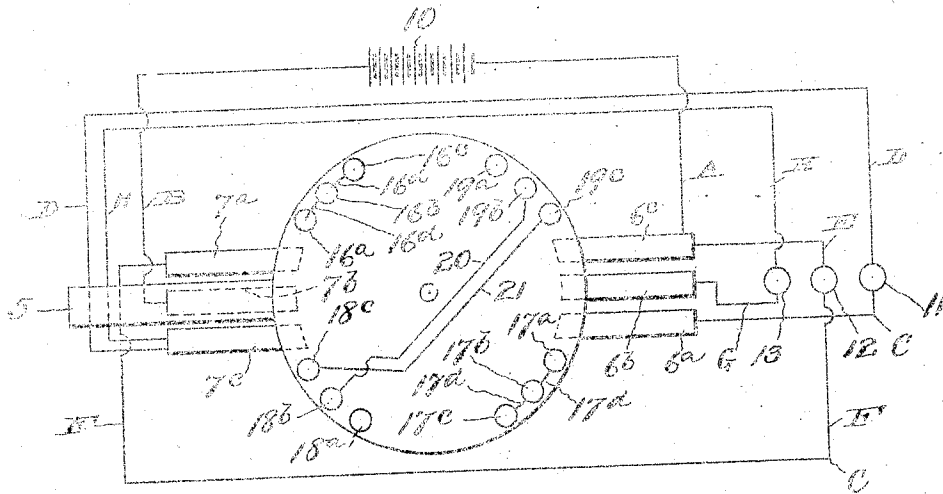
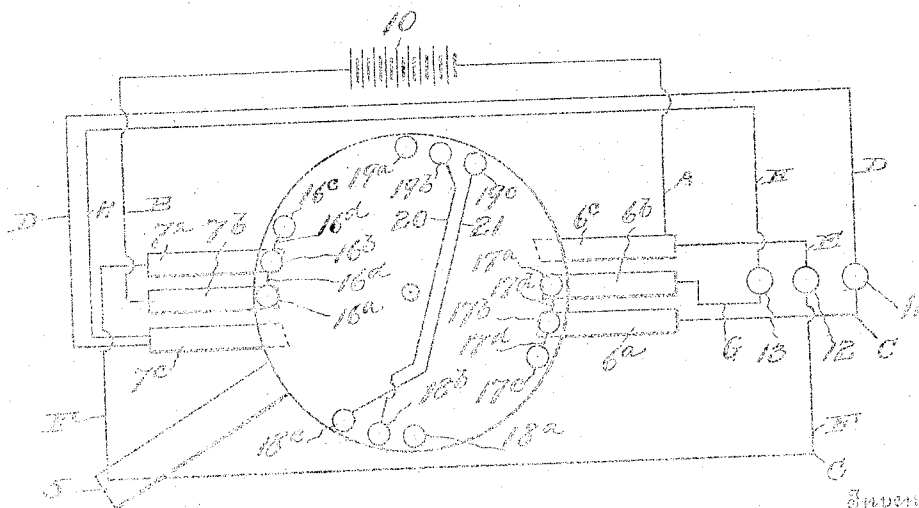


FIG. 5.



Inventor

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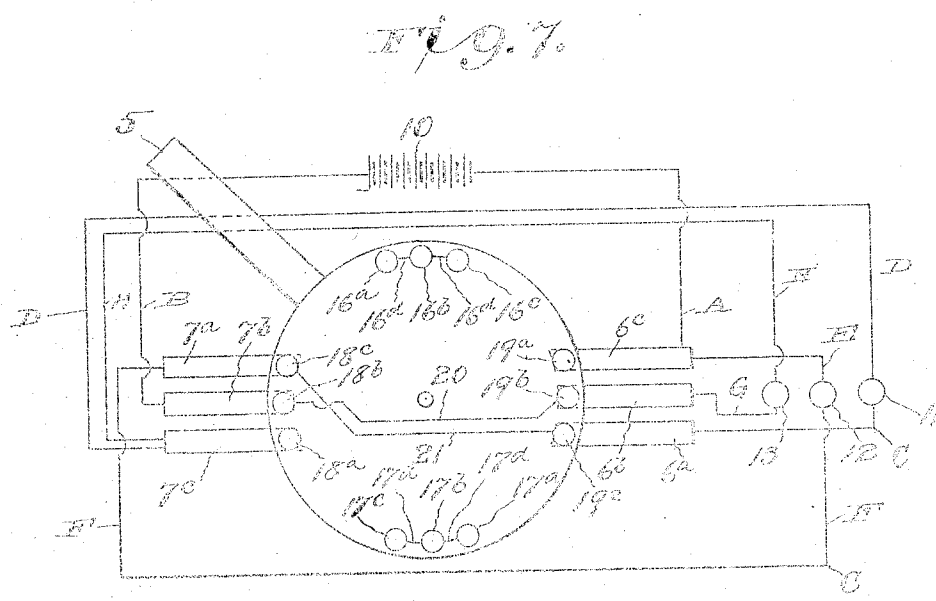
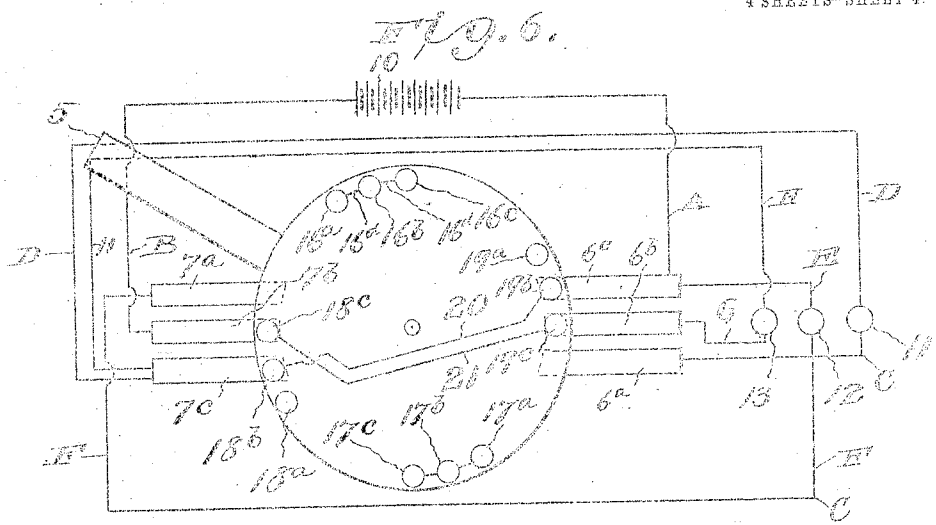
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R. MILLER.
 COMMUTATOR SWITCH.
 APPLICATION FILED SEPT. 26, 1910.

1,010,666.

Patented Dec. 5, 1911.
 4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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COMMUTATOR-SWITCH.

1,010,666.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed September 28, 1910. Serial No. 584,247.

To all whom it may concern:

Be it known that I, RALPH MILLER, a citizen of the United States, and a resident of Ann Arbor, in the county of Washtenaw and State of Michigan, have invented certain new and useful Improvements in Commutator-Switches, of which the following is a specification.

My invention relates to switches for controlling the direction of a power current to a plurality of light-circuits, and is especially adapted to use on motor-vehicles having two front lamps and a tail-lamp; and it has for its object the provision of a switch arranged to light a single side lamp, the tail lamp only, the three lamps in series at reduced candle power, and the three lamps in multiple full candle power.

My invention will be described in detail hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my improved commutator-switch, showing the top partly broken away; Fig. 2, a bottom plan view; Fig. 3, a cross-section on a vertical plane indicated by the line 3-3 of Fig. 1; Fig. 4, a diagrammatic view showing the switch set so that the lights are off; Fig. 5, a similar view showing the position of the switch when one side lamp only is lighted; Fig. 6, a similar view showing the position of the switch when the tail-lamp only is lighted; Fig. 7, a similar view showing the three lamps lighted in series; and Fig. 8, a similar view showing the three lamps lighted in multiple.

In the drawings similar reference characters indicate corresponding parts throughout all of the several views.

My improved switch is installed in a cylindrical casing 1, having a plate 2 secured therein, to which is secured a central tubular journal-pin 3, on which is revolvably mounted a disk 4, having an operating-arm 5 secured thereto that extends through a slot 1^a in the side of the casing. The plate 2 and disk 4 are made of any desired insulating material, such as vulcanized fiber or the like. Secured to the under side of plate 2 are two sets of three spring-contact fingers, designated 6^a, 6^b, and 6^c, and 7^a, 7^b,

and 7^c, respectively, and two other spring-fingers 8^a and 8^b, positioned to be engaged by a plug 9 inserted through the opening in the top of the casing and through tubular journal-pin 3.

10 indicates a battery, and 11, 12, and 13 the three lamps to be lighted thereby, lamps 11 and 12 being the two side lamps, and lamp 13 the tail-lamp. One pole of battery 10 is connected by wire A with finger 8^a, and the other pole with finger 7^b by means of wire B. Lamp 11 is connected by means of wire C with finger 6^a, and wire D with finger 7^c. Lamp 12 is connected with finger 6^b by means of wire E and with finger 7^a by means of wire F. Tail-lamp 13 is connected with finger 6^c by means of wire G and finger 7^c by means of wire H. Fingers 6^a and 8^b are also connected by means of wire I, so that when plug 9 is in position and engaging the free ends of fingers 8^a and 8^b the battery will be in circuit with finger 6^c through wire A, finger 8^a, plug 9, finger 8^b, and wire I.

14 indicates holes in plate 2 above the free ends of fingers 6^a, 6^b, 6^c, 7^a, 7^b, and 7^c, in which are loosely mounted contact-pins 15 that engage the underside of disk 4.

Disk 4 is, as stated above, made of a material that is a non-conductor of electricity, and has secured therein four series of contact-buttons which I will now describe in detail. Said contact-buttons extend through disk 2 and are positioned so that they engage contact-pins 15 when the disk 2 is rotated, while their upper ends extend above the top surface of the disk and are provided with binding-nuts. Two of the series of buttons, designated 16^a, 16^b and 16^c and 17^a, 17^b, and 17^c, respectively, are electrically connected by means of conductors 16^a and 17^a, respectively. The other sets of contact-buttons are designated 18^a, 18^b, and 18^c and 19^a, 19^b, and 19^c, respectively. Buttons 18^b and 19^b are joined by conductor-wire 20, and buttons 18^c and 19^c by conductor-wire 21.

It will be understood that the switch is operated by rotating disk 4 by means of operating-arm 5, and that when it is in the middle position shown in Fig. 4 none of the contact-buttons are in contact with pins 15 and none of the lamps will be lighted.

When the disk is turned counter-clockwise, as shown in Fig. 5, the first effect will be to bring the buttons 16^a and 16^b into contact with pins 15, engaging fingers 7^a and 7^b, respectively, and buttons 17^a and 17^b into contact with pins 15, engaging fingers 6^b and 6^a, respectively. The current from battery 10 will then be directed through wire A, finger 8^a, plug 9, finger 8^b, finger 6^c, wire E, side lamp 12, wire F, finger 7^a, pin 15 engaging finger 7^a, button 16^b, connection 16^a, button 16^a, pin 15 to finger 7^a, and by wire B back to the battery.

When the disk is rotated as far as the slot 1^a will permit the arm 5 to swing, as shown in Fig. 8, the current will flow from battery 10 through wire A, finger 8^a, plug 9, finger 8^b, wire I to finger 6^c, from thence it will be distributed by means of buttons 17^a, 17^b, and 17^c, and connections 17^a, to the fingers 6^a and 6^b, through pins 15 and from fingers 6^a, 6^b, and 6^c through wires C, E, and G to lamps 11, 12, and 13, respectively, then back through wires D and H to finger 7^c and wire F to finger 7^a, through buttons 16^a and 16^c and connections 16^a to button 16^b, thence through finger 7^b and wire B back to the battery, the lamps being lighted full candle power.

When the disk is turned clockwise from the position shown in Fig. 4, as shown in Fig. 6, the first effect is to bring the buttons 18^a and 18^c into contact with pins 15 engaging fingers 7^c and 7^b, respectively, and buttons 19^b and 19^c into contact with pins 15 engaging fingers 6^c and 6^b, respectively. The current will then flow from the battery 10 through wire A, finger 8^a, plug 9, finger 8^b, wire I, finger 6^c, button 19^b, wire 20, button 18^b, finger 7^c, wire H, tail-lamp 13, wire G, finger 6^b, button 19^c, wire 21, button 18^c, finger 7^b, and wire B back to the battery.

When the disk is rotated to its farthest point, clockwise, as shown in Fig. 7, buttons 18^a, 18^b, and 18^c contact with pins 15 engaging fingers 7^c, 7^b, and 7^a, respectively, and buttons 19^a, 19^b, and 19^c contact with pins 15 engaging fingers 6^c, 6^b, and 6^a, respectively. In this position the three lamps 11, 12, and 13 are lighted in series, the current passing from the battery through wire A, finger 8^a, plug 9, finger 8^b, wire I, finger 6^c, wire E, through lamp 12, then through wire F, finger 7^a, button 18^c, wire 21, button 19^c, finger 6^a and wire C to lamp 11, then through wire D, finger 7^c and wire H to lamp 13, then through wire G, finger 6^b, button 19^b, wire 20, button 18^b, finger 7^b, and wire B back to the battery 10.

In the diagrammatic views, Figs. 4, 5, 6, 7, and 8, the fingers 8^a and 8^b and plug 9 are omitted, the plug being assumed to be in position engaging said fingers so that one pole of the battery is directly in circuit with wire

6^c, and this connection is shown by a wire 65 designated A.

In order to guide the operator I provide a pin 22 in arm 5 that engages notches 23 in the lower wall of slot 1^a when the arm reaches the several positions to operate the lamps as above described.

When the switch is not in use the plug 9 may be removed to prevent lighting any of the lamps.

Having thus described my invention, what I claim is—

1. In an electric switch, a casing, a disk revolubly mounted in the casing, series of fingers suitably secured in the casing, four series of contact buttons secured to the disk, said series of buttons being arranged in pairs diametrically of the disk, the series of buttons in one pair being electrically connected, and a part of the buttons in each of the other pair of series being joined by conductors extending across the disk, substantially as shown and described.

2. In an electric switch, a casing, a plate secured in the casing, a disk revolubly mounted in the casing, two series of three fingers each secured to the plate, four series of three contact-buttons secured to the disk, said series of buttons being arranged in pairs diametrically of the disk, the series of buttons in one pair being coupled by conductors, and two of the buttons in each of the other pair of series being joined by conductors, substantially as shown and described.

3. In an electric switch, a casing, a plate secured in the casing, a disk revolubly mounted in the casing, two series of three fingers each secured to the plate, four series of contact-buttons secured to the disk, said series of buttons being arranged in pairs diametrically of the disk, the series of buttons in one pair being electrically connected, two of the buttons in each of the other pair of series of buttons being joined by conductors, a plug removably and replaceably mounted in the disk, and contact fingers secured to the plate and engaging said plug when in position in the disk, substantially as shown and described.

4. An electric switch comprising a casing, a plate secured to the casing, a tubular journal secured to the plate, a disk revolubly mounted on said journal, two series of spring-contact fingers secured to said plate, four series of contact-buttons secured to the disk, said series of buttons being arranged in pairs diametrically of the disk, the series of buttons in one pair being electrically connected by conductors, two of the buttons in each of the other pair of series of buttons being joined by conductors, the plate provided with holes in line with the buttons in the disk and over the free ends of said spring-fingers, said disk being adapted to be ro-

tated to bring the contact-buttons and fingers in circuit, a plug removably and replaceably mounted on the tubular journal aforesaid, and contact-fingers secured to the
5 plate and engaging said plug when in position on the journal, substantially as shown and described.

In witness whereof, I have hereunto set my hand in presence of two subscribing witnesses.

RALPH MILLER.

Witnesses:

GEORGE W. SAMPLE,
PHILIP BLUM.