B. M. LEECE.

ELECTRIC SWITCH.

APPLICATION FILED JUNE 10, 1915.

1,206,552. Patented Nov. 28, 1916.

Fig. 1.

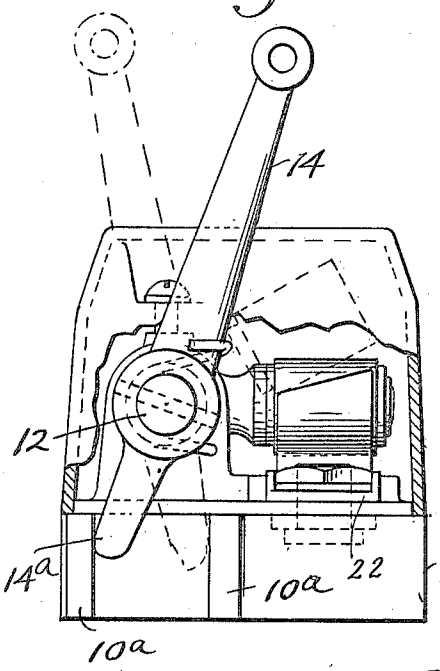


Fig. 2.

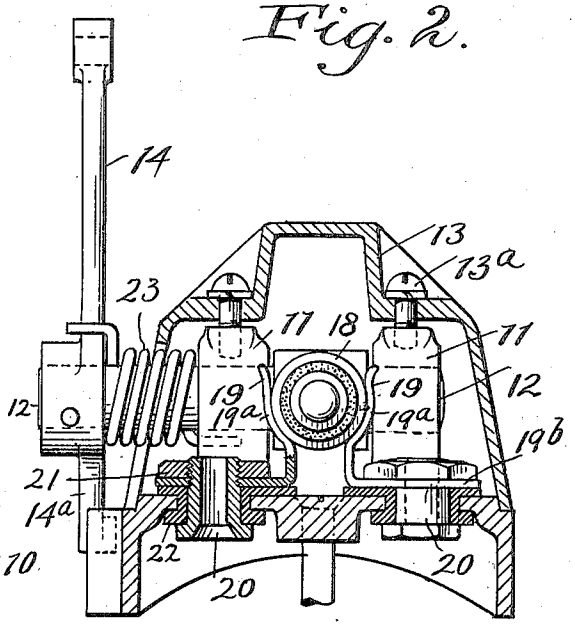
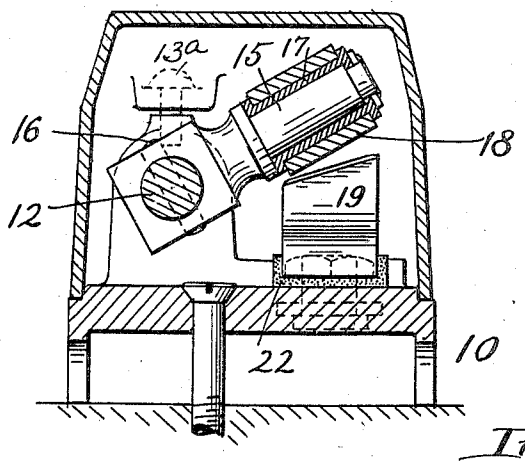


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

1,206,552. Specification of Letters Patent. Patented Nov. 28, 1916.

Application filed June 10, 1915. Serial No. 33,220.

To all whom it may concern:

Be it known that I, BENNETT M. LEECE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Electric Switches, of which the following is a full, clear, and exact description.

This invention relates to an electric switch capable of general use in electric circuits, but adapted particularly for lighting or starting and lighting apparatus wherein at times heavy current at low voltage is transmitted.

The main object of the invention is to provide a switch which is so constructed that the surfaces of the coöperating contacts or contact members are maintained in good clean condition, and which is so constructed that the liability of the contacts freezing or fusing together is minimized. A further object is to provide a switch which has the above characteristics and which is simple in construction, compact and durable.

The invention may be briefly summarized as consisting in certain novel details of constructure and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

In the accompanying sheet of drawings, wherein I have shown the preferred embodiment of my invention, Figure 1 is an end view of the switch with a portion of the casing broken away to show the interior construction; Fig. 2 is a vertical sectional view of the switch; Fig. 3 is a vertical sectional view at right angles to the plane of the section of Fig. 2.

Referring now to the drawings, it will be observed that the switch is provided with a base 10 which in practice is mounted directly upon the field frame of a dynamo electric machine used in lighting or starting and lighting apparatus for motor vehicles. Extending upwardly from this base are two bosses or bearings 11 arranged side by side and spaced a short distance apart, and in these bearings is mounted a horizontal rock shaft 12, one end of which projects laterally outward from a metal casing 13 in which the operating parts of the switch are inclosed and which may be secured to the base in any suitable manner, such as by screws 13ª which pass through the cover into the bearing bosses 11. The outer end of the rock shaft is provided with an operating arm or lever 14 to which the switch closing mechanism is adapted to be connected.

The rock shaft is provided between the bearings 11 with an arm 15 projecting laterally at right angles to the rock shaft. This arm is short and rigid and is securely fastened to the rock shaft by a pin 16 or equivalent securing means. The outer portion of this arm is reduced, as shown in Fig. 3, and fitted tightly therein is an insulating sleeve 17. Mounted on this insulating sleeve, so that it may turn rather freely thereon, is a ring, annulus or roller 18 of good conducting material, such as brass, this ring, annulus, or roller, constituting the bridging contact or contact member of the switch.

The coöperating stationary contacts or contact members of the switch consist of two spring clips or jaws 19 of good conducting material, such as brass. These clips or jaws are provided with upstanding portions 19ª so positioned relative to each other and to the ring or roller 18 that when the switch is closed the roller will enter between and will be tightly engaged by the two upstanding portions of the jaws. The latter are provided also with flat bases or feet 19ᵇ which are secured to the base 10, and in this instance this is accomplished by hollow terminal screws 20 and coöperating fastening nuts 21, which are screwed down tightly onto the bases 19ᵇ of the clips or jaws 19.

The terminal screws 20 and the contacts 19 are insulated from the base by suitable insulation 22, and, of course, these contacts are insulated from each other except when the switch is closed. The ends of two flexible conductors are adapted to be electrically and mechanically connected to the terminal screws 20, and preferably the conductors will be fastened to the sockets or openings of the screws and secured therein by any suitable means, such as by soldering.

The spring contact clips or jaws are so located and shaped that when the switch is closed by rocking the arm or lever 14 the roller 18 will enter between the spring contact clips with a sliding or wiping action. The clips which are slightly concaved or bowed, yield outwardly and permit the roller to snap in between them. The clips then partially envelop the roller and tightly engage the latter, the said roller then com-

pleting the path from one terminal screw to the other, the current passing from one contact clip or jaw through the roller 18 to the other contact clip or jaw. When the switch is opened the roller will invariably drag on one contact clip a little more than on the other, with the result that it will be turned slightly, and this takes place each time the switch is opened. In consequence, in successive operations of the switch, new contact surfaces of the roller are constantly presented to the clips, and the co-acting or coöperating surfaces of the clips and roller will be maintained for a long period of time in the desirable clean smooth condition.

In addition to keeping the contacts in good condition, the roller action of the movable contact renders the rupture or tearing apart of any fusing between the contacts much easier than is the case with switches having the ordinary sliding contacts. Much trouble in electric starting systems for automobiles has been experienced in practice because of the freezing or fusing together of the contacts of the motor starting switch, and the roller type of bridging contact is especially useful in overcoming this trouble.

The switch may be opened as well as closed manually, but preferably it is opened by a spring such as a coil spring 23 surrounding the rock shaft and one end engaging one of the bearings 11 and the other the operating arm 14, as shown in Fig. 2.

The movements of the rock shaft and of the parts carried thereby are limited by a pair of spaced ribs or projections 10^a on the base 10, which ribs are adapted to be engaged by a finger or lug 14^a projecting downwardly from the hub of the arm or lever 14. This switch has proven, by practice, to possess to a vary high degree the above desirable features, and, in addition, it is very serviceable due to its simplicity, compactness and rigid construction.

It is obvious that the construction may be modified in several minor particulars without affecting the action of the roller and spring contacts, and I, therefore, do not desire to be confined to the exact details shown, but aim in my claims to cover all modifications which do not involve a departure from the spirit and scope of the invention.

Having described my invention, I claim:

1. In a switch, a pair of flexible contact clips spaced apart, and a movable switch member comprising a bridging contact in the form of a roller having its axis parallel to and movable in a plane substantially midway between the clips, the spacing of the clips and diameter of the roller being such that the roller enters between and engages the inner faces of the two clips with a sliding or wiping action, a support on which the roller is free to turn, and on which it is coaxially mounted, and means for shifting the roller and its support so as to cause the former to move into and out of the space between the clips.

2. In a switch, a pair of flexible contact clips spaced apart, and a movable switch member comprising a bridging contact in the form of a roller having its axis parallel to and movable in a plane substantially midway between the clips, the spacing of the clips and diameter of the roller being such that the roller enters between and engages the inner faces of the two clips with a sliding or wiping action, a support for said roller comprising an arm on which the roller is coaxially arranged, and which is mounted to turn about an axis at right angles to the axis of the roller, and means for giving said arm an oscillatory movement such as to cause the roller to move into and out of the space between the clips.

3. In a switch, a support, a pair of flexible contact clips spaced apart on said support and insulated from each other, a rock shaft mounted on said support adjacent the clips to turn on an axis at right angles to the clips, an arm projecting laterally from said rock shaft and having its axis movable in a plane substantially midway between said clips, a bridging contact arranged coaxially on said arm and insulated therefrom but free to turn thereon, and means for turning said rock shaft so as to cause the roller to move into and out of the space between the clips, the spacing of the clips and diameter of the roller being such that the roller may enter between and engage the inner faces of the two clips with a sliding or wiping action.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

BENNETT M. LEECE.

Witnesses:
L. I. PORTER,
A. J. HUDSON.