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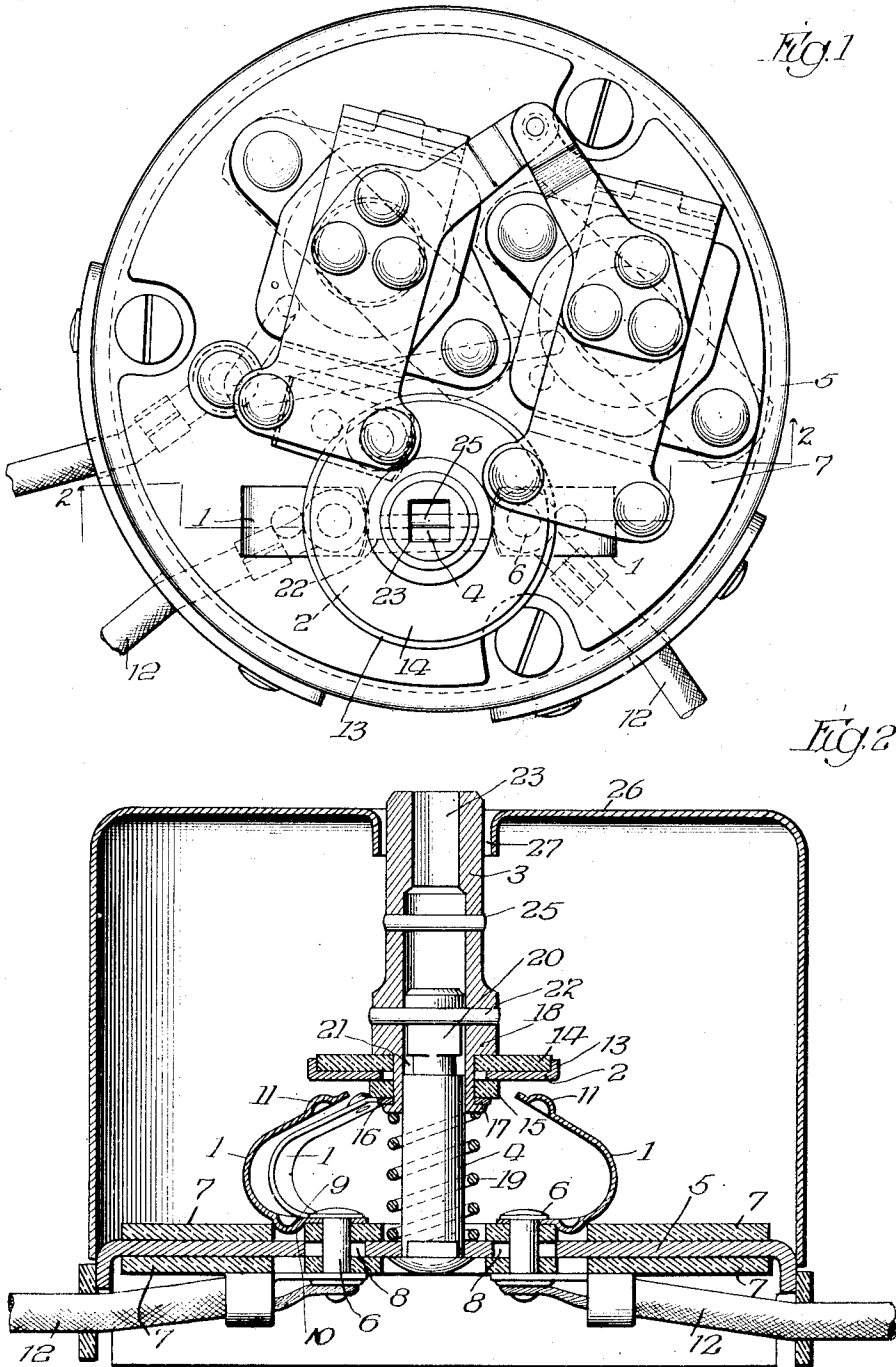
1,595,232

W. S. HARLEY

ELECTRIC SWITCH

Filed April 13, 1922

2 Sheets-Sheet 1



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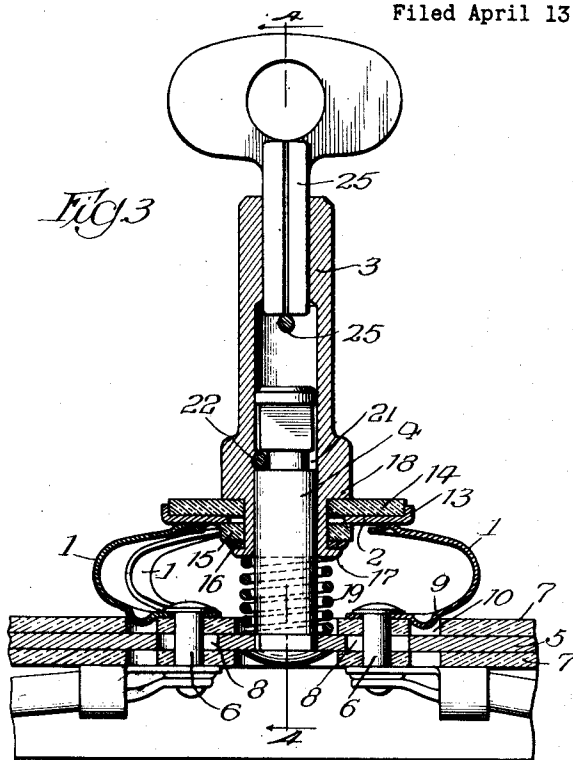
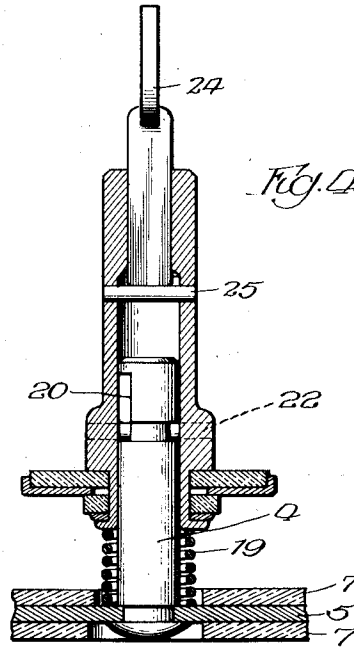
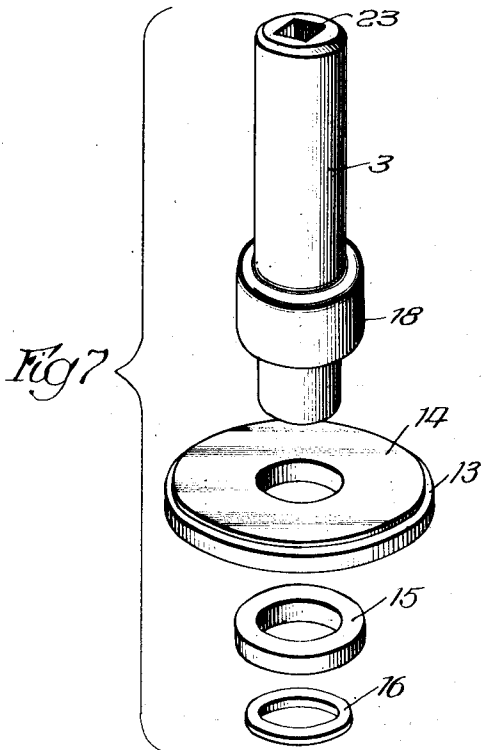
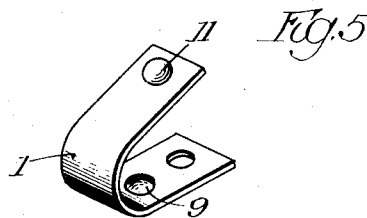
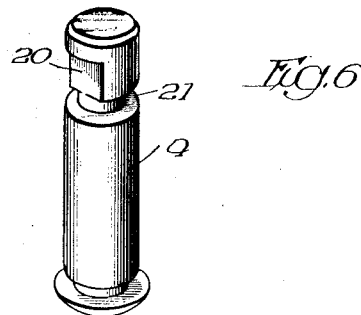
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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE.

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## ELECTRIC SWITCH.

Application filed April 13, 1922. Serial No. 552,407.

This invention relates to an electric switch.

This electric switch, which comprises in general a plurality of stationary contacts and a movable bridging contact member, is particularly applicable to the ignition and lighting system of a motorcycle to connect the generator and storage battery, but may, of course, be employed for other purposes.

An object of this invention is to provide a durable efficient electric switch which may be economically manufactured.

Another object is to provide an electric switch which may be positively locked in closed position.

Other objects and advantages will hereinafter appear.

The views of the drawings are:

Fig. 1 is a top plan of the switch with the cover removed.

Fig. 2 is a vertical section through the switch on line 2—2 of Fig. 1 showing the switch in open position.

Fig. 3 is a vertical section through the switch when in closed position.

Fig. 4 is a vertical section on line 4—4 of Fig. 3.

Fig. 5 is a perspective of one of the contact springs.

Fig. 6 is a perspective of the switch guide stem.

Fig. 7 is an exploded perspective of the switch plunger and parts carried thereby.

The electric switch comprises a plurality of stationary contact members 1, a movable contact member 2 for engaging the contact members 1, and a tubular plunger 3 having longitudinal movement on a guiding stem 4 so as to move the contact member 2 into engagement with the contact members 1, and rotary movement thereon to lock the switch in closed position.

The stationary contact members 1 which take the form of U-shaped springs are rigidly fastened to a base 5 by terminal rivets 6 or other fastening means. The contact springs 1 are insulated from the base 5 by insulating disks 7 on either side thereof, the rivet opening 8 in the base being larger than the rivet 6 so as to insulate the same therefrom.

A projection 9 on each contact spring 1 resting in an opening 10 in the upper insulating disk 7 positions the contact spring.

The upper or free end of each contact spring 1 is formed into a spherical or rounded contact 11.

Conductor leads 12 extending into the inverted cup shaped base 5 may be connected to the rivet terminals 6.

The movable switch contact member 2 which takes the form of an annular disk is mounted on the plunger 3, slidably and rotatably mounted on the stem 4.

The annular contact disk 2 surrounding the lower end of the plunger 3 has a peripheral flange 13. An insulating washer 14 seated within the flanged contact disk 2 holds the same in concentric spaced relation to the plunger 3.

An insulating washer 15 immediately below the contact disk 2 assists in insulating the same from the plunger.

The lower end of the plunger is spun over onto a protecting metal washer 16 and clamps the insulating washers 14 and 15 and interposed contact disk 2 between the spun over end 17 and a shoulder 18 on the plunger.

The guide stem or post 4 is riveted or otherwise rigidly fastened to the base 5.

A compression spring 19 surrounding the stem 4 normally holds the plunger 3 elevated and the contact disk 2 out of engagement with the contact springs.

The stem 4 is provided with a slot 20 at one side and near the upper end thereof. The lower end of this slot 20 forms a part of a peripheral groove 21.

A transverse pin 22 fastened in the plunger 3 and extending across the slot 20 co-operates with the upper and lower walls thereof to limit the longitudinal movement of the plunger 3.

By rotating the plunger 3 on the stem 4, when the former is forced into its extreme lower position, the pin 22 moves into the groove 21, thus locking the switch in closed position with the contact disk 2 in engagement with the contact springs 1.

The spring 19 tends to elevate the plunger 3, so that as soon as the pin 22 is moved out of the groove 21 and into the slot 20, the spring forces the plunger upward, causing the disengagement of the contact disk 2 and contact springs 1, thus opening the switch.

The upper end of the plunger 3 forms a socket 23 for receiving a key or wrench 24 by

which the plunger 3 is forced down against the action of compression spring 19 and rotated to lock the switch.

A transversely extending pin 25 fastened in the plunger 3 acts as a stop for the lower end of the key or wrench 24.

The switch may be employed to control electric circuits to electric signaling or other electrical apparatus mounted on the same base or mounted independently thereof.

The switch parts are protected by a cover 26 having an opening 27 therein through which extends the socket 23 of the plunger 3.

By rounding the contacts 11 of the contact springs 1, a smooth wiping contact with the contact disk 2 is obtained.

The compression spring 19 acting upon the plunger 3 and tending to force the same upward, assists in locking the switch in closed position for it reduces the possibility of rotation of the plunger 3 due to vibration of a motorcycle or other vehicle to which it may be attached.

The switch may be employed advantageously in a motorcycle ignition and lighting system wherein it connects and disconnects the generator, ignition apparatus and storage battery, each being connected to one of the stationary contacts thereof. A copending application of William S. Harley, Serial No. 552,406, filed April 13, 1922, illustrates such a system wherein the switch is employed.

The invention contained herein is, of course, susceptible of other embodiments and adaptations.

The invention claimed is:

1. An electric switch comprising a plurality of spaced stationary contacts, a stationary guide stem, a cylindrical plunger mounted on the stem and having longitudinal movement with respect thereto, a contact disk carried by the plunger and engageable with the stationary contacts, and a member carried by the plunger and co-operating with the stem to limit the longitudinal movement of the plunger.

2. An electric switch comprising a plurality of spaced stationary contacts, a stationary guide stem, a cylindrical plunger mounted on the stem and having longitudinal movement with respect thereto, a contact disk carried by the plunger and engageable with the stationary contacts, a member carried by the plunger and co-operating with the stem to limit the longitudinal movement of the plunger, and means tending to hold the contact disk disengaged from the contacts.

3. An electric switch comprising a pair of telescopic members, one of which is stationary and the other movable longitudinally with respect thereto, a contact carried by the movable member, a stationary contact engageable with the other contact by longitu-

dinal movement of the movable member, and means including a pin carried by one of said members, and a slot and groove in the other of said members for limiting the movement of the movable member in both directions and for locking it in one extreme position.

4. An electric switch comprising a pair of members, one of which is stationary and the other movable longitudinally thereon, a contact carried by the movable member, a stationary contact engageable with the other contact by longitudinal movement of the movable member, one member having a longitudinal slot and an annular groove therein, and a projection on the other member extending into the slot and cooperating therewith to limit the longitudinal movement of the movable member in either direction and engaging with said groove to lock the contacts in engagement.

5. An electric switch comprising a pair of members, one of which is stationary and the other movable longitudinally thereon, a contact carried by the movable member, a stationary contact engageable with the other contact by longitudinal movement of the movable member, a pin and slot connection between said members for limiting the longitudinal movement of the movable member in either direction and a key socket in said movable member for the reception of a key for actuating and locking the switch in one of its positions.

6. An electric switch comprising a pair of members, one of which is stationary and the other movable longitudinally thereon, a contact carried by the movable member, a stationary contact engageable with the other contact by longitudinal movement of the movable member, one member having a longitudinal slot therein, and a projection on the other member extending into the slot and cooperating therewith to limit the longitudinal movement of the movable member in either direction, said slotted member having a circumferential groove at one end of the slot for receiving the projection so as to lock the movable member against longitudinal movement.

7. An electric switch having a pair of telescopic members, one of which is stationary and the other movable longitudinally with respect thereto, a bridging contact member carried by the movable member, a plurality of stationary yieldable contacts engaged by the contact member by movement of the movable member to hold the contact member disengaged from the contacts, and a pin and groove connection between the telescopic members rendered effective by rotary movement of the movable member to hold the contact member in engagement with the contact springs.

8. An electric switch comprising a stationary member, a movable member tele-

- scopic therewith, a contact and a key socket carried by the movable member, a yieldable contact in the path of said first mentioned contact, means urging said movable member away from said yieldable contact, and means engaging both of said members for limiting the movement of said movable member, said means being operative to lock the switch in closed position.
- 10 9. An electric switch comprising a yieldable contact, a movable contact, a movable member longitudinally and rotatably mounted for supporting said movable contact, said movable member having a key socket, means urging said movable member away from said yieldable contact, and means for locking said movable member against longitudinal movement when said contacts are in closed position by turning of a key placed in said socket.
- 20 In witness whereof, I have hereunto subscribed my name.
- WILLIAM S. HARLEY.