May 9, 1933. E. J. VON HENKE 1,907,688

ELECTRIC SWITCH

Filed Feb. 11, 1929

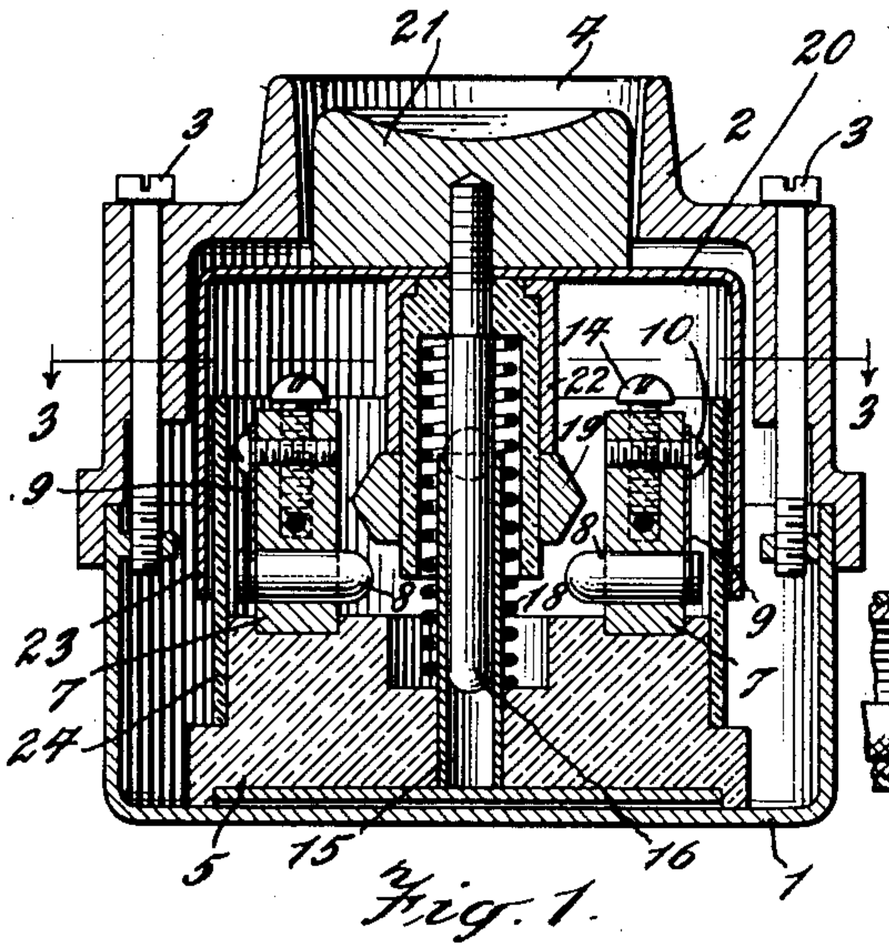

Fig. 1.

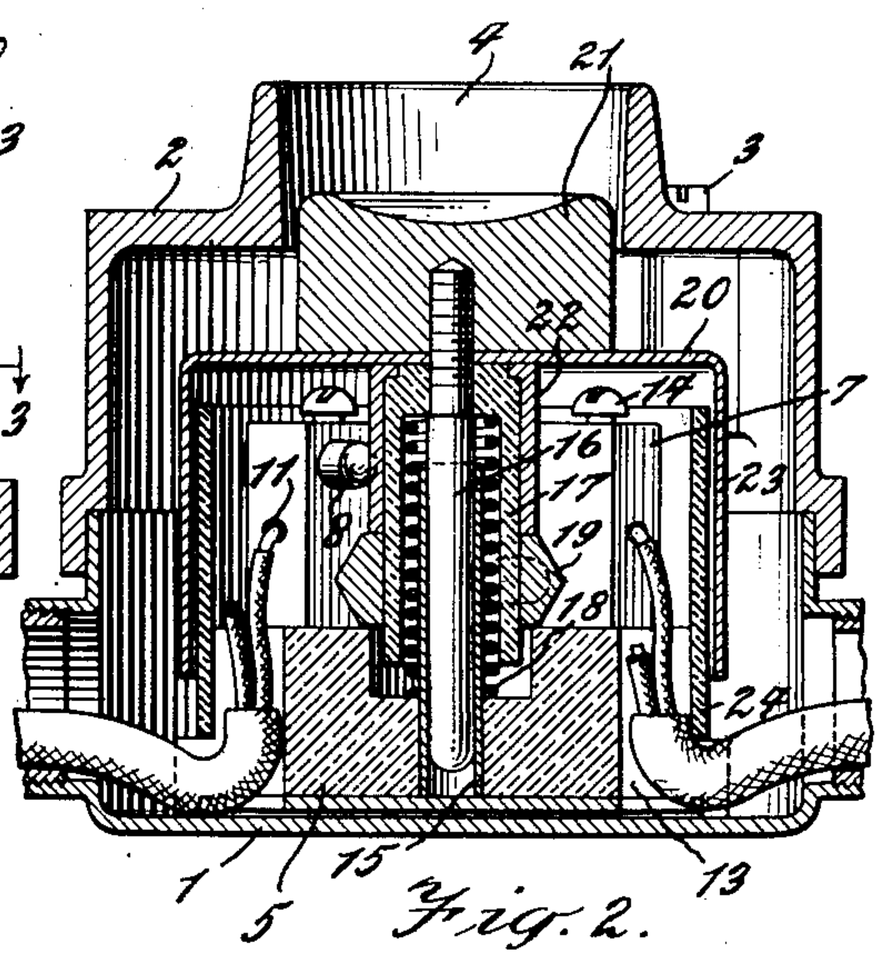

Fig. 2.

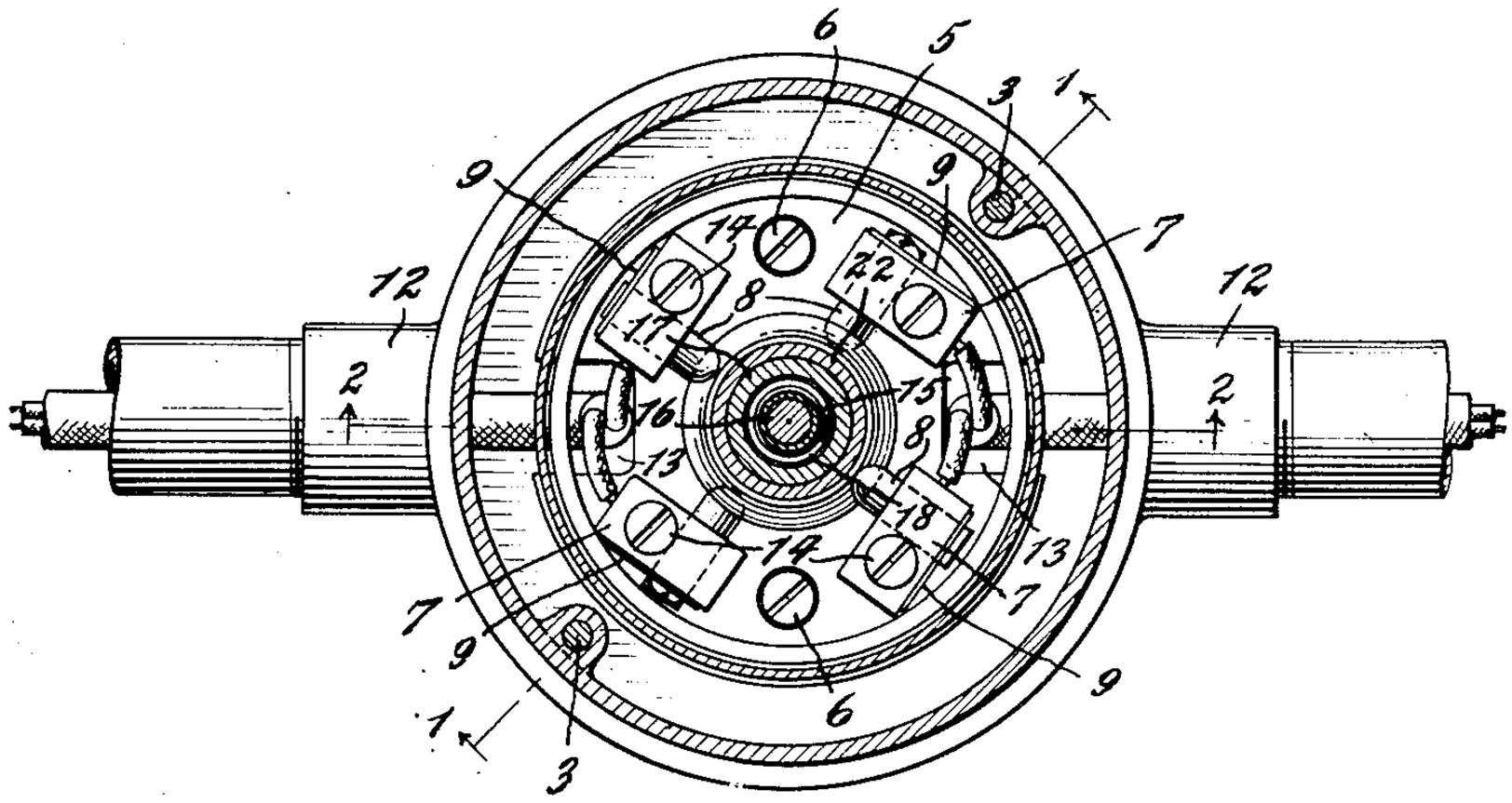

Fig. 3.

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UNITED STATES PATENT OFFICE

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ELECTRIC SWITCH

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This application relates to a novel and improved form of electric switch and the novel features will be best understood from the following description in connection with the annexed drawing, in which is shown a selected embodiment of the invention and in which;

Fig. 1 is a vertical sectional view through the switch, taken approximately on the line 1—1 of Fig. 3.

Fig. 2 is a second vertical sectional view taken approximately on the line 2—2 of Fig. 3.

Fig. 3 is a horizontal sectional view through the switch, taken approximately on the line 3—3 of Fig. 1.

In the use of electric switches, short circuits are often caused by means of the fact that dirt and dust will get between the contacts to such an extent as to form a connection therebetween. This is particularly true in places where the switch has to be operated by workmen whose hands have graphite thereon, in which case the graphite is apt to rub off and get between the contacts. Similar results occur in other situations, but the above has been given merely as an example. According to my invention the above difficulty is avoided by the novel construction described below.

In the illustrative embodiment I have shown my invention as embodied within a casing formed of a lower portion 1 and an upper portion 2 having overlapping engagement with each other, as plainly shown in both Figs. 1 and 2. These portions may be secured together by suitable bolts 3. The upper portion 2 of the casing has an opening 4 therein through which the switch may be operated in a manner to be described presently.

Secured to the bottom portion 1 is a base 5 of insulating material, this base being shown as held in place by suitable screws 6. Extending upwardly from the base is a plurality of contacting supporting blocks 7 and these blocks carry sliding contacts 8 which are yieldingly forced inwardly towards the center of the casing as by leaf springs 9 secured to the back of each block. Each of these springs has one end secured to a contact and the other end held in position by a screw 10 in the block, as best shown in Fig. 1. Each block is of conducting material and has therein a hole 11 for the reception of a connection in the form of a wire. In the illustrative embodiment, cables enter the opposite sides of the casing through necks 12, each cable carrying two conductors which are connected to two adjacent contact blocks and are thus in electric connection with the contacts carried by those blocks. The base 5 is recessed, as shown at 13, to receive the cabled ends. Each conductor may be secured to a block by means of a set screw 14.

Secured in the base and extending vertically upward thereof substantially on the axis of the casing, is a sleeve 15 in which is slidably received a spindle 16. Secured to the top of the spindle is a second sleeve 17 of insulating material spaced from the sleeve 15 but substantially coaxial and telescoping therewith, and between these two sleeves is received a compression spring 18 whereby the spindle 16 is normally urged upwardly. Secured on the sleeve 17 is a switch member 19 adapted to close the circuit between any two contacts 8 which are in the same circuit.

Secured on the spindle 16 above the upper end of the sleeve 17 is a shield 20, and secured above the shield is a button 21. The parts may be secured on the spindle as by the threaded engagement indicated, and a suitable collar 22 may be disposed between the shield and the switch member in order to hold the parts in proper relative position. The shield 20 is of the substantially cylindrical form shown and is provided with a top portion beneath the button 21 and with the depending skirt 23. This skirt is of sufficient length to extend below the upper part of the base 5 and below all of the contacts supported on the base. Telescoping with the shield, or more specifically with the skirt 23 thereof, is a second cylindrical shield 24 of insulating material mounted on the base 5. The top of this shield terminates a short distance below the top portion of the shield 20. By the arrangement described above,

the operator may press the button 21 with his hand, in order to bring the switch member 19 into engagement with a pair of contacts which it is desired to connect, in order to close the circuit therethrough. Any dirt or grease which may be on the operator's hand and which may be left on the button, is effectively prevented from reaching the contacts by the switch member. In order to reach any of these elements the dirt must work along the top of the shield 20, down the skirt 23, up the outside of the shield 24, and then down into the interior of the shield to the contacts. In practice, certain of these parts are of insulating material, along which dirt would not work so rapidly as it would along a metal surface. The parts 23 and 24 are preferably spaced apart slightly so that, in the movement of the switch member, which of course entails movement of the shield 20, movement of the dirt between the skirt 23 and shield 24 will not be helped by movement of the skirt. It will also be seen that the bottom edge of the skirt 23 is spaced a substantial distance from the bottom or lower portion 1 of the casing. This means that in practice dirt will drop on to this bottom and will have to accumulate to a considerable depth before there is any danger of it working upwardly between the parts 23 and 24. It will also be seen that upon removal of the bolts 3, the upper portion 2 may be removed and then the button 21 and associated parts may be lifted upwardly without restraint of any kind, thus making it easy to get at the interior of the switch.

While I have shown the invention as embodied in a specific form, it is to be understood that various changes in details may be made without departing from the scope of the invention, and I therefore do not intend to limit myself except by the appended claims.

I claim:—

1. In combination, a base having a sleeve extending upwardly therefrom, spaced contacts on said base, a spindle slidably mounted in said sleeve and carrying a second sleeve spaced from the first sleeve and telescoping therewith, a contact carried by said second sleeve and adapted to bridge said first-named contacts, a spring between said sleeves and adapted to force said spindle upwardly, an actuating button on the spindle, and telescoping shields on the base and spindle, with the shield on the spindle outside the shield on the base.

2. In combination, a base having a sleeve extending upwardly therefrom, spaced contacts on said base, a spindle slidably mounted in said sleeve and carrying a second sleeve spaced from the first sleeve and telescoping therewith, a contact carried by said second sleeve and adapted to bridge said first-named contacts, a spring between said sleeves and adapted to force said spindle upwardly, an actuating button on the spindle, and telescoping shields on the base and spindle, with the shield on the spindle outside the shield on the base and the shield on the base extending above said contacts.

3. In combination, a base having a contact supported thereon, two telescoping sleeves, one extending upwardly from the base and the other slidable coaxially of said upwardly extending sleeve and carrying a contact adapted to engage the contact on the base, a spring disposed within one of said sleeves and adapted to move the slidable sleeve coaxially of the other, an actuating button attached to said slidable sleeve, and telescoping shields mounted respectively on the base and on the slidable sleeve, with the shield on the sleeve outside the shield on the base.

4. In combination, a base having a contact supported thereon, two telescoping sleeves, one extending upwardly from the base and the other slidable coaxially of said upwardly extending sleeve and carrying a contact adapted to engage the contact on the base, a spring disposed within one of said sleeves and adapted to move the slidable sleeve coaxially of the other, an actuating button attached to said slidable sleeve, and telescoping shields mounted respectively on the base and on the slidable sleeve, with the shield on the sleeve outside the shield on the base and the shield on the base extending above said contacts.

5. In combination, a base having a contact supported thereon and a centrally disposed sleeve extending upwardly therefrom, a second sleeve surrounding said first sleeve, a shield carried by said second sleeve and having a portion extending generally parallel to the base and a depending skirt extending toward the base, a second shield extending upwardly from the space within said skirt, a spring disposed between said sleeves and adapted to move one sleeve axially with respect to the other, a contact on said second sleeve adapted to engage the contact on the base, and an actuating button secured to said sleeve and to the shield carried thereby.

6. In combination, a base having a contact supported thereon and a centrally disposed sleeve extending upwardly therefrom, a second sleeve surrounding said first sleeve, a shield carried by said second sleeve and having a portion extending generally parallel to the base and a depending skirt extending toward the base, a second shield extending from the space within said skirt, a spring disposed between said sleeves and adapted to move one sleeve axially with respect to the other, a contact on said second sleeve adapted to engage the contact on the base, an actuating button secured to said sleeve and to the shield carried thereby, and a spindle secured

to said second sleeve and extending within the first sleeve.

7. In combination, a casing having a base disposed on the bottom thereof and extending upwardly therefrom, a contact mounted in fixed position on said base, a second contact movably mounted on said base and adapted to be brought into and out of engagement with said first contact, a button connected to said movable contact and disposed adjacent an opening in the casing, and two telescoping shields, one extending upwardly from said base and secured thereto and the other secured to said button and extending downwardly therefrom on the outside of the shield secured to the base, the lower edge of said downwardly extending shield being disposed a substantial distance above the bottom of the casing in all positions of the movable contact.

8. In combination, a casing having a bottom with a base disposed thereon, a contact fixed in position on said base, a second contact vertically movable on the base and into and out of engagement with the fixed contact, means to operate said movable contact through an opening in the casing, said casing being made in two parts, with the upper part removable from the lower part, and means to support the movable contact on the base but permitting removal therefrom in a vertical direction upon removal of the upper part of the casing.

9. In combination, a casing having a bottom, a base disposed on said bottom and extending upwardly therefrom, a circumferential shield disposed on said base and extending upwardly therefrom, a contact fixed on said base and disposed within said shield, a movable contact adapted to engage said fixed contact, means to movably support said movable contact on said base for vertical movement with respect to the fixed contact, a second shield fixed to said movable contact and lying on the outside of said first-named shield, means to operate said movable contact through an opening in the top of the casing, said casing being formed in upper and lower portions, and means to detachably hold said portions together, whereby upon separation of said portions, said movable contact and the shield connected thereto may be lifted out of the lower portion of the casing.

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