Dec. 22, 1936. R. A. WAITE 2,064,998

SWITCH CONTACT

Filed Aug. 27, 1935

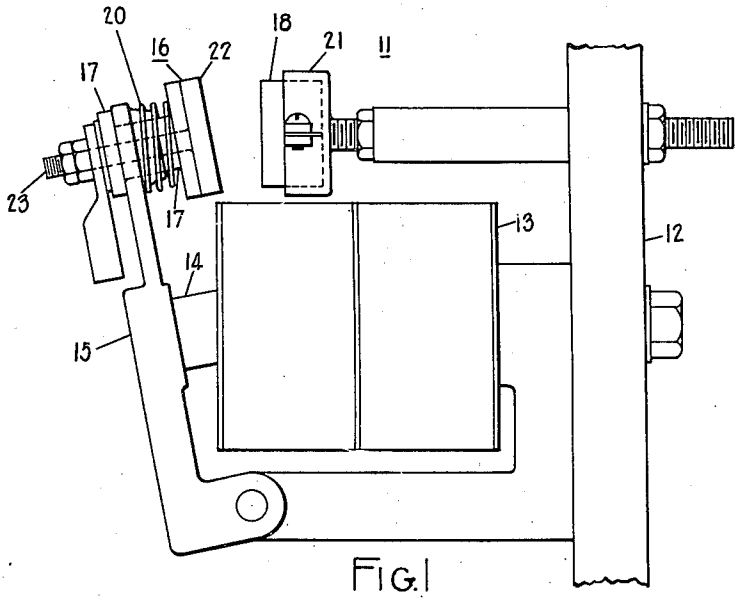


FIG. 1

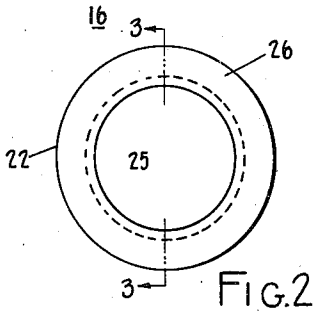


FIG. 2

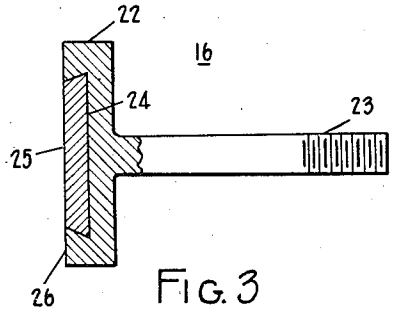


FIG. 3

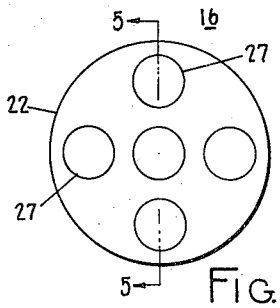


FIG. 4

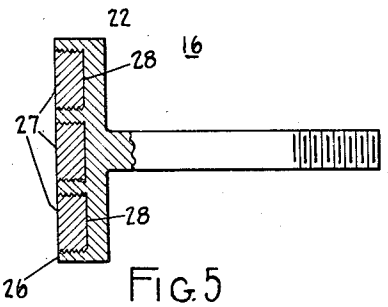


FIG. 5

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SWITCH CONTACT

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Application August 27, 1935, Serial No. 38,011

1 Claim. (Cl. 200—166)

This invention relates to electric contacts and to the method of manufacture of such contacts.

Contacts in electric circuits are subject to wear due in part to burning caused by the arcing which occurs as a circuit is made and broken. Worn contacts require replacement at intervals according to the rate of wear, which depends upon the particular service required of such contacts. Such replacements involve considerable expense in time and materials. It has been found that by using a copper contact having a cadmium insert as one of a pair of contacts the wear thereon caused by arcing has been minimized, especially when used in cooperation with a cadmium impregnated carbon contact. For example, with a certain switch having a copper contact cooperating with a carbon contact, the life of the carbon contact was about three months and that of the copper contact about six months in commercial operation. Upon replacing the carbon contact with a cadmium impregnated carbon contact, the life of the copper contact was less than when used with the carbon contact without cadmium impregnation. Upon using a copper contact having cadmium inserted in its face in place of the copper contact for cooperating with the cadmium impregnated carbon contact, the switch has continued in commercial operation for over a year without appreciable wear on the contacts.

A feature of the invention is the use of cadmium as an insert in a metallic contact.

A second feature of the invention is a simple and economical method of manufacturing the contact involved in this invention.

A third feature of the invention is the provision of a pair of contacts, one contact having a cadmium insert and the other contact being of carbon impregnated with cadmium.

Other features and advantages will be apparent from the following description and appended claim.

The invention will be described by way of illustration in connection with a switch adapted to open and close an electric circuit.

In the drawing:—

Figure 1 is a side view of a switch having contacts embodying the invention;

Figure 2 is an enlarged view of the face of the movable contact shown in Figure 1;

Figure 3 is a section taken along the line 3—3 of Figure 2;

Figure 4 is a view of the face of another style of contact in accordance with the invention; and

Figure 5 is a section taken along the line 5—5 of Figure 4.

Referring to the drawing, a switch 11, embodying the present invention, is mounted on an insulating panel 12. Switch 11 upon energization and deenergization of a magnet coil 13, is arranged to attract and release an armature 14 and a switch arm 15 secured thereto. A movable contact 16, carried by arm 15 and insulated therefrom by a bushing 17, is adapted upon movement of the arm to cooperate with a fixed contact 18 in the making and breaking of an electric circuit. A spring 20 between arm 15 and bushing 17 acts to cushion the closing movement of the contacts. Fixed contact 18, clamped in a holder 21 secured to panel 12, is made of carbon impregnated with cadmium.

Movable contact 16, shown enlarged in Figures 2 and 3, consists mainly of an integral head 22 and stem 23 made of copper. Stem 23 is suitably machined for accommodating various necessary electrical connections. Head 22 is provided with an undercut recess 24 of dovetail section, in which a cadmium insert 25 is fixedly secured. Insert 25 covers the greater part and is flush with a contacting surface 26. Insert 25 is formed in head 22 of contact 16 by pouring molten cadmium into recess 24, with the contact cold, the copper walls of the recess being at the time relatively clean and free of oxide. The contact is then heated to the melting point of cadmium. This heating process causes the cadmium to adhere or bind to the copper in much the same manner as solder to a cleaned and tinned surface. Upon cooling the cadmium insert is finished flush with surface 26.

As previously stated, contact 18 consists of carbon impregnated with cadmium. When both contacts are of metal there is a possibility that they might fuse or freeze together due to arcing. It has been found that by using a contact of carbon against one of metal the possibility of freezing together is eliminated. The use of a carbon contact impregnated with cadmium, such as contact 18, combines the non-freezing feature of carbon with the long wearing feature of cadmium.

Head 22 may contain more than one cadmium insert and these inserts may be of different anchoring shape. One such variation is shown in Figures 4 and 5, where head 22 has a plurality of cadmium inserts 27 embedded therein in apertures 28 of screw thread section. Inserts 27 are formed and secured in head 22 in a manner as previously described for insert 25.

What is claimed is:

In an electric switch, a copper contact with a cadmium insert embedded therein, said insert covering a portion of the contacting face of said contact and being flush with said face, and a carbon contact impregnated with cadmium for cooperating with said copper contact.

RAYMOND ALONZO WAITE.