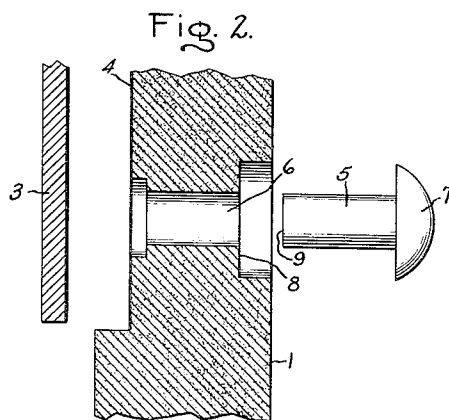
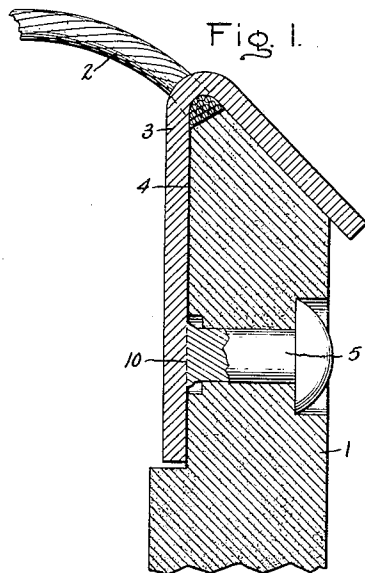


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ELECTRICAL CONTACT MEMBER AND
METHOD OF MAKING THE SAME
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ELECTRICAL CONTACT MEMBER AND METHOD OF MAKING THE SAME

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4 Claims. (Cl. 171—325)

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Our invention relates to electrical contact members and particularly to such as are utilized as brushes for rotating electrical machinery and a method of making the same.

An object of our invention is to provide an improved electrical contact member.

Another object of our invention is to provide an improved method of making an electrical contact member.

A further object of our invention is to provide an improved electrical contact brush member having a carbonaceous material portion with a metal terminal clip member attached thereto by an improved securing arrangement and a method of making the same.

Further objects and advantages of our invention will become apparent and our invention will be better understood from the following description referring to the accompanying drawing, and the features of novelty which characterize our invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

In the drawing, Fig. 1 is a sectional side elevational view through an end of an electrical contact member, such as a brush, illustrating an embodiment of our invention; and Fig. 2 is a side sectional elevational view of the arrangement shown in Fig. 1 illustrating the parts adapted to be secured together prior to the assembly thereof.

Referring to the drawing, we have shown in Figs. 1 and 2 an embodiment of our improved electrical contact member illustrated as comprising a carbonaceous material portion 1 which may be formed of any suitable composition, such as graphite, metal-graphite, or other similar materials or combination of materials as are conventionally used for such purposes and commonly used for transferring electric current between stationary electrical conductors and rotating equipment. These electrical contact brush members usually are arranged in brush holders and provide a relatively loose contact with the brush holders so that a separate flexible electrical connection generally is provided between the contact member and a stationary terminal in order to decrease the resistance of the connection between the contact member and the stationary terminal. This flexible connection may include a stranded electrical conductor 2 which is brazed, welded, or otherwise suitably secured mechanically and in good electrical contact with a metal terminal clip member 3, which may be formed of steel, and adapted to be arranged over an end

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and in contact with a surface of the carbonaceous material brush portion 1 and rigidly secured thereto. It is desirable that the electrical resistance between the terminal clip member 3 and the carbonaceous material brush portion 1 should be as low as possible to minimize losses therebetween and heating of the contact surfaces. We have found that this can be attained and that a more secure bond between the terminal clip member and the brush member may be obtained by forming a bonded coating of low electrical resistance metal, such as copper, over the contacting surface of the brush member 1 which is adapted to be engaged by the terminal clip member 3. This low resistance electrical coating may be formed by spraying a coating 4 of fine particles of molten copper over the surface of the member 1 adapted to be engaged by the terminal member 3, and a good bond is thereby formed between the copper and the carbonaceous material. The electrical resistance between the terminal member and the brush member portion 1 is further decreased by applying an adherent coating of an alloying metal, such as tin or zinc, over the surface of the clip 3 and then arranging the clip over the end of the member portion 1, as shown in Fig. 1, and alloying the copper coating on the brush member 1 with the tin coating on the clip member 3, and at the same time forming a further mechanical connection between the clip member and the carbonaceous material brush portion 1 by welding a connector between these members. This may be done by arranging a rivet 5 in an opening 6 preformed in the end of the carbonaceous material brush portion 1, such that a head 7 of the rivet engages an outer surface of a countersunk portion 8 of the brush member and an inner end 9 of the rivet contacts the inner surface of the terminal clip member 3, after which an electric current is passed through the rivet 5 and the carbonaceous material brush portion 1 and through the terminal clip member 3, such that the rivet, which is made slightly longer than the thickness of the carbonaceous brush material through which it extends, is softened and spreads under the pressure of the welding electrodes and becomes welded to the terminal clip 3, as indicated at 10 in Fig. 1. The heat of this welding and of the passage of current through the carbonaceous brush material 1 and the clip 3 raises the temperature of the engaging alloying metals on the contacting surfaces of the terminal clip member 3 and the end of the carbonaceous material brush portion 1 to such a degree as to alloy effectively these metals. In

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most instances, it will be found that this alloying is facilitated by removal of the oxide coating the alloying metals which may be done by the application of a light coating of a noncorrosive flux, such as a mixture of rosin and alcohol, to the surface of one or both of the alloying metals prior to the assembly of the unit. This arrangement forms a very good electrical contact between the terminal clip member 3 and a carbonaceous material brush portion 1 through the steel-to-tin-to-alloy-to-copper-to-carbon joint therebetween, and in addition, forms a very strong reinforced mechanical connection therebetween by the rigid unitary clip and rivet obtained by the weld 19.

While we have illustrated and described a particular embodiment of our invention, modifications thereof will occur to those skilled in the art. We desire it to be understood, therefore, that our invention is not to be limited to the particular arrangement disclosed, and we intend in the appended claims to cover all modifications which do not depart from the spirit and scope of our invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. An electrical contact member, a terminal member arranged in contact with a surface of said contact member, and means including a rivet-shaped member extending through said contact member with a head on the outer end thereof arranged in contact with the surface of said contact member and with the other end thereof welded to an innermost surface of said terminal member for forming a unitary terminal member and rivet-shaped member secured to said contact member.

2. An electrical contact brush member having a carbonaceous material portion, a terminal member arranged over one end and in contact with a side face of said carbonaceous material brush portion, and means including a rivet-shaped member extending through said carbonaceous material brush portion with a head on the outer end thereof and with the other end thereof butt welded to the adjacent face of said

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terminal member for forming a unitary terminal member and rivet-shaped member secured to said carbonaceous material brush portion.

3. An electrical contact brush member having a carbonaceous material portion, a metal terminal clip member arranged over one end and in contact with a surface of said carbonaceous material brush portion, a preformed passage in said carbonaceous material brush portion, and means including a rivet extending through said passage with a head on the outer end thereof arranged in contact with the surface of said carbonaceous material brush portion adjacent said passage with the other end thereof butt welded to an inner surface of said terminal clip member for forming a rigid unitary clip and rivet secured to said carbonaceous material brush portion.

4. An electrical contact brush member having a carbonaceous material portion, a metal terminal clip member arranged over one end and along a side of said carbonaceous brush portion, a coating of copper over the surfaces of said brush portion adapted to be engaged by said clip member, a coating of tin over the surfaces of said clip member adapted to be engaged by said brush portion, a preformed passage in said carbonaceous material brush portion, and means including a rivet-like member extending through said passage with a preformed head on the outer end thereof arranged in contact with a surface of said carbonaceous material brush portion and with the other end thereof butt-welded to the inside face of said terminal clip member.

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