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2,429,847

ELECTRIC CONTACT BRUSH AND CONNECTOR

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Fig. 1.

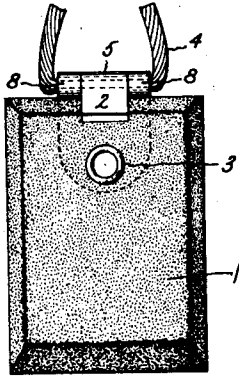


Fig. 2.

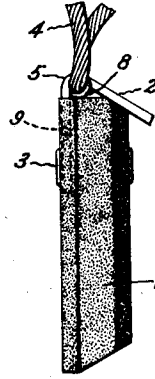


Fig. 5.

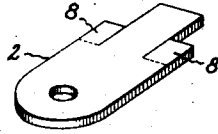


Fig. 3.

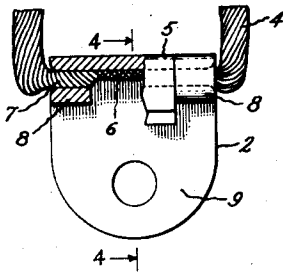
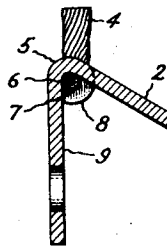


Fig. 4.



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UNITED STATES PATENT OFFICE

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ELECTRIC CONTACT BRUSH AND CONNECTOR

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6 Claims. (Cl. 171—326)

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My invention relates to an electric contact brush and connector and a method of making the same.

An object of my invention is to provide an improved and simplified contact brush and connector.

Another object of my invention is to provide an improved connector for an electric contact brush.

Further objects and advantages of my invention will become apparent and my invention will be better understood from the following description referring to the accompanying drawing, and the features of novelty which characterize my 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 front elevational view of an electric contact brush and connector embodying my invention; Fig. 2 is a side elevational view of the brush shown in Fig. 1; Fig. 3 is an enlarged view of a flexible connector and brush clip such as that shown in Fig. 1, with part of the clip broken away to illustrate the manner in which the flexible conductor is secured to the clip; Fig. 4 is a sectional view taken along line 4—4 of Fig. 3; and Fig. 5 is a perspective view of the clip used in the other figures of the drawing prior to its connection to the flexible conductor.

Referring to the drawing, I have shown a carbon electric contact brush 1 such as that used with commutating dynamoelectric machines provided with a connector of my improved construction. This connector comprises a substantially V-shaped terminal clip 2 made of any suitable conducting material and secured to the brush by a hollow rivet 3. A flexible stranded electrical conductor 4 is secured to the clip 2 by my improved connection and includes a stranded loop which is adapted to be connected to a suitable terminal such as is conventionally used with brush holders for this type contact brush. In the past it has been found that in securing such a flexible conductor to brush terminal clips, the strands of the conductor are embrittled by soldering to the clip or by fusing by the heat of a flame to such a terminal. Furthermore, it has been found that spot welding a portion of such a conductor to a clip forms a rigid portion, at the ends of which the strands may become broken if subjected to undesirable vibration. In order to overcome these difficulties, I arrange the closed portion of the loop conductor 4 so that a predetermined length of the

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conductor is in contact with the inner surface of the apex 5 of the clip 2. As shown in Fig. 3, the flexible conductor is connected to the clip by an integral union formed by a wetted metal or fused bond, such as may be provided by soldering, or preferably by welding or brazing at 6 intermediate the ends of the portion of the loop in contact with the clip, so that less than the predetermined length of conductor in contact with the clip becomes hardened and welded to the clip at 2. In addition, this secured portion is made sufficiently less to provide an unsecured portion of conductor 7 at each side of the welded joint 6 within the outer side edges of the clip 2. In this manner, only the intermediate portion of the flexible conductor becomes hardened by the welded or soldered connection, and a small portion 7 adjacent each end of the clip within the apex thereof remains flexible. In the spot welding operation, preferably no flux is used and, therefore, no embrittlement of the conductor is produced by penetration of flux into the conductor between the strands thereof. This spot welding is preferably done by pressing an electrode against the portion 6 of the flexible conductor 4 and against the outer side of the apex 5 of the clip 2 and then passing an electric current between these two electrodes. The clip 2 is formed with a finger 8 on each side thereof which is bent around the flexible end portion 7 of the conductor within the apex of the clip so as to clamp the conductor on each side of the weld for mechanically holding it in position adjacent the weld to prevent the movement of the strands of the conductor by vibration at the ends of the welded portion 6. This provides for securely holding these edge portions of the conductor without rigidly binding them in position or embrittling the strands where they emerge from the clip as a flexible pigtail connection. The brush connector is then applied to the carbon brush 1, and one side of the clip 2 is arranged in a slot in one side of the brush adjacent an end thereof so that the loop of the flexible conductor 4 is closely adjacent the upper side of the brush. The inturned fingers 8 will usually be in contact with the top of the brush; however, it is not necessary that the fingers 8 be in contact with the top of the brush since the electrical contact is made from cable 4 to the clip 2 through the soldered or welded joint 6, then to the brush at surface 9. The carbon brush material also may be sprayed with molten metal where surface 9 of clip 2 contacts the brush material, thus providing good electrical

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contact between the clip and the carbon. The metal clip also may be soldered to the metal sprayed on the surface of the carbon if a still better electrical connection is desired. In this manner, I provide a simplified brush and connector and method of making the same wherein the portion of the flexible conductor which connects the brush terminal clip to the brush holder terminal is not embrittled adjacent the terminal clip by the method of securing it to this clip, and the useful life of the brush is increased by insuring the flexibility of this conductor and thereby reducing the possibility of breakage of the conductor at the point where it is secured to the brush terminal clip.

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

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

1. An electric contact brush having a terminal clip secured thereto, a flexible electrical conductor arranged in electrical contact with said clip for a predetermined length thereof and secured thereto for less than said predetermined length by a spot weld intermediate the side edges of said clip, and means for mechanically securing said conductor to said clip on each side of said weld.

2. An electric brush having a V-shaped terminal clip secured thereto, a flexible electrical conductor secured to said clip by a weld within the apex of said clip intermediate the ends thereof, and means including a finger on each side of said clip clamped around said conductor on each side of said weld for mechanically holding said conductor adjacent said weld.

3. An electric contact brush having a V-shaped terminal clip secured thereto, a flexible electrical conductor formed as a loop inserted between said clip and said brush, a weld securing said conductor loop within the apex of said clip intermediate the side edges thereof, and means including a finger on each side of said clip clamped around said conductor on each side of said weld for mechanically holding said conductor adjacent said weld.

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4. An electric contact brush having a terminal clip secured thereto, a flexible electrical conductor arranged in electrical contact with said clip for a predetermined length thereof and secured thereto for less than said predetermined length by a spot weld intermediate the side edges of said clip, and means including a finger on each side of said clip bent around said conductor on each side of said weld for mechanically securing said conductor adjacent said weld.

5. An electric contact brush having a terminal clip secured thereto, a flexible electrical conductor arranged in contact with and secured to said clip by a spot weld for a length thereof less than the width of said clip intermediate the ends thereof, and means including a finger on each side of said clip clamped around said conductor on each side of said weld for mechanically holding said conductor adjacent said weld.

6. An electrical connector for a carbon brush or the like including an electrically conductive clip, a flexible electrical conductor having a predetermined length thereof arranged in electrical contact with said clip, a spot weld intermediate the ends of said predetermined length securing said electrical conductor to said clip intermediate the side edges thereof, and a finger formed on each side of said clip and clamped around said conductor on each side of said weld for mechanically holding said conductor adjacent said weld.

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