C. W. ADAMS.

ELECTRIC CONDUCTOR.

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1,274,493. Patented Aug. 6, 1918.

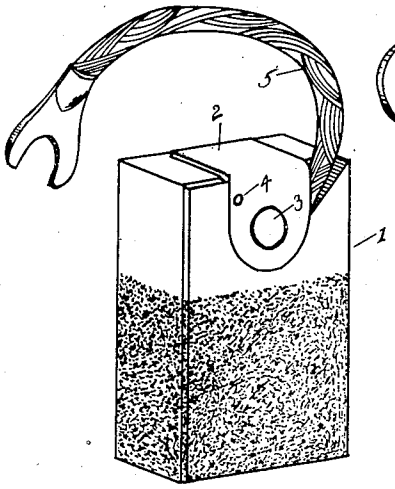


Fig. 1

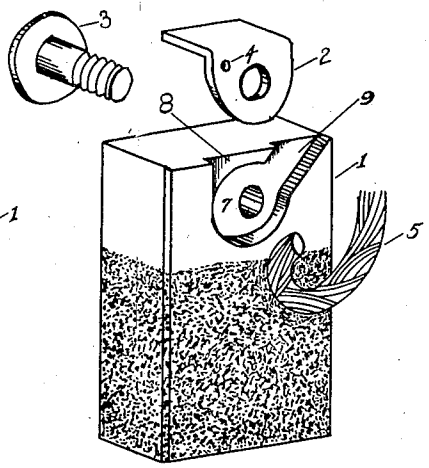


Fig. 2

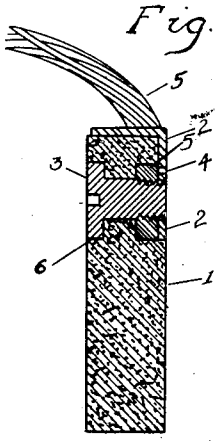


Fig. 3

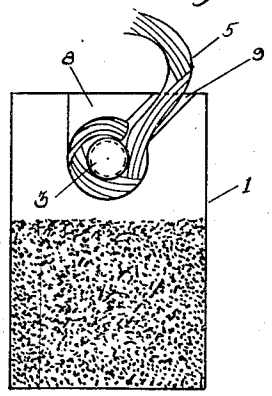


Fig. 4

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ELECTRIC CONDUCTOR.

1,274,493. Specification of Letters Patent. Patented Aug. 6, 1918.

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To all whom it may concern:

Be it known that I, CHARLES W. ADAMS, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Electric Conductors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to carbon brushes and pertains more particularly to an improved means for attaching flexible conductors or pig tails to carbon brushes and an improved method of making the connection between the brush and the pig tail.

The objects of my invention are, first, to provide a simple and inexpensive means for attaching pig tails to carbon brushes, whereby the pig tail will be as firmly secured to the brush and will have as effective electrical contact therewith as is possible with pig tail connections in which brass or copper sleeves are employed; but my invention produces this desirable result without the use of copper sleeves or the necessity of riveting; second, to produce a fastening device that will firmly anchor the pig tail to the brush, making effective electric contact therewith and causing the end of the flexible pig tail to become thoroughly incorporated as one solid mass with the anchoring bolt, the clip and the coating of metal which is electro-plated upon the carbon, leaving no spaces or opportunity for defective contacts.

A further object is to provide a connection that can be easily and quickly assembled and that will insure proper electric contact without the necessity of employing highly skilled labor in the work of assembling.

With these and certain other objects in view, which will appear later in the specification, my invention comprises the devices described and claimed and the equivalents thereof.

In the drawings, Figure 1 is a perspective view showing one form of my invention; Fig. 2 is a perspective view showing the construction of Fig. 1 in a partially assembled state.

Fig. 3 is a vertical section showing the completed construction.

Fig. 4 is a side view, showing the pig tail assembled on the block, and the clip being removed.

In the drawings, 1 represents a carbon block such as an ordinary carbon brush, to which is attached a pig tail of the ordinary flexible type, commonly used to connect the brush to the brush holder.

To attach the pig tail to the brush I employ a bolt which passes through a hole drilled in the carbon block and is threaded or connected in any equivalent manner with a washer or clip 2. Underneath the clip, and bent to form an eye surrounding the bolt 3, is the end of the flexible pig tail 5.

The head of the bolt is preferably made flat and is received in a countersunk recess in the face of the carbon block. The opposite face of the carbon block is similarly countersunk to form a chamber 7, in which the pig tail may be inclosed when wound around the end of the bolt. This face of the block is also preferably recessed, as at 8, to a depth equal to or a little greater than the thickness of the washer or clip 2, so that the washer will not project beyond the face of the block. An open channel 9 in the face of the block, is also formed, leading from the bolt to the outside of the block. The purpose of this channel is to loosely receive that part of the flexible pig tail which projects out from the block, and to serve as a guide to prevent the pig tail being broken by too sharp bending when in use. The channel is preferably of such depth that the side of the pig tail will not project from the face of the block.

The washer or clip 2, is preferably threaded to receive the threaded end of the bolt 3, so that the bolt when tightened causes the clip to draw down tightly upon the end of the pig tail 5, compressing the latter into a mass of the same shape as the chamber 7.

The method of assembling is as follows:

The block is first drilled transversely to receive the bolt 3, and the two faces of the block are counterbored and recessed as above described.

The inside surfaces of the bore, and of the countersunk recesses are then coated with metal, such as copper, preferably by electroplating.

The end of the brush is next dipped in molten solder, or its equivalent. This tins the copper plating, but does not affect the

other surfaces of the brush. The bore and countersunk surfaces being now tinned, the bolt is inserted, the end of the pig tail is wrapped around the bolt in the countersunk recess. The clip 2, is next laid on top of the pig tail and is clamped in place by means of the threaded bolt 3. This draws the clip down tightly upon the top of the pig tail and squeezes its flexible wires into a compact mass.

The clip serves as a washer to hold the wires in place, and as a threaded nut by which the wires are compressed and clamped into a solid mass. The upper end of this clip extends over the top of the carbon block to form a bearing for the finger spring of a brush holder. Thus the clip serves three important purposes.

The clip is formed with a small hole or notch 4 to serve as a vent, as will presently be described.

The clip 2 and bolt 3 are now touched with acid and the assembled parts are heated to about 110° C. The brush may then be dipped in molten solder, tin or lead, but preferably solder is applied to the edge of the bolt head. The hot solder immediately runs or "sweats" over the surfaces of the bolt, covers the underside of the bolt head and thoroughly penetrates the rope-like mass of small wires that constitutes the wired end of the pig tail, thoroughly soldering the outside surfaces of the end of the pig tail to the electroplated carbon, and soldering the inside surfaces to the threaded end of the bolt and to the inside surface of the clip, thereby producing almost perfect electric contacts over all these areas, and soldering the bolt, the clip, and the end of the pig tail together so that they can not become loosened. The block, the bolt, and the clip are thus soldered together so as to form practically one solid mass. The vent hole or notch 4 in the clip 2 enables the gases to pass out and facilitates the flowing of the solder.

The eye or bent part of the conductor insures firm anchorage to the bolt. The bolt head supports one side of the carbon block at one end of the bore, while the clip reinforces the block at the other side. The threaded bolt and clip mechanically clamp and compress the flexible mass of small wires of which the conductor is composed into a molded body that shapes itself to and completely fills the recess 7. The solder unites the conductor to the bolt and to the clip.

The open-sided channel 9 leaves the unsoldered part of the conductor free to bend without breaking, and also guides the conductor so it cannot be bent too sharply at a point close to the solder.

By the means above described I have produced a pig tail connection for carbon brushes that is simple in construction, strong and durable and has exceedingly high efficiency as a transmitter of electricity, and can be easily and quickly assembled without employing skilled labor.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

In combination, a carbon brush formed with a transverse bore, and a recess, a bolt received in said bore and projecting into said recess, a flexible conductor, one end of said conductor wrapped around said bolt within said recess, a clip superposed on said conductor and clamped thereagainst by said bolt, said clip formed with a vent opening, and solder for securing said brush, bolt, conductor and clip together.

In testimony whereof, I affix my signature.

CHARLES W. ADAMS.