W. SHAW.

PIGTAIL CONNECTION.

APPLICATION FILED APR. 1, 1913.

1,122,432. Patented Dec. 29, 1914.

Fig. 1.

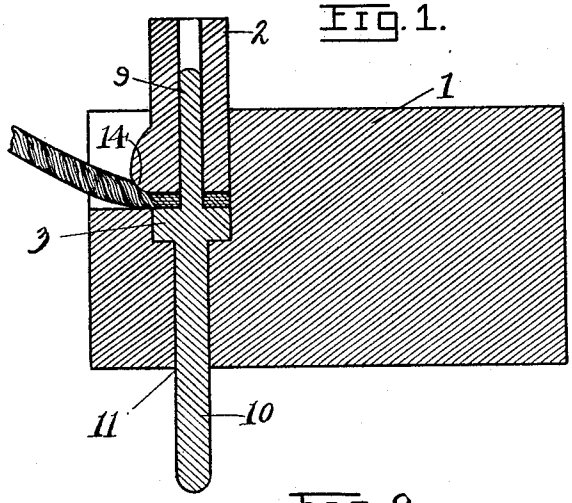


Fig. 3.

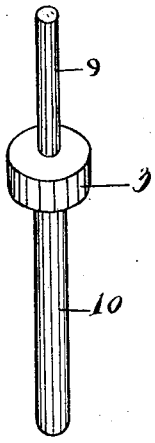


Fig. 2.

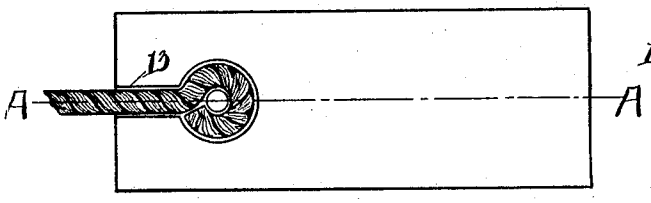


Fig. 4.

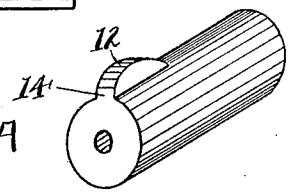
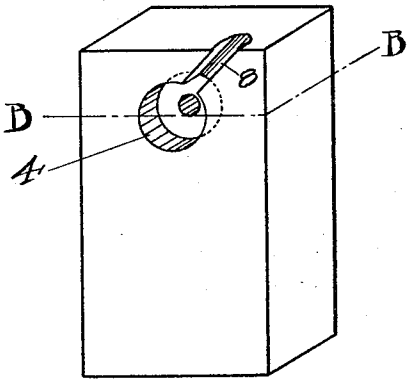


Fig. 5.



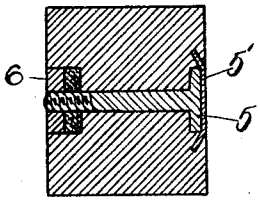


Fig. 6.

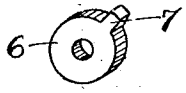


Fig. 7.

WITNESSES

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PIGTAIL CONNECTION.

1,122,432. Specification of Letters Patent. Patented Dec. 29, 1914.

Application filed April 1, 1913. Serial No. 758,180.

To all whom it may concern:

Be it known that I, WILLIAM SHAW, a subject of the King of England, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Pigtail Connections, of which the following is a full, clear, and exact description.

My invention relates to a method of attaching flexible conductors to dynamo electric brushes and other contacts.

There are various ways in which the flexible conductors or "pigtails" are connected to brushes, but my invention more particularly relates to the type in which the pigtail is secured to the brush in a recess or cavity therein, such as are shown, by way of example, in my application filed August 6, 1912, Serial #713570 and October 15, 1912, Serial #725850. It has been the prior practice in this type to place the pigtail end in the cavity of the brush and clamp it therein by means of a screw or rivet or else to form a metal clip on the end of the pigtail and secure this clip in the cavity by the same means.

When the end of the pigtail is coiled around inside the cavity and clamped in by a screw, it is liable to become loosened in practice due to the vibrations of the brush. The vibrations cause the small wires of the pigtail to assume different positions or to flatten out to a slight extent until they are no longer tightly packed against the brush. This is, of course, objectionable inasmuch as the good contact is destroyed. If a clip or eye is secured to the end of the pigtail and attached to the brush, additional labor and material is required which increases the cost of the connection.

My invention aims to overcome the disadvantages of these and other prior types.

Referring to the drawings: Figure 1 is a sectional elevation of the punch and die for compression of the end of the pigtail, the section being taken on the line A—A of Fig. 2. Fig. 2 is a top view of the parts shown in Fig. 1 with the exception that the pigtail is shown at the top of the die in position to be pushed downward and compressed by the punch. Fig. 3 is a perspective view of the die seat. Fig. 4 is a perspective view of the punch of Fig. 1. Fig. 5 is a perspective view of one form of the brush with which my improved pigtail may be used. Fig. 6 is a sectional view taken on the line B—B of Fig. 5 showing in addition the end of the pigtail clamped in position in the brush. Fig. 7 is a perspective view of the nut which may be used to retain the pigtail in the cavity of the brush.

The method used in forming the pigtail connection and attaching it to the brush is as follows: The flexible pigtail which consists of a plurality of strands is coiled around at the top of the die as shown in Fig. 2. The punch 2 is then placed in the die and the pigtail is shoved to the bottom. Pressure is then applied to the punch to densely compact the end of the pigtail between it and the die seat 3. This pressure can be applied in any way. For instance, it can be obtained by means of striking several heavy blows against the punch 2 with a hammer or the parts as shown in Fig. 1 may be placed in a vise and the tool pressed inward by manipulation of the vise. Preferably, however, the punch 2 would be connected to the well known power punch. When the end has been compressed, the tool 2 is removed and the pigtail taken out and secured to the brush. The pigtail may be removed by punching up on the rod 10.

In the type of brush shown in Fig. 5, the compressed end is placed in the cavity 4 which is approximately the same diameter as the die of the block 1, and it is secured in place by means of screw 5 and nut 6. The nut 6 may have a lug 7 thereon to enter the slot 8 to prevent it from turning. The bail 5′ described in my prior application 713570, may be used to prevent the screw from turning. It consists of a wire fitting in the slot of the screw head and extending into slanting holes drilled in the brush as shown in Fig. 6.

The die seat 3 preferably has a pin 9 projecting upward from the center as shown in Figs. 1 and 3. This pin should be of approximately the same diameter as the screw 5. The die seat may also have a pin 10 extending downward in hole 11 so as to aid in removing the pigtail from the block 1. The punch 2 preferably has a lug 12 to fit into the slot 13 of the block as shown in detail in Fig. 4. The lug has a rounded bottom portion 14 so that there will be no sharp corners to cut the small strands of the pigtail where they join the part that is compressed in the die. The parts 2 and 3

should preferably be made of tool steel and hardened so that they will stand the repeated operations of compressing pigtails.

A pigtail attached to a brush in accordance with my method can only be loosened in practice when the screw 5 is unthreaded from the nut 6, and since these are prevented from turning, it follows that the pigtail attachment will be held tightly in place regardless of the vibrations encountered in practice.

On the drawing I have only shown one typical means for carrying out the method. The method, however, is not limited thereto as it may be performed by various other forms of apparatus.

Having described my invention, what I claim is:

The herein described method of attaching a flexible conductor of bare metal strands in a recess of a carbon brush which consists in placing the end of the conductor in a die of substantially the same form as the said recess, and applying pressure thereto to force the same into a dense compact mass with all the strands in good electrical contact, and securing the compacted strands in the said recess by bolt and nut whereby the said end will not assume a new shape under the pressure applied in said securing operation.

In testimony whereof, I hereunto affix my signature.

WILLIAM SHAW.

Witnesses:
IRA J. ADAMS,
H. G. GROVER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."