A. S. McDANIEL.

ELECTRICAL CONNECTION OR PIGTAIL.

APPLICATION FILED JULY 31, 1913.

1,141,069. Patented May 25, 1915.

Fig. 1.

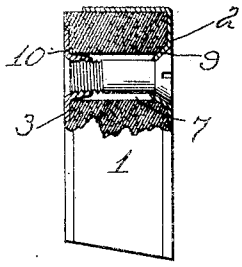


Fig. 2.

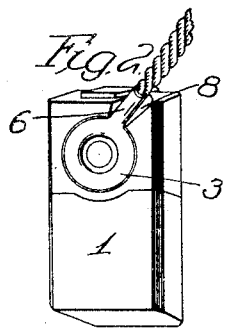


Fig. 3.

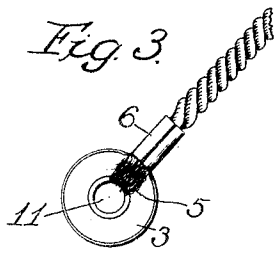
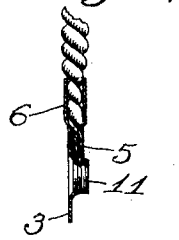


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL CONNECTION OR PIGTAIL.

1,141,069. Specification of Letters Patent. **Patented May 25, 1915.**

Application filed July 31, 1913. Serial No. 782,343.

To all whom it may concern:

Be it known that I, ALEX S. McDANIEL, citizen of the United States, residing at Bradford, Pennsylvania, have invented certain new and useful Improvements in Electrical Connections or Pigtails, of which the following is a specification.

My invention relates to an improved arrangement for connecting flexible metallic conductors to granular conducting bodies, such as the carbon blocks employed as brushes of dynamo-electric machines, and particularly to an improved form of terminal washer or ring by which the flexible metallic conductor is connected to the carbon block or other granular conducting body.

The main object of my invention is to provide a simple and inexpensive means for fastening a flexible metallic conductor, or "pig tail" to an ordinary carbon brush, in such a way that there is no danger of breaking the brush, no matter how small or thin it may be, and, at the same time, to secure a better electrical connection, and, at the same time to provide a connecting means that can be easily detached when the brush is worn out, and used again with other brushes.

There are now in use two types of carbon brush, in which the connection is made substantially as follows:—Transversely through the upper end of the block is drilled a hole or bore recessed at its opposite ends to receive the parts hereinafter described and to prevent them from extending beyond the faces of the said brush; at one end of the bore a slot is formed extending from the upper end of the bore to the upper end of the block; a washer fits snugly into the recess at one side of the block; it is provided with a tongue bent at right angles so as to extend over and against the upper end of the block; the terminal washer of the flexible metallic conductor or "pig tail" fits snugly into the corresponding recess of the bore at the other side of the block; this terminal is formed with a short tubular extension in which the fine strands of copper wires forming the "pig tail" itself are secured. In one type, the first described washer (on one side of the block), and the last described terminal washer (on the other side of the block), are fastened together and obtain their electrical connection by a hollow rivet extending through the bore, and having its projecting ends beaded or upset against the washers. The objection to this type is that in manufacture it requires the extra act of upsetting the ends of the rivet; and when the brush is worn out, the flexible metallic conductor and the connecting means cannot be easily detached from the carbon brush. In another type of connection, the washers are fastened together by a screw extending through the bore, the screw being held in place by a nut screwed on the end of the screw and engaging the washer. The objection to this type of connection is that, in order to sink the nut even with the surface of the carbon block, it is necessary to recess the bore for the reception of the washer to such a depth, that in thin or small carbon brushes, the brush is weakened so as to be easily broken, either in process of manufacture or in use.

My invention is a terminal washer of new design, for use in a carbon brush, substantially as described, in which I use neither a rivet nor a nut, and which is also so designed as to give better electrical connection between the flexible metallic conductor and the screw.

In the accompanying drawings, I have illustrated the carbon block of which my invention is a part, and the terminal washer of new design, which is my invention.

Figure 1 is an illustration of a cross section of the carbon block with my invention attached and used therein. Fig. 2 is a perspective view of the block with my invention attached and used therein. Fig. 3 is a perspective view of the terminal washer, which is my invention. Fig. 4 is a cross section of the terminal washer, which is my invention.

The terminal washer is a circular ring with a short tubular extension in which the fine strands of copper wires forming the "pig tail" itself are secured. The side of the washer adjacent to the tubular extension is hollow, so that the strands of copper wire may extend to the center of the washer. This allows the wire strands to come in direct contact with the screw, afterdescribed, thereby giving a better electrical connection between the flexible metallic conductor and the carbon brush. In the center of the washer a hole is swaged large enough

to admit the end of the screw which connects the two washers, and the metallic projection formed by this swaging is of a size to enter the bore or hole through the carbon block, and the inside of this projection is threaded to engage the screw which connects the two washers. In this way I dispense with a nut to hold the screw and it is necessary to cut a recess in the carbon block around the end of the bore only as deep as the thickness of the terminal washer.

In Figs. 1 and 2 of the drawings, 1 represents the brush made of carbon or some analogous material. 7 represents the hole or bore extending transversely through the upper end of the block. 9 and 10 represent the recesses at each end of the bore. 8 shows the diagonal slot extending from the bore to the upper end of the block. 2 represents a washer which fits snugly into the recess 9 at one side of the block, and is provided with a tongue bent at right angles so as to extend over and against the upper end of the block. The washer is slightly depressed around its bore to form a rim which extends into the bore 7 of the block.

In Figs. 1, 2, 3 and 4, 3 represents the terminal washer of new design, which I claim as my invention. This terminal washer 3 fits snugly into the corresponding recess 10 of the bore 7. 6 represents the extension. This extension is hollow and extends to the circumference of the washer. Inserted in the tubular extension 6 are fine strands of copper wire 5, which extends to the swaged hole of the washer. 11 represents the hole at the center of the washer, formed by swaging the metal, the collar formed by the swaging of the metal being threaded. This strand is engaged by the screw 4, which extends through the bore 7 and holds the washers fast to the carbon block. The head of this screw is sunk within the depression surrounding the bore of the washer 2, and is flush with the outer edge of washer 2.

What I claim as new and desire to secure by Letters Patent is:—

In combination, a carbon brush having a transverse bore through it from side to side, a flexible metallic conductor having a terminal washer, having a central inturned metallic projection threaded internally and adapted to fit within one end of said bore, a metallic washer similarly provided with a central inturned projection adapted to fit in a recess on the opposite side of the block and having a tongue or plate bent so as to extend over and against the top of said block, and means for detachably securing said parts in their respective places consisting of a screw extending through the bore of the said block and having its head engaging said inturned projection of the metallic washer and its stem engaging with said screw threaded projection of said terminal washer of the flexible conductor, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

ALEX S. McDANIEL.

Witnesses:
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