

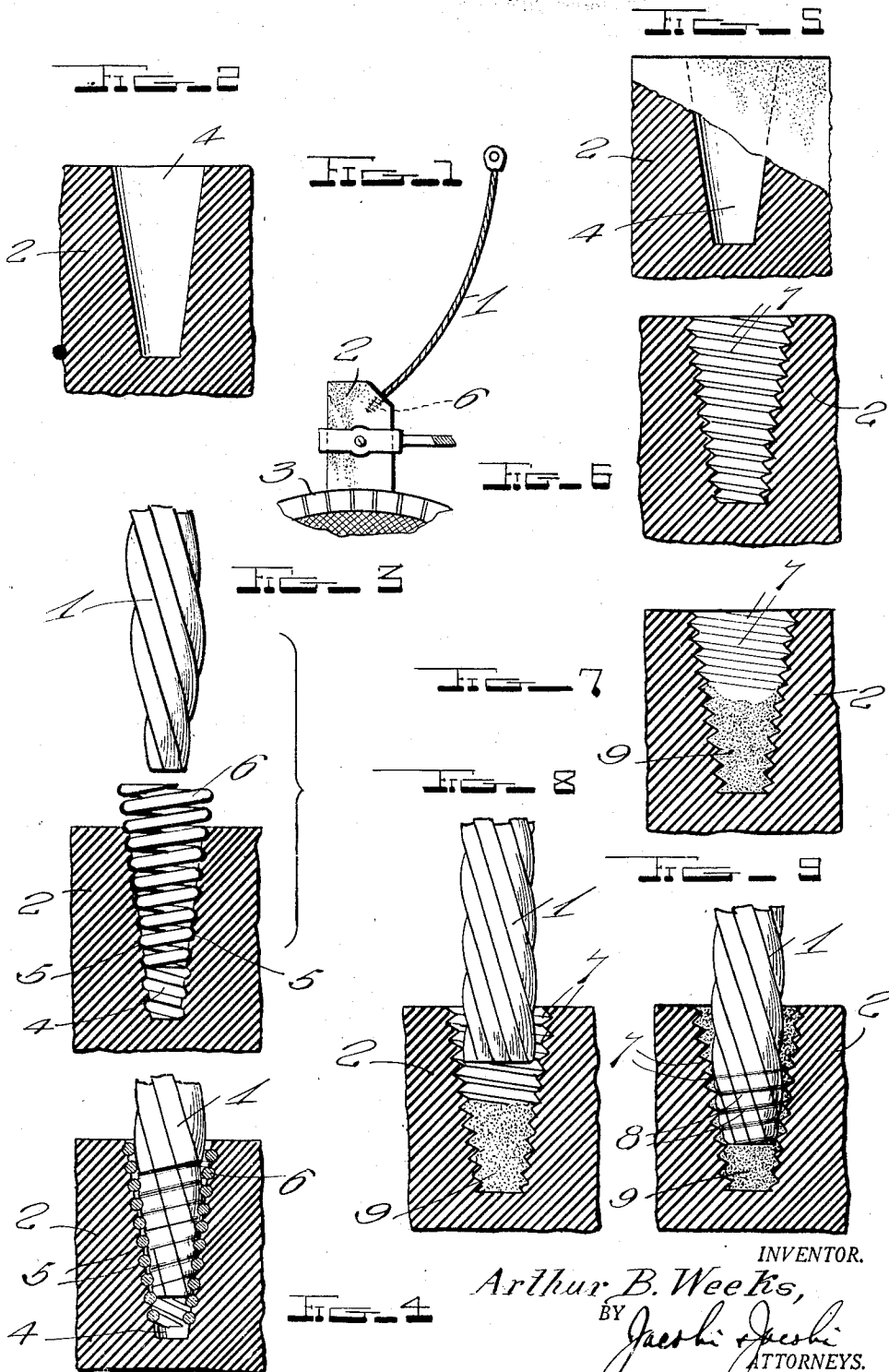
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SHUNT WIRE FASTENER

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SHUNT WIRE FASTENER

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3 Claims. (Cl. 171—326)

This invention relates to an improved fastener for connecting shunt wires with carbon brushes and it is one object of the invention to so connect a wire with a brush that it will be firmly held and movements of the brush and wire relative to each other prevented. Therefore, a short circuit due to a loose connection will be prevented and also arcing and resulting damage to the wire or the brush avoided.

Another object of the invention is to provide a connection wherein the wire is equipped with a threaded terminal of conductive material which tapers towards its outer end and is screwed into a correspondingly tapered and threaded socket where it will be firmly held against accidental slippage out of the socket.

Another object of the invention is to provide a wire terminal which is expanded as it is engaged with the conductor and frictionally grips the same, thereby causing the terminal to be firmly held in engagement with the conductor as well as being threaded into the socket.

Another object of the invention is to so form the terminal that while it will cause the conductor to be firmly secured in a socket against accidental loosening or detachment therefrom, easy removal of the conductor and the terminal from the socket when so desired will be permitted.

Still another object of the invention resides in providing a device which is simple and durable in construction, inexpensive to manufacture and one which will be very efficient in operation and application to use.

With these and numerous other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts as will be hereinafter referred to and more particularly pointed out in the specification and claims.

The invention is illustrated in the accompanying drawing wherein:

Figure 1 is a view in elevation showing a conductor connected with a carbon brush, the connection being in accordance with the invention.

Figure 2 is a fragmentary sectional view showing a portion of the carbon brush with a tapered socket formed therein.

Figure 3 is a group view showing a portion of a twisted-wire conductor and a spring terminal for the conductor in position to be engaged in the socket of the carbon brush.

Figure 4 is a view showing the conductor and its tapered helical terminal anchored in the socket.

Figure 5 is a view showing a portion of a carbon

brush partially in elevation and partially in section, the sectional portion showing the socket.

Figure 6 is a view showing the brush in section and the walls of the socket threaded.

Figure 7 is a view showing the threaded socket partially filled with cement.

Figure 8 is a view showing an end portion of a conductor thrust into the socket without having a helical terminal applied to it.

Figure 9 is a view showing the conductor engaged with threads of the socket and cemented into place.

The subject matter of this invention relates to improved means for securing a shunt wire or conductor 1 to a carbon brush 2 which in Figure 1 has been shown in operative relation to the commutator 3 of an electric motor or generator, it being understood that the motor or generator will be provided with the usual number of brushes and not merely the one shown. The carbon brush must have the shunt wire firmly connected with it as otherwise a short circuit will result and arcing will occur with resulting damage to the brush and the commutator.

According to this invention, the brush 2 is formed with a socket 4 which is bored therein or formed during molding of the brush and is tapered towards its inner end as clearly shown in Figure 2. The walls of the socket are formed with threads as shown at 5 and by referring to Figures 3 and 4, it will be seen that these threads are coarse and of arcuate cross section so that they will accommodate the convolutions of the tapered helical spring 6 which is formed of copper or other conductive material and constitutes a terminal for the shunt wire 1. This shunt wire is formed of a plurality of twisted wire strands as shown clearly in Figure 3 and at its extremity the shunt wire is tapered so that it may extend into the terminal 6 for substantially the full length thereof. The tapered helical spring or terminal 6 is of such diameter that it is expanded somewhat as the extremity of the conductor 1 is forced into it and its contraction about the conductor will cause it to have binding engagement therewith and firmly grip the twisted-wire conductor. Solder may then be applied to one or both ends of the helical spring to provide a positive connection between the terminal and the conductor and eliminate any danger of them slipping out of tight binding engagement with each other. After the tapered helical spring has been applied to the conductor, it may be screwed into the socket where the conductor will be firmly held by engagement of the convolutions of the

spring in the threads of the socket, but since the terminal is screwed into the socket, it may be easily removed therefrom if so desired by merely unscrewing it from the socket. In view of the fact that the terminal and the socket taper, easy insertion of the terminal may be accomplished by merely thrusting it into the socket and then turning it a few times to effect binding engagement of the terminal in the threads of the socket. This taper also permits easy and quick removal of the conductor and its terminal when so desired. If so desired, the terminal may be fitted into the socket as shown in Figure 3 and the tapered end of the twisted-wire conductor then thrust into the terminal and turned so that it will be tightly wedged into the terminal and the terminal engaged in the threads of the socket. The positive connection between the conductor and the terminal will be omitted but since the terminal has close fitting binding grip about the conductor, accidental slippage of the conductor out of the terminal will be prevented.

In Figures 5 through 9, there has been shown a modified embodiment of the invention wherein the socket has its walls formed with sharp threads as shown at 7. It should also be noted that the tapered helical spring terminal is omitted and the end portion of the conductor screwed into the socket for direct engagement with the threads thereof. These threads cut grooves or threads into the strands of the conductor as shown at 8 when the conductor is thrust into the socket with a twisting movement and threaded engagement will be created between the conductor and the threaded walls of the socket. Before the conductor is screwed into the socket, cement formed of copper dust and a binder is poured into the socket as shown at 9 and when this cement is displaced by the conductor, it will be forced upwardly about the conductor and completely fill portions of the socket not occupied by the conductor as shown in Figure 9. Therefore, the conductor will be very firmly held in the socket by the combined action of the cement and the threads of the socket and since the cement contains copper dust, a very good electrical connection will be provided between the conductor and the carbon brush. Copper dust cement may also

be applied before screwing the terminal 6 into the socket if so desired and thus insure a good connection between the conductor and the walls of the socket and in addition a good binding engagement between the terminal and the conductor.

From the foregoing description of the construction of my improved device, the operation thereof and the method of applying the same to use, will be readily understood. It will be seen that I have provided a simple, inexpensive and efficient means for carrying out the objects of the invention and while I have particularly described the elements best adapted to perform the functions set forth, it is obvious that various changes in form, proportion and in the minor details of construction may be resorted to, without departing from the spirit or sacrificing any of the principles of the invention.

Having thus described the invention, what is claimed is:

1. A carbon brush formed with a socket tapered towards its inner end, a conductor formed of twisted strands, and a terminal consisting of a longitudinally tapered helical coil of conductive metal fitting about an end portion of said conductor and tightly gripping the same, said terminal and the portion of the conductor surrounded thereby extending into said socket and held therein by engagement of convolutions of the terminal with walls of the socket.

2. A carbon brush formed with a socket tapered towards its inner end and having its walls formed with threads, a conductor, and a terminal for one end portion of said conductor consisting of a tapered helical coil fitting tightly about the conductor and disposed within the socket with its convolutions engaged in threads of the socket.

3. A carbon brush formed with a socket tapered towards its inner end and having its walls formed with threads arcuate in cross section, a conductor formed of twisted strands, and a terminal for an end portion of said conductor consisting of a tapered helical coil fitting tightly about the conductor in gripping engagement therewith and disposed within the socket with its convolutions engaged in the threads of the socket.

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