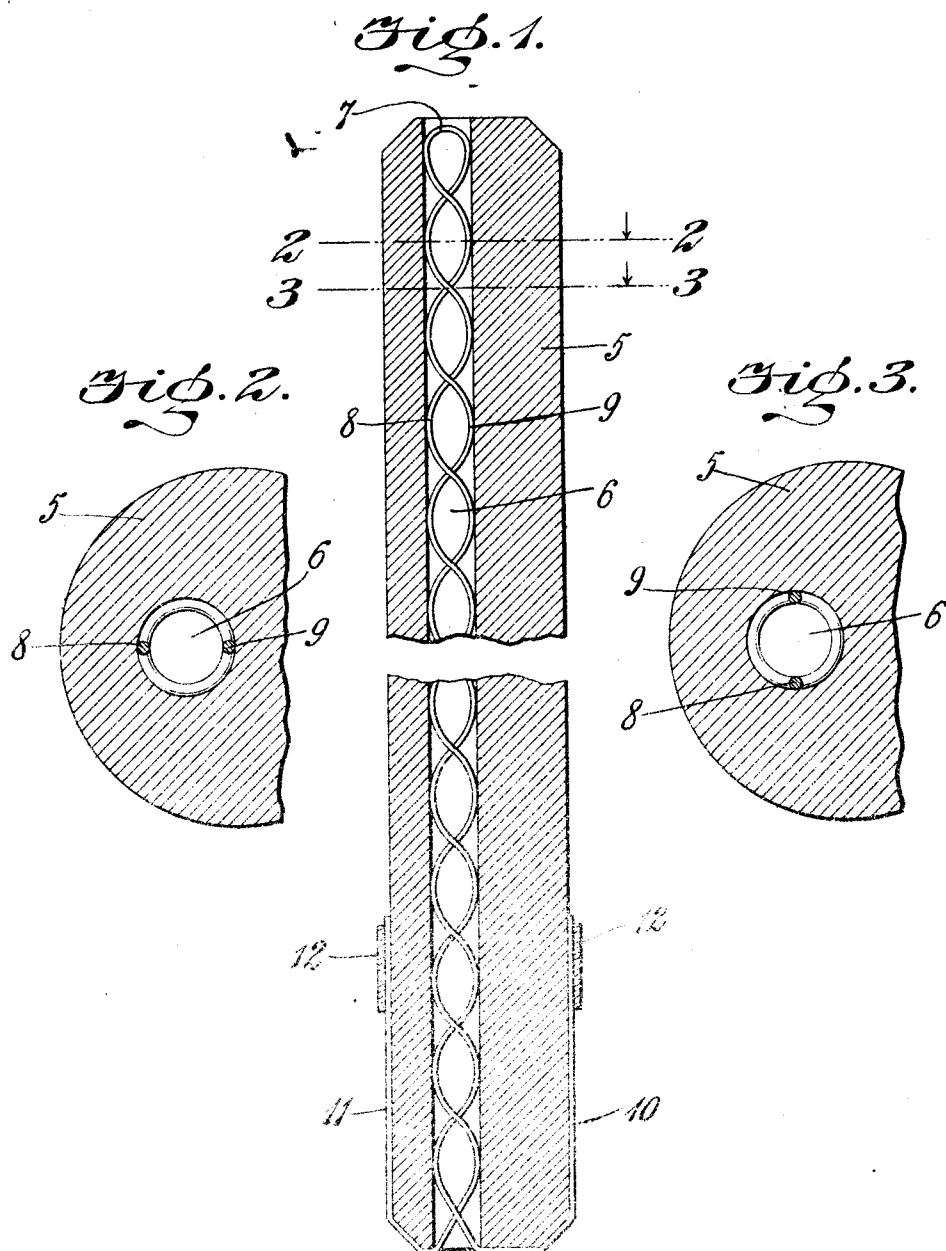


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CARBON FOR ELECTRIC ARC LAMPS.
APPLICATION FILED AUG. 29, 1811.

1,066,183.

Patented July 1, 1913.



WITNESSES:

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CARBON FOR ELECTRIC-ARC LAMPS.

1,066,183.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed August 29, 1911. Serial No. 646,612.

To all whom it may concern:

Be it known that I, HARRY CAIRD, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a certain new and useful Carbon for Electric-Arc Lamps, of which the following is a specification.

This invention is a carbon for electric arc lamps, and it pertains, more particularly, to a carbon of that kind which is provided with a metal conductor embedded or incased in the carbon material, said conductor forming a path of low resistance for the flow of current through the carbon pencil.

The invention consists of a double coiled wire incased within the carbon material in such manner that each wire of a double coil will contact throughout its length with the carbon material, whereby a continuous contact is secured between the wire coils and the carbon material for the purpose of conducting the current through the carbon material.

Other features and advantages of the invention will appear from the following detailed description taken in connection with the drawings.

In the accompanying drawings, I have illustrated one practical embodiment of the invention, but the construction shown therein is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a longitudinal section, on an enlarged scale, of a carbon embodying the invention. Figs. 2 and 3 are cross sections on the lines 2--2 and 3--3, respectively, of Fig. 1.

The carbon pencil or rod 5 is composed of any usual or preferred carbonaceous material. Said rod or pencil is provided with a continuous channel or passage 6, the same extending from end to end of the pencil or rod. Said channel is, preferably, circular in cross section, and is uniform in diameter throughout the length thereof. Said channel opens through the respective ends of the pencil or rod, and it is positioned, preferably, at one side of the longitudinal axis of said rod or pencil.

The salient feature of the invention is a metal conductor in the form of a double coil, preferably composed of a small gage wire, so incased within the channel or passage as to contact with the walls of carbon material throughout the length of the coil or coils.

In a preferred embodiment of the invention, a single wire of the required gage, is doubled or bent upon itself to produce a loop 7, and the two strands of wire are then twisted so as to result in coils 8, 9. The convolutions of said coils cross or intersect, as shown in Fig. 1, so that the lines of contact of one coil with the carbon material will be opposite to, or across from, the lines of contact of the other coil with said carbon material. The coils are composed of spring wire, and they are positioned within the channel or passage 6 so that said coils will expand sufficiently to secure good frictional contact with the walls of said channel or passage, whereby said coils are retained within the carbon material by frictional contact therewith.

In the manufacture of the carbon, the pencil 5 with the passage therein is produced in the usual way, and the doubled conductor in an untwisted or uncoiled condition is inserted into the channel, the looped end of said conductor being inserted into the channel until it can be engaged by a suitable holding device. The free ends of the doubled conductor are twisted tightly around each other, preferably by a machine, after which the wire is stretched lengthwise, the loop 7 being drawn into the rod or pencil as shown in Fig. 1, and said free ends are released, thus allowing the coils 8, 9 to recoil or untwist. When tension is released from the wire, the coils spring away from each other and expand within the carbon, thereby forming a metal conductor of greater diameter than a single strand of wire. It will be noted that in the operation of twisting the wires together to produce the coils, the diameter of the two wires is less than the internal diameter of the passage within the carbon rod. After the twisting operation is completed and the wires released, the two helices resulting therefrom are free to expand within the rod, thus securing firm contact with said rod due to the aforesaid expansion, the area of such contact being double the area of contact in the case of a single coil. Furthermore, by interlacing the coils and expanding them as described within the passage of the rod, the convolutions of the coils diverge as shown in Fig. 1, thus imparting to the coils the functions of wedges, the effect of which is to secure increased

frictional contact with the interior surface of the carbon and to render the removal of the carbon from the coils, or vice versa, the removal of the coils from the carbon, more difficult than were a single coil employed. The ends 10, 11 are now bent over the end of the pencil or rod 5, and said bent ends are secured to the sides of said rod by a suitable band or collar 12, the bent exposed ends of the conductor forming contacts for engagement with the carbon holder of an arc lamp. It is preferred to secure the bent ends 10, 11 at opposite points on the exterior of the pencil or rod 5, as shown, thereby providing two exposed contacts. This is advantageous for the reason that should only one contact be used, and should that become broken, it is necessary to withdraw the conductor from the rod or pencil sufficiently to form a new contact, whereas if two contacts are employed, and should one be broken off, the remaining contact will perform its function without affecting the position of the conductor within the channeled rod.

Having thus fully described the invention, what I claim as new, and desire to secure by Letters Patent is:

1. An arc-lamp carbon embodying a rod composed of carbonaceous material and pro-

vided with a longitudinal passage, and a conductor positioned within said passage, said conductor consisting of a plurality of coils which are expanded within the passage and have forcible contact with the walls thereof, the convolutions of said coils interlacing and crossing each other and said convolutions diverging toward the area of contact with the carbonaceous material.

2. In an arc lamp carbon, a rod composed of carbonaceous material and provided with a longitudinal channel, a metal conductor positioned within said channel, said conductor comprising a wire of spring metal doubled upon itself and coiled to form a plurality of helices which are in substantially continuous contact with the carbon material of said rod, the ends of said coils being bent into engagement with the outer surface of said rod, and means for securing said bent ends of the coils in contact with the exterior surface of the rod.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY CAIRD.

Witnesses:

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J. F. MOTHERSHEAD.