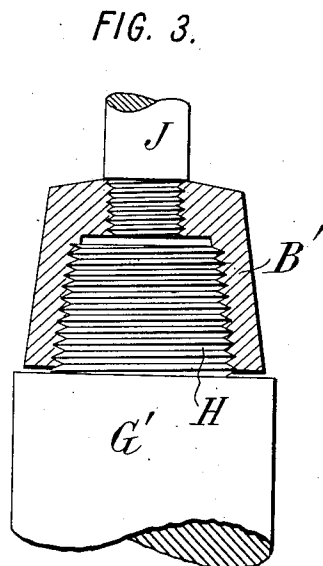
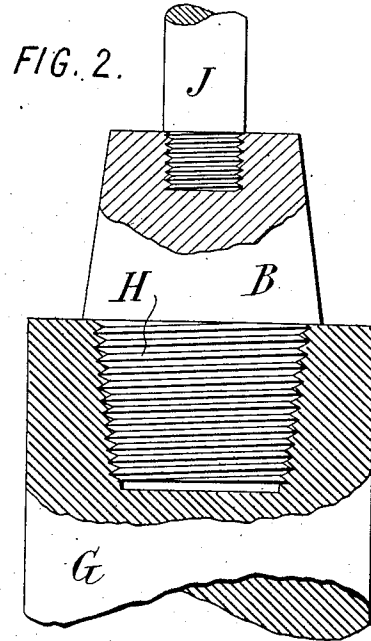
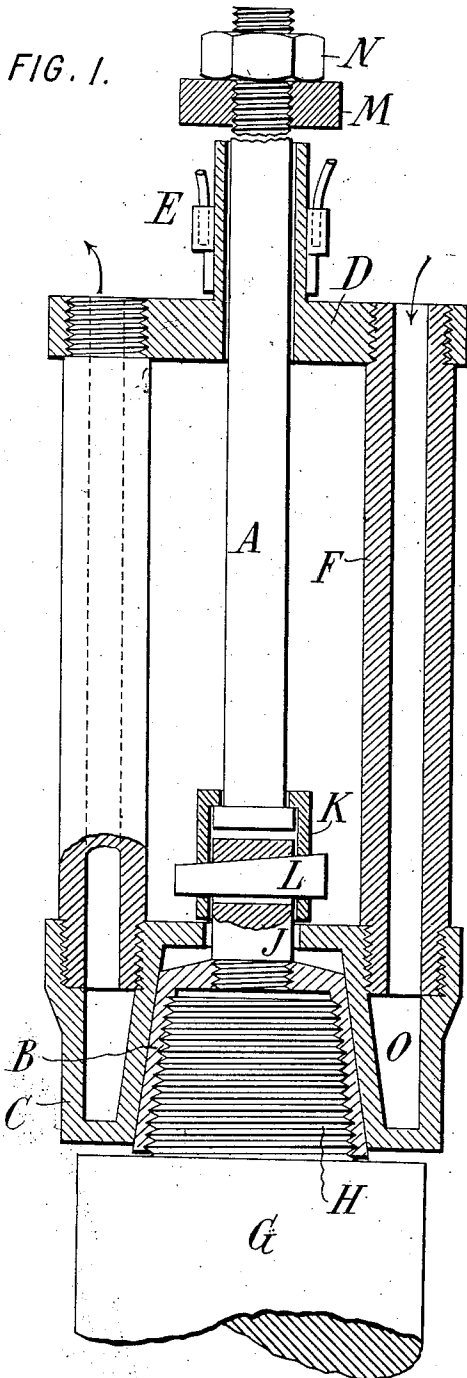


G. O. SEWARD,
CARBON HOLDER FOR ELECTRIC FURNACES.
APPLICATION FILED MAY 8, 1904.



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UNITED STATES PATENT OFFICE.

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CARBON-HOLDER FOR ELECTRIC FURNACES.

No. 824,153.

Specification of Letters Patent.

Patented June 26, 1906.

Application filed May 3, 1904. Serial No. 206,250.

To all whom it may concern:

Be it known that I, GEORGE O. SEWARD, a citizen of the United States, residing in Holcombs Rock, in the county of Bedford and State of Virginia, have invented certain new and useful Improvements in Carbon-Holders for Electric Furnaces, of which the following is a specification.

In electric-furnace practice it is common to suspend the electrodes from carbon-holders through which the connection of the electrode with the line is made, the cables carrying the current being connected directly with the carbon-holder. It is necessary generally to dress or finish the end of the electrode so as to obtain a good contact between it and the carbon-holder. The holder in these constructions carries the weight of the electrode, which weight in most cases tends to lessen the intimacy of contact between the two. This construction also introduces a certain amount of difficulty in the renewal of electrodes or in the changing from electrodes of one size to another. It also necessitates a renewal of the entire holder when any damage is done by arcing or otherwise.

The present invention provides a method of suspending the carbon and connecting it with the cables constituting the line-wire which eliminates or minimizes the disadvantages above referred to and which presents certain novel features of advantage.

An important feature of the invention is the use of a separate contact member, preferably in the form of a metallic tapered bushing screwed on the head of the electrode and electrically connected with the line-wire. Such a bushing facilitates the renewal of electrodes, it being only necessary to unscrew the old electrode therefrom and screw in a new one. Also by the use of a series of bushings with screw-threads of different diameters the holder may be readily adapted to electrodes of different sizes by a mere change of the bushing. Also the wear or accidental damage which results by arcing is taken by the easily-renewable and inexpensive bushing, and the remaining parts of the holder are not injured.

The line wire or cable is preferably connected to the bushing by means of an intermediate connecting device including, preferably, a ring surrounding the bushing and having a tapered

surface which is in engagement with the tapered surface of the bushing, so that the two make an intimate contact. Preferably the electrode supports the ring, whose weight and the weight of the cables insures the desired close contact. The electrode, for example, may be supported by a suspending-rod connected to the bushing or contact member mounted on the head of the electrode. The surrounding ring has preferably a passage for circulating water, and thus cooling it and by contact the bushing.

Various other points of improvement are referred to in detail hereinafter.

The accompanying drawings illustrate embodiments of the invention.

Figure 1 is a vertical section, partly in elevation, through a complete holder with a carbon therein. Figs. 2 and 3 are elevations, partly in section, of different contact members or bushings.

Referring to the embodiments illustrated, the entire carbon-holder comprises a suspending-rod, which is connected to the electrode by a contact member, and a connecting device for carrying the current to the electrode. The suspending-rod is indicated at A and is attached at its lower end to a contact member B. The connecting device comprises a ring C, surrounding the contact member B, a guide D, surrounding the suspending-rod A and having an upward projection to which is connected the line-cable E, and hollow members F, connecting the ring C with the guide D. The electrode G is supported within the contact member B.

The contact member B is in the form of a bushing or cap or head formed with tapered screw-threads corresponding with similar screw-threads formed on the top of the electrode. In Figs. 1 and 3 the member B is formed with internal screw-threads fitting upon an upwardly-projecting threaded portion H of the electrode. In Fig. 2 the member B is a solid metal head having a projecting screw-threaded portion H, which fits into the correspondingly-threaded electrode. The outside of the member B is turned with a taper to fit into a corresponding cavity in the surrounding ring, whereby it may be drawn or forced into close electrical contact with the latter.

The member B is designed to serve not

only as a bushing for making electrical contact, but as a suspending cap or head for connection to the supporting structure. The member B may be connected with the suspending-rod A by having an upwardly-projecting rod J screwed into the top of the member B and fitting within a ring K, carried on the lower end of the suspending-rod. A slot through the projecting rod J and corresponding slots through the ring K permit of their connection by means of a pin or wedge L. The suspending-rod A is supported on a fixed support M, preferably by means of an adjusting-nut N screwing onto the upper end of the rod. The member B is designed to facilitate the supporting of the carbon in the manner explained, whether used as an intermediate contact member or with any other method of connecting the carbon to the line.

The ring C, as stated, is formed with a tapered surface fitting the tapered surface of the contact member B and is preferably provided with a circumferential passage O, through which water is circulated to cool the ring and also the member B. A guide D surrounds the suspending-rod A somewhat above the top of the electrode and is provided with an upwardly-projecting sleeve, to which the cable E may be attached in any usual or suitable manner. The ring C and the guide D are connected by means of hollow rods or pipes F, which serve to convey water to and from the passage O in the ring C in the manner indicated by the arrows. The tubes F are of copper, so as to efficiently convey the current from the cables to the lower ring C. The connecting device, including the ring C and parts connected thereto, is supported upon the electrode G (through the intermediate bushing B forming, in effect, a part of the electrode) and by its weight and the weight of the cables presses down with considerable force, so as to maintain an intimate contact.

In order to facilitate changing the size of electrode used, a series of bushings B may be provided having a contact-surface of the same shape and having the screw-threads for connection with the electrodes of different diameters. Thus in Fig. 3 is shown a bushing B' the inclination of the face of which is the same as that of B in Fig. 1, while its internal screw-thread is smaller to accommodate a smaller electrode G'.

In order to remove an electrode, it is only necessary to knock out the pin L and lower the carbon and the surrounding ring until the guide D rests on the top of the ring K and then withdraw the carbon with its bushing. A new carbon or a new bushing may then be applied, the bushing forced into the ring C to make a good fit, and the whole lifted until the rod J enters the ring K and the pin L can be replaced.

Though I have described with great particularity of detail certain specific embodi-

ments of the invention, yet it is not to be understood thereby that the invention is limited to the specific embodiments disclosed. Various modifications thereof in detail and in the arrangement and combination of the parts may be made by those skilled in the art without departure from the invention.

What I claim is—

1. The combination with an electrode of a metallic bushing B and a surrounding member, said bushing screwed on the head of the electrode and electrically connected with the line-wire and having a tapered face for making a good electrical contact with such surrounding member.
2. The combination with an electrode, of a metallic tapered bushing B screwed on the head of the same, and a ring connected with the line-wire and having a tapered socket into which said bushing fits and makes close contact.
3. The bushing B adapted to be connected with a suspending-rod, having a screw-thread for connection with an electrode and having a tapered surface for making a good electrical contact with a surrounding member.
4. The combination with an electrode, of a bushing on the same, a support, and a ring independent of said support, connected with the line-wire and in electrical contact with said bushing.
5. The combination with an electrode, of a suspending-rod, a ring connected with the line-wire and surrounding said electrode, and a guide for said ring surrounding said rod.
6. The combination with a ring adapted for connection with an electrode, of a support for the electrode, a guide for the ring, and connecting members between the ring and the guide, the ring being adapted for connection with the line-wire independently of said support.
7. The combination with a ring having a passage for the circulation of water, said ring being adapted for electrical connection with the line-wire and with an electrode, of a guide D, and hollow connecting members F between the ring and guide and for communicating with said passage.
8. The combination of an electrode and a heavy connecting device supported by said electrode and adapted by the weight of said device to make an intimate contact therewith.
9. The combination of an electrode, a contact member thereon having a tapered surface, and a heavy connecting device supported by said contact member and adapted by the weight of said device to make an intimate contact therewith.
10. The combination with an electrode of a contact member fastened on the head thereof, an upwardly-projecting rod J on said member, a suspending-rod having a ring K, and a coupling-pin L passing through said rod J and ring K.

11. The combination with an electrode, of
a bushing thereon, a suspending-rod attached
to said bushing and supporting the same and
the electrode, and a connecting device sup-
ported by said bushing and electrically con-
5 nected thereto and to the line independently
of the suspending-rod.

12. The combination with an electrode, of
a bushing screwed on the head of the elec-
10 trode and having a tapered surface, a sus-
pending-rod attached to said bushing and

supporting the same and the electrode, and a
ring having a tapered surface by which it is
supported upon said bushing, and connected
thereto and to the line.

In witness whereof I have hereunto signed
my name in the presence of two subscribing
witnesses.

GEORGE O. SEWARD.

Witnesses:

GEO. T. LANCASTER,
F. VON KÜGELGEN.