

B. D. SAKLATWALLA AND A. N. ANDERSON.

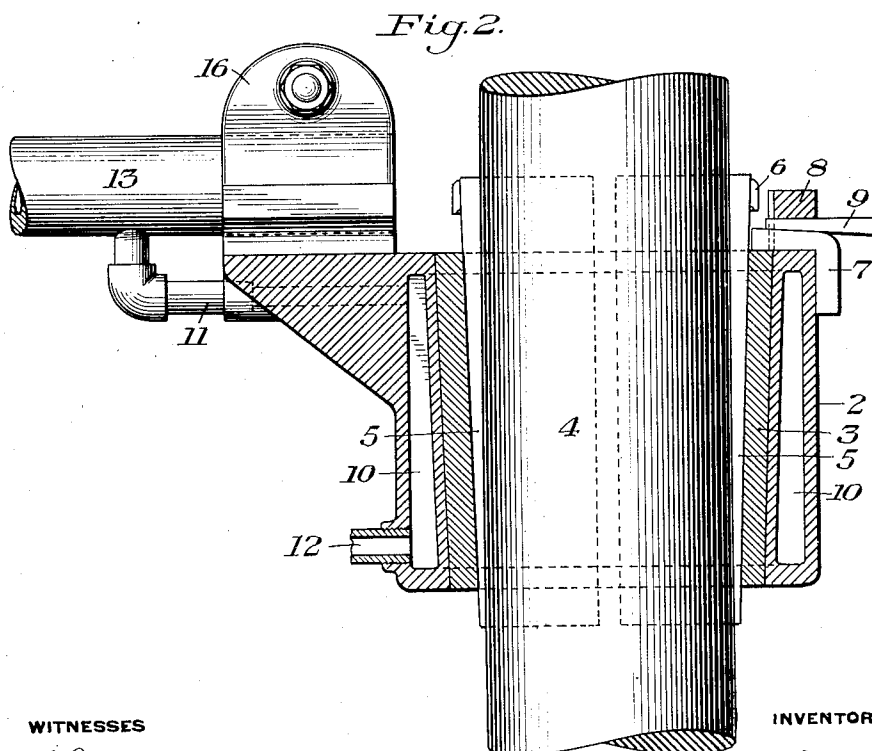
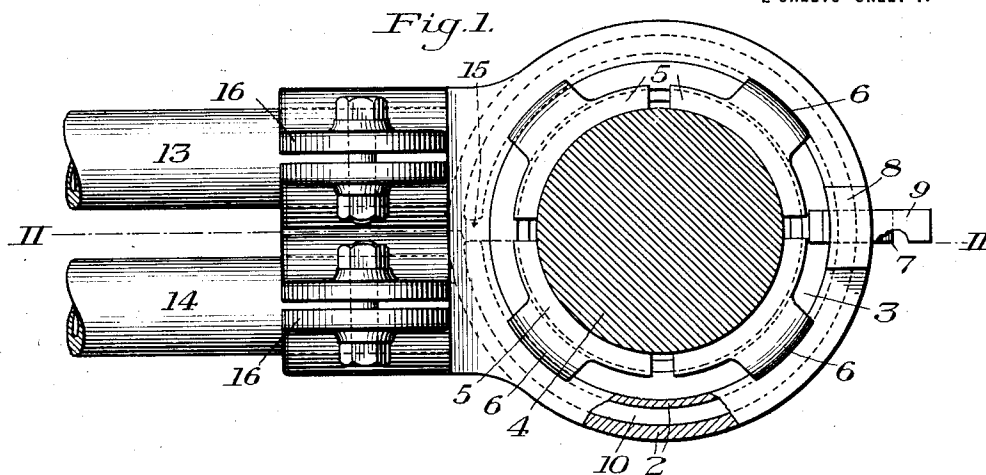
ELECTRODE HOLDER.

APPLICATION FILED APR. 24, 1919.

1,363,815.

Patented Dec. 28, 1920.

2 SHEETS—SHEET 1.



WITNESSES

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2 SHEETS—SHEET 2.

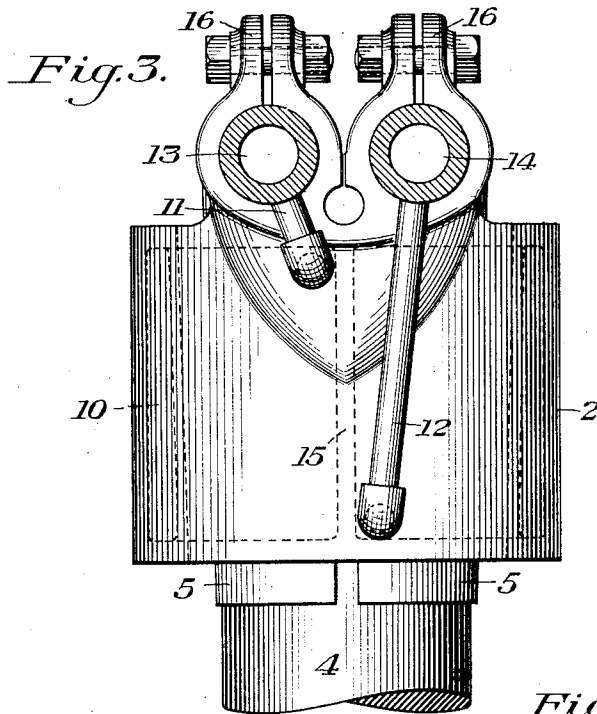


Fig. 4.

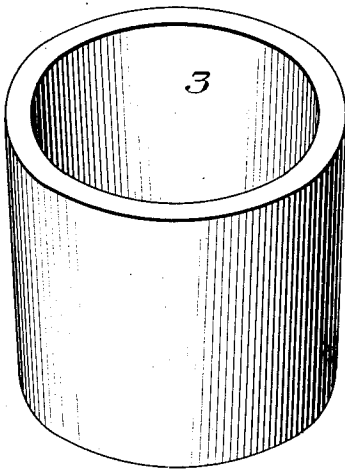
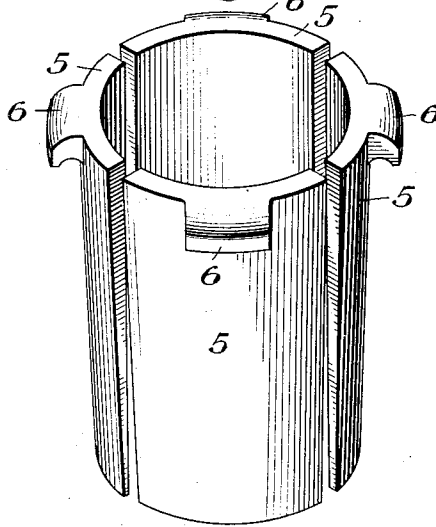


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

BYRAMJI D. SAKLATWALLA AND ARTHUR N. ANDERSON, OF CRAFTON, PENNSYLVANIA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO VANADIUM CORPORATION OF AMERICA, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

ELECTRODE-HOLDER.

1,363,815.

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To all whom it may concern:

Be it known that we, BYRAMJI D. SAKLATWALLA, a subject of the British Empire, residing at Crafton, in the county of Allegheny and State of Pennsylvania, and ARTHUR N. ANDERSON, a citizen of the United States, residing at Crafton, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electrode-Holders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

15 Figure 1 is a plan view of the electrode holder.

Fig. 2 is a vertical section through the holder along the line II—II of Fig. 1.

Fig. 3 is a side elevation of the holder.

20 Fig. 4 is a perspective view of the electrode holding ring, and

Fig. 5 is a perspective view of the tapered wedges.

The present invention relates to electrode-
25 holders and more particularly to electrode-
holders for holding the carbon-electrodes of
an electric furnace.

The object of the invention is to provide an electrode-holder which will securely hold the electrode under varying heat conditions and from which the electrode may be readily removed and replaced. With these objects in view, the present invention consists in the electrode-holder hereinafter described, and particularly pointed out in the claims.

Referring to the illustrated embodiment of the invention, the electrode holder comprises an outer metal casing 2, which has a tapered opening or bore therethrough. Seated in this tapered opening is a tapered metal ring or inner casing 3 which surrounds the electrode 4. Four tapered metal wedges 5 are arranged to be driven between the tapered interior of the ring 3 and the cylindrical outer surface of the electrode to secure the electrode and ring together. The wedges 5 are provided with lugs 6, by means of which the wedges may be loosened to remove the electrode from the ring 3. The ring is retained in place by a keeper 7 which fits in a hole in the lug 8 on the outer casing 2 and is maintained in place by a wedge 9. The ring 3 may be easily removed from the casing 2 by taking out the keeper 7 and

knocking the ring and electrode upwardly. 55
In order to provide for the quick replacement of the electrode, the ring 3 is secured by wedges to the new electrode which is to be inserted. The used electrode and its ring 3 are removed and the new electrode ring 60 dropped into place, which operation takes but a very short time.

The casing 2 is maintained cool by a water circulation through a water chamber 10 formed in it. This water chamber 10 is supplied with water by pipes 11 and 12 which extend from the top and bottom of the chamber 10 to the hollow electrical conductors 13 and 14 which lead the current to the electrode. The conductors 13 and 14 are clamped in split sockets 16. The lifting connections may be secured to clamping bolts of these sockets. As shown by the dotted lines in Figs. 1 and 3, the water chamber 10 is divided by a partition 15 between the openings into it of the pipes 11 and 12, which insures the circulation of the water completely around the water chamber. Water for maintaining the cooling circulation enters through the hollow conductor 14, passes down through the pipe 12 to the bottom of the water chamber 10, and around the water chamber and out the pipe 11 at its top and away through the hollow conductor 13.

The carbon electrode has a smaller coefficient of heat expansion than the metal from which electrode-holders are constructed. The result has been that with the usual construction of electrode holders, when the electrode and holder have become heated, the electrode-holder and its clamping means expands away and is loosened from the electrode. In the present holder, the expansion of the metal is utilized to more securely clamp the electrode when it becomes heated. When the electrode becomes heated, the wedges 5 and inner casing or ring 4 are heated from the electrode, and therefore have a considerably greater expansion than the water-cooled outer casing 2, so that they serve to clamp the electrode tighter as their temperature increases. Moreover, the holder construction herein shown, tends to remedy a loose contact of the parts. If, for example, there should be a loose contact between the electrode 4 and the wedges 5, the heat developed by the loose contact would

heat the wedges and cause them to expand against the outer substantially non-expandible water cooled casing, and clamp the electrode tighter.

- 5 As will be seen from the above description, the electrodes may be changed very quickly by dropping in a new electrode to which a ring 3 has been previously secured. This ring and its wedges are cold when the
10 new electrode is dropped into place so that when the parts become heated in use, the electrode is clamped even more firmly than when first inserted.

While the present invention has been illustrated particularly as applied to a holder for an electric furnace carbon electrode, it is to be understood that the invention is not limited to its illustrated embodiment but may be embodied in other electrode holder
20 structures within the scope of the following claims.

We claim:

1. An electrode holder, comprising an outer casing having a tapered opening there-
25 through, a tapered ring removably seated in the tapered opening and wedges adapted to be driven between the tapered ring and the electrode, substantially as described.

2. An electrode holder, comprising an
30 outer casing having a tapered opening therein, a tapered ring adapted to be secured to the electrode and removably seated in said opening so as to permit the used electrode with its ring to be removed and replaced by
35 a new electrode to which a ring has been previously secured, substantially as described.

3. An electrode holder, comprising a cooled outer casing having an opening there-

through, an inner casing removably seated
40 in said opening and adapted to be secured to the electrode, substantially as described.

4. An electrode holder, comprising an outer casing having an opening therethrough
45 and a water chamber in the casing surrounding said opening, and heat expansible means for securing the electrode in said opening, substantially as described.

5. An electrode holder, comprising an outer casing having a tapered opening there-
50 in, and a tapered ring adapted to surround the electrode and removably seated in said opening, substantially as described.

6. An electrode holder, comprising an outer casing having an opening there-
55 through, a ring adapted to surround the electrode and be removably seated in said opening, and means for securing the electrode in the ring, substantially as described.

7. An electrode holder, comprising an
60 outer casing surrounding the electrode and having a water chamber therein, and hollow water conducting current conductors connected with the water chamber so as to maintain a cooling water circulation there-
65 through, substantially as described.

8. An electrode holder, comprising an outer casing having a tapered opening there-
70 in, and a water chamber around said opening, means for maintaining a cooling circulation of water through the chamber, and a tapered electrode holding ring fitting in the tapered opening of the outer casing, substantially as described.

In testimony whereof we have hereunto
75 set our hands.

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