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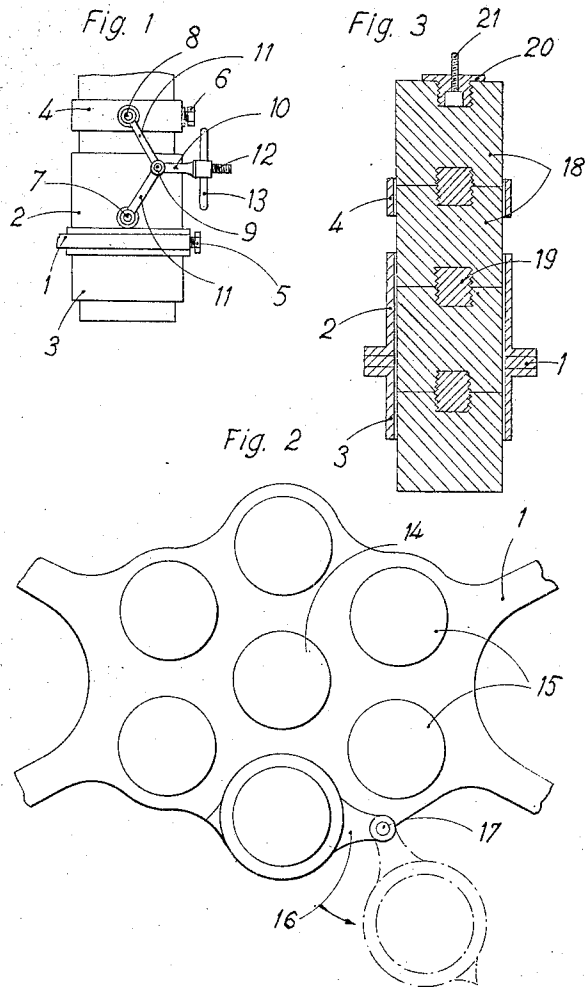
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DEVICE FOR MOUNTING AND OPERATING ELECTRODES

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2 Sheets-Sheet 1



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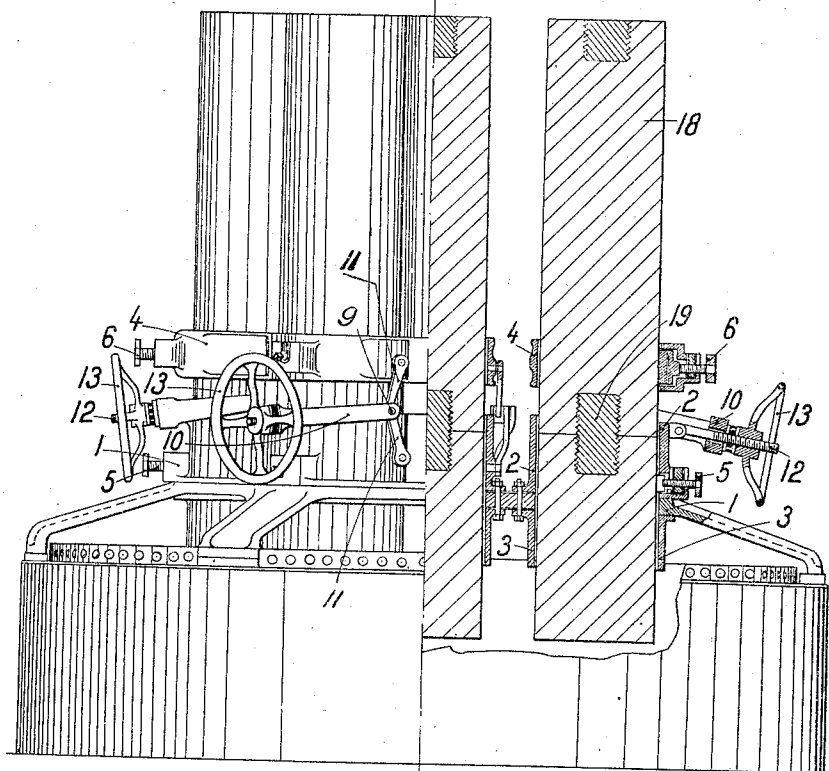
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2 Sheets-Sheet 2

Fig. 4



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DEVICE FOR MOUNTING AND OPERATING ELECTRODES

Application filed November 4, 1929, Serial No. 404,816, and in France August 27, 1929.

The present invention relates to improvements in devices for mounting and operating the electrodes of an electric furnace or an electrolytic tank, preferably of the type comprising multiple electrodes. The said improvements are chiefly applicable to aluminum furnaces, and they provide for the ready replacing of the worn parts of the electrodes, also facilitating the access to the centre of the bath by the removal of an electrode.

The following description with reference to the accompanying drawings which is given by way of example, relates to a suitable embodiment of the invention.

Fig. 1 is a view of the apparatus in which the electrode is secured to a fixed member or to a movable member, also showing the means for displacing the latter.

Fig. 2 shows disposition of the central electrode and the outer electrodes upon a fixed support, as well as the displacement of an electrode so as to give access to the centre of the bath.

Fig. 3 is a longitudinal section of an electrode and its support.

Fig. 4 is an elevation partly in vertical section showing the apparatus in accordance with this invention as applied to a furnace.

The said device can be used with any of the current types of electric furnaces or tanks. The cathode usually consists of suitable pieces forming the bottom of the chamber of the furnace or the bottom of the tank holding the bath, and the current is supplied to said cathode by suitable means.

The upper electrode consists of a certain number of anodes, and these are provided with the said device according to the invention.

With reference to Figure 1, the electrodes are mounted in a fixed support consisting of the plate 1 which is optionally secured to the tank, as may be required, and the said plate is apertured for the insertion of each electrode; corresponding to each aperture, the said plate carries an upper ring 2 and a lower ring 3 serving to guide the electrode and also to protect it against the oxidizing action of the air. The electrode also passes through a

movable collar 4 which may be displaced with reference to the fixed support 1.

The electrode is secured to the fixed support and to the movable collar by suitable means such as the set screws 5 and 6 shown in the figure.

The movable collar can be connected to the fixed support by any suitable means, and Figure 1 shows a very simple device for this purpose, and wherein the collar 4, and one of the rings such as 2 each carry two diametrically disposed journals or axles 7 and 8, the axles 7 serving for the ring 2 and the axles 8 for the collar 4. At each side of the electrode, an axle 7 and an axle 8 are connected to an axle 9 disposed at the respective end of a strap 10, by means of the links 11, in such manner that the said links will constitute a deformable triangle at each side of the electrode.

The central part of the strap 10 is apertured for the insertion of a threaded rod 12 secured to the ring 2, and upon this rod is screwed a hand wheel 13 mounted loose on the strap 10, and thus each end of the said strap is situated at the apex of the respective triangle, and this latter can be expanded or contracted according as the strap is moved towards or from the electrode. Said strap might be displaced by mechanical means, optionally controlled according to the amount of current in the electrode.

The operation of the electrode is as follows: The electrode is inserted through the collar 4 and the rings 2 and 3, and is lowered near the surface of the bath, being then secured to the fixed support by means of the screw 5. The movable collar 4 is then raised to the maximum by screwing the hand wheel 13 upon the rod 12; the screw 6 of the movable collar 4 is then screwed down in order to secure the electrode in this collar, then releasing the screw 5 so as to disengage the electrode from the fixed support. The hand wheel is then turned and thus screwed back, thus closing up the triangle formed by the links 12, and the electrode is thus brought nearer the bath. The amount of current carried by the electrodes is thus regulated by

the use of the hand wheel, and the electrode can also be lowered as it becomes worn.

When the triangle has been closed to the maximum, the screw 5 is tightened and the screw 6 released, thus securing the electrode to the fixed support and releasing it from the movable collar, then the said collar is raised, and the aforesaid operation is again commenced. When the electrode becomes too short, another unit piece is added, as above mentioned.

Fig. 2 shows a preferred arrangement of multiple electrodes, comprising a central electrode 14 and a plurality of electrodes 15 disposed in a circular row around the central electrode. A portion 16 of the fixed support carrying one of the electrodes 15 is pivotally mounted on an axle 17, and the electrode can thus be rotated, after it has been raised out of the bath, to facilitate the removal of the metal at the centre of the furnace. The position of the part 16, after this rotation, is shown in dotted lines.

As shown in Figure 3, the anode consists of a plurality of interchangeable sections 18, which are connected together by cores 19 screwing into the adjacent sections. The current is supplied to the anodes by rigid conductors which are brought as far as the said fixed support on the tank, and the current is then carried by flexible conductors leading to the anodes. The contact at the top of each anode is made by a bronze socket 20 having the same diameter and screwthread as the cores 19; the said socket carrying a threaded rod 21 upon which the flexible conductor (not shown) may be mounted. Any other suitable means for supplying the current can be employed.

As the anodes become worn, a new section is added at the top of the superposed sections shown in Figure 3, and for this purpose the flexible conductor is removed and the socket 20 unscrewed, then screwing in its place the new section already provided with its core; the socket is now screwed into the top of this section, finally mounting the flexible conductor as before.

Obviously, the constructional form represented in the drawings is not of a limitative nature, and it is susceptible of all desired modifications without departing from the spirit of the invention.

We claim:

Apparatus for mounting electrodes comprising an apertured horizontal main plate, a side section plate having an aperture there-through and pivoted to said main plate so as to swing laterally thereof, a plurality of vertical tubular members extending from said main plate and side section plate arranged concentric with said apertures for receiving the electrodes, and independent means associated with each electrode and its mounting for supporting and adjustably raising and

lowering each electrode, said pivotally mounted side plate adapted for swinging movement laterally of said main plate when its electrode is raised by its supporting and raising and lowering means to an elevated position.

In testimony whereof we have signed this specification.

ALFRED FRANCHINI.

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