July 9, 1929. E. WIRZ 1,719,863

FURNACE ELECTRODE CARRIER

Filed Dec. 27, 1926

Fig. 1

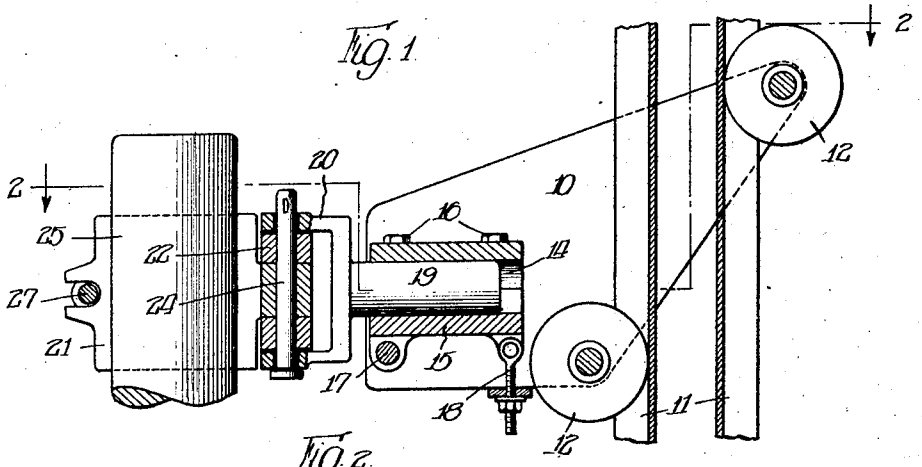


Fig. 2

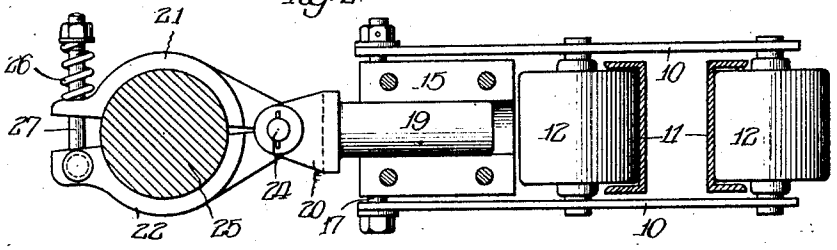


Fig. 3

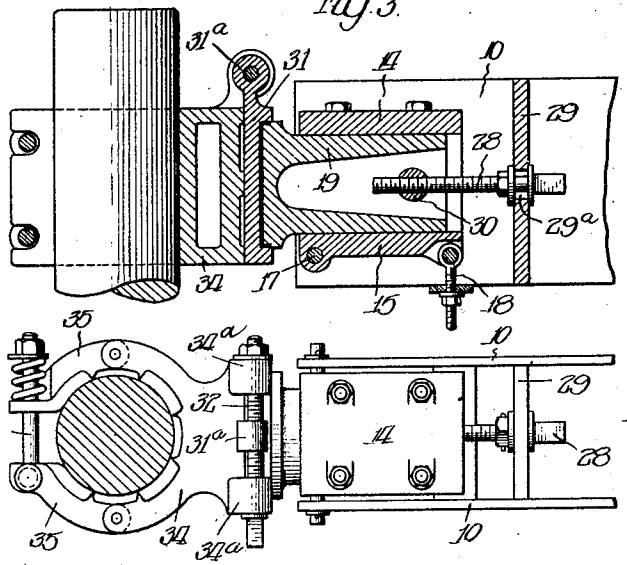


Fig. 4

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UNITED STATES PATENT OFFICE.

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FURNACE ELECTRODE CARRIER.

Application filed December 27, 1926, Serial No. 157,260, and in Germany January 7, 1926.

This invention relates to electric furnaces, and pertains particularly to improvements in the construction of electrode carriers.

In the erecting of electric melting furnaces, difficulty is usually experienced in adjusting the electrodes so that they will feed accurately and without jamming in the seals or cooling rings or cover of the furnace. This is due to the fact that it is almost impossible, in practice, to obtain absolute accuracy in the brick work of the furnace and in the positioning of the carriage guides and the carriage handling mechanism with respect to the furnace.

The general object of the present invention is the provision of an improved construction for the electrode carrier which will afford a suitable adjustability of the electrode with respect to the carriage and the furnace, so that the electrode may be properly positioned and fed.

Another object is the provision of an improved adjusting gear which may be used with different types of carriages and electrode holders, so that the carriage does not have to be designed particularly with reference to the electrode holder or the furnace.

Other and further objects of the invention will be pointed out or indicated hereinafter, or will appear to one skilled in the art upon an understanding of the invention or its employment in practice.

In the accompanying drawing forming a part of this specification, I show two structural arrangements in which the invention may be embodied, but these are submitted for purpose of illustration only, and are not to be given any interpretation having the effect of limiting the claims short of the true and most comprehensive scope of the invention in the art.

In the drawing,

Fig. 1 is a sectional elevation of a portion of the electrode handling gear taken on the longitudinal axis of the same;

Fig. 2 is a cross section on substantially line 2—2 of Fig. 1;

Fig. 3 is a sectional elevation similar to Fig. 1 but of a modified form of construction; and

Fig. 4 is a top view of same.

In the construction illustrated in Figs. 1 and 2, the reference numeral 10 designates a portion of the electrode carrier frame, which frame is supported for vertical travel on the guides 11 by the rollers 12. Adjustably mounted on the carriage frame is a split sleeve comprising an upper member 14 which is connected to a lower member 15 by means of bolts 16. The lower member 15 has pivotal mounting on a pivot 17 so that it may be rocked in a vertical direction, its adjustment being determined by a stay bolt 18. In the split sleeve member is clamped a cylindrical shank 19 of a fork member 20, which may be rotated on a horizontal axis when the bolts 16 are backed off, and clamped in the desired adjustment by the setting up of the bolts 16. The jaws 21 and 22 of the electrode holder have a hinge mounting on a spindle 24 in the fork member 20, and clasp the electrode 25 under the pressure of a spring 26 carried on a swing bolt 27. The jaws and the electrode are movable horizontally as a unit by swinging movement on the spindle 24. By virtue of this construction, the electrode is universally adjustable with respect to the furnace. It has rectilinear vertical movement by virtue of the vertical adjustability of the carriage on the guides 11; it has rectilinear horizontal adjustability toward and from said guides by virtue of the longitudinal adjustability of the shank 19 in the split sleeve member; it has arcuate adjustability in vertical planes by virtue of the rotary adjustment of the shank 19 in the split sleeve member and the adjustability of the split sleeve member about the spindle 17, and it has arcuate horizontal adjustability about the spindle 24. Accordingly, the position of the electrode may be adjusted so that it will feed vertically and accurately, irrespective of inaccuracies in the relative positioning of the furnace and the carriage guides.

In the embodiment illustrated in Figs. 3 and 4, the carriage frame portions 10 support the split sleeve member 14—15 which is pivoted on the pivot 17, is adjustably controlled by a stay bolt 18, and the shank portion 19 is adjustable both longitudinally and rotatably in the split sleeve member. The horizontal adjustment of the shank portion 19 is accomplished by a screw 28 which is angularly adjustable in a slot 29^a in a cross member 29 and has thread engagement in a nut 30 that is adjustable about a horizontal axis in the shank 19. At the outer end of the shank 19 is a head piece 31 fixed to and insulated from the shank and carrying a tapped extension 31^a in which is threaded an adjusting

screw 32. This screw 32 has a journal mounting in lugs 34[a] of the carrier head 34 which has a sliding bearing against the outer face of the member 31. Thus, rotation of screw 32 will accomplish rectilinear adjustment of the carrier head 34 transversely of the member 31. The clamping jaws 35 have a hinge mounting on the carrier head 34 and are retained by swinging bolt 36 in clasping engagement with the electrode. By virtue of this construction, therefore, the electrode is given horizontal adjustment by virtue of the longitudinal adjustability of the shank 19 and the transverse adjustability of the carrier head 34, vertical adjustment by virtue of the vertical mobility of the frame 10 on the carriage guides 11, as in the first example and arcuate adjustment by virtue of the rotary adjustability of shank 19 and pivotal adjustability of the split sleeve about the pivot 17.

For convenience of designation, the electrode retaining elements may be referred to collectively as the electrode holder, the split sleeve, whereby the device is mounted on the carriage, as a mounting, and the adjustable member whereby the holder is attached to the mounting, as an intermediate member.

For purpose of simplification, the connections and devices for supplying current and cooling fluid to the carrier are omitted from the illustration. It will be understood also that suitable arrangement of insulation is provided for isolating the holder from the carriage.

What I claim is:

1. In electric furnace apparatus, an electrode holder, a supporting carriage, a mounting universally adjustable on the carriage, and an intermediate member having adjustable connection with both the holder and mounting and providing a supporting connection therebetween.

2. In electric furnace apparatus, an electrode holder, a supporting carriage, a mounting having adjustable connection with the carriage, an intermediate member having adjustable connection with both the mounting and the holder, said intermediate member having angular and rectilinear adjustability on the mounting, and means for securing the mounting and intermediate member against relative movemet.

3. In electric furnace apparatus, the combination with a vertically movable carriage, of an intermediate member having angular and rectilinear adjustment on the carriage, and an electrode holder having transverse adjustability on the intermediate member.

4. In electric furnace apparatus, the combination with a vertically movable carriage, of a mounting having pivotal connection with the carriage, an intermediate member supported on the mounting and having pivotal and rectilinear adjustment thereon, an electrode holder having adjustable mounting on the intermediate member, and means for securing the mounting and the intermediate member in fixed positions with respect to the carriage.

In testimony whereof I have hereunto subscribed my name at Zurich, Switzerland, this 9th day of Dec., 1926.

ERNST WIRZ.