C. W. HARPER.

ELECTRODE ADJUSTING MEANS.

APPLICATION FILED APR. 29, 1920.

1,366,073. Patented Jan. 18, 1921.

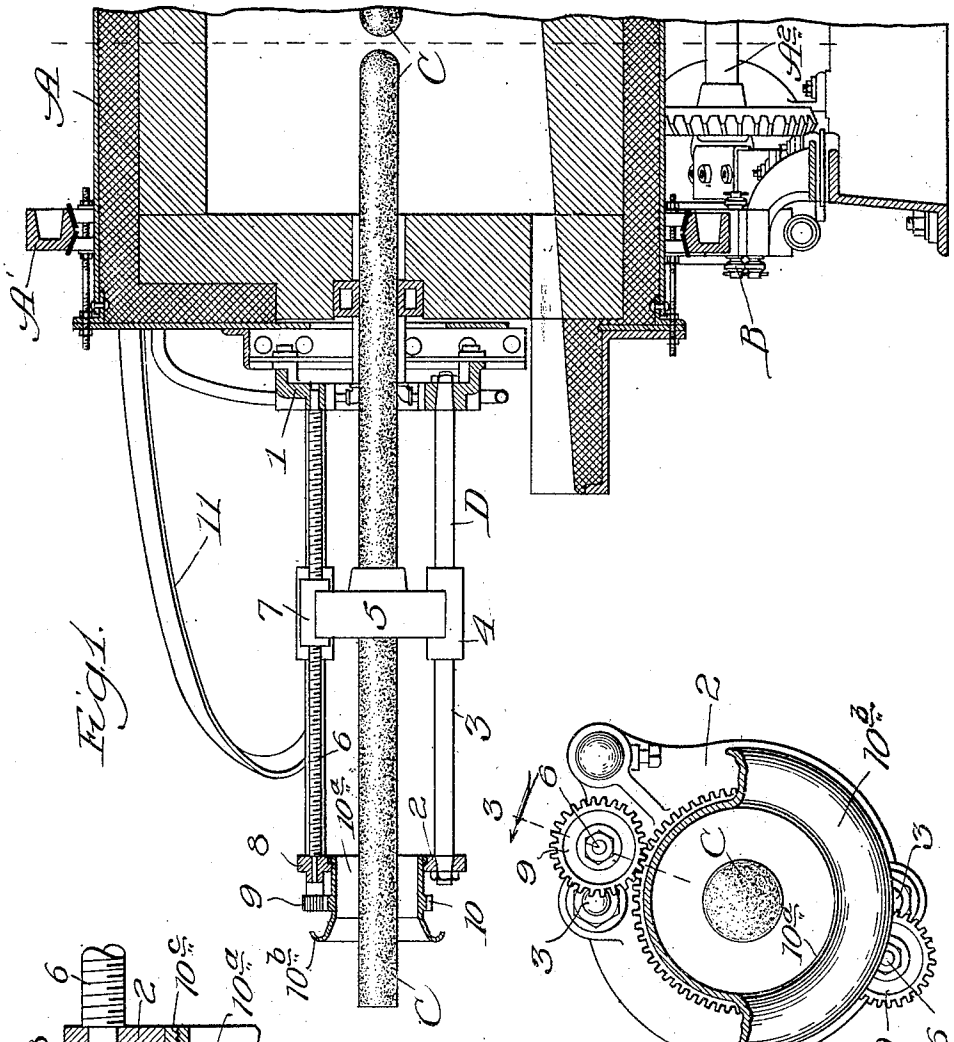


Fig. 1.

Fig. 2.

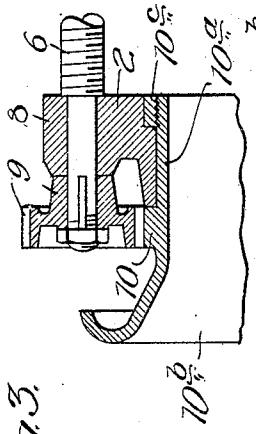


Fig. 3.

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ELECTRODE-ADJUSTING MEANS.

1,366,073. Specification of Letters Patent. Patented Jan. 18, 1921.

Application filed April 29, 1920. Serial No. 377,528.

To all whom it may concern:

Be it known that I, CHARLES W. HARPER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Electrode-Adjusting Means, of which the following is a specification.

This invention relates particularly to means for adjusting electrodes in electric furnaces; and the primary object is to provide simplified and improved means of this character.

The invention is illustrated, in its preferred embodiment, in the accompanying drawings, in which—

Figure 1 represents a broken vertical sectional view of an electrical furnace equipped with electrode-adjusting mechanism embodying the invention; Fig. 2, a broken end elevational view of the electrode-adjusting mechanism; and Fig. 3, a broken longitudinal sectional view, on an enlarged scale, taken as indicated at line 3 of Fig. 2.

In the illustration given, A represents a furnace-body of the rotary or oscillating type. Such furnaces are usually supported on rollers. In the illustration given the furnace-body is equipped with an insulated annular track A′ mounted on rollers (not shown) and rotated or oscillated by means of gear mechanism A^2. It will be understood that an annular track A′ is provided near each end of the furnace-body; and these annular tracks serve as annular contact members, which are engaged by brushes B (one shown).

C, C, represent the electrodes, which in the illustration given, are axially disposed and extend through the end walls of the furnace. At the ends of the furnace are provided electrode-supporting frames and electrode-adjusting mechanism. The construction at one end of the furnace is illustrated, but this may be substantially duplicated at the opposite end. D represents an electrode-supporting frame, which comprises an inner plate 1 secured to the end wall of the furnace, an outer end plate 2, and guide-rods 3 connecting said plates. Upon the guide-rods 3 is mounted a slide or carriage 4, which may be of any suitable construction. and which carries the electrode-clamping means 5, which may be of any suitable construction. The carriage, or slide, 4, is actuated by means of screw rods 6 which are journaled in the plates 1 and 2 in such manner as to be longitudinally immovable. The intermediate portions of the screw rods pass through internally-threaded bearings 7, so that the carriage will be adjusted toward or away from the end of the furnace when the screw rods are actuated. The outer ends of the screw rods extend through and are journaled in bearings 8, with which the outer end plate 2 is provided. The projecting ends of the screw rods are equipped with pinions 9, fixedly secured to the screw rods. The pinions 9 are actuated by an annular gear 10 which is formed integrally with the tubular shank 10^a on an annular hand-wheel 10^b. The body of the gear 10 forms a flange which bears against the outer face of the plate 2, and the tubular shank of the hand-wheel is confined against removal from its bearing in the plate 2 by means of a collar 10^c, which is threaded on the inner end of the tubular shank.

The electrode clamp 5 is connected by a flexible conductor 11 with the annular contact member A′. The annular contact members will be charged through a suitable local electric circuit, and the circuit will be completed through the flexible conductors 11 (one shown), the electrode clamps and the electrodes, the furnace operating by means of an arc between the inner ends of the electrodes.

It will be understood that the carriage 4 may be moved toward and away from the furnace by turning the hand-wheel 10^b in the bearing provided therefor in the outer end-plate 2. Rotation of the hand-wheel causes the gear 10 to actuate the pinions 9 and turn the screws 6, thus actuating the carriage in one direction or the other, depending upon the direction in which the hand-wheel is turned.

The construction provides for the well balanced operation of the screw-rods, and through the medium thereof, of the electrode-clamping means. Moreover, the construction affords a free passage through the hand-wheel for accommodating the electrode.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitation should

be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

1. In means of the character set forth, the combination of an electrode-supporting frame, a carriage mounted thereon and equipped with electrode-clamping means, screw-rods journaled in said frame and having threaded connection with said carriage, pinions on the outer ends of said screw-rods, and a hand-wheel journaled in said frame and equipped with a gear engaging said pinions.

2. In means of the character set forth, the combination of an electrode-supporting frame comprising guide-rods and an outer end plate, a carriage mounted on said guide-rods, screw-rods journaled in said frame and having threaded engagement with said carriage, a hand-wheel having a tubular shank journaled in the outer end plate and equipped with a gear, and pinions secured on said screw-rods and engaging said gear.

3. In means of the character set forth, the combination of an electrode-supporting frame comprising an inner end plate and an outer end plate, guide-rods connecting said plates, a carriage mounted on said guide-rods and equipped with electrode-clamping means, screw-rods journaled in said plates and having threaded engagement with said carriage, a hand-wheel having a tubular shank journaled in the outer end plate and equipped exteriorly with a gear, and pinions mounted on the outer ends of said screw-rods and engaging said gear.

4. The combination with a furnace-body adapted to turn about an axis, an electrode-frame projecting from one end of said body, an electrode-carriage mounted on said frame and equipped with a clamp, an electrode mounted in said clamp, and an adjusting-screw for said carriage, of an annular hand-wheel for actuating said adjusting-screw having its axis co-axial with the furnace-body and through which said electrode extends.

5. The combination of an electrode-frame, an electrode-clamp slidably mounted thereon, an electrode carried by said clamp, an adjusting-screw adapted to adjust said clamp, and an annular hand-wheel through which the electrode extends and which serves to actuate said adjusting-screw.

CHARLES W. HARPER.