

J. H. REID.

ELECTRIC INDUCTION FURNACE.

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1,021,478.

Patented Mar. 26, 1912.

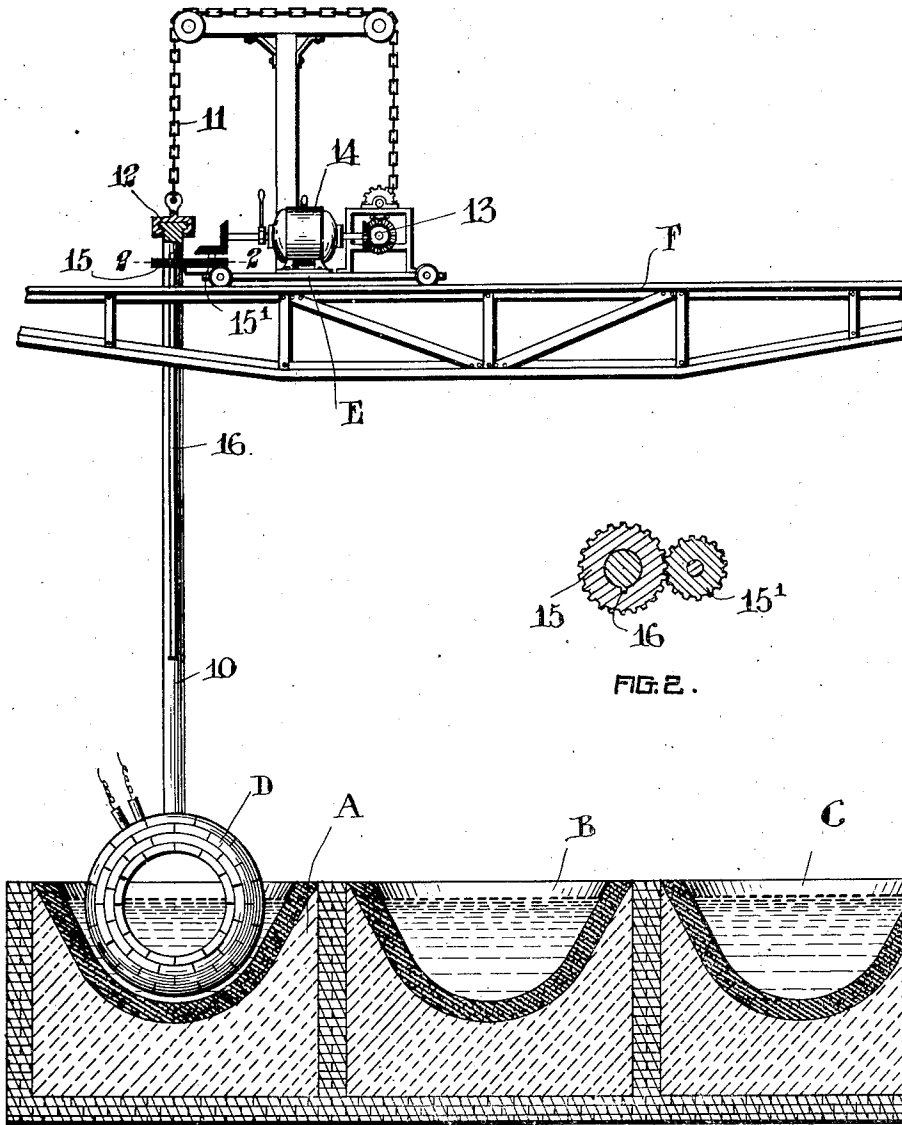


FIG. 1.

FIG. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES HENRY REID, OF NEWARK, NEW JERSEY, ASSIGNOR TO GEORGE GOODWIN, OF OTTAWA, CANADA.

ELECTRIC INDUCTION-FURNACE.

1,021,478.

Specification of Letters Patent. Patented Mar. 26, 1912.

Application filed March 19, 1910, Serial No. 550,495. Renewed April 28, 1911. Serial No. 623,963.

To all whom it may concern:

Be it known that I, JAMES HENRY REID, of the city of Newark, in the State of New Jersey, United States of America, have invented certain new and useful Improvements in Electric Induction-Furnaces, of which the following is a specification.

My invention relates to improvements in electric induction furnaces of the type in which the heat is obtained through the medium of electric heating coils, and the objects of my invention are to secure a more uniform distribution of the heat of the heating coil and to insure that all parts of the charge are treated thereby.

Further objects are to enable a number of hearths or furnaces to be heated by a single heating coil moved successively to them.

In its construction, the invention includes a heating coil; means for rotating the same and a traveler for moving the heating coil from one furnace to another, all as hereinafter more fully set forth and described in detail in the accompanying specifications and drawings.

In the drawings: Figure 1 is an elevation partially in section showing a plurality of hearths and my improved heating coil in coöperative relation thereto. Fig. 2 is a sectional detail on the line 2-2, Fig. 1.

In the drawings like characters of reference indicate corresponding parts in each figure.

Referring to the drawings, A, B and C represent a plurality of hearths of any usual form, adapted to contain charges of material to be treated, such for example as charges of molten iron to be refined to steel by the action of the electric current.

D represents a heating coil of any suitable type or character by means of which heat may be produced within any of the hearths and the charges therein treated. For example the heating coil might be constructed as set forth in my earlier United States application 475,908, filed Feb. 3/09.

Following the present invention each hearth is hemispherical in shape and the heating coil is annular whereby the hearth will fit closely to the edges of the coil. Means are provided for continuously rotating the heating coil in the hearth, whereby, the charge is caused to flow through the center thereof and thus to be uniformly treated

by the electric current, a continual motion being thus imparted to the charge, and this in the case of iron, effecting a puddling as well as a heating operation. Means are also provided to raise and lower the heating coil into the charge, which means may be automatically controlled as set forth in my said earlier application #475,908.

In the embodiment illustrated, the heating coil is supported from a shaft 10 having a chain 11 connected to the top thereof by a swivel connection 12, said chain being controlled by a winch 13 operated by a motor 14, which motor may if desired be controlled by a pyrometer, as set forth in my earlier application #475,908. In order to continuously rotate the heating coil about a transverse axis, a gear 15 is mounted on the shaft, which latter is provided with a feather 16 enabling the gear to slide on the shaft while the same is being raised and lowered, the gear 15 meshing with a pinion 15' which is connected to a suitable source of power and driven continuously.

In order to enable the same heating coil to heat the charge in the different hearths, the shaft 10, winch 13 and motor 14 are all mounted on a traveler E mounted on a suitable track F, extending over the hearths: the construction of the traveler, motor and winch being all well known in the art and not forming part of the present invention. In this way, while the charge in one hearth is cooling, the charge on the other hearth may be treated by the heating coil, thereby, enabling a furnace of a very large capacity to be produced at a minimum cost. It is of course, to be understood that each hearth may be provided with suitable trap holes which do not appear on the views shown in the present invention.

As many changes could be made in the above construction, and many apparently widely different embodiments of my invention within the scope of the claims could be made without departing from the spirit or scope thereof, it is intended that all matter contained in the accompanying specifications and drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim as my invention is:

1. In an electric furnace, a heating coil having a magnetic circuit and means for continuously rotating the same.

2. In an electric furnace, a heating coil having a magnetic circuit and means for rotating the same about a transverse axis.

3. In an electric furnace, a heating coil
5 having a magnetic circuit and means for rotating the coil in such a way as to stir the charge in the furnace.

4. In an electric furnace a hearth, a heating coil adapted to be raised and lowered
10 into the charge thereon, said heating coil being adapted to fit closely to the surface of the hearth.

5. In an electric furnace a hearth and induction heating coil therein having a magnetic circuit, said heating coil being adapted
15 to fit closely to the hearth and being independent of the charge thereon.

6. In an electric furnace a hearth, and induction heating coil having a magnetic circuit and extending into the hearth from the
20 upper side and adapted to conform closely to the surface thereof.

7. In an electric furnace, a hearth having a semi-spherical surface and an annular
25 heating coil extending close to said surface.

8. In an electric furnace, a hearth having a semi-spherical surface, an annular heating coil extending close to said surface and means for continuously rotating the heating
30 coil about a vertical axis.

9. The combination with a plurality of hearths of a traveler mounted over the hearths and a heating coil carried by the traveler adapted to be raised and lowered
into each of the hearths. 35

10. The combination with a plurality of hearths of a traveler mounted over the hearths, a heating coil carried by the traveler adapted to be raised and lowered into each of the hearths, and means for continuously rotating the coil. 40

11. In an electric furnace a hearth, a coil adapted to fit into the hearth, a shaft connected to the coil, means for rotating the shaft and means for raising and lowering
45 the shaft.

12. The combination with a plurality of hearths of a traveler mounted over the same, a shaft carried by the traveler, means on the traveler for raising and lowering the
50 shaft, means on the traveler for rotating the shaft and a heating coil at the lower end of the shaft adapted to extend into all the charges on the hearths.

In witness whereof I have hereunto set
my hand in the presence of two witnesses. 55

JAMES HENRY REID.

Witnesses:

RUSSEL S. SMART,
PEARLE GARROW.