F. LOUVRIER.

ELECTRIC FURNACE.

APPLICATION FILED SEPT. 22, 1910.

1,013,189.

Patented Jan. 2, 1912.

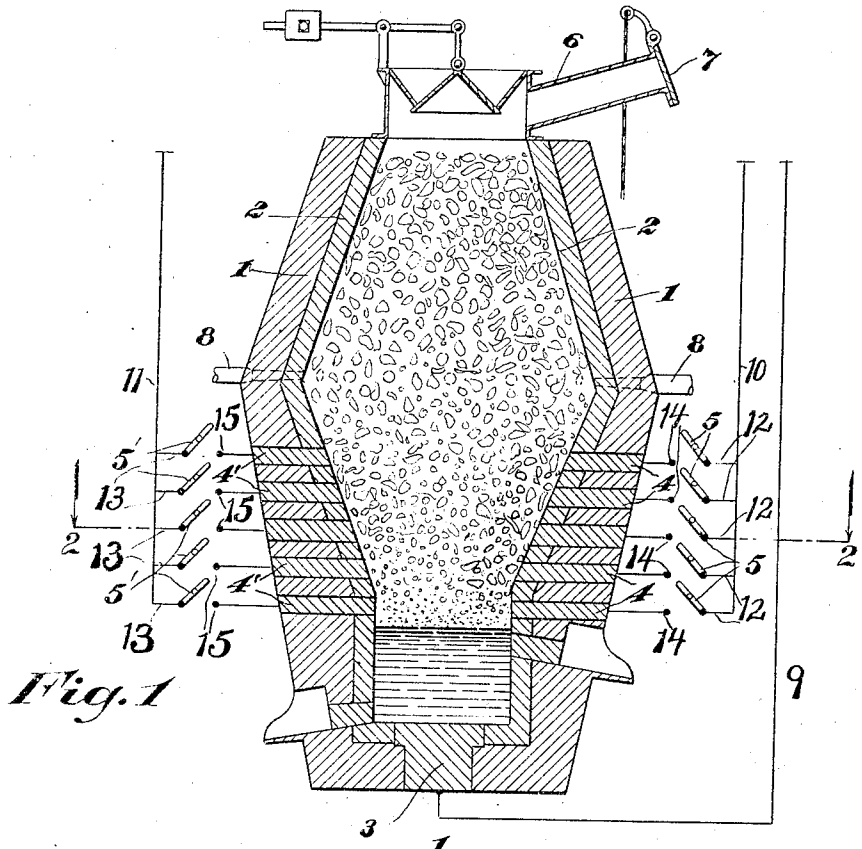

Fig. 1

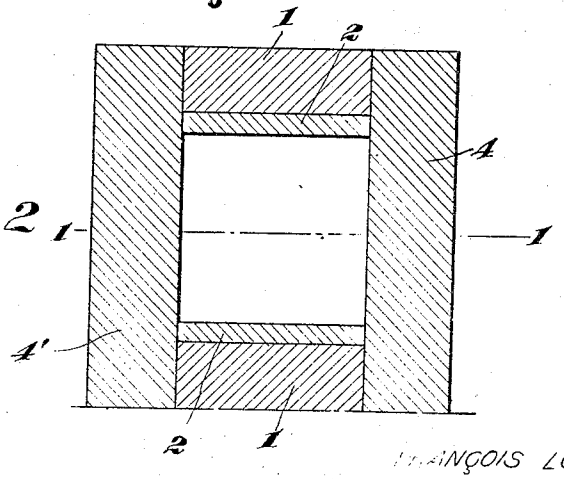

Fig. 2

Witnesses:

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UNITED STATES PATENT OFFICE.

FRANÇOIS LOUVRIER, OF MEXICO, MEXICO.

ELECTRIC FURNACE.

1,013,189. Specification of Letters Patent Patented Jan. 2, 1912.

Application filed September 22, 1910. Serial No. 583,315.

To all whom it may concern:

Be it known that I, FRANÇOIS LOUVRIER, a citizen of the Republic of France, residing at Apartado 1984, in the city of Mexico, Mexico, have invented certain new and useful Improvements in Electric Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention to be hereinafter described relates to a new process to distribute and regulate electric energy in electric furnaces.

Broadly speaking, it comprises one or more fixed electrodes seated in the walls of a furnace body; means for passing an electric current through the fixed electrodes and through the interior of the furnace; and means for leading the current out of the furnace.

In order to more clearly disclose the disposition, operation and use of the invention, reference should be had to the accompanying drawing forming part of the present application.

Throughout the several figures of the drawings like reference characters designate the same parts.

In the drawings, which show the process applied to a polyphase furnace: Figure 1 is a central, vertical cross section on line 1—1 of Fig. 2; and Fig. 2 is a horizontal cross section on line 2—2 of Fig. 1.

Referring to the drawings, 1 indicates the furnace body which may be of any well known shape or form and provided with a lining of highly refractory, electrically non-conductive material 2. The sole or floor 3 is made of electrically conductive material and is connected with circuit wire 9, constituting the terminal electrode thereof.

In the walls of the furnace body are seated, fixed electrodes 4 and 4′ arranged in two sets having the same number of contacts 14 and 15 similarly arranged in two sets and connected to said electrodes by short wires as shown. Branch wires 12 of circuit wire 10, equal in number to contacts 14, are connected individually at will to said contacts by interposed circuit closers 5; and the corresponding branch wires 13 of circuit wire 11 are similarly connected by circuit closers 5′ to the other series of contacts 15. As shown in the drawings, the two sets are isolated one from the other, being arranged in opposite sides of the furnace. Also, the electrodes of each set are electrically isolated from one another by a certain thickness of the walls and lining of the furnace body. The electrodes of each set can be connected, at will, with the same phase of the current, each one apart, connection being made by means of well known forms of interrupters 5 and 5′, arranged in the branch lines between the electrodes and the main wires of the circuit.

The fixed electrodes as well as the floor 3, or the entire furnace body can be provided, if necessary, with an exterior water-jacket, the requisite precautions being taken for the electric isolation.

The top of the furnace, near the usual charging opening, is provided with a tube or flue 6 through which the gases escape. This tube may be kept closed by a door or damper plate 7 of well known form. If desired, the door may be omitted and the tube 6 connected direct to a suitable reservoir, not shown.

If combustible gases are evolved during treatment, they may be burned in the upper part of the furnace body, by injecting air through suitable twyers 8 arranged at the proper points.

The lower part of the furnace, of course, is provided with two draw-holes, one for slag, and the other for melted metal.

The electric current passes through the materials to be treated in the furnace body, between each set of fixed electrodes and between these latters and the sole 3. As it is easy to understand, the intensity of the current used, and, consequently, the temperature in the furnace, is regulated by the number and position of the fixed electrodes put in circuit.

It is clear that there can be grouped together two or more furnace bodies similar to those described above, with or without communication one with the other and with or without intermediary crucible, the electric connections being arranged as required.

It is thought that the operation and use of the invention will be clear from the preceding description.

Changes may be made in the construction, arrangement and disposition of the several parts of the invention without in any way departing from the field and scope of the same, and it is meant to include all such within this application wherein only a preferred form has been disclosed.

It is obvious that the circuit may be made from the bottom of the furnace up through its contents obliquely to any one of the electrodes of one series only, or to more than one. Or the electrodes of both series may be used in whole or in part. Thus I provide for a great variety in the currents traversing the material within the furnace both as to direction, number and individual effect with corresponding difference of result, all controlled by my two series of circuit closers, the several electrodes in the body of the furnace and the parts coöperating therewith.

I am aware that it is not new to provide a furnace with an electrically conducting floor or base and with an electrode in its body nor to provide a furnace body with electrodes at different heights and on opposite sides above the same; nor to provide a series of branch-wires governing electrodes, with circuit closers for controlling the course of electric current. I do not broadly claim these combinations, but

What I do claim and desire to secure by Letters Patent is:

1. An electric furnace having an electrode in its base and two series of electrodes arranged in its opposite sides, in combination with contacts having electric connections with the electrodes of said series respectively, circuit wires 9, 10 and 11, the former being connected to said electrode in the base, and circuit closers 5, 5′ individually connected to wires 10 and 11 respectively and arranged to make circuit through any one or more of said contacts and electrodes as shown.

2. An electric furnace having an electrically conducting floor and two series of electrodes arranged in its opposite sides, in combination with contacts having electric connections with the electrodes of said series respectively, circuit wires 9, 10 and 11, the former being connected to said floor and circuit closers 5, and 5′ individually connected to wires 10 and 11, and arranged to make circuit through any one or more of said contacts and electrodes as shown.

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

FRANÇOIS LOUVRIER.

Witnesses:

JEAN UMAMA,

GEO. LUIRONI.