

1,375,615.

C. SONCINI.
ELECTRIC FURNACE.

APPLICATION FILED APR. 12, 1920.

Patented Apr. 19, 1921

2 SHEETS—SHEET 1.

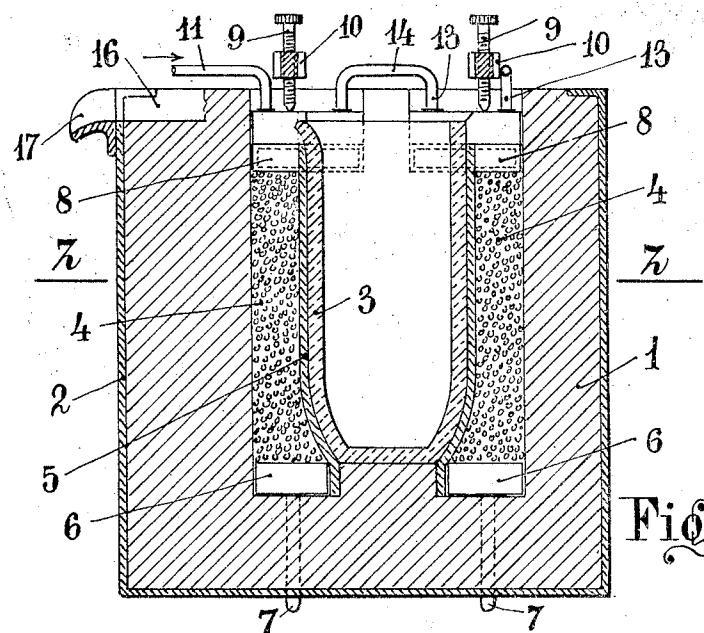
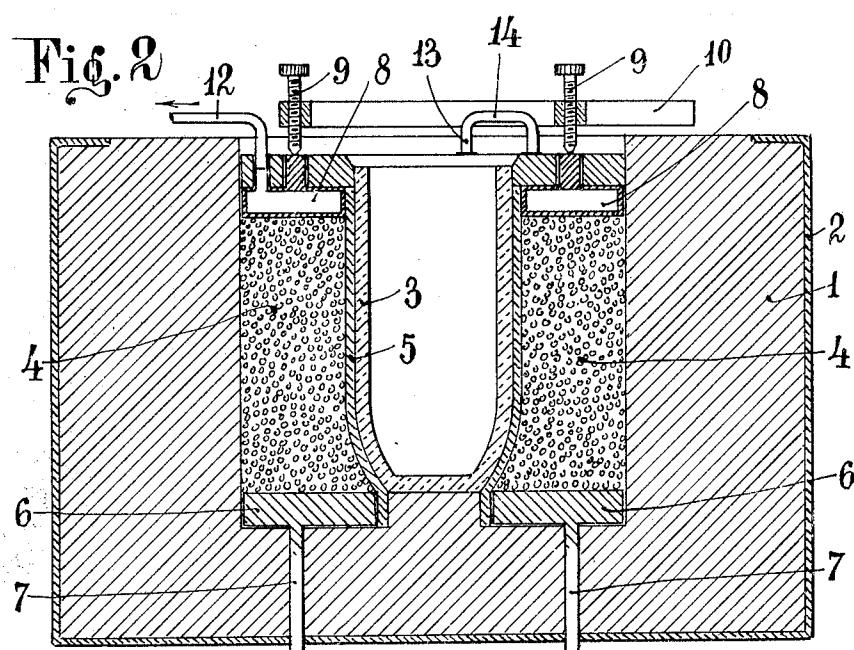


Fig. 1



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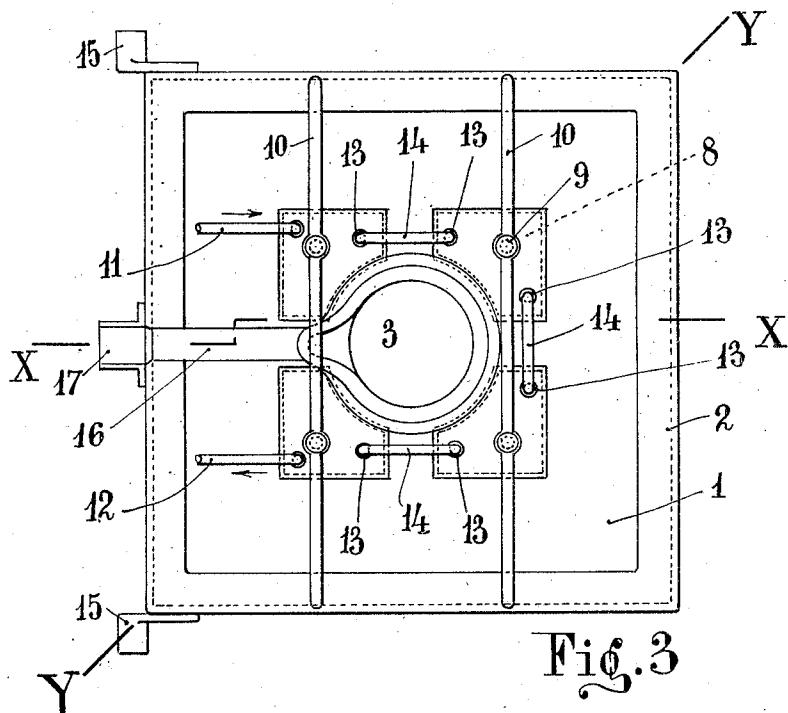


Fig. 3

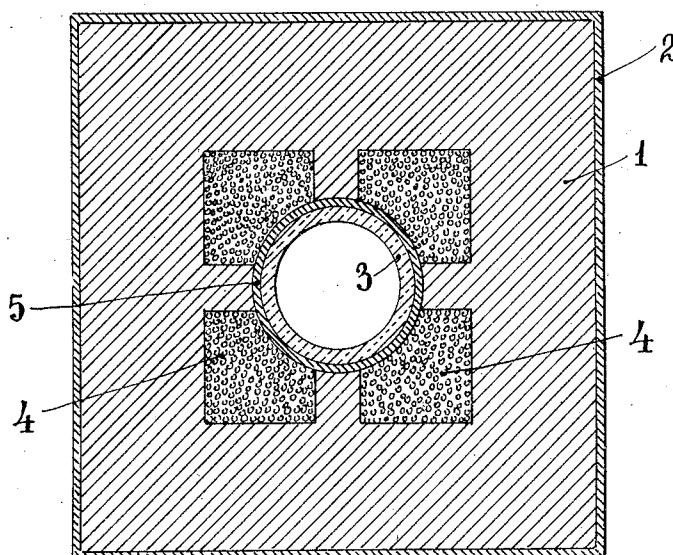


Fig. 4

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UNITED STATES PATENT OFFICE.

CESARE SONCINI, OF PONT ST. MARTIN, ITALY.

ELECTRIC FURNACE.

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Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed April 12, 1920. Serial No. 373,204.

To all whom it may concern:

Be it known that I, CESARE SONCINI, subject of the King of Italy, and resident of Pont St. Martin, Italy, have invented certain new and useful Improvements in Electric Furnaces, of which the following is a specification.

This invention relates to electric furnaces and particularly to resistance furnaces adapted for heating and melting materials located within crucibles.

The invention has for its object an improved furnace in which the crucible is heated by means of a plurality of electric resistances which are located adjacent to the crucible, said resistances being independent of each other and adapted to be inserted in the feeding electric circuit in different manners in order to properly adjust the amount of heat developed by them.

The invention also provides means for cooling the members feeding the electric current to said resistances, as well as means for adjusting the contact pressure exerted by said members on said resistances, which latter preferably consist of granular material.

The annexed drawing shows by way of example a construction of the furnace according to this invention, Figure 1 being a central vertical sectional view of the furnace taken on line $x-x$, Figs. 3 and 4; Fig. 2 is a central section on line $y-y$ Figs. 3 and 4; Fig. 3 is a plan view; and Fig. 4 is a horizontal section on line $z-z$, Figs. 1 and 2.

As shown on the drawing, the furnace according to this invention comprises a body 1 of refractory material which is inclosed within a sheet metal casing 2 and is provided with a chamber adapted to contain the crucible 3.

The refractory material forming said body is suitably shaped to provide vertical chambers 4 which are independent from each other and are intended to contain the resistance material which may consist of granular carbon, graphite or the like.

The number and shape of the chambers 4 may be modified according to requirements, but in any case said chambers are located adjacent to and around the crucible chamber. The internal wall of said chambers is provided by a sleeve 5 of refractory, non-conducting material adapted to immediately receive the crucible 3, as shown.

In case the crucible is made of non-conducting material, the sleeve 5 may be omitted and the resistance material may contact directly with the wall of the crucible. 60

Thus the heat is evenly distributed over the whole surface of the crucible, and at the same time the resistances are independent from each other for the purpose referred to.

The electric current is fed to each resistance by means of a pair of metal contact members, one of which is located at the bottom and the other one at the top of each chamber 4; the resistance material being arranged in said chambers between the contact members. 70

As shown in the drawing, each bottom contact member consists of a block 6 having a tail 7 projecting through the bottom portion of body 1, said tails enabling the contact blocks to be connected with each other and with the feeding wires in the desired manner. At the top of the chambers 4 are located the contact members 8 which are pressed against the resistance material 9 enclosed within chambers 4 by means of threaded spindles 9 which are screwed into rods or bars 10 suitably secured or clamped to body 1 or to casing 2. The spindles 9 may be operated from outside, during the 85 operation of the furnace, by means of wrenches, hand wheels or the like.

The contact members 8 are in the form of boxes for the purpose of providing therein a cooling water circulation, and for that 90 reason each box 8 is provided with two sockets 13, and the sockets of the several boxes are connected with each other in succession by means of pipes 14 made of metal or of insulating material. One of the 95 sockets is connected with a water supply pipe 11, and another is connected with a water discharge pipe 12, so that the water supplied by the pipe 11 flows through the box 8 connected therewith, and thence 100 through the corresponding sockets 13 and pipe 14 to the next box 8, and so on until it reaches the pipe 12 and is exhausted.

By the described arrangement, it is possible to adjust at will and to the exact required value, the amount of heat developed in the resistances and, therefore, the temperature of the crucible. In fact, the resistances may be inserted in the feeding circuit in different manners, say in series or in 110 parallel, or by sets in series and in parallel, by suitably connecting the tails 7, blocks 6

and boxes 8 with each other and with the feeding wires.

The resistances may be fed with a current having any required intensity, and more-
5 over the contact pressure of the boxes 8 on the resistance material may be adjusted by manipulating the screws 9, this operation allowing of modifying at will the character of contact between said parts, as well as the
10 density of the resisting material and, therefore, its resistance.

The furnace is provided with trunnions
15 arranged in register with one of the top edges of the body 1 for rocking the furnace
15 to effect the tapping operation; and the upper face of said body 1 is provided with a channel 16 connected with the crucible mouth and leading to the spout 17.

I claim as my invention:

20 1. An electric furnace, comprising a body of refractory material having a crucible-receiving space therein, and also having a plurality of chambers independent from each other arranged around said space; a filling
25 of resistance material in said chambers to form heating resistances; members feeding the electric current to the ends of said resistances; and means for connecting said members with each other and with the current-feeding means.

2. An electric furnace, comprising a body of refractory material having a crucible-receiving space therein, and also having a plurality of chambers independent from each
35 other arranged around said space; a filling of resistance material in said chambers to form heating resistances; contact blocks at one end of said chambers having projections passing through said body; contact members
40 at the other end of said chambers; adjustable means for forcing the contact members against said resistances; and means for connecting said projections and contact members with each other and with the current-
45 feeding means.

3. An electric furnace, comprising a body of refractory material having a crucible-receiving space therein, and also having a plurality of chambers independent from
50 each other arranged around said space; a filling of resistance material in said chambers to form heating resistances; contact blocks at one end of said chambers having projections passing through said body; contact
55 members at the other end of said

chambers; rods clamped to said body; threaded spindles screwed into said rods and engaging said contacting members for forcing the latter against the resistances; and means for connecting said projections and contact members with each other and with the current-feeding means.

4. An electric furnace, comprising a body of refractory material having a crucible-receiving space therein, and also having a plurality of chambers independent from each other arranged around said space; a filling of resistance material in said chambers to form heating resistances; members feeding the electric current to the ends of said resistances; means for cooling said members; and means for connecting said members with each other and with the current-feeding means.

5. An electric furnace, comprising a body of refractory material having a crucible-receiving space therein, and also having a plurality of chambers independent from each other arranged around said space; a filling of resistance material in said chambers to form heating resistances; contact blocks at one end of said chambers having projections passing through said body; hollow contact members at the opposite end of said chamber; rods clamped to said body; threaded spindles screwed into said rods and adapted to engage said hollow contact members to force them against said resistances; means for supplying and exhausting water to and from said hollow contact members to cool
80 the same; and means for connecting said contact members and projections with each other and with the current-feeding means.

6. An electric furnace, comprising a body of refractory material having a space there-
95 in and also having a plurality of recesses independent from each other in the wall of said space; a refractory sleeve in said space for co-operation with said recesses to form a plurality of independent chambers, said
100 sleeve being adapted to receive a crucible; a filling of resistance material located in said chambers to form heating resistances; members feeding electric current to the ends of said resistances; and means for connecting
105 said members with each other and with the current-feeding means.

Signed at Turin, Italy, this 25 day of Mar.,
1920.

CESARE SONCINI.