

T. F. BAILY.
ELECTRIC FURNACE.
APPLICATION FILED OCT. 13, 1908.

933,815.

Patented Sept. 14, 1909.

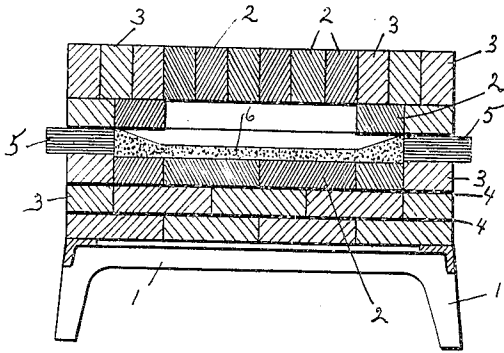


Fig. 1.

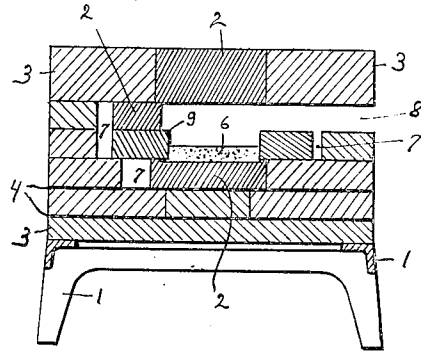


Fig. 2.

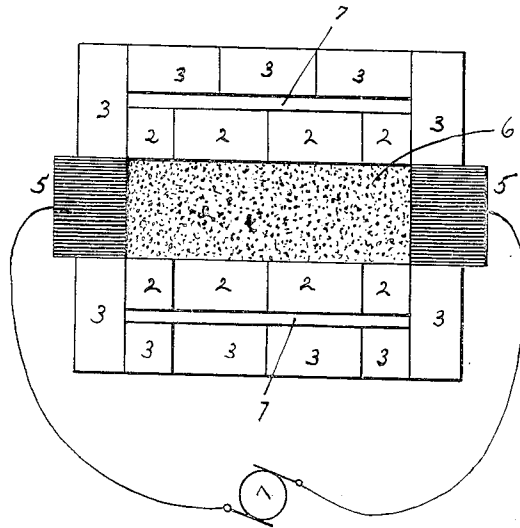


Fig. 3.

Witnesses

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ELECTRIC FURNACE.

933,815.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed October 13, 1908. Serial No. 457,458.

To all whom it may concern:

Be it known that I, THADDEUS F. BAILY, a citizen of the United States, residing at Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Electric Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawing, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to electric furnaces and has for its object the production of a furnace which will yield a great amount of heat developed from a given strength of current and at the same time save the rapid oxidation of the core.

In the accompanying drawing: Figure 1 is a longitudinal section. Fig. 2 is a transverse section. Fig. 3 is a top view showing the top or cover of the furnace removed.

Similar numerals of reference indicate corresponding parts in all the figures of the drawing.

In the accompanying drawing, 1 represents a metallic base or foundation upon which the furnace structure is built. The base 1 is for the purpose of bringing the furnace into proper elevation for use and such use as hereinafter described, and hence the metal base 1, may be dispensed with if desired and the furnace built upon a non-metallic or brick foundation if desired.

The furnace proper is constructed of non-metallic heat resisting and low electrical conducting material 2 and fire brick 3, and the brick so arranged with reference to each other that an oven or chamber will be formed just below the top or cover of the furnace proper and also air chambers, which chambers are for the purpose hereinafter described.

For the purpose of providing better or perfect insulation strips of asbestos 4 should be embedded in the furnace wall proper preferably just below the tier of brick constituting the bottom of the oven; but if desired, additional strips of asbestos may be employed without departing from the nature of my invention.

At opposite ends of the furnace proper are located the electrodes 5, which electrodes are preferably located as shown in Figs. 1 and 3. Between the electrodes 5 and in proper con-

tact therewith is located a resistance body of charcoal, or coke or like material 6, which body of charcoal or coke is in granular form and located in direct contact with the non-metallic bottom of the oven or furnace chamber. The electrodes 5 are located in the path of the circuit as conventionally shown in Fig. 3 and as shown the body of charcoal or coke is located in the path of the circuit and between the electrodes.

It should be noted that the electrodes 5 are of considerable vertical dimension and of considerable width, thus presenting a relatively large surface for contact with the resistance body 6. It will be noted by an inspection of Fig. 1 that the said body 6 diminishes in vertical thickness from the said electrodes toward the center of said body, the body 6 in the middle of the furnace being of considerably less cross-section than at its ends where contact is made with the said electrodes. By this construction it will readily be understood by those skilled in the art that the resistance in the body 6 will be greater in the center than at the ends of said body adjacent the electrodes. In this way rapid oxidation of the said body adjacent said electrodes and rapid oxidation of said electrodes is prevented while at the same time concentrating the heat in the center of the furnace where it is desired.

For the purpose of providing proper electric and also thermal insulation the side walls of the furnace are provided with the air spaces 7 and the wall below the heating chamber or oven is provided with the air spaces 7, which spaces provide better insulation and especially so if the brick should become more conductive from excessive heat or if said brick from long use should become changed in such manner that the current might be shunted from the resistance body to the brick wall of the furnace proper.

One side of the furnace wall is provided with the opening 8, which opening is for the purpose of inserting metallic bars to be heated, and for the purpose of holding the metallic bars out of contact with the electrically charged body of coal or coke, the shoulder 9 is provided, which shoulder or ledge is for the purpose of holding the inner ends or portions of the bars in proper elevation so that the current will not be shunted to the metallic bars.

The furnace illustrated in the drawings is one specifically designed for the heating of

metallic bars, but it will be understood that the same general plan and arrangement can be carried out for heating ingots.

It will be noted from the above description that by the construction disclosed an electric furnace is produced wherein the resistance body may be readily and cheaply renewed, in which the said resistance body will not readily burn away from the electrodes and in which the said electrodes will be kept at a comparatively low temperature. The fact should also be noted that there is nothing interposed between the incandescent resistance body acted on by the current and the material to be heated and that the said material to be heated is located above the said resistance body, thereby being in the most advantageous position for the accomplishment of good results.

20 Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is—

1. An electric furnace comprising non-metallic walls forming a heating chamber, electrodes held in spaced relation within said chamber, a resistance body located on the bottom of said heating chamber and in contact with said electrodes, the area of contact between each of said electrodes and said body and the area of the cross-section of said body adjacent said electrodes being greater than the area of the cross-section of said body substantially midway between said electrodes, one of the walls of the furnace provided with an opening and the opposite wall provided with a ledge, the upper surface of said ledge and the bottom of said opening being located above the top surface of said resistance body, said ledge and the bottom of said opening adapted to support material to be heated.

2. An electric furnace comprising a base, furnace walls arranged upon said base and composed of heat resisting and low electrical conducting brick arranged in tiers with strips of asbestos between adjacent tiers, said bricks arranged to form an oven, spaced electrodes located in said oven, a resistance body located upon the bottom of the interior of said oven and extending from one to the other of said spaced electrodes and in contact therewith, the area of contact between each of said electrodes and said body and the area of the cross-section of said body adjacent said electrodes being greater than the area of the cross-section of said body substantially midway between said electrodes, one of the walls of the furnace pro-

vided with an opening and the opposite wall provided with a ledge, the upper surface of said ledge and the bottom of said opening being located above the top surface of said resistance body.

3. An electric furnace comprising a base, furnace walls arranged upon said base and composed of heat resisting and low electrical conducting bricks arranged in tiers with strips of asbestos between adjacent tiers, said bricks arranged to form an oven, spaced electrodes located in said oven, and a resistance body located upon the bottom of the interior of said oven and extending from one to the other of said spaced electrodes and in contact therewith.

4. An electric furnace comprising a base, furnace walls, said furnace walls composed of heat resisting and low electrical conducting bricks arranged to constitute an oven, electrodes spaced from each other and located in said oven, a resistance body located upon the bottom of the interior of said oven and extending from one end to the other between the electrodes and in contact therewith, the area of contact between each of said electrodes and said body and the area of cross-section of said body adjacent said electrodes being greater than the area of the cross section of said body substantially midway between said electrodes, one of the walls of the furnace provided with an opening.

5. An electrical furnace comprising a base, furnace walls, said furnace walls composed of heat resisting and low electrical conducting bricks arranged to constitute an oven, electrodes spaced from each other and located in said oven, a resistance body located upon the bottom of the interior of said oven and extending from one end to the other between the electrodes and in contact therewith, said resistance body composed of material in granular form, the area of contact between each of said electrodes and said body and the area of cross-section of said body adjacent said electrodes being greater than the area of the cross section of said body substantially midway between said electrodes, one of the walls of the furnace provided with an opening.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

THADDEUS F. BAILY.

Witnesses:

W. W. MATCHETT,
W. B. FERGUSON.