Aug. 2, 1932. R. A. WAGSTAFF 1,869,591

CENTER WALL FURNACE

Filed Nov. 30, 1928

FIG. 1.

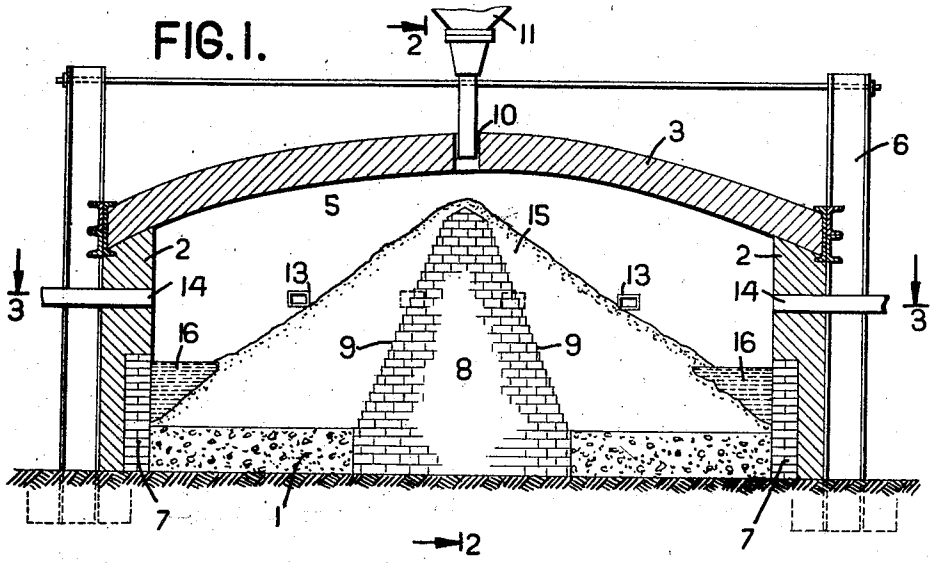


FIG. 2.

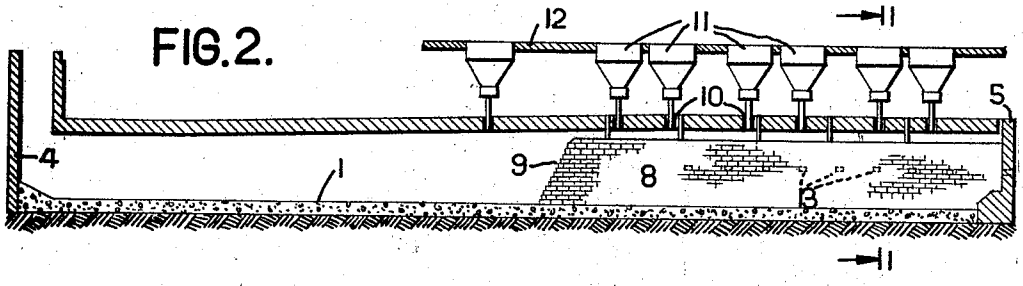
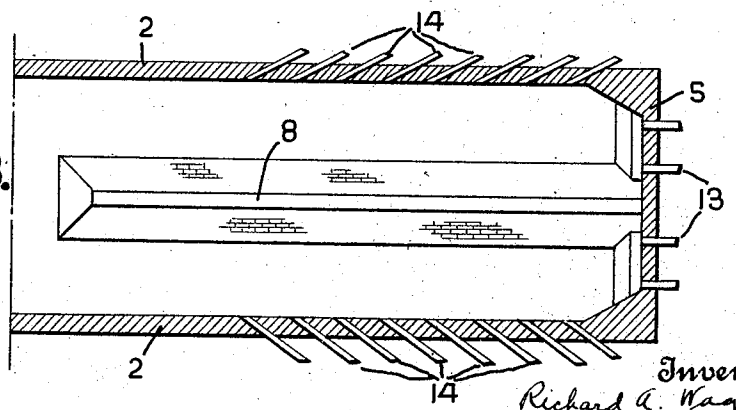


FIG. 3.



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UNITED STATES PATENT OFFICE

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CENTER WALL FURNACE

Application filed November 30, 1928. Serial No. 322,752.

The invention relates in general to metallurgical furnaces, and more particularly, to a metallurgical furnace of the reverberatory type.

According to one form of the invention, a reverberatory furnace is provided with a structural center wall extending from the firing end of the furnace longitudinally toward the flue end through the smelting zone. Feed openings are provided in the center of the roof over the center wall so that the center wall is covered with a mound of charge sloping toward the side walls and forming valleys therewith for the reception of the molten charge. Suitable burners may be provided both in the back wall and in the side walls near the back wall for supplying the necessary heat to smelt the charge.

The invention also consists in certain new and orginal features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part thereof, in which

Fig. 1 is a cross section through the furnace on the line 1—1 of Fig. 2;

Fig. 2 is a longitudinal section through the furnace on the line 2—2 of Fig. 1; and

Fig. 3 is a plan section taken on the line 3—3 of Fig. 1 of a part of the furnace.

In the following description and in the claims parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Like reference characters denote like parts in the several figures of the drawing.

In the drawing accompanying and forming part of this specification, a practical commercial embodiment of the invention is shown, but as such illustration is primarily for purposes of disclosure, it will be understood that the structure may be modified in various respects without departure from the broad spirit and scope of the invention as hereinafer defined and claimed.

Referring now to the drawing, the furnace comprises a bottom or hearth 1, side walls 2, an arched roof 3, a front end wall 4 at the flue end and a back end wall 5 at the firing end. Suitable structural members are provided for properly holding the parts in proper relation in ways well known in the art, these members being denoted generally by 6. The side walls 2 at points subjected to the contact of the molten charge are lined with linings 7 of non-corrosive brick such as magnesite.

Extending longitudinally of the furnace is a pyramidal center wall 8 of structural brick having sloping faces 9 and extending from the back wall 5 part way the length of the furnace, through the smelting zone. A plurality of feed openings 10 are provided in the roof over the center wall, these openings connecting with hoppers 11 which open on an upper level 12 by which the hoppers may be filled with charge.

Disposed along the back wall 5 and along the side walls 2 are a plurality of burners for either powdered coal or oil. The burners along the back wall are denoted by 13 and the burners along the side walls by 14, the latter being disposed at an angle to the length of the furnace, as illustrated.

In operation, the furnace is charged with ore from the upper level 12 through the center feed openings 10, the ore denoted by 15 covering and protecting the center wall 8. The surfaces of the ore are determined by the angle of repose of the material. The charge forms a central mound covering the center wall 8 and preferably the ore is so fed and the charge openings 10 so disposed that the wall is kept covered continuously, forming a substantially continuous mound of ore having for a core the structural center wall 8.

As the burners 13 and 14 heat the furnace, the charge smelts and the melting charge runs down into the valleys denoted by 16 formed by the side walls 2 and the charge 15, the molten charge running to the front

or flue end of the furnace where it is removed through doors (not shown) in a manner well known in the art.

Thus a reverberatory furnace is provided having a large smelting area and economical of fuel consumption. The center wall also displaces a large amount of ore and metal, thereby reducing the amount of ore and metal tied up in the furnace. The disposition of the charge is such that the molten charge naturally runs to the side valleys 16, then being conducted to the flue end of the furnace where it is removed.

While certain novel features of the invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. A reverberatory furnace comprising a firing end, a flue end and a roof and side walls connecting said ends and extending longitudinally of the furnace, there being a smelting zone between said ends, an auxiliary center furnace wall located between said side walls and extending within the smelting zone and longitudinally of the furnace and above the bath line thereof, said roof having center charge holes arranged longitudinally over said center wall for covering said center wall with the charge to be smelted, and means at the firing end for firing the furnace, said charge receiving heat both directly from said firing means and indirectly from said firing means in the form of heat reflected and radiated from said side walls and roof.

2. A reverberatory furnace comprising a firing end, a flue end and a roof and side walls connecting said ends and extending longitudinally of the furnace, there being a smelting zone between said ends, an auxiliary center furnace wall located between said side walls and extending within the smelting zone and longitudinally of the furnace, said roof having center charge holes arranged longitudinally over said center wall for covering said center wall with the charge to be smelted, and means for firing said furnace from said side walls, said firing means extending a substantial distance longitudinally of the furnace and being directed somewhat transversely of the furnace against the charge covering said center wall, said charge receiving heat both directly from said firing means and indirectly from said firing means in the form of heat reflected and radiated from said side walls and roof.

In testimony whereof I have hereunto set my hand.

RICHARD A. WAGSTAFF.