July 19, 1932. R. L. LEVENTRY 1,868,172

FURNACE CONSTRUCTION

Filed Sept. 15, 1926

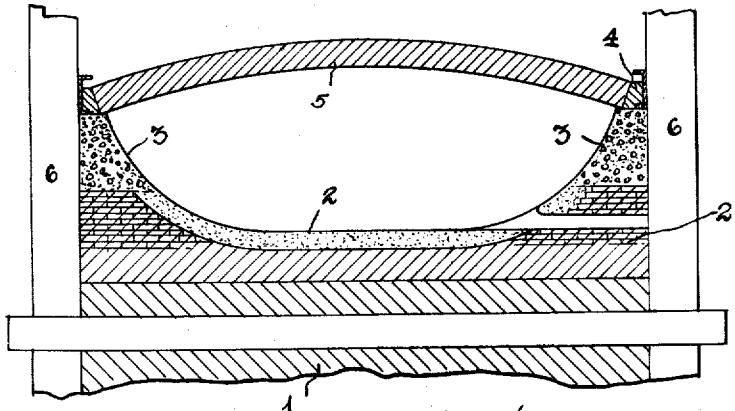


Fig. 1

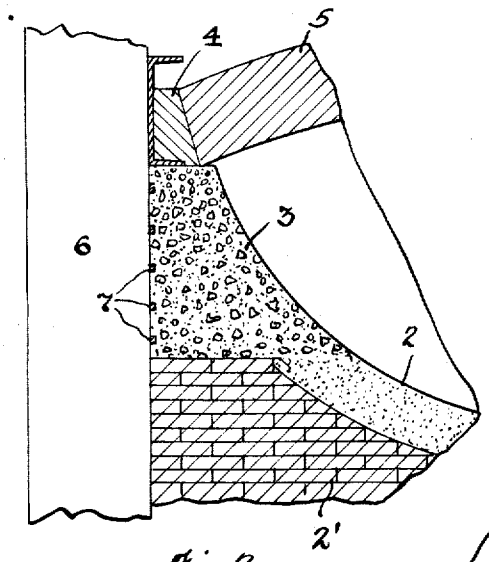


Fig. 2

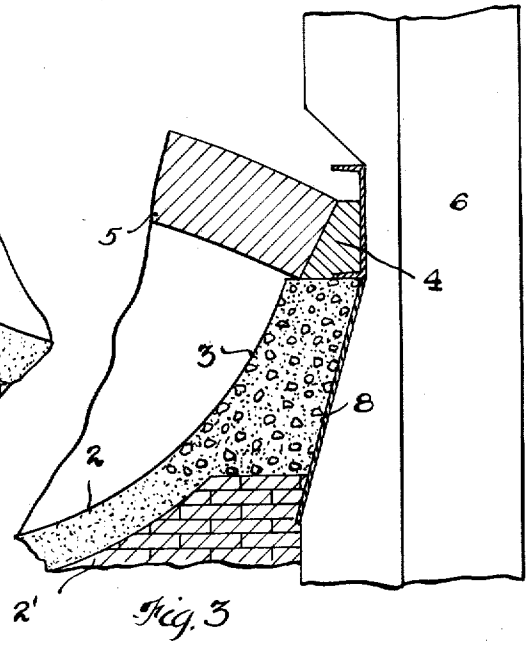


Fig. 3

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Patented July 19, 1932 1,868,172

UNITED STATES PATENT OFFICE

ROY L. LEVENTRY, OF YOUNGSTOWN, OHIO, ASSIGNOR TO REPUBLIC IRON AND STEEL COMPANY, OF YOUNGSTOWN, OHIO, A CORPORATION OF OHIO

FURNACE CONSTRUCTION

Application filed September 15, 1926. Serial No. 135,547.

This invention relates to metallurgical furnaces, and more particularly furnaces of the open hearth type. As well known, in apparatus of this character there is not only a high temperature to be contended with but there is also more or less chemical action upon the surfaces with which the hot gases come in contact. Various attempts have been made to meet these drastic conditions by the use of lining or wall-forming materials of general basic type but satisfactory construction involving both the chemical characteristics and the sufficient mechanical strength has not heretofore been realized to the extent demanded in the art. A wall construction therefore which embodies the qualities essential, and withal of reasonable cost and ready applicability is accordingly highly desirable.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the means hereinafter fully described, and particularly pointed out in the claims, the annexed drawing and the following description setting forth in detail certain features embodying the invention, such disclosed means constituting, however, but few of various forms in which the principle of the invention may be used.

In said annexed drawing:—

Fig. 1 is a vertical sectional view showing a furnace wall construction embodying my invention; and Fig. 2 is an enlarged sectional detail; and Fig. 3 is a similar view of a modification.

The foundation and the supporting structure 1 of the furnace may be of any usual or preferred construction, and the floor 2 may be surfaced with magnesite or the like. As a surface for the walls, and particularly the back wall, I employ chrome iron ore, the important content of which may be represented as $FeOCr_2O_3$. This may be obtained in varying grades and size of pieces, and where desired may be applied in plastic mass. Generally however, I prefer to lay up the wall of lump material. This may be roughly sized and shaped, at least for the immediate surface layer if desired. Ordinarily however, it is preferable to employ the material without a special shaping operation and it is advantageous in this connection to lay out the angle of slope of the wall such as to favor a self-sustaining condition. The slope may even be flattened out to the extent required by the angle of repose of the particular grade of material being used.

By surfacing the floor with magnesite or the like, and providing under-layers of bricks 2′, and more especially around the wall base area, a support is had upon which the chrome rock 3 may be laid up, more or less choice being used in the selection of the immediate surfacing pieces. A skew back 4 as customary may be arranged to take up the thrust of the roof arch 5 against the buckstays 6 which form the general outside framing. I may reenforce the wall at the back or outside by the use of billets 7, these being spaced along between the buckstays and the mass of chrome rock as laid up. Where it is desired to lessen the thickness required particularly at the base of a wall, I prefer to arrange a reenforcement of plates 8, seating these at an angle under the skew back to the floor. Modified buckstays may be here interposed if desired between the plates and the general system of buckstays externally, or these may be combined in effect by one system of correspondingly shaped buckstays.

With a wall constructed along the lines described, a superior durability in performance is attained, and where the slope of the wall is flattened out as may be most favorable to small sizes or irregular material, a corresponding reduction in labor and cost may be realized, as compared with where it is necessary to shape up or cut the blocks to be employed.

Other modes of applying the principle of my invention may be employed instead of those explained, change being made as regards the features herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. An open-hearth furnace having a base, a roof substantially co-extensive with the area of the base, backstays, and a back wall

between said base and said roof having a surface-retaining incline of refractory lump chrome iron ore held by a thickening of the wall in its lower portion, and by spaced billets, said billets engaging said backstays.

2. An open-hearth furnace having a base, a roof substantially co-extensive with the area of the base, backstays, and a back wall between said base and said roof having a surface-retaining incline of refractory lump chrome iron ore held by a thickening of the wall in its lower portion, and by spaced billets, said billets engaging said backstays, said wall having its full thickness formed of said lump chrome iron ore.

Signed by me this 9th day of September, 1926.

ROY L. LEVENTRY.

CERTIFICATE OF CORRECTION.

Patent No. 1,868,172. July 19, 1932.

ROY L. LEVENTRY.

It is hereby certified that the name of the assignee in the above numbered patent was erroneously described and specified as "Republic Iron and Steel Company", whereas said name should have been described and specified as Republic Steel Corporation, as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of November, A. D. 1932.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.

between said base and said roof having a surface-retaining incline of refractory lump chrome iron ore held by a thickening of the wall in its lower portion, and by spaced billets, said billets engaging said backstays.

2. An open-hearth furnace having a base, a roof substantially co-extensive with the area of the base, backstays, and a back wall between said base and said roof having a surface-retaining incline of refractory lump chrome iron ore held by a thickening of the wall in its lower portion, and by spaced billets, said billets engaging said backstays, said wall having its full thickness formed of said lump chrome iron ore.

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