N° 13,877 A.D. 1903

(*Under International Convention.*)

Date claimed for Patent under Patents Act, 1901, being date of first Foreign Application (in United States), 16th Jan., 1903

Date of Application (in the United Kingdom), 22nd June, 1903

Accepted, 10th Sept., 1903

COMPLETE SPECIFICATION.

Improvements in Ore Roasting Furnaces.

I, JOHN BROWN FRANCIS HERRESHOFF, of 25 Broad Street New York City, United States of America, Chemist; do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement.

My invention relates to ore roasting furnaces, and particularly to furnaces of the character of that forming the subject of previous Letters Patent No. 27393 of December 28th 1898. In furnaces of this character it has been found that in case the ore particles are very fine, they are liable to be carried upward by the gases, so that a portion of the ore is lost. The purpose of my present invention is to overcome this drawback and to reduce to a minimum the action of the upward current of gas upon the ore, so that said current of gas may carry away very little of the ore, if any.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings in which—

Fig. 1 is a vertical section showing the lower part of an ore roasting furnace provided with my invention;

Fig. 2 is a sectional plan illustrating a portion of my invention;

Fig. 3 is a sectional elevation showing another form of my invention; and

Fig. 4 is a detail view showing one of the rakes and a spout carried thereby.

The class of furnaces to which my invention relates comprises a series of superposed shelves or partitions, upon which the ore is adapted to rest temporarily, the partitions being provided with openings alternately at the centre and at the periphery for the purpose of allowing the ore to pass from one partition to the next partition below. In combination with the stationary shelves there are employed rotary rakes for the purpose of conveying the material gradually toward the said discharge openings. Thus one rake will convey the material inward, while the next rake below will be arranged to carry the material outwardly. Now, according to the present invention, instead of simply providing openings in the partitions or shelves, as has been done heretofore, there are employed spouts extending from one shelf toward the other and arranged to so conduct the ore that it will be exposed but very little to the upward current of gas. These spouts may be arranged in various manners and in the drawings I have illustrated several typical arrangements.

A indicates the shelves, B the openings at the centre, B' the openings at the

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periphery; and C the rakes which are secured to a shaft C^1 and which have teeth so inclined that upon rotation of the rakes the ore will be fed toward the openings of the shelves. So far the construction is substantially the usual one.

According to one form of my invention shown in Fig. 1, the spouts D—D^1 are stationary, being secured to the shelves A, or forming part thereof. In order that the material may reach the spouts only and may not be carried beyond the same, a raised ridge or flange D^2, D^3, extending continuously around, may be provided on that side of the spout which is opposite to that from which the ore is supplied. By the flange D^3 the ore is prevented from dropping through the central opening B and there being exposed to the current of gas, which might carry the ore dust or fine particles away. The ore passes through the spouts D, D^1, only, and as these spouts are practically outside the path of the gas, the gas current will interfere but very little, if at all, with the downward movement of the ore. The spouts D, D^1, will be, preferably, practically continuous or annular.

In another form of my invention (see Figures 2 & 3) the spouts, instead of being stationary, are carried so as to rotate with the rakes C. The spouts at the inner or central portion of the apparatus can be carried directly by the shaft C^1, and, if desired, the connection may be made detachable, as by means of a lip D^4 on the spout D^5, which lip engages a pocket C^2 on the shaft, and a pin D^6 which engages a slot C^3 of the shaft (Fig. 2). It will be understood that the rakes feed the material inward toward the central opening B, but such material is discharged only adjacent to the innermost tooth of each rake and a spout D^5 is arranged immediately below the innermost portion of each rake, so that the spout is always in position to receive the material which the rake conveys toward the central opening B. In this case, also, it will be observed that the spout gives the ore a path protected from the influence of the upward current of gas.

The rotary spouts D^7 which are intended for co-operation with the peripheral openings B^1 are, as shown in Fig. 3, carried by the outer portions of the respective rakes C. These spouts also perform the function of keeping the ore together and preventing small particles of the ore from being carried away by the gas current.

My invention in any one of the forms shown enables an apparatus of the class described to be efficiently used with very fine crushed ore, and thus considerably increases the usefulness of the roasting furnace.

Various modifications may be made without departing from the nature of my invention.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A roasting furnace having superposed shelves apertured for the passage of the ore, and means for conveying the ore toward the apertures of the shelves, in combination with spouts extending between the shelves and adapted to direct the ore on its way from one shelf to the next shelf below in such a manner as to protect the ore from the influence of the draft.

2. A roasting furnace comprising superposed shelves apertured for the passage of the ore, and means for conveying the ore toward the apertures of the shelves, in combination with spouts arranged to rotate between the shelves in receiving relation to the apertures thereof.

3. A roasting furnace comprising superposed shelves apertured for the passage of the ore, and rotary rakes for conveying the ore toward the apertures of the shelves, in combination with spouts connected to rotate with the rakes so as to always preserve the same position relatively thereto, said spouts being arranged between the shelves and in receiving relation to the apertures thereof.

4. A roasting furnace comprising superposed shelves apertured for the passage of the ore, and rotary rakes for conveying the ore toward the apertures of the

shelves in combination with spouts secured to said rakes and arranged between adjacent shelves in receiving relation to the apertures of the upper shelf.

5. A roasting furnace comprising superposed shelves apertured alternately at the centre and at the periphery, means located between the shelves for conveying the material alternately inward to the central aperture and outward to the peripheral apertures, and spouts located between the shelves and arranged to direct the ore on its way from one shelf to the next shelf below in such a manner as to protect the ore from the influence of the draft.

6. A roasting furnace comprising superposed shelves apertured alternately at the centre and at the periphery, a shaft extending through the central apertures of the shelves, rakes secured to said shaft between the shelves and arranged to convey the material alternately inward and outward, spouts secured to said shaft below the central apertures of the shelves, and spouts carried by the rakes and disposed below the peripheral apertures of the shelves.

Dated this 13th day of May 1903.

A. M. & WM. CLARK,
Chartered Patent Agents, 53, Chancery Lane, London.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1903.

A.D. 1903. JUNE 22. N° 13,877.
HERRESHOFF'S COMPLETE SPECIFICATION

2 SHEETS
SHEET 1

FIG. 1.

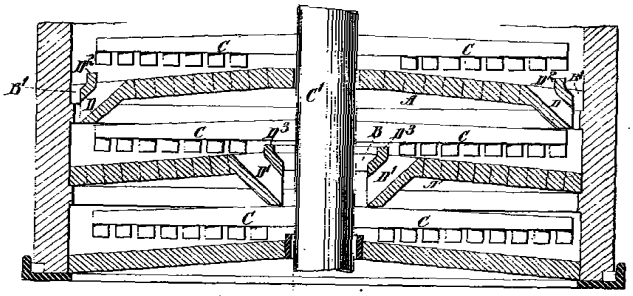
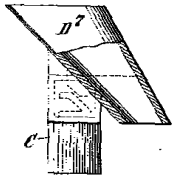


FIG. 4.



SHEET 2

FIG. 2.

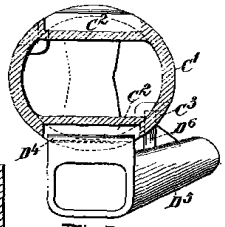
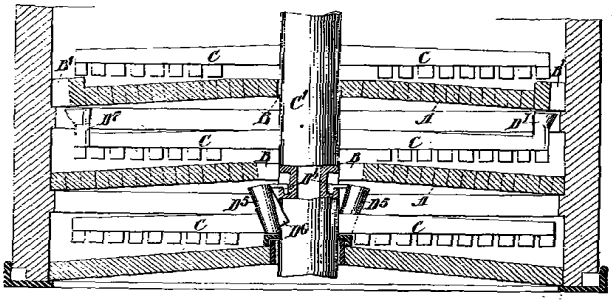


FIG. 3.

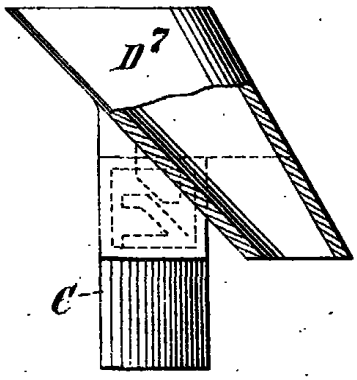


[This Drawing is a reproduction of the Original on a reduced scale]

A.D. 1903. JUNE 22. Nº 13,877.

HERRESHOFF'S COMPLETE SPECIFICATION.

Fig. 4.



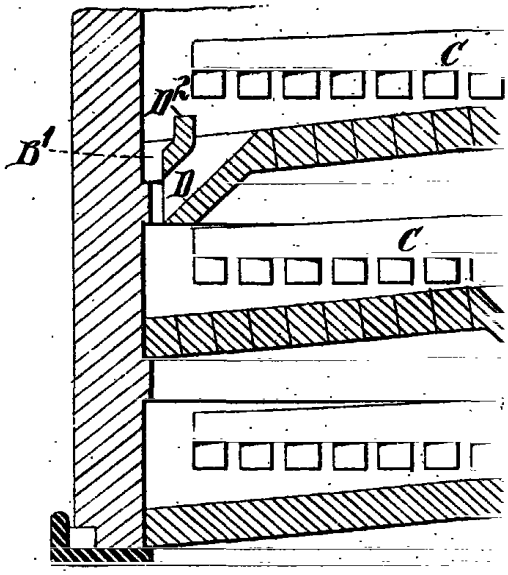
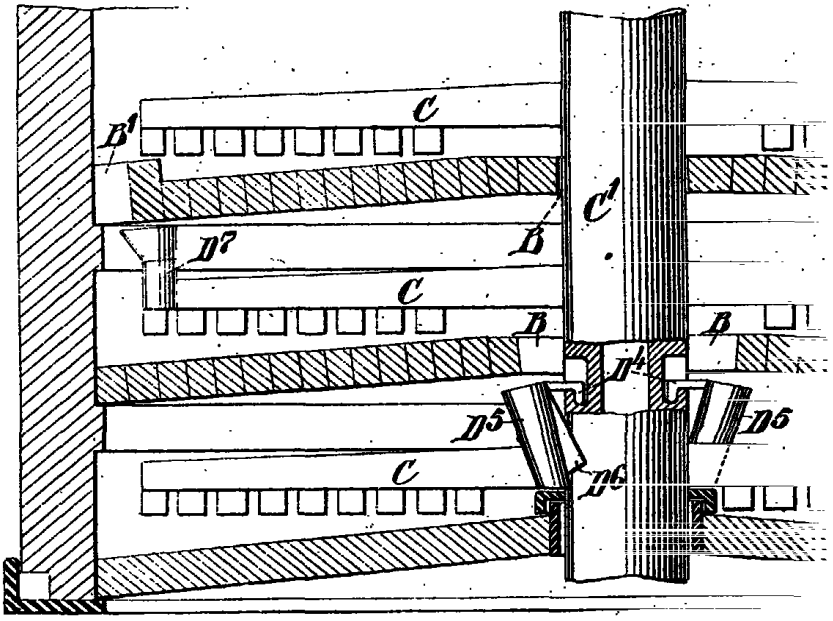


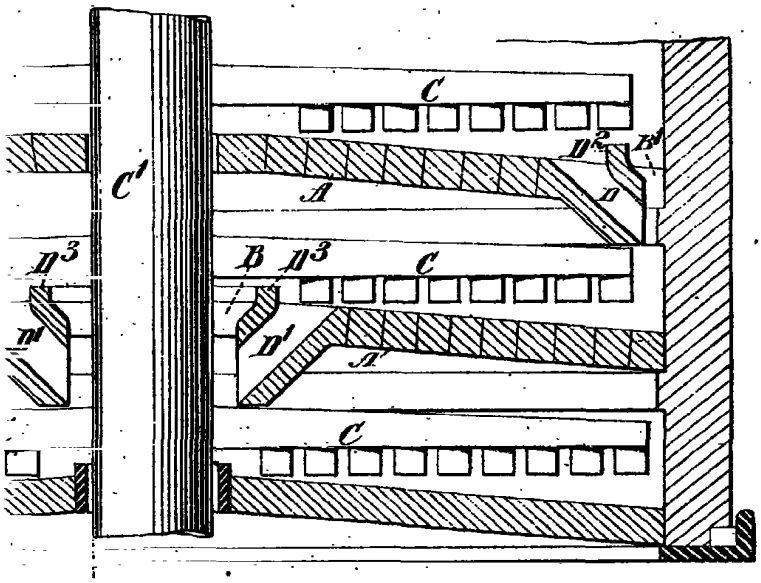
Fig. 3.



(2 SHEETS)

SHEET 1.

Fig. 1.



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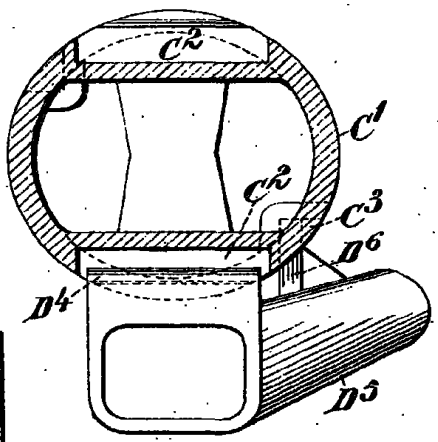
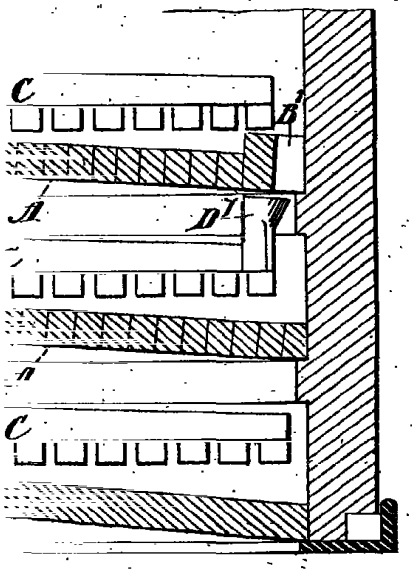


Fig. 2.



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