(No Model.)

I. B. HAMMOND.

ROASTING HEARTH ATTACHMENT FOR OPERATING STIRRERS.

No. 428,094. Patented May 20, 1890.

Fig. 2.

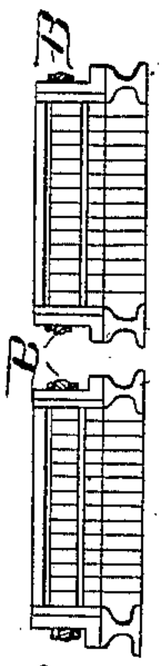

Fig. 1.

WITNESSES:

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ISAAC B. HAMMOND, OF CHICAGO, ILLINOIS.

ROASTING-HEARTH ATTACHMENT FOR OPERATING STIRRERS.

SPECIFICATION forming part of Letters Patent No. 428,094, dated May 20, 1890.

Application filed June 12, 1889. Serial No. 314,008. (No model.)

To all whom it may concern:

Be it known that I, ISAAC B. HAMMOND, of Chicago, in the county of Cook and State of Illinois, a citizen of the United States, have invented certain new and useful Improvements in Ore-Furnace Attachments, of which the following is a specification.

My invention relates to improvements in that class of furnaces employed particularly for chloridizing and desulphurizing ores, in which a plurality of rakes are used to spread the ore in the furnace so that it may be better exposed to the action of the heat.

The object of my invention is to improve the mechanism whereby the rake-rods are operated, as will hereinafter appear.

In the accompanying drawings, Figure 1 is a perspective of my machine, and Fig. 2 a front elevation of a pair of the rakes detached.

In the drawings I have represented in perspective a view of a portion of a furnace in connection with which my present improvement is shown in the form now best known to me. In the apparatus shown in the drawings A represents the end of the furnace, in the present instance provided with four floors and with two rakes B for each floor, each rake being provided with a pair of operating-rods. The outer ends of these rake-rods are attached to a vertical frame C, by means of which power is applied to the rake-rods to move the rakes to and fro over the floors of the furnace. The power to operate the rods is commonly hydraulic, and furnished from a cylinder D, in which works a piston connected to the rod-carrying frame C by suitable connections E E E E. Water is supplied to the cylinder before and behind the piston alternately by the pipes D' D^2, respectively.

To support the frame C as it travels, I provide a pair of rollers and a shaft, forming the carriage F, the wheels of which are adapted to run on a pair of suitable tracks G. As there is or may be a tendency through unequal friction, or from other causes, for the rakes to move with unequal resistance, and to prevent the tendency of the frame to twist and consequently of the rods to bind on this account, I provide in connection with the frame C, and preferably upon the extended axle of its carriage, a pair of notched wheels or pinions H H, adapted to mesh in fixed racks I I, of corresponding pitch, which racks extend parallel to the path of travel of the frame C. With the rack-and-pinion connection thus formed between the frame and its means of support, over which it travels, the tendency of the frame to twist or spring under the unequal resistance of the rake-rods is counteracted.

I have described and shown hydraulic power as that used for reciprocating the frame and rake-rods, as this type of power is usually most convenient. I have not shown, however, in the drawings a reversing-valve for admitting the head of water to the cylinder alternately on opposite sides of the piston, as such apparatus is well known to persons conversant with the art, forms no part of my invention, and is not necessary to its perfect exposition. It is moreover well known that steam-power may be substituted for hydraulic power when more convenient.

I claim—

The combination, with the rake-rods of an ore-furnace, of a frame C, to which the outer ends of the rods are attached, a suitable wheeled carriage connected with and carrying the frame, suitable rails or tracks upon which the wheels of the carriage may run, a pair of pinions journaled in the said frame, a pair of fixed racks with which the pinions may engage, said racks lying in the path of the to-and-fro motion of the said frame, and means for operating the carriage independent of the racks and pinions, substantially as set forth.

In testimony whereof I have hereunto subscribed my name this 5th day of June, A. D. 1889.

ISAAC B. HAMMOND.

Witnesses:

ALEXANDER THOMAS,

JOACHIM H. BURFEIND.