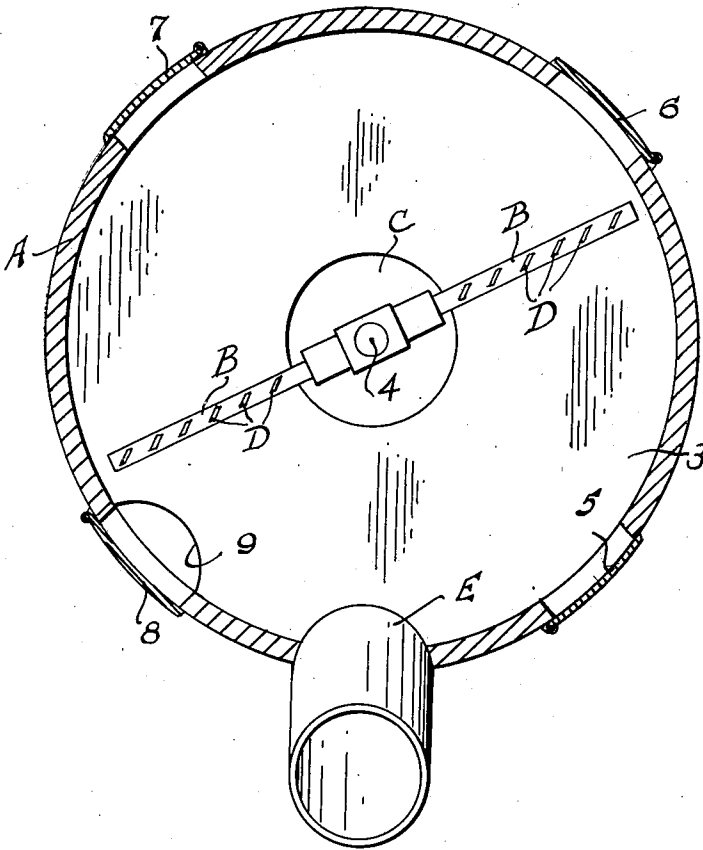


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ROASTER FURNACE

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ROASTER FURNACE

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1

My invention relates to multiple hearth roaster furnaces, and has for a principal object to prevent overloading of and consequent damage to rabble arms of such furnaces, caused principally by introduction of wet ores.

Further objects are to increase production of such furnaces, to permit the feeding of greater quantities of ore, to prevent breakage, and to eliminate work stoppages and the need for extra crews to clear the top ore hearth as a result of shut downs through overloading.

These and other objects I accomplish by an improvement in the top floor of such furnaces, as hereinafter described.

In the drawing, the single figure represents a horizontal section through a typical multiple hearth roaster furnace embodying my invention, the section being taken above the first or uppermost hearth, so as to show the rabble arms, feed hopper for ore to be processed, and customary clean-out doors.

Referring now to the drawing—in the illustrated roaster furnace A, which is largely of conventional construction, the usual rabble arms B, operating on the uppermost hearth 3, are fixed, as is customary, to a vertical rotating shaft 4 which extends through the usual central ore discharge opening C. Raw ore is fed to the ore hearth 3 through the customary ore hopper E, and is rabbled by the rabbling projections D of the rabble arms B as it is swept from the outer periphery of the hearth 3 to the central discharge opening C.

There are usually four clean-out doors in this type of furnace, the same being here shown at 5, 6, 7, and 8.

In front of the last door 8 (considering the rotating rabble arms B to pick up ore at the feed hopper E and carry it around in a counter-clockwise motion), I provide a secondary ore-discharge opening 9 through the hearth 3 at the outer peripheral margin thereof. Thus, a certain amount of the usually damp and sticky ore which resists normal movement to the primary central discharge opening C during the rabbling process, discharges through the secondary opening 9, thereby preventing overloading of the rabbling arms B and of the entire top floor or hearth 3 of the furnace where overloading and consequent trouble always occur in operation upon wet or damp ores.

In actual operation with my improvement, it has been found that excess ore dropped through the secondary opening 9 onto the second floor or hearth (not shown) does not cause any over-

2

loading of the rabble arms on such second floor, and that this is all the relief necessary to prevent overloading on the top floor or hearth 3. Expensive shut-downs and repairs, ordinarily necessitated due to overloading, are completely eliminated in instances where my invention is utilized.

It should be noted that the secondary ore-discharge opening 9 is disposed on that side of the ore feed hopper E which is swept last in the rotative sweep of the rabble arms. Thus, ore fed onto the uppermost hearth 3 of the furnace from the hopper E is rabbled through approximately a full rotative cycle of the rabble arms before being discharged through the secondary opening 9. As illustrated, the secondary opening 9 is preferably of approximately semicircular configuration, with its diameter coextensive with the width of the clean-out opening 8.

Having thus described a preferred form of my invention, I claim:

1. In a multiple hearth roaster furnace having two or more floors with four diametrically opposed doors opening onto the top floor, a feed hopper arranged for feeding wet ores onto the top floor, and rabble arms mounted centrally of the said top floor to agitate the ores and feed them toward the center, the combination of a primary central opening to discharge the ores from the top floor to the next floor; and a secondary opening through the top floor in front of the last door in rotation of the rabble arms from the feed hopper, said opening being at the outside edge of the top floor near the peripheral wall of the furnace to carry excess wet ore from the top floor down onto the second floor to prevent overloading of the rabble arms.

2. In a multiple hearth roaster furnace having a primary ore-discharge opening disposed centrally of the uppermost hearth, rabble arms mounted for rotation centrally of said opening, and means for feeding ore onto said hearth, a secondary ore-discharge opening disposed peripherally of said hearth and adjacent the said ore feeding means on the side thereof which is swept last in the rotative sweep of the rabble arms.

3. In a multiple hearth roaster furnace having a primary ore-discharge opening disposed centrally of the uppermost hearth, rabble arms mounted for rotation centrally of said opening, means for feeding ore onto said hearth, and a clean-out door through the side wall of the furnace, opening onto the said hearth, said clean-out door being disposed adjacent the said means

3

for feeding ore and on the side thereof which is swept last in the rotative sweep of the rabble arms, a secondary ore-discharge opening formed through said hearth substantially at the location of said clean-out door.

4. In a multiple hearth roaster furnace having a primary ore-discharge opening disposed centrally of the uppermost hearth, rabble arms mounted for rotation centrally of said opening, means for feeding ore onto said hearth, and a clean-out door through the side wall of the furnace, opening onto the said hearth, said clean-out door being disposed adjacent the said means for feeding ore and on the side thereof which is swept last in the rotative sweep of the rabble arms, a secondary ore-discharge opening of sub-

4

stantially semicircular formation extending through said hearth substantially at the location of said clean-out door, said secondary opening having a diameter which is substantially equal to the width of the clean-out opening.

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