P. N. NISSEN.

ORE STAMP MILL MORTAR.

APPLICATION FILED SEPT. 28, 1904.

945,135. Patented Jan. 4, 1910.

Fig. 1

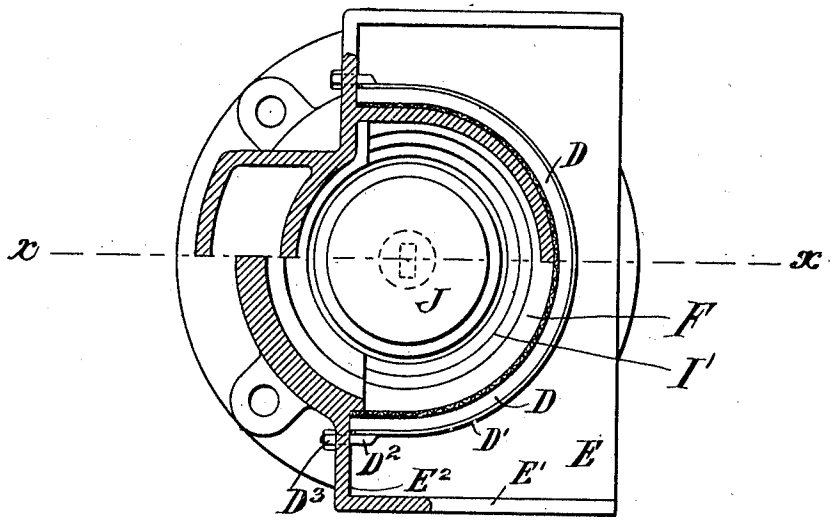
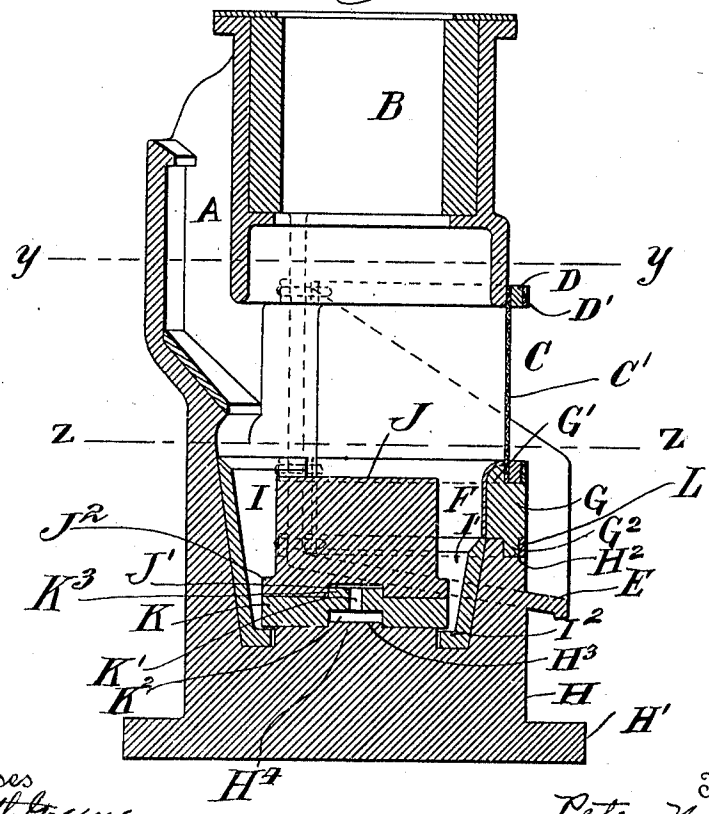


Fig. 2.



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UNITED STATES PATENT OFFICE.

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ORE-STAMP-MILL MORTAR.

945,135. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed September 28, 1904. Serial No. 226,274.

To all whom it may concern:

Be it known that I, PETER N. NISSEN, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Ore-Stamp-Mill Mortars, of which the following is a specification.

My invention relates to improvements in the mortars of stamp mills adapted to be used for crushing quartz and extracting precious metals therefrom.

It relates particularly to the portions of the mortar wherein the crushing or pulverizing operation takes place and is in the nature of an improvement on the device shown in my Patent No. 776,414.

The objects of my invention, among others, are to render the parts easily adjustable to different conditions and adapted to be renewed without disturbing the other parts of the machine.

As a rule stamp mills of this character are used in places where the facilities for repairing machinery or reconstructing parts thereof are extremely limited; and when it becomes necessary to reconstruct or repair a mill, or any part thereof, serious delay and considerable expense are often caused, not only reducing the output of the mill but sometimes compelling the entire mining plant to remain idle for a very considerable period, and thus causing a serious loss of labor. It will be apparent therefore that one of the greatest necessities in machinery of this kind is to have the parts of the mortar readily adjustable and renewable, without the necessity of employing skilled mechanical labor or machinery. It is with these considerations in view that the mortar embodying my invention has been designed.

The invention consists of the combination of parts and arrangement of details hereinafter described and claimed and illustrated in the accompanying drawings.

In the said drawings Figure 1 is a horizontal section of a mortar embodying my improvements, the upper half on the line *y—y* of Fig. 2 and the lower half on the line *z—z* of Fig. 2. Fig. 2 is a vertical section of the same on the line *x—x* of Fig. 1.

The base of the mortar H′ is circular in form and extends a suitable distance beyond the vertical walls thereof. The walls H of the mortar proper are substantially cylindrical, and the cavity within which the ore is crushed is of inverted cone frustum form. The walls of this cavity are provided with a suitable lining I, preferably of hardened steel, to resist the wear of the ore while being crushed on the dies. This lining conforms to the shape of the integral portions of the mortar walls by having its forward portion cut away, and the lower portion I′ extended to the upper edge of the cut-away portion of the mortar wall only. An annular flange I^2 extends from the lower edge of the lining I and is adapted to fill the bottom of the mortar cavity between the side walls and the circular table H^4. The table H^4 extends a short distance from the bottom of the mortar and is provided with a central boss H^3 adapted to enter the recess K^2 in the false bottom K, and thus hold the false bottom in position. The said false bottom is of greater diameter than the table H^4, so that its edges will extend beyond said table and overlap the flange I^2 of the lining, thus holding the said lining in position. The false bottom K in turn has a central boss K^3 adapted to engage the recess J′ in the bottom of the die J. An elongated opening K′ extends through the boss K^3 to the circular recess K^2, which is somewhat deeper than the boss engaging it, thereby leaving a cavity above the upper surface of said boss. The object of this arrangement is to provide a convenient means for removing the false bottom. It will be seen that by inserting an L- or T-shaped hook through the opening K′ into the recess K^2 and turning it, a ready means of removing the said false bottom is obtained. The die J is held in position by the engagement of its central recess J′ with the boss K^3 and has a flange J^2 at its lower edge extending to the edge of the false bottom. It will be observed that the sides of the die are substantially vertical, and the walls of the mortar being inclined outwardly from bottom to top therefore provide an annular space, narrowing from top to bottom between the die and the said mortar walls.

The mortar is provided with an inlet A for ore and water, an outlet C, provided with a screen C′, and has a cylindrical upper portion B adapted to allow the reciprocation of the stamp stem therein. The outlet C preferably extends more than half way

around the circumference of the mortar, and the screen C′ is held in position, covering this outlet, by strips D extending along its upper and lower edges, secured to the side flanges E^2 by means of a metallic strip D′ secured to the strip D and having screw bolts D^2 at both ends, which extend through the said side flange and are retained by nuts D^3 threaded on their outer ends. The strip D is preferably made of wood, or other comparatively soft material, so that it will securely hold the screen against slipping when pressed against the same by the tightening of the strip or band D′. In this manner the screen is securely held between the retaining strips and the edges of the discharge opening.

A table E, preferably cast integral with the mortar walls, extends around the lower edge of the discharge opening and is provided with vertical sides E′ running from the front edge of the table to the side flanges E^2, and by this means the product of the mortar is caused to flow out over the outer edge of the table.

In order to adjust the height of the lower edge of the discharge opening—and for other purposes—I have provided the removable segmental block G, which rests upon the step H^2 of the upper edge of the vertical mortar wall at its cut-away portion. This block G has a tongue G′ running along its top, which tongue has its outer vertical face back of the outer surface of the block, so that the lower edge of the screen and the screen-retaining strips may rest upon the upper surface of said block and the screen be held between the tongue G′ and the retaining strip which also assists in holding the upper part of the block in position. The inner surface of the tongue G′ is curved to receive the curved upper portion of the plate or metallic lining F, which lining covers the inner surface of the block. The lower surface of the block is also provided with a tongue, G^2, adapted to be held on the stepped portion H^2 by the band L, which is in all respects similar to the strip or band D′, and secured to the side flange of the mortar in the same manner. By employing the block G the height of the discharge opening may be adjusted to the height of the die J, as the said die wears down in use, and thus the said discharge opening will always be in the same relative position to the top of the die. It will be understood that, for the purpose of making such adjustment, blocks of various heights are provided, and also that the operation of removing one block, and replacing it with another, can be quickly and easily accomplished. This arrangement renders it unnecessary to move the die at all as it wears down; and when the die becomes worn down below the step H^2 the block may be dispensed with, and the lower edge of the screen secured to the said step H^2 direct. It will be understood also that screens of different widths must be used to cover the discharge opening when made adjustable by the use of the blocks G, or a screen used which is wider than the opening as shown in the drawings, and in this latter instance the screen, when the opening is comparatively narrow, may be allowed to extend above the upper edge of said opening. With this latter arrangement the screen may be adjusted vertically without detaching it from the mortar by simply loosening the retaining band.

What I claim as new is:—

1. In a device of the character described, the combination of an interior removable lining covering the walls of the mortar, an inwardly extending flange at the lower edge of said lining, a die resting in the mortar, the edges of which extend laterally beyond the inner edge of said flange, a recess in the bottom of said die and a removable part secured on the bottom of the mortar and adapted to engage said recess.

2. In a device of the character described, the combination of an interior lining, an inwardly extending flange at the lower edge of said lining, a table in the bottom of said mortar raised a distance equal to the thickness of said flange, a false bottom on said table extending beyond the same and overlapping said flange, a central boss on the table and a central recess of greater depth than the thickness of the boss is the false bottom adapted to receive said boss, said false bottom having an elongated opening extending from the said recess therethrough, a central boss in the upper surface of the false bottom, a die resting upon said false bottom and a central recess therein adapted to receive the boss in the false bottom.

3. The combination of a die resting on the bottom of the mortar, walls having an inlet for ore and an outlet opening for the product of the mortar above said die, a screen covering said outlet opening, a removable block extending along the lower edge of the outlet, a metallic lining on the inner side of said block extending from the opening to the level of the die and an interior lining of the mortar meeting the lower edge of the said block lining.

4. In a device of the character described, the combination of a cylindrical mortar, walls having inlet and outlet openings therein, a segmental detachable block partly closing the lower part of the outlet opening, a metallic lining on the inner side of said block and an interior lining of the mortar meeting the lower edge of the said block lining.

5. The combination of a mortar wall having an inlet opening for ore and an outlet

opening for the crushed product, a die below the said openings, a screen covering said outlet opening, a removable block extending along the lower edge of the outlet, means for securing the upper edge of the screen, and means for securing the lower edge of the screen constructed to be detachable without removing the means for securing the upper edge, and to assist in holding the removable block in position.

6. The combination of a mortar wall having an inlet opening for ore and an outlet opening for the crushed product, a die below the said openings, an adjustable screen covering said outlet opening, a removable block extending along the lower edge of the outlet, means for securing the lower edge of the screen, and means for securing the upper edge of the screen, detachable therefrom and constructed to permit of vertical adjustment of the screen without detachment of the last named securing means from the mortar.

7. The combination of a mortar, walls having inlet and outlet openings therein, a die in the lower part of the mortar, a removable lining extending above the die at one part and terminating near the top of the die at another part, a removable block partly closing the outlet at its lower part and a metallic lining on said block extending from the upper part of the portion of the lining which terminates near the top of the die to a point above said die.

8. In a device of the character described, the combination of an interior removable lining covering the walls of the mortar, an inwardly extending flange at the lower edge of said lining, a die supported in the mortar and overlapping said flange, and means for holding the said die against lateral movement and entirely out of contact with the side walls of the mortar.

9. In combination with a substantially cylindrical mortar having walls provided with an outlet opening, a segmental block extending along the lower edge of said outlet opening and seated on the mortar wall, a metal band extending around the outside of and normally in contact with but disconnected from said segmental block, and adjustable means connecting said band with the mortar at the ends of said lower edge of the opening.

10. In a mortar, the combination of an internal lining covering the walls of the mortar, an inwardly extending flange at the lower edge of said lining, a table in the bottom of the mortar raised a distance equal to the thickness of said flange, a false bottom on said table extending laterally beyond the same and overlapping said flange, and a die resting on said false bottom, the false bottom having a recess in its bottom to receive a corresponding boss on the table and the die having a recess in its bottom to receive a corresponding boss on the false bottom.

Witness my hand this 19th day of September, 1904.

PETER N. NISSEN.

Witnesses:
R. J. ADCOCK,
T. D. REYMERT.