

P. N. NISSEN.
ORE STAMP MILL.

APPLICATION FILED FEB. 29, 1904.

NO MODEL.

Fig. 1.

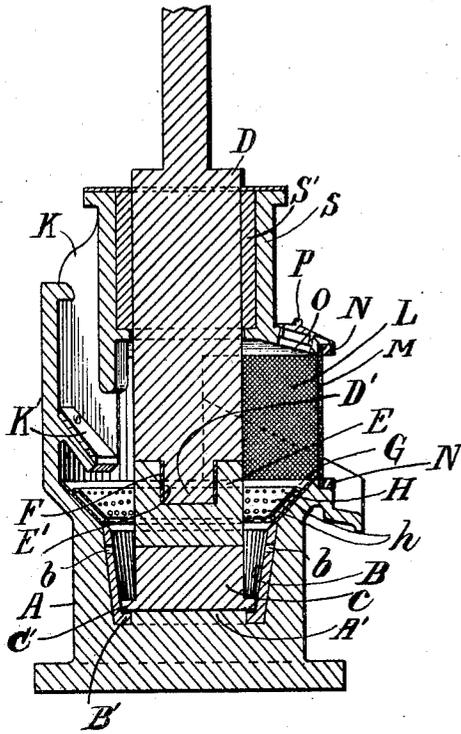


Fig. 2.

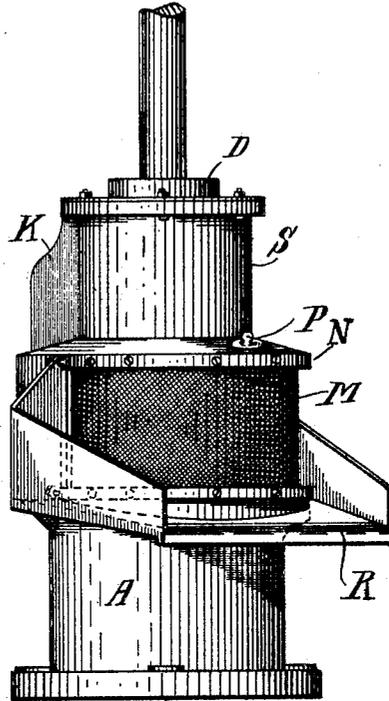


Fig. 3.

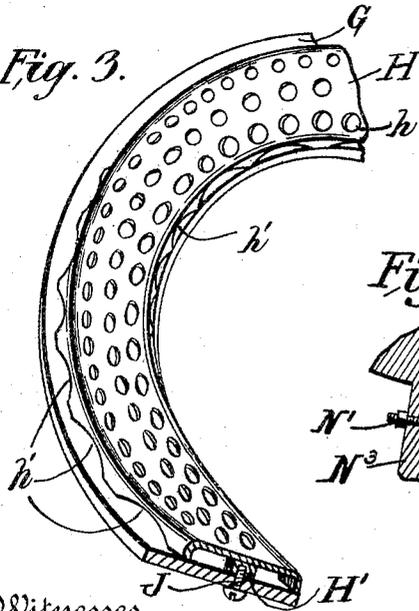


Fig. 4.

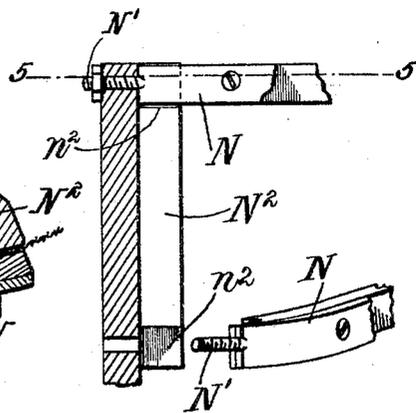
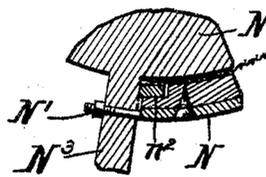


Fig. 5.



Witnesses
 C. M. Tuttle
 B. J. Smith.

Inventor
 Peter N. Nissen
 By his Attorney Stephen J. Cox.

UNITED STATES PATENT OFFICE.

PETER N. NISSEN, OF PRESCOTT, ARIZONA TERRITORY.

ORE STAMP-MILL.

SPECIFICATION forming part of Letters Patent No. 776,414, dated November 29, 1904.

Application filed February 29, 1904. Serial No. 195,759. (No model.)

To all whom it may concern:

Be it known that I, PETER N. NISSEN, a citizen of the United States, and a resident of Prescott, in the county of Yavapai and Territory of Arizona, have invented certain new and useful Improvements in Ore Stamp-Mills, of which the following is a specification.

My invention relates to ore stamp-mills, and particularly to what is known as the "mortar" of such mills and the adjacent parts. Its objects are, among others, to provide a simple, strong, and durable construction of great efficiency which can be manufactured at a comparatively small cost and the wearing parts of which may be easily and perfectly renewed without disturbing the other parts.

My device relates to that class of stamp-mills in which the ore is fed to the mortar and crushed on a die therein by means of a reciprocating pestle or stamp and after being pulverized is caused to flow out through a screen or strainer, where the metal not recovered within the mortar is collected by suitable means outside the same. My mortar is particularly designed to be used in the milling of precious-metal quartz.

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

In the said drawings, Figure 1 is a vertical section of a stamp-mill mortar and adjacent parts embodying my invention. Fig. 2 is a three-quarter side view of the same. Fig. 3 is an enlarged detail of the amalgamating-plate of the mortar. Fig. 4 is an enlarged detail of a portion of the screen-holding frame. Fig. 5 is a detail sectional view on the broken line 5 5 of Fig. 4.

The mortar A is round in form and has a cone-frustum-shaped recess within which the ore is crushed. At the center of this recess, in its bottom, is a central raised table A', upon which the removable die C rests. The walls of the recess are lined with a removable lining B, fitting closely thereto and provided with an annular horizontal flange B' at its lower edge, which extends to the table A'. The die C has an outwardly-extending flange C', which

extends to the lining B and over the flange B'. This arrangement holds the lining in position and prevents it from working up when the mill is in operation. The lining and die are preferably made of highly-tempered steel to afford the maximum amount of resistance to the wearing of the ore crushed within the mortar. Holes b' in the lining facilitate its removal.

The stamp-rod D is provided with a removable shoe E, secured thereto by means of the recess E', which receives the central boss D', the two being secured together by a suitable filling F, of wood or other serviceable material, which will expand by the action of moisture after being packed or wedged therein.

The upper portion of the mortar is flared at an angle of about forty-five degrees and is lined with an amalgamation-plate G, fitting closely thereto and extending to the discharge level of the mortar. This plate is preferably copper-lined with silver when used in connection with gold-ore and is removable, so that it may be readily cleaned and the gold collected thereon recovered. In order to prevent scouring of the amalgamating-plate, I provide it with a protecting-plate H, made of any suitable metal and secured in position by a screw J, which passes through from the outside of the amalgamating-plate and is threaded into a stud or boss H' on the inner side of the protecting-plate. Any desired number of these fastenings may be provided. In order to allow free access of the crushed ore to the amalgamating-plate, the protecting-plate is numerously perforated and provided at its inwardly-turned edges with notches h', formed by cutting away portions of the said edges, thus forming serrated or notched flanges. The perforations h of the protecting-plate are preferably larger at the top than at the bottom of the same, and the notches h' are larger in the lower edge than at the upper, so that any pieces of partially-pulverized ore which may enter between the two plates near the upper portion thereof may have free egress therefrom as they gravitate to the stamp and die.

The crushed ore is ejected through the screen or strainer M, which covers the semi-circular opening L of the mortar and prevents

the larger particles from escaping there-through, and in the flange above the discharge-opening is a port or hole O, provided with a lid P, through which hole the hand may be inserted and particles having a tendency to clog the screen removed. This hole is an important provision, as without it the screen could not be freed of obstructions without removing it from the mortar, and while care is exercised to prevent the feeding of wood or other similar substances to the mill along with the ore such substances, nevertheless, are frequently allowed to enter, and unless some means is provided for removing them they will float on the partially-pulverized ore and soon find their way to the screen, obstructing the meshes of the same. In the port O, however, there is provided a ready means of access to the interior of the screen for the removal of such obstructions without interfering with the operation of the mortar or necessitating the removal of any of its fixed parts. The pulp passing through the screen flows over the table R upon suitable amalgamation-plates or into any other receptacle that may be provided therefor.

The screen is held in position by means of a suitable frame which secures its edges at the edges of the discharge-opening L. This frame consists of the upper and lower segmental strips N and the straight vertical strips N², engaging the horizontal and vertical edges, respectively, of the screen. The segmental strips N are preferably constructed of wood, reinforced on the outer side by metal, having screw-bolts N' integral with said metal at either end. These screw-bolts are adapted to pass through holes in a flange N³ of the mortar and are secured, by means of a nut, on the rear side of said flange. The vertical strips N² are mortised at both ends, as shown at n², to receive the mortised ends of the horizontal strips N, and in this manner the said vertical strips are held in position and caused to hold the edges of the screen beneath them. It will be seen that the screen-holding frame may be quickly removed for the purpose of renewing the screen or attending to any of the parts within the mortar, while at the same time the screen is securely held in position without any obstruction of the discharge-opening by the retaining means.

The upper portion of the mortar is provided with a sleeve S, having a suitable lining S', and within this sleeve the stamp-rod D reciprocates and is prevented thereby from having any lateral motion.

The ore is fed to the mortar through the hopper K, which has a wear-plate K' on its lower lip, which may be readily renewed when worn out by the friction impact of the ore in falling thereon.

In operation the ore fed through the hopper to the mortar, together with a suitable amount of water, is crushed upon the die by

the stamp, which may be lifted and allowed to fall by means of any suitable mechanism. The ore as it is crushed forms a thick liquid mass, the smaller and lighter particles of which pass upward over the amalgamating-plate, through the screen, and out over the table R, and any particles too large to pass through the screen gravitate to the die, where they are pulverized, and this circulation of the particles of ore continues until they are crushed fine enough to pass through the screen. While this operation is going on the amalgamating-plate is continually collecting gold from the liquid mass as it passes over the surface thereof, and a large quantity of the gold in the ore is amalgamated by this plate.

I claim—

1. In an ore stamp-mill, the combination of a mortar, provided with an anvil projecting upwardly from the bottom thereof, a removable interior lining therein having a horizontal inwardly-projecting flange surrounding said anvil, and a removable die within said mortar resting upon the anvil and overlapping said horizontal flange of the lining whereby said lining is held in position.

2. In an ore stamp-mill, the combination of a mortar having an inlet for the ore, a die extending upward from the bottom of the mortar, a reciprocating stamp adapted to impinge upon said die, an amalgamating-plate in the upper part of the mortar, a protecting-plate covering a portion of said amalgamating-plate and removed a slight distance therefrom, and provided with openings of different sizes, and means for securing the same in position on the amalgamating-plate.

3. In an ore stamp-mill, the combination of a mortar having an inlet for ore, a die extending upward from the bottom of the mortar, a reciprocating stamp adapted to impinge upon said die, an amalgamating-plate in the upper part of the mortar, and a protecting-plate covering a portion of said amalgamating-plate and removed a slight distance therefrom and provided with openings, the openings in the lower edge thereof being larger in diameter than the openings near the upper end thereof.

4. In an ore stamp-mill, the combination of a mortar having an inlet for ore, a die extending upward from the bottom of the mortar, a reciprocating stamp adapted to impinge upon said die, an amalgamating-plate in the upper part of the mortar, and a perforated protecting-plate covering a portion of said amalgamating-plate removed a slight distance therefrom and provided with serrated or notched flanges resting thereon, whereby the pulp may pass upward over said protecting-plate while portions thereof pass downward between said plate and the amalgamating-plate.

5. In an ore stamp-mill, the combination of a mortar having an inlet for ore and an outlet for the pulverized product, a die within said mortar, a stamp adapted to impinge upon said

die, a screen covering said outlet, and a frame for holding said screen, consisting of vertical strips resting against the vertical edges of the screen, and horizontal strips detachably secured to the mortar adapted to hold said vertical strips against the vertical edges and clamp both vertical and horizontal edges of the said screen between the strips and the edges of the opening.

6. In an ore stamp-mill, the combination of a substantially cylindrical mortar having a cone-frustum-shaped recess within which the ore is crushed, an annular amalgamating-plate surrounding said recess and extending upwardly and outwardly from the same and a protecting-plate covering said amalgamating-plate and having portions extending to contact with the mortar for the purpose of supporting said protecting-plate and separating the same from the amalgamating-plate.

7. In an ore stamp-mill, the combination of a mortar of substantially cylindrical form, an inlet for ore and an outlet at one side of the mortar for the crushed product, a crushing-die within the mortar, a substantially semi-cylindrical screen covering said outlet, vertical strips disconnected from said screen adapted to hold its vertical edges in contact with

the walls of the mortar, horizontal strips resting upon the horizontal edges of the screen and upon said vertical strips, and a detachable connection between said horizontal strips and the mortar.

8. In an ore stamp-mill, the combination of a mortar having an inlet for ore, walls extending above the mortar proper forming a chamber to receive the pulverized product, an outlet in said walls for the pulverized product, a screen covering said outlet and resting against its edges, detachable vertical strips adapted to hold the vertical edges of said screen between them and the said walls, horizontal strips holding said vertical strips and the horizontal edges of the screen, said strips being cut away at their points of intersection, whereby they are permitted to contact with the screen throughout their entire length, and means for detachably securing the strips to the walls of the mortar.

Witness my hand, this 17th day of February, 1904, at the city of Prescott, in the county of Yavapai and Territory of Arizona.

PETER N. NISSEN.

Witnesses:

HENRY T. ANDREWS,
SAMUEL L. PATTEE.