

APPLICATION FILED JULY 9, 1906.

Patented Nov. 9, 1909.

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M. P. BOSS.
STAMP MORTAR.

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939,208.

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2 SHEETS—SHEET 2.

Fig. 2.

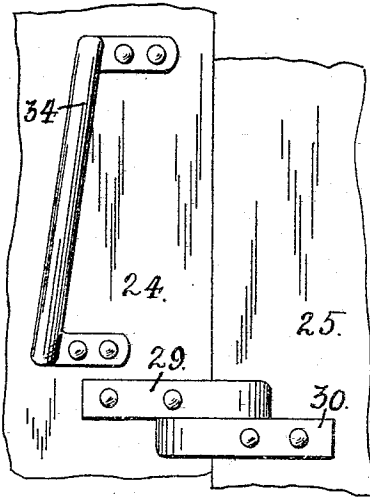
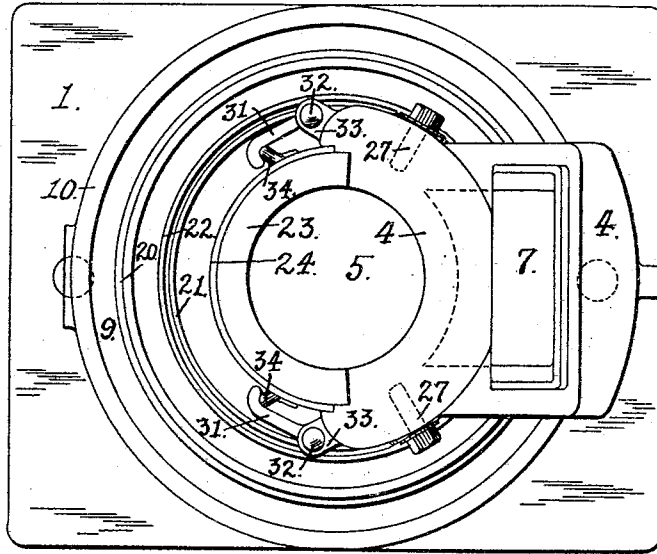


Fig. 3.

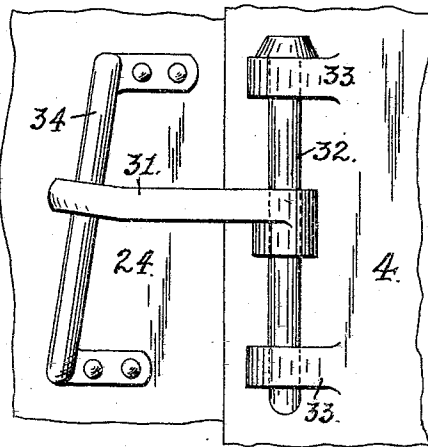


Fig. 4.

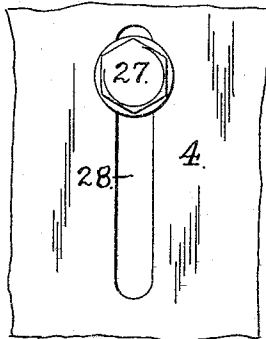


Fig. 5.

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UNITED STATES PATENT OFFICE.

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STAMP-MORTAR.

939,208.

Specification of Letters Patent.

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Application filed July 9, 1906. Serial No. 325,300.

To all whom it may concern:

Be it known that I, MARTIN P. BOSS, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Stamp-Mortars, of which the following is a specification.

My invention relates to the class of mortars for stamp-mills, and it consists essentially in a dividing wall separating the mortar cavity into an inner space in which the stamp operates, and into which the ore is fed, and an outer space communicating with the inner space under said wall, the ore being expelled into said outer space by the blow of the stamp.

It also consists in the novel combination of parts hereinafter fully described.

The objects of my invention will hereinafter fully appear.

Referring to the accompanying drawings Figure 1 is a vertical section of my stamp-mortar. Fig. 2 is a top plan of the same. Fig. 3 is a detail elevation showing the supporting straps of the dividing wall sections. Fig. 4 is a detail elevation showing the hook for clamping the wall sections together. Fig. 5 is a detail elevation showing shot and bolt for vertically adjusting the dividing wall.

The mortar casting comprises a base 1 adapted to be anchored to a bed or foundation; a body 2 in which is formed the cavity 3; a vertical side bracket 4 with a housing head 5 for the stamp 6, (the stamp being shown in dotted lines); and a feed chute 7.

The mortar cavity 3 has a boundary wall 8, outside of which is a discharge trough 9 bounded by an outer wall 10, through which is made the delivery hole 11. In the bottom of the mortar cavity 3 is the bed plate 12, to which is fitted the die 13, against which the shoe 14 of the stamp acts to crush the ore.

15 is a sizing ring. It fits within the wall 8 of the mortar cavity, the connection being an adjustable one formed by the packing 16, which enables the sizing ring to be adjusted up or down according to the wear of the shoe and die, as will be presently explained. The sizing ring has on its inner surface, near its lower portion, a downwardly sloping ledge 17 fitted with a wearing plate 18, the lower edge of which terminates a little below the plane of the top of the die 13. The upper portion of the sizing ring is outwardly sloping as shown

at 19, which portion ends in a straight flange 20 forming the overflow rim of the sizing ring, said rim lying, as shown, above the discharge trough 9. One or more overflow barriers are located inside the sizing ring. Two are here shown, the inner one 21 fitting above and separated at its lower edge from the wearing plate 18, and the outer one 22 being about midway between said inner barrier 21 and the overflow flange 20 of the ring 15, and, preferably, higher than said flange. The barrier 22 is raised at its lower edge above the slope 19, so that a space is left under it.

The housing head 5 of the vertical bracket 4 of the casting is formed by the bracket proper on one side, and by a removable section 23 on the other side, these parts forming a long housing for the stamp. From this housing extends downwardly what I term a dividing wall for the mortar cavity. It may be constructed in any suitable manner. A good construction consists of two opposing sections abutting at their meeting edges, the one section 24 fitting outside, at its upper end, the lower portion of the housing section 23, and the other section 25, fitting within the bracket 4. The sections forming the dividing wall extend down into the mortar, between the inner barrier 21 of the sizing ring and the stamp and terminate in a plane below the normal level $w-w$ of the liquid or semiliquid content of the mortar. On their inner surface, at their base, they are fitted with a wearing plate 26, sloped inwardly to serve also as a directing surface to guide the fed material to the vicinity of the shoe and die. This dividing wall is supported, held together and is made vertically adjustable, as follows. The section 25 is bolted to the bracket 4 by bolts 27 which pass through elongated slots 28 in the bracket, thereby enabling said section to be moved up or down according to the wear on the shoe and die. The other section 24 is supported from the section 25, by means of straps 29 upon it, resting on straps 30 on said section 25; and the two sections are clamped together by means of a hook 31, one on each side, which said hook is fitted at its base to swing and to slide vertically upon a pin 32 mounted in lugs 33 on the bracket 4 and engaging with its hooked end a vertically disposed sloping rail 34 on the dividing wall section 24. The slope of this rail 34 is downwardly away from the pivotal

center of the hook, so that when the hook 31 is driven down, it is forced tighter upon the rail, thereby drawing the section 24 to the section 25. When the hook is knocked upwardly on its pin 32, it frees itself from the sloping rail and may be swung away from it, thereby allowing the wall section to be separated. A handle 35 is fitted to section 24 to remove it.

36 is a wearing plate in the feed chute 7.

The operation of the mortar is as follows:—The ore and water are fed through the chute 7, and fall down in the space between the stamp and the dividing wall 24, 25, and fill the mortar cavity 3 up to the level *w—w* thus submerging the lower end of the dividing wall. As the stamp rises, the level of the mortar content is lowered, due to the removal of the displacing stamp shoe 14 and to a certain amount of suction in this removal, and that portion of the material which lay in the space between the sizing ring 15 and the dividing wall, returns or flows back under the wall, to the vicinity of the die 13. When the stamp drops, its displacement, added to the impetus of the blow, forces or expels the material out again and raises its level. There is thus created, at each stroke of the stamp, a surging flow outwardly, and a resurge inwardly, passing beneath the dividing wall. This surge, the air being excluded by the submerged wall, is a comparatively quiet one, thereby enabling the space between said wall and the sizing ring 15 to act as a sizing chamber, in which the lighter and sufficiently crushed material will seek the top of the wave, while the heavier material, which still requires to be further crushed, will return to the vicinity of the shoe and die to be again acted upon. In the sizing or separating chamber, the lighter and fully crushed material will be carried over the top of the overflow rim 20 of the ring 15 and will fall into the discharge trough 9 below. This overflow of the finished pulp is continuous and uninterrupted around the whole mortar. Slightly coarser material may flow back under the barriers, into the crushing space again.

Heretofore, the sizing or separation of the sufficiently crushed material, from that which has to be subjected to further action of the stamp has been effected by screens, with which the wall of the mortar is provided. That which is fine enough is splashed through the screens, while the coarser material falls back. The screens are expensive, sometimes difficult to obtain, require time and labor to be fitted, and replaced, and soon wear out under the severe friction of the operation of the mill. These are disadvantages which, heretofore, have been impossible to avoid. By my invention they are all obviated by the fact that screens may be dispensed with, as the overflow siz-

ing chamber, rendered possible and effective by the dividing wall in the mortar cavity, serves to size and separate the finished pulp. The parts constituting this chamber are cheap in construction, durable, subject to little wear, and form part of the mortar itself, thereby being permanent and requiring no renewal. I may state, however, that in case it be desired, the walls or barriers of the sizing chamber may be screens or fitted with screens, in which case, they would not be open to the usual objection of great frictional wear, because the submerged dividing wall of the mortar would serve to protect them by creating a comparatively quiet zone in which the separation would take place.

In the drawings here illustrating my invention, a single mortar is shown, from which it follows that the contours are all circular. It is obvious however, that when the mortar is adapted for a number of stamps, it will assume a different shape, and the construction constituting my improvement will be varied in contour accordingly.

The object of the vertical adjustment of the sizing ring 15, and of the dividing wall 24, 25, is to set these parts down to their proper relative position to each other, to the ore level, and to the shoe and die, as said shoe and die wear.

It is to be noted, as I have before stated, that the overflow or discharge of the finished pulp is uninterrupted throughout the whole circumference of the mortar. This advantageous result is gained by the construction of the vertical bracket 4, which is curved outwardly from the mortar body, as shown, thereby enabling the mortar walls and its sizing ring to be formed continuous within said curved out portion, which thus offers no obstruction to the continuous discharge of the pulp.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is—

1. In a stamp-mortar, a vertically adjustable dividing wall separating it into an inner space in which the stamp operates and to which the ore is fed, and an outer space communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp, said wall having the inner surface of its lower end inwardly sloping to direct the material to the crushing surfaces.

2. In a stamp-mortar, the combination of a sizing ring fitted to the wall of the mortar cavity, and an inner dividing wall separating the mortar cavity into an inner space in which the stamp operates and to which the ore is fed, and an outer space between said wall and ring communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp.

3. In a stamp-mortar, the combination of a vertically adjustable sizing ring fitted to the wall of the mortar cavity, and a vertically adjustable inner dividing wall separating the mortar cavity into an inner space in which the stamp operates and to which the ore is fed, and an outer space between said wall and ring communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp.

4. In a stamp-mortar, the combination of a sizing ring fitted to the wall of the mortar cavity, and an inner wall descending into said cavity, to a plane below the normal level of the ore therein, and separating said cavity into an inner space in which the stamp operates and to which the ore is fed, and an outer space between said wall and ring communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp.

5. In a stamp-mortar, the combination of a vertically adjustable sizing ring fitted to the wall of the mortar cavity, and an inner vertically adjustable dividing wall descending into said cavity to a plane below the normal level of the ore therein, and separating said cavity into an inner space in which the stamp operates and to which the ore is fed, and an outer space between said wall and ring communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp.

6. In a stamp-mortar, a dividing wall descending into its cavity to a plane below the normal level of the ore therein, and separating it into an inner space in which the stamp operates and to which the ore is fed, and an outer space communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp, and an overflow barrier in said outer wall.

7. In a stamp-mortar, the combination of a sizing ring fitted to the wall of the mortar cavity, an inner dividing wall separating said mortar cavity into an inner space in which the stamp operates and to which the ore is fed, and an outer space between said wall and ring communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp, and an overflow barrier in said outer space.

8. In a stamp-mortar, the combination of a vertically adjustable sizing ring fitted to the wall of the mortar cavity, a vertically adjustable dividing wall separating the mor-

tar cavity into an inner space in which the stamp operates and to which the ore is fed, and an outer space between said wall and ring communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp, and an overflow barrier in said outer space.

9. In a stamp-mortar, the combination of a sizing ring fitted to the wall of the mortar cavity, an inner dividing wall descending into said cavity to a plane below the normal level of the ore therein, and separating said cavity into an inner space in which the stamp operates and to which the ore is fed, and an outer space between said wall and ring communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp, and an overflow barrier in said outer space.

10. In a stamp-mortar, the combination of a vertically adjustable sizing ring fitted to the wall of the mortar cavity, an inner vertically adjustable dividing wall descending into said cavity to a plane below the normal level of the ore therein, and separating said cavity into an inner space in which the stamp operates and to which the ore is fed, and an outer space between said wall and ring communicating with the inner space under said wall, into which said outer space the ore is expelled by the blow of the stamp, and an overflow barrier in said outer space.

11. A stamp-mortar, having a continuous rim discharge, and having also a bracket extending outwardly from it below the level of its discharge and rising beyond and clear of said discharge, said bracket having its upper end formed with a feed opening and one side of a stamp-housing, and a separate section forming the other side of said housing.

12. A stamp-mortar, having a continuous rim discharge from its cavity and a circumscribing discharge trough outside of and below the peripheral discharge, said mortar having also a bracket extending outwardly from it below and beyond the discharge trough, and thence rising clear of the trough and peripheral discharge, and having its upper end formed with a feed opening and one side of a stamp-housing, and a separate section forming the other side of said housing.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARTIN P. BOSS.

Witnesses:

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J. COMPTON.