J. MICHEL.

Amalgamator.

No. 211,248. Patented Jan. 7, 1879.

Fig. 1

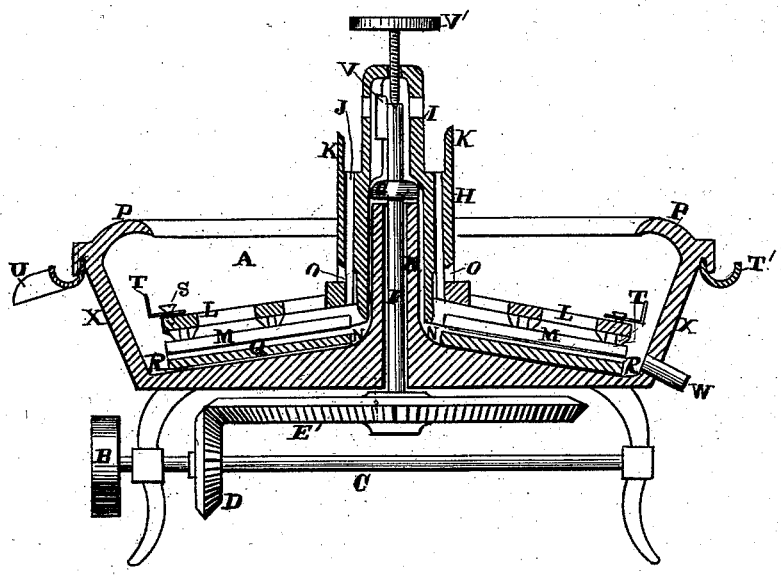


Fig. 2

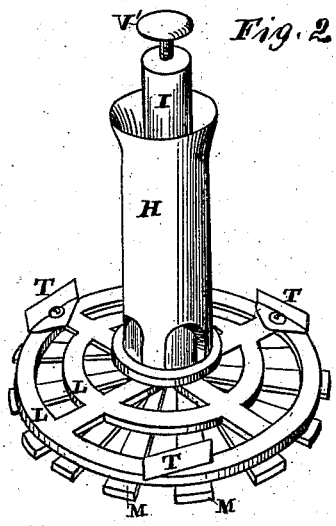
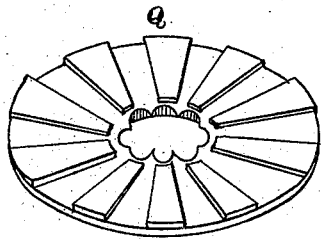


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

JUSTIN MICHEL, OF NEVADA CITY, CALIFORNIA.

IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **211,248**, dated January 7, 1879; application filed September 16, 1878.

To all whom it may concern:

Be it known that I, JUSTIN MICHEL, of Nevada City, county of Nevada, and State of California, have invented an Improved Amalgamating-Pan; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to an improved amalgamator for working ores containing precious metals; and my improvements consist in a novel method of forming a pan so as to provide interior and exterior bodies of mercury, into which the ore is injected by centripetal and centrifugal action, and this action is facilitated by peculiar construction and arrangement of the parts of the pan, as will be more fully described by reference to the accompanying drawings, in which—

Figure 1 is a vertical section. Fig. 2 is a view of the muller. Fig. 3 is a view of the dies.

My invention consists in a pan provided with a bottom gradually descending from the center to the circumference, and provided with a flaring rim which merges into an inwardly-curved projection or rim, whereby a more rapid feed and circulation are kept up, the form of the bottom always starting the current at once outwardly, and aiding the centrifugal action.

Let A represent my amalgamating-pan, with inclined sides X, mounted on the usual standards, and having the pulley B, shaft C, gear D, and pinion E′, as shown, said pulley, shaft, gear, and pinion being for the purpose of directing the power to the operating parts of the mechanism, as hereinafter described.

In the center of the pan is the hollow standard E, which projects upwardly above the top of the pan, and inside of which plays the vertical shaft F, having the pinion E′ at its lower end, which engages with the gear D. A collar, G, is formed on this vertical shaft, which revolves on the top of the hollow standard, thus forming a bearing for said shaft. A hollow cylinder or sleeve, H, slips down over the shaft F and standard E. This sleeve has an extension, I, made somewhat smaller than the sleeve, and inside of which the upper end of the shaft F projects, the sleeve itself inclosing the standard E. At the point where the sleeve and extension join an offset is formed, as shown, the sleeve being larger in diameter than the extension, and at the same time thicker. Feed-holes J are bored or formed vertically down through the sleeve H, communicating with the center of the pan, as shown. Several of these feed-holes are formed in the sleeve, and the pulp is fed to the pan through them. An upwardly-extending rim or flange, K, is formed on or attached to the upper end of the sleeve H, as shown, and answers as a sort of hopper above the feed-holes. The ore fed into this ring or hopper passes down through the feed-tubes to the center of the pan, so that a sort of funnel is formed for the continuous introduction of ore and water. To the lower part of the sleeve H are attached the muller rings or frames L, to which are secured the shoes M by dovetail mortise and tenon.

The dies Q are so placed on the bottom of the pan as to leave a groove, N, around the center of the pan, into which quicksilver is placed. The lower part of the sleeve H is cut away above this groove N, as shown at O, so that amalgamation may be accomplished by centripetal injection, the centripetal force being induced by means of the curved rim P, as hereinafter described.

The dies Q are so formed as to leave a groove, R, around the pan, into which quicksilver is introduced for amalgamation by centrifugal injection, the centrifugal force being induced by the rotation of the arms and shoes attached to the sleeve, as herein described.

On the upper sides of the arms or frames L are placed adjustable agitators T, which, by their peculiar shape, regulate the centrifugal motion of the water. These agitators have a set-screw or common screw, S, by which they are attached to the arms or frame, and which will hold them in any desired angle or position.

The pan has an inwardly-projecting curved rim, P, which tends to direct the heavier particles of ore to the center, as hereinafter described. The lighter particles flow over the edge of this rim and fall into the channeled plate or conveyer T′, passing from this through the spout U to the settlers, or wherever it is desired to lead them.

A feather, V, is formed on the upper end of the vertical shaft F, which engages with a longitudinal groove formed in the extension I of the sleeve H, so that when the shaft F is set in motion this motion is imparted to the sleeve carrying the arms and shoes.

In order to be able to regulate the height of the shoes above the dies, a set-screw, V′, passes down through the upper end of the extension I, and its lower end rests in the top of the shaft F, a suitable bearing being formed at that point. As this set-screw is screwed through the extension, by turning it the extension may be raised or lowered, thus raising or lowering the sleeve carrying the arms and shoes. A discharge-pipe, W, on the lower side of the pan, is used for drawing off the contents when it is desired to clear up the pan.

It will be seen that continuous feed and discharge may be maintained in my improved pan. The pulp may be led by appropriate means into the ring or receiver K, and is directed by the holes in the shell down to the bottom of the pan, where it falls into the quicksilver in the central groove, N. The natural centrifugal motion imparted to the mass of pulp by the motion of the shoes and agitators is such as to direct it to the outer edge of the pan, where it again mingles with the quicksilver in the groove or channel R. The pulp is then directed by the inclined or beveled edge of the pan toward the upper edge of the pan, where it strikes the inwardly-projecting curved rim P, which throws the heavier particles of pulp by centripetal action toward the central groove, N, through the opening O, where they may again mingle with the quicksilver. The lighter material may then pass off with the water, which is continuously overflowing all around the pan, as herein described. In this way the pan is kept free by the ore passing off in the muddy water after it is ground sufficiently fine to float, and the ore is not ground and reground, as in other pans.

The grooves N and R are formed by the dies or false bottom, which are of the same dimensions as the shoes or grinders, and which do not cover the entire surface of the bottom, but leave the channel around the outer edge and center of the pan, as described. These grooves are filled with quicksilver, where it is held in one body, instead of being ground with the pulp, as is the case with many ordinary pans. The quicksilver not being ground is not floured or ground into fine particles, which will pass off and be lost.

As a uniform motion of the water and pulp while the pan is in operation is desirable, the adjustable agitators are added. When the shoes are new the desired velocity is obtained without the use of the agitators; but as the former wear down the position of the latter is changed, so as to keep the motion of the water and pulp the same.

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

1. The pan A, having a flat descending bottom from center to circumference, the outwardly-inclined sides X, and inwardly-curved rim or lip P, in combination with the rotating shoes and muller, whereby a continuous grinding and circulation of pulp take place, substantially as herein described.

2. The pan A, with its outwardly-inclined sides X and the inwardly-curved rim P, in combination with the muller L and the adjustable flanges or agitators T, whereby the outward flow of the current is increased and is thrown up the sides into the returning curve, substantially as herein described.

In witness whereof I hereunto set my hand.

JUSTIN MICHEL.

Witnesses:
R. C. WALRATH,
A. HOARD.