Hepburn & Peterson.

Ore Amalgamator.

No. 42,371. Patented Apr. 19, 1864.

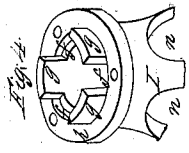


Fig. 4.

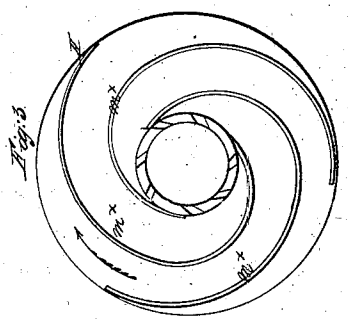


Fig. 3.

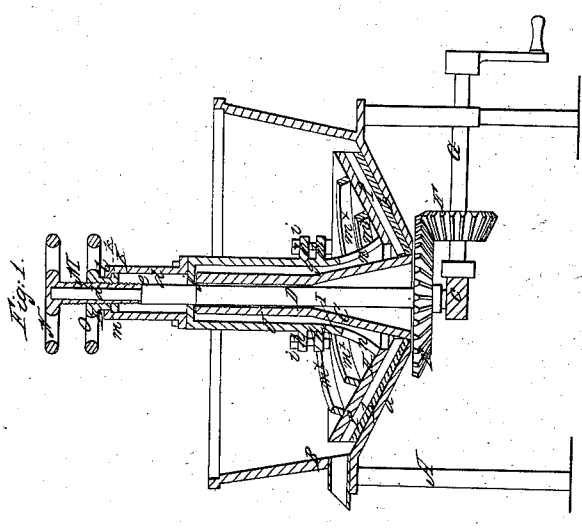


Fig. 1.

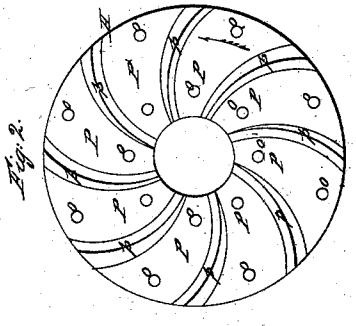


Fig. 2.

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UNITED STATES PATENT OFFICE.

W. H. HEPBURN AND G. K. PETERSON, OF SAN FRANCISCO, CALIFORNIA.

MACHINE FOR GRINDING AND AMALGAMATING GOLD AND SILVER.

Specification forming part of Letters Patent No. 42,371, dated April 19, 1864.

To all whom it may concern:

Be it known that we, W. H. HEPBURN and G. K. PETERSON, of San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Gold and Silver Amalgamator; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical central section of our invention; Fig. 2, a bottom view of the muller; Fig. 3, a plan or top view of the same; Fig. 4, a detached perspective view of the joint or connection between the muller and the driving mechanism.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in the employment or use of a pan provided with a conical bottom and a muller, which is in the form of a conical shell, and provided at its upper surface with spiral ribs or flanges, and at its under surface with shoes, so disposed and arranged as to form spiral grooves, all being so constructed and arranged to operate in such a manner that all the pulp or pulverized ore will be brought in contact with the quicksilver in the pan, and all the particles of gold perfectly amalgamated.

To enable those skilled in the art to fully understand and construct our invention, we will proceed to describe it.

A represents a frame, on which a pan, B, is placed, having a conical bottom *a* on the upper surface of which iron plates *b* are bolted or secured in such a manner that they may be removed at any time when worn by use and replaced by new ones.

C represents an upright tube, which is connected centrally with the bottom *a* of the pan, and projects upward a suitable distance. Through this tube C a vertical shaft, D, passes, the lower end of said shaft being stepped in a bar, *c*, of a frame secured to the inner side of the pan B, and having a bevel-wheel, E, upon it, which gears into a pinion, F, on a horizontal driving-shaft, G. The shaft D extends a considerable distance above the upper end of the tube C, and it is square for a short distance, as shown at *d*, and cylindrical the remaining distance, as shown at *d'*, but smaller in diameter, so as to form a shoulder, *e*, on the shaft D, as shown plainly in Fig. 1.

H represents a muller, which is in the form of a conical shell, the taper or inclination of which corresponds with that of the bottom *a*, as shown in Fig. 1. This muller has an upright hollow hub I at its center, the upper end of which has clatches *f* made radially into it, as shown plainly in Fig. 4, and on the upper end of the hub I there is fitted a hollow cylinder, J, the lower end of which is notched like the upper end of I, so that the notches *f* of the hub I will receive the projections between the notches at the lower end of J, and the notches at the lower end of J receive the projections *g* between the notches *f* of I.

The upper part of the hub I is provided with a flange, *h*, as also is the lower part of the cylinder J, and through these flanges bolts *i* pass, as shown in Fig. 1.

The upper end of the cylinder J rests on the upper end of the tube C when the muller is lowered to its fullest extent, and in the upper end of the tube C a square hole, *j*, is made for the square portion *d* of the shaft D to pass through. By this means the muller H is rotated from the shaft D.

On the upper end of the cylinder J there is secured a cylinder, K, in the upper end of which a thimble, L, is fitted and allowed to turn freely, the lower end of said thimble being provided with a flange, *k*, which is fitted under a lip, *l*, at the upper end of the cylinder K. This thimble L is provided with an internal screw, *m*, into which a tubular screw, M, is fitted, having a hand-wheel, N, upon it, the upper cylindrical part, *a*, of the shaft G fitting in the tubular screw M. On the upper end of the thimble L a hand-wheel, O, is secured.

On the upper surface of the muller H there are a number of spiral flanges or ribs, *m**, which are shown clearly in Fig. 3, said flanges or ribs extending from the periphery of the muller to the hub I, which has openings *n* made in it.

To the under side of the muller H there are attached by bolts *o* a series of shoes, P, of curved form, the edges of which are beveled, so as to form oblique grooves *p*, a space being

allowed between the shoes in order to form said grooves. which are of curved or spiral form, as shown clearly in Fig. 2.

The direction of the rotation of the muller is indicated by the arrows in Figs. 2 and 3.

The operation is as follows: The pulp and quicksilver are placed in the pan B and the muller rotated by rotating the shaft G by any convenient power. The pulp or ore is made to pass from the periphery of the muller H toward its center by means of the spiral flanges or ribs m^*, the pulp or ore passing through the openings n in the hub I, and then down through the hub, between the shoes P on the bottom of the muller and the plates b on the bottom of the pan, and is forced by the grooves p toward the periphery of the muller, the shoes P being grinding-surfaces, and causing the pulp or ore and quicksilver to be thoroughly incorporated with each other, so that all particles of metal which the pulp or ore contains will be amalgamated.

The conical form of the muller and bottom a of the pan gives the pulp or ore and the quicksilver a gravitating tendency toward the center of the pan and muller, thereby counteracting centrifugal force and insuring a regular and constant flow of the pulp or ore and the quicksilver toward the periphery of the muller and back toward its center. By this means the pulp or ore may be worked over and over with the quicksilver until all the particles of metal are amalgamated with the former.

The muller H is raised and lowered, so as to have its shoes P run or work as close to the plates b on the bottom a as may be desired, by turning either the tubular screw M or the thimble L. When it is desired to raise the muller, the wheel O of the thimble L, when the muller is in motion, is held with one hand, while the wheel N of the tubular screw M is turnd in the direction in which the muller is rotated. When it is desired to lower the muller, the wheel N of the thimble is held with one hand, while the wheel O of the tubular screw M is turned in the direction of the rotation of the muller H.

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

1. The conical bottom a of the pan B in connection with the conical muller H, in shell form, arranged substantially as and for the purpose set forth.

2. The shoes P, provided with curved beveled edges and attached to the under side of the muller H, so as to form oblique curved grooves p, in connection with the spiral flanges or ribs m^* on the upper side of the muller, as and for the purpose specified.

3. The arrangement of the hand-wheels O N, thimble L, and tubular screw M, substantially as described, for raising and lowering the muller, as set forth.

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