

(No Model.)

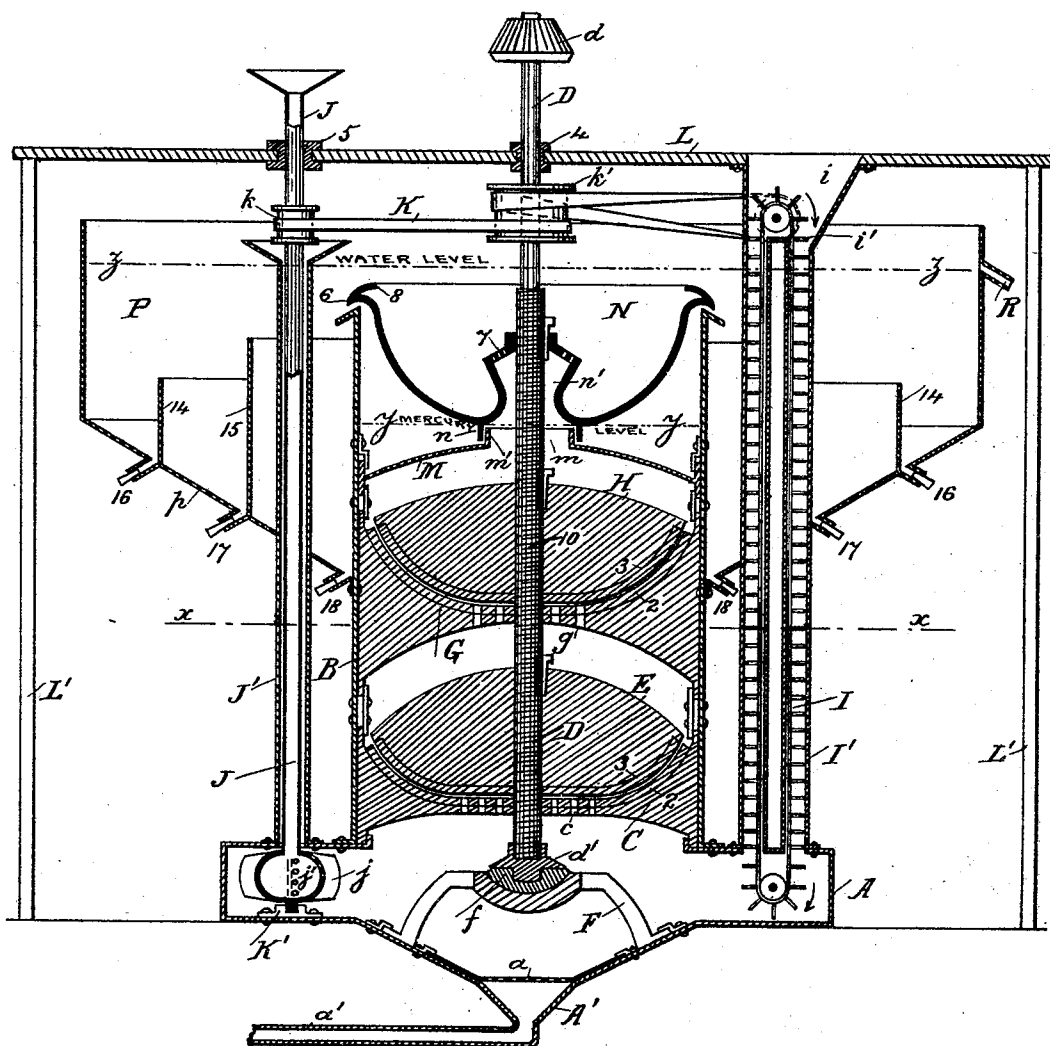
2 Sheets—Sheet 1.

H. L. SIMMONS.
AMALGAMATOR.

No. 496,670.

Patented May 2, 1893.

FIG - 1 -



WITNESSES
J. M. Weston
N. H. Pumphrey

INVENTOR
Henry L. Simmons.
by *Herbert W. Jenner.*
Attorney

(No Model.)

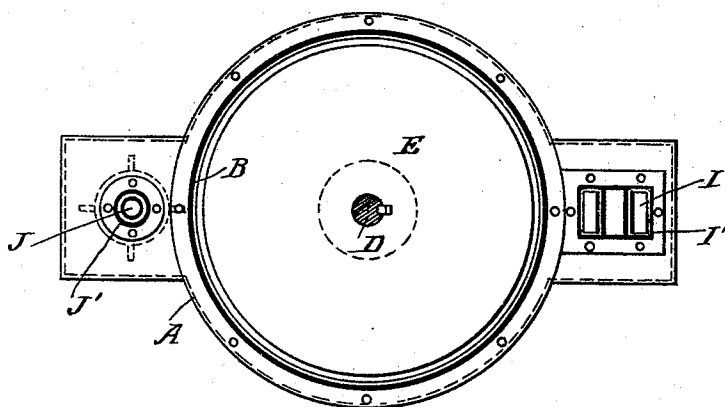
H. L. SIMMONS.
AMALGAMATOR.

2 Sheets—Sheet 2.

No. 496,670.

Patented May 2, 1893.

FIG. 2—



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

HENRY L. SIMMONS, OF WICKES, MONTANA.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 496,670, dated May 2, 1893.

Application filed December 3, 1892. Serial No. 453,928. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. SIMMONS, of Wickes, in the county of Jefferson and State of Montana, have invented certain new and useful Improvements in Amalgamators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to amalgamators in which mercury is used to remove the metal from the ore; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings: Figure 1 is a vertical section of the amalgamator; and Fig. 2 is a cross-section of the same taken on the line *x x* in Fig. 1, with the pan G removed.

A is the hollow base on which the amalgamator is supported.

B is a cylindrical vessel adapted to be filled with mercury up to the line *y y* in Fig. 1.

C is a pan secured at the bottom of the vessel B, and provided with openings *c* near its center.

D is a shaft which passes through the center of the vessel B, and is provided with means, such as the beveled toothed wheel *d*, for revolving it.

E is a disk secured on the shaft D inside the pan C.

The lower end of the shaft D is provided with a bearing-piece *d'* which runs in the step *f*; and F is a bracket for supporting the step inside the hollow base A. The base A is provided with a concave bottom and a strainer *a*, and A' is a funnel below the strainer for collecting the amalgam which falls through the strainer and guiding it into the amalgam pipe

a'. The amalgam pipe *a'* is connected to an amalgam safe of any approved construction. A second pan G is secured in the vessel B above the pan C and has holes *g* near its center. A disk H is secured on the shaft D inside the pan G. The under sides of the pans C and G are dome-shaped so that the ore is guided up to the holes *c* and *g* as it rises through the mercury in the vessel B. The pans C and G are provided with wearing plates 2, and the disks E and H with wearing plates 3. These plates may be renewed as they become worn.

The pulverized ore is delivered into the lower part of the base A by any approved feed mechanism. One mechanism for this purpose consists of a conveyer I working in a casing I'. The ore is placed in the hopper *i* at the top of the casing and is carried down and discharged into the base A by the descending conveyer buckets *i'*. The conveyer may be driven from the central shaft as shown, or in any other approved manner.

Another means for feeding the ore to the base consists of a pipe J which is inclosed in an outer tube J' and carried up above the top of the machine. The bottom of the pipe J has an enlarged portion provided with wings *j* and holes *j'* so that the ore is discharged into the mercury when the pipe J is revolved. The ore is introduced into the top of the pipe J; and K is a belt which passes over the pulley *k* on the pipe and over the pulley *k'* on the shaft D so that the pipe may be revolved. The pipe J however may be revolved in any other approved manner, and its lower end may be formed of any other approved construction that will enable the ore to be thrown out of the discharge openings by centrifugal force as the pipe is revolved.

K' is a step in the base A for supporting the lower end of the pipe J.

L is a cover for the machine provided with supporting legs L', and 4 and 5 are bearings in the cover for the shaft D and the pipe J to revolve in respectively.

M is a dome-shaped guide-plate secured to the vessel B above the disk H. This guide-plate has a central outlet hole *m* having an upwardly-projecting lip *m'* around its edge. A deep pan N is secured on the shaft D above the plate M and is provided with a depending lip *n* closely encircling the lip *m'*. The pan N has a central tubular portion *n'* extending upwardly within it and provided with holes 7 at its upper part where it is fastened to the shaft. The edge 6 of the pan is arranged to come above the holes 7 and is provided with the inwardly-projecting curved lip 8. The edge 6 is curved over and is arranged to project slightly beyond the periphery of the cylindrical vessel B. The two grinding disks E and H and the pan N are adjustable upon the shaft D, and for the purpose of adjustment the said shaft may be provided with screwthreads 10, or the disks

and pan may be connected to it in any other approved manner.

P is a circular tank encircling the upper part of the vessel B and provided with the inclined bottom *p*. This tank, and the upper part of the vessel B, is adapted to be filled with water up to the level of the line *zz* in Fig. 1.

The tank P is divided into compartments by concentric partitions 14 and 15, and each compartment is provided with outlets, 16, 17 and 18, at its lowest point. The ore rises through the mercury in the base A, passes through the holes in the lower pan and is ground up and rubbed together with the mercury in the narrow space between the disk and the pan. The amalgam sinks in the mercury, and the ore rises and is again rubbed together with the mercury in the upper pan. The portions of the ore which will not amalgamate are guided by the dome-shaped plate M into the tubular portion *n'* of the pan N. They pass through the holes 7 and are thrown over the edge of the pan into the tank P. The lip 8 catches any particles of mercury or amalgam that may have got into the pan N, and these particles collect in the bottom of the pan, from which they may be removed from time to time. The particles of ore are discharged over the edge of the pan into the tank by centrifugal force, and collect in the compartments of the pan according to their quality; the heavier particles falling into the compartment nearest the vessel B, and the lighter into those nearer the circumference of the tank.

R is the water overflow from the tank, which is supplied with water in any convenient way.

What I claim is—

1. In an amalgamator, the combination, with a hollow base, and feed mechanism for forcing the ore into the base, of a cylindrical vessel supported on the base and adapted to contain mercury, a pan having holes near its center and a dome-shaped under-surface and secured in the said vessel, a revoluble grinding disk arranged in the pan, and the wearing plates secured to the said pan and disk whereby the ore is guided upward through the said holes and rubbed-together with the mercury in the pan, substantially as set forth.

2. In an amalgamator, the combination, with a cylindrical vessel adapted to contain mercury and provided with a fixed pan and a revoluble grinding disk, of a tube connected to the lower part of the vessel and extending upward above the said pan, and a revoluble feed-pipe for the ore arranged in the said tube and provided with an enlarged portion

having lateral openings at its lower end and projecting wings for discharging the ore under the pan, substantially as set forth.

3. In an amalgamator, the combination, with a vessel adapted to contain water and mercury, of a dome-shaped guide-plate secured in the upper part of the said vessel and provided with a central opening and an upwardly-projecting lip, and a revoluble pan provided with a central tubular portion projecting upwardly within it and having small holes at its upper end and a downwardly-projecting lip engaging the aforesaid lip, substantially as set forth.

4. In an amalgamator, the combination, with a vessel adapted to contain water and mercury, of a revoluble pan arranged in the upper part of the said vessel and provided with a central tubular portion projecting upwardly within it, a curved edge projecting over the periphery of the said vessel, and an inwardly-projecting lip around its periphery for catching particles of amalgam and mercury, substantially as set forth.

5. In an amalgamator, the combination, with a vessel adapted to contain water and mercury and a conduit for delivering solid matters thereto, of a water tank encircling the said vessel and provided with an inclined bottom and concentric partitions dividing it into compartments, and a revoluble pan arranged in the upper part of the said vessel and provided with a central tubular portion, communicating with the water and mercury vessel whereby the solid matter from the said vessel is driven into the said tank and graded, substantially as set forth.

6. In an amalgamator, the combination, with a vessel adapted to contain water and mercury, of feeding mechanism for discharging ore into the lower part of the vessel, a pan secured in the said vessel and having holes near its center, a central shaft, a grinding disk secured on the said shaft inside the said pan, a dome-shaped guide-plate secured in the said vessel above the said pan and disk, a pan secured on the said shaft above the guide-plate and provided with a central tubular-portion communicating with the space below the guide-plate, and a water-tank surrounding the said vessel and communicating with the space above the last said pan, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

H. L. SIMMONS.

Witnesses:

E. C. SCOTT,
R. A. PRYOR.