

L. CANNADAY.
AMALGAMATING CONCENTRATOR.
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1,059,436.

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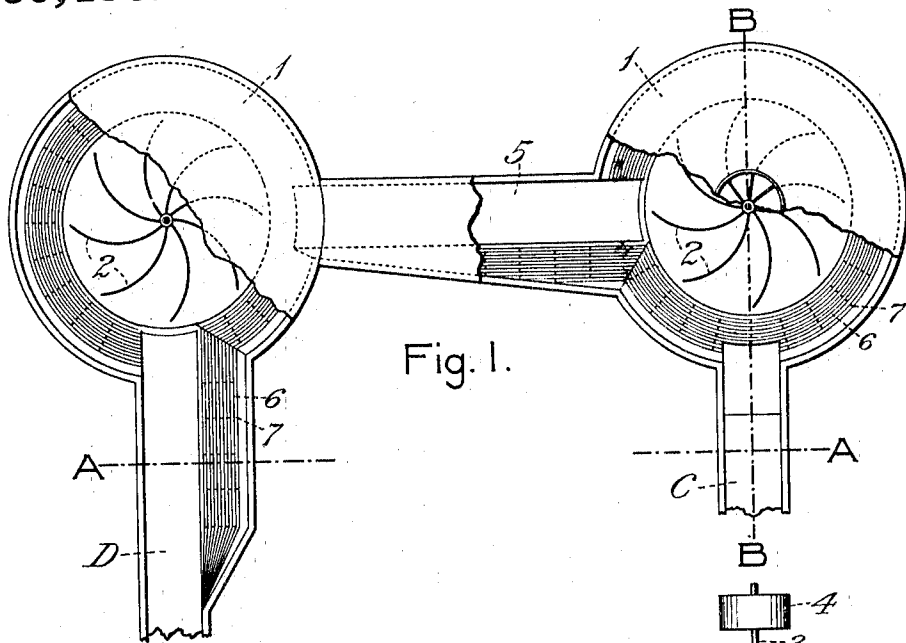


Fig. 1.

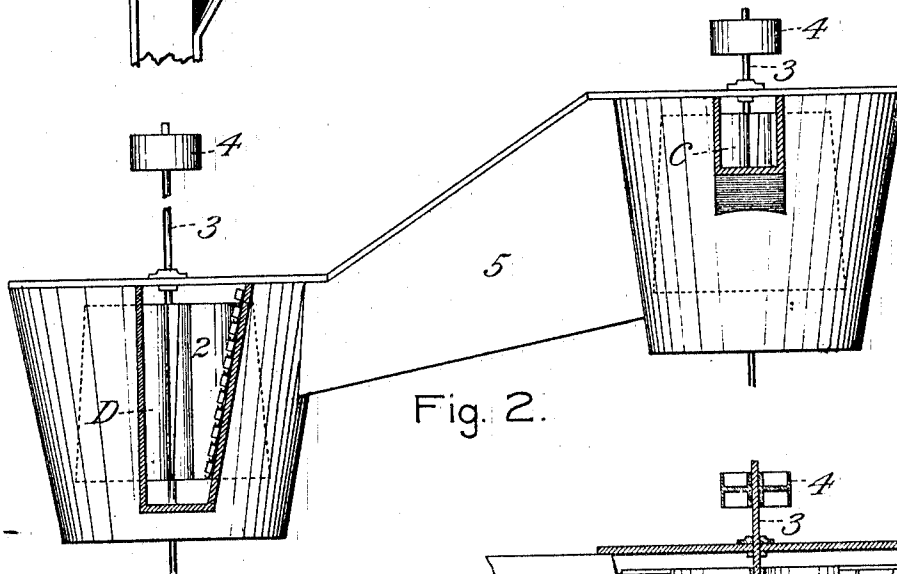


Fig. 2.

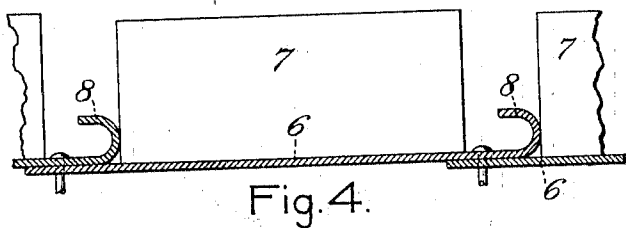


Fig. 4.

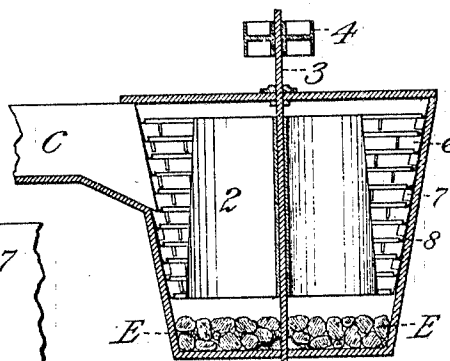


Fig. 3.

Witnesses.

W. J. Gammitt
B. A. Lawrence

Inventor.

Lee Cannaday

per F. B. Scott
Attorney.

UNITED STATES PATENT OFFICE.

LEE CANNADAY, OF PARK CITY, UTAH.

AMALGAMATING-CONCENTRATOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LEE CANNADAY, of Park City, in the county of Summit and State of Utah, have invented certain new and useful Improvements in Amalgamating-Concentrators, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to amalgamating concentrators used for separating the precious metal from the pulp of water and crushed rock for sand, which contains it, and to those concentrators that combine the use of mercury, for amalgamating, with the force of gravity and centrifugal motion as a means of so separating and collecting the precious metal.

The object of my invention is to provide a more efficient concentrator than that commonly used. I accomplish this object by the device illustrated in the accompanying drawings in which—

Figure 1 is a plan view; Fig. 2 is a section on the line A—A; Fig. 3 is a section on the line B—B, and Fig. 4 is a full size section of the copper plates used for amalgamating purposes.

The construction of my device is as follows: A sluice enters a circular chamber of such dimensions as experience may show to be the best and this circular chamber is connected with one or more other circular chambers as experience may ascertain to be necessary. In my drawings I have two circular chambers. These circular chambers are connected by a sluice way. Each circular chamber is of the shape of an inverted frustum of a cone. Along the sides of each chamber and along the sides of the sluice ways connecting the various circular chambers are placed and fastened amalgamating plates. At intervals along the side plates are placed baffle plates projecting at right angles to the side plates. These baffle plates and side plates are covered with a coating of mercury before each operation and are scraped in the usual manner after the cessation of the operation to collect the amalgam deposited thereon. Within each chamber I provide a propeller having the diameter of the lower portion of its blades in excess of the diameter of its upper portions. These propellers have their blades curved backward and are rotated by means of a shaft and pulley propelled by any convenient motive power. The copper side plates are bent

in such shape as to form a grooved channel at the bottom of each and the baffle plates are placed at right angles thereto at a slight distance above the turned up edge of the outer side of the groove.

Referring now to the drawings; C is the sluice box through which the pulp enters the first circular chamber 1.

2 is one of the propellers; 3 is the shaft on which the propeller revolves; 4 is the pulley driving the shaft; 5 is the sluice way connecting the two circular chambers; 6, 6 are copper side plates of the shape shown in Fig. 4; 7, 7 are baffle plates attached at right angles to the side plates.

The manner of operation of my device is as follows: The pulp enters the first circular chamber through a sluice C and is caught by the revolving blades of the propeller and thrown against the sides of the first circular chamber by centrifugal motion. It will also be noticed that the plates of the propeller are curved backward in the opposite direction of their motion. The object of this is to assist in throwing the pulp against the circular walls of the chamber. It will also be noticed that the plates of the propeller have a greater diameter at the bottom than at the top. The object of this is to assist in throwing the pulp upward and to prevent its falling to the bottom of the chamber. The pulp having been thrown by the blades of the propeller against the circular walls passes on through the sluice way 5, into the next circular chamber. In its passage through the sluice way the pulp has a tendency, owing to its propulsion by the plates of the propeller, to impinge on one of the sides of the sluice way. Accordingly the copper side plates and baffle plates are placed along this side of the sluice way. After the pulp enters the second chamber it is again caught by the revolving plates of the propeller and thrown around and against the walls of the circular chamber and thus out through the sluice D, to the dump. As there is the same tendency of the pulp to impinge on one side of the last mentioned sluice the copper baffle plates and side plates are placed down on that side.

It will be understood that silver plates or any other suitable plates for amalgamating purposes can be used instead of the copper plates.

By reason of the well known law of centrifugal force the heavier particles of the

pulp, namely, the precious metal, are thrown against the walls of each circular chamber and one side of each sluice way. There, they are caught by the various baffle plates and dropping downward, continue their course through the grooved channel at the bottom of each side plate until the particles of metal amalgamate with the mercury or until they are thrown out of the chamber along the sluice way into the next circular chamber where the same operation is repeated, the sluice and tailings at last passing through the sluice D to the dump. In the case of gold there is sometimes a greasy coating which prevents the gold from amalgamating. By reason of friction against the walls of the first chamber, I find that the gold is polished and hence when it strikes against the amalgamating plates in the second chamber, amalgamating takes place at once. It will be understood that particles of gold or other precious metal being heavier than the surrounding part of the pulp, are thrown farthest against the walls of the circular chambers. Such mercury as falls from the plates collects at the bottom of each chamber as shown at E, Fig. 3, along with particles of the pulp.

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

1. An amalgamating concentrator consisting of a tank, feed means, an exit sluice, the sides of the tank and the side of the exit sluice upon which the tangential current from the tank impinges being covered with a plurality of amalgamating plates with their lower edges turned up to form a channel, a plurality of baffle plates positioned at intervals vertically along the circumference of the said amalgamating plates, a vertically placed propeller having a plurality of blades and means of propelling the said propeller.

2. An amalgamating concentrator consisting of an inverted frustum of a cone shaped tank, the sides of the said tank being covered with horizontally placed amalgamating plates having their lower edge bent up to form a groove, a plurality of baffle plates positioned at intervals verti-

cally against the said amalgamating plates, a propeller revolving in the said tank having a plurality of blades the upper radius of each blade being less than the lower, means for revolving the said propeller, an exit sluice having the side upon which the tangential current from the tank impinges covered with a continuation of the said amalgamating plates and provided with a plurality of baffle plates in a like manner.

3. An amalgamating concentrator consisting of a tank, a revolving propeller having a plurality of blades curved backward in the opposite direction to the path of revolution, an exit sluice leading from the said tank, the side of the exit sluice upon which the tangential current from the tank impinges being covered with a plurality of amalgamating plates having their lower edges turned up to form channels, a series of baffle plates positioned at right angles to the said amalgamating plates and said amalgamating plates and baffle plates continuing around the inner circumference of the said tank.

4. An amalgamating concentrator consisting of a tank, the inner circumference of the said tank being covered with a plurality of horizontally placed amalgamating plates having their lower edges bent up to form a channel and a plurality of amalgamating baffle plates placed radially and vertically against the said circumferential amalgamating plates, said circumferential and baffle amalgamating plates being provided with a coating of quick silver, a revolving propeller having a plurality of blades, the blades having their upper radius less than their lower and each blade being curved backward in a direction opposite to the path of its motion, an exit sluice having the side upon which the tangential current from the tank impinges covered with a continuation of the said channeled and baffle plates.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses this 16th day of September, 1912.

LEE CANNADAY.

Witnesses:

H. P. BRIMHALL,
W. J. CAMORICH.