

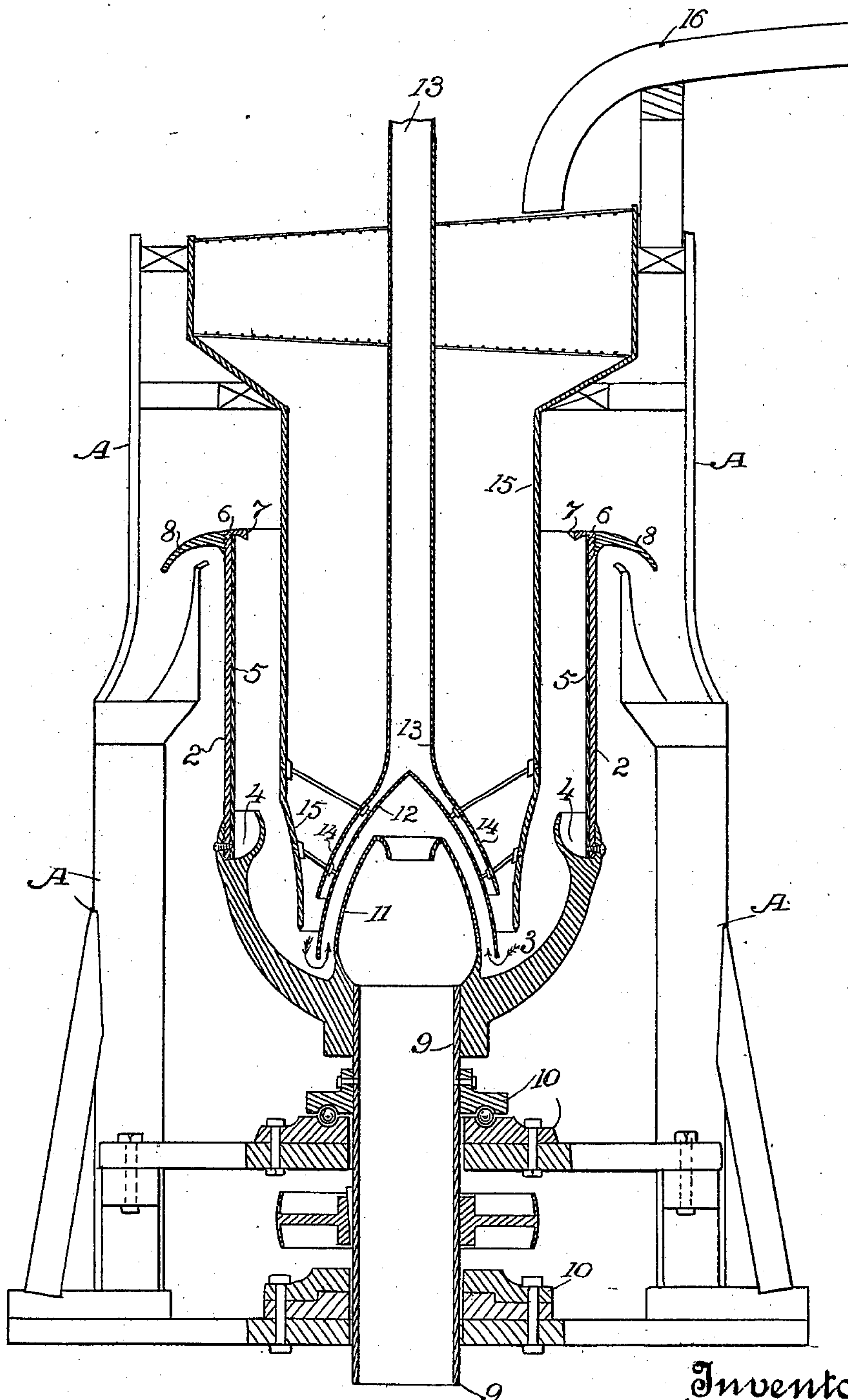
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A. P. PALMER.
GOLD SEPARATOR.

(Application filed Jan. 26, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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GOLD-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 685,005, dated October 22, 1901.

Application filed January 26, 1901. Serial No. 44,792. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH P. PALMER, a citizen of the United States, residing in Oakland, county of Alameda, State of California, have invented an Improvement in Gold-Separators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which is especially designed for separating gold and heavy valuable material from sand or lighter material with which it may be mixed or associated.

It consists of a revoluble vertically-disposed cylinder adapted to contain mercury or amalgamated or silvered plates and having an inwardly-projecting flange around the top to prevent the overflow or escape of the mercury, while allowing the lighter material to constantly flow over this edge and be discharged. The cylinder has the bottom so constructed that material delivered therein will be carried outwardly and upwardly by centrifugal force and by overflow caused by constant additions from the feed apparatus, which delivers the material into the bottom of the cylinder. A central discharge-cone projects upwardly into the cylinder, and a water-pipe has its lower end so contrived as to deliver water into the mass remaining in the bottom of the cylinder when the latter is at rest, so that it can be washed out through the central discharge.

The invention also comprises details of construction which will be more fully explained by reference to the accompanying drawing, in which the accompanying figure is a vertical section of my gold-separator.

A is an exterior framework or support, of any suitable material and construction, adapted to carry the necessary machinery.

2 is an open-topped cylinder, which may be made of iron, steel, or other material, the bottom being preferably made concave, as at 3, in its inner surface, and between the upper edge of this concaved or globular portion and the vertical sides 2 I form an annular trough 4 of sufficient capacity to contain mercury when the latter is to be employed. In lieu of the mercury I may also employ a lining 5, which may be of silvered or amalga-

mated metal and also adapted to retain any particles of gold brought in contact therewith, as will be hereinafter described. When this amalgamated surface is employed, it is locked in place by a screw, flange, or collar 6, fitting upon the upper end of the cylinder 2.

7 is an annular flange projecting inwardly from the inner edge and top of the cylinder 2, and this serves to arrest mercury, which is carried up and spread over the inner sides of the cylinder by the rapid centrifugal movement of the latter. Under such conditions the mercury will form a sheet or surface over the inner face of the centrifugal portion and will act in a similar manner with the amalgamated or silvered plate 5, and this flange 7 prevents its being thrown outward over the top of the cylinder and lost. At the same time the space within the flange 7 is sufficient to allow a continuous flow of sand or pulp and water, with which it is mixed, and this rising above the upper edge of the cylinder flows outward over the discharge-plate 8 and may be delivered to any suitable chute or receptacle or simply allowed to run to waste. Whenever the revolution of the cylinder is arrested, if mercury is employed the latter will gradually settle into the annular channel 4, where it will remain while the apparatus is at rest, and it is thus prevented from settling down into the concaved bottom 3 and mixing with whatever sand or material remains at that point.

In order to revolve this apparatus with sufficient rapidity, the cylinder is mounted upon a vertically-journaled shaft 9, which may be carried in boxes or bearings, as at 10, and, if desired, ball or other suitable antifrictional bearings can be employed to provide for a free and easy revolution. The shaft 9 is revolved by belt or chain pulley gearing or other motor, by which any desired rate of speed can be given to the cylinder revolving on this vertical axis. As here shown, the shaft 9 is made hollow and opens directly into the bottom of the concaved portion 3 of the cylinder, having an upward conical or acorn-shaped extension with inturned lip, as shown at 11. Above this part 11 is fixed a cone 12, the apex of which is closed, as shown, and

the lower edges surround the base of the part 11, leaving a space between these edges and the bottom 3 of the cylinder, so that under the proper conditions a discharge may be made between the parts 11 and 12. Above the cone 12 is a water-pipe 13, and this pipe is approximately axial with the cone and other parts, its lower end being flared or diverged, as shown at 14, so as to approximately follow the outline of the cone 12 and leaving a space between the two.

15 is a stationary cylindrical chamber, which may be hopper-shaped or enlarged at the top, if desired, and into this the feed-pipe 16 discharges the material to be treated. The material passing down through the cylinder 15 and its reduced lower end is delivered near the bottom of the concaved portion 3 of the cylinder, and the latter being set in motion the rapid revolution produces a centrifugal action that continually carries up the sand, pulp, or other auriferous material, which, passing over the edge of the trough 4, will be thrown against the mercury or the amalgamated surface 5, which lines the upper part of the cylinder, during its revolution. The sand thus passing over this part is gradually moved upward and rolled over and over, so that any gold contained therein will be brought into contact with the mercurial or other surface either by gravitation or by constant movement of the particles and will there be arrested, while the sand and waste products will flow over the flange 7 and be delivered outwardly over the annular apron 8, as previously described.

When it is desired to stop for the purpose of cleaning up, the motion of the cylinder having been arrested, any sand or pulp remaining in the bottom of the concavity 3 may be discharged through the center of the tube 9 by means of a jet of water passing down through the pipe 13 and its divergent base 14, and this will cause the sand to be carried up between the cones 11 and 12, where, overflowing into the central discharge of the cone 11, it passes down through the tube 9 and is discharged.

The mercury, if it be used, will, as previously stated, only descend into the annular channel 4, where it will remain until the machine is again started up, or if the amalgamated surface 5 be used this can be taken bodily out of the cylinder for the purpose of cleaning and removing the gold by unscrewing the locking-rim 6 at the top.

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

1. An apparatus for separating gold from associated gangue, comprising a vertically-supported open-topped vessel having an interior surface capable of collecting particles

of gold, a hollow revoluble shaft fixed to said vessel and having a conical portion at its upper end, a water-pipe above and approximately axial with said conical portion and having its lower end flared or shaped substantially to the contour of the cone, and separated from the latter, and means for delivering material into the lower part of the vessel, said cone and shaft serving as a discharge when cleaning up the vessel.

2. An apparatus for separating gold from associated gangue, including a vertically-disposed cylinder, having a concave bottom and an overflow flange or rim at the top, and an annular mercury-containing trough around the inner sides of the vessel at a point between said bottom and flange or rim, and forming a collecting-chamber for mercury flowing down the sides of the cylinder, a revoluble shaft fixed to the cylinder and entering the bottom thereof, and having a conical extension of its upper end said extension and shaft forming a discharge for cleaning up the cylinder, means for delivering material into the lower part of the vessel, and a water-pipe above and in the axial line of the cone and having its lower end flared or shaped substantially to the contour of the cone, and separated from said cone, and a cone intermediate of the first and second named cones.

3. An apparatus for separating gold from associated gangue, including a revoluble cylinder, a feed-chamber entering the cylinder to a point near the bottom thereof, a revoluble shaft and a cone surmounting its upper end and located within the bottom of the cylinder, said shaft and cone having a passage through them, and a water-supply having its lower end inclosing the said cone and separated therefrom to form a passage through which material is directed into the cone and shaft in cleaning up the cylinder.

4. An apparatus for separating gold from associated material consisting of a vertically-journaled axle, a revoluble cylinder having a concaved bottom and extended sides, adapted to collect the particles of gold, and an overflow flange or rim at the top, a stationary cylindrical feed-chute extending downwardly to near the bottom of the interior of the cylinder, a hollow discharge-pipe extending through the bottom of the cylinder, a stationary surrounding cone and a water-pipe, the lower part of which incloses said cone whereby a body of water may be delivered to wash out material remaining in the bottom of the cylinder when the latter is at rest.

In witness whereof I have hereunto set my hand.

ADOLPH P. PALMER.

Witnesses:

GEO. H. STRONG,
S. H. NOURSE.