No. 803,868. PATENTED NOV. 7, 1905.

W. D. BANEY.

GOLD SAVING APPARATUS.

APPLICATION FILED MAR. 28, 1905.

Fig. 1.

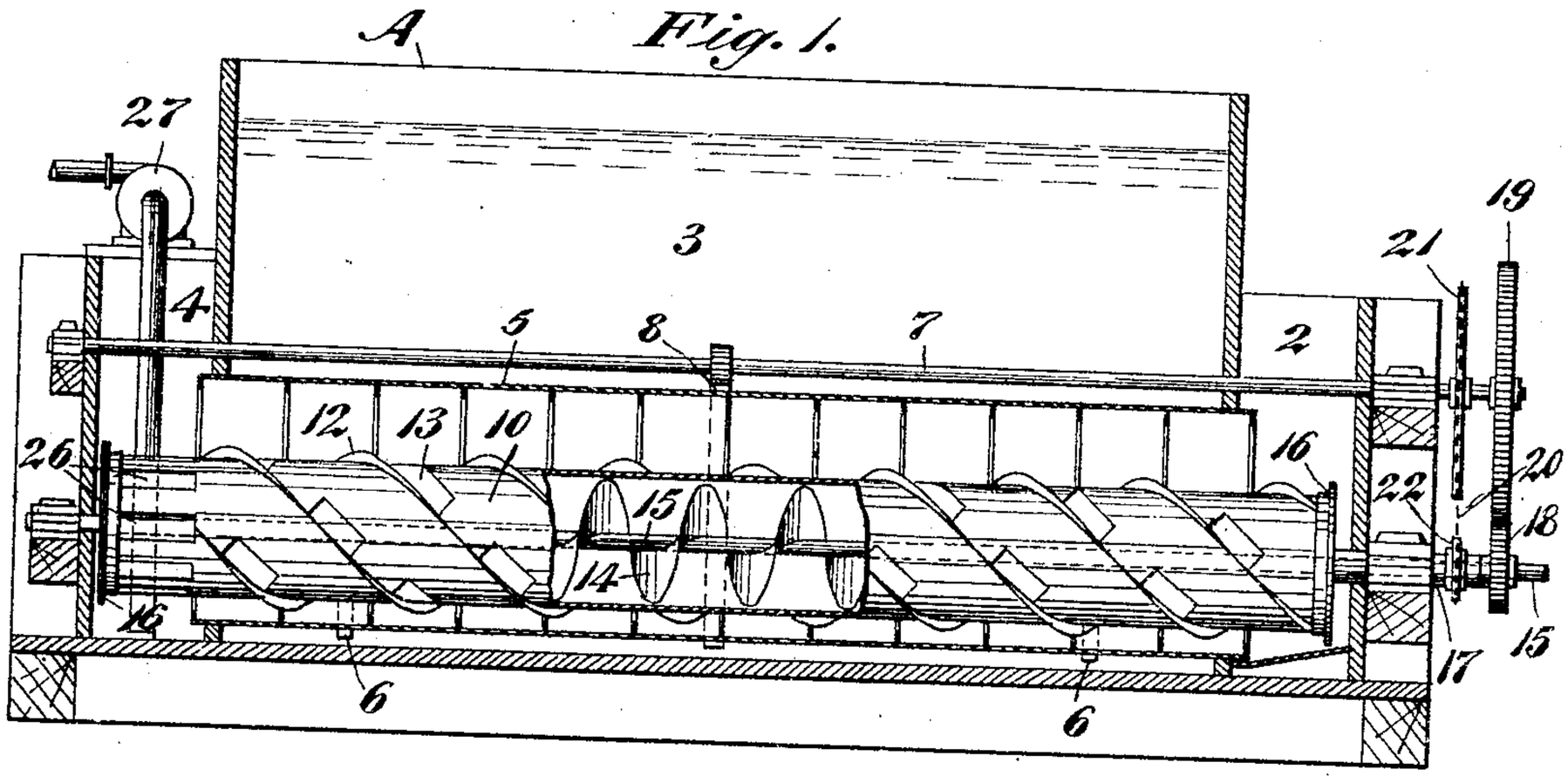


Fig. 2.

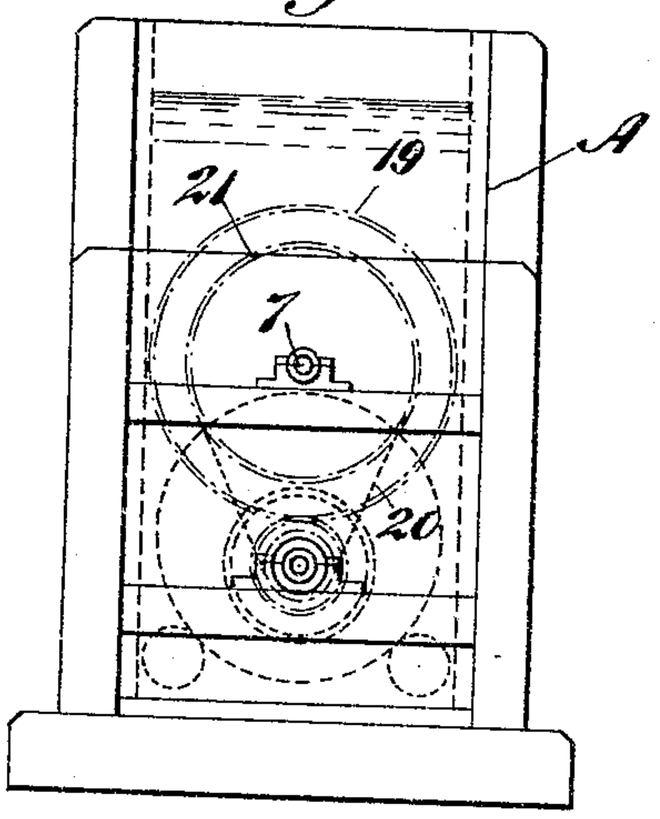


Fig. 3.

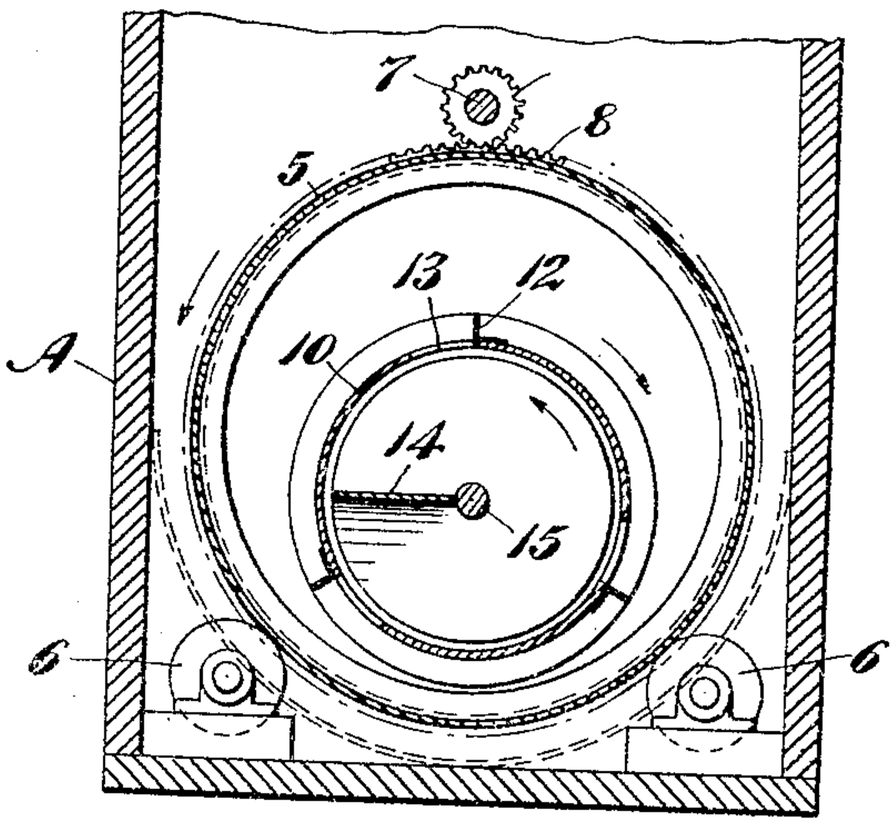
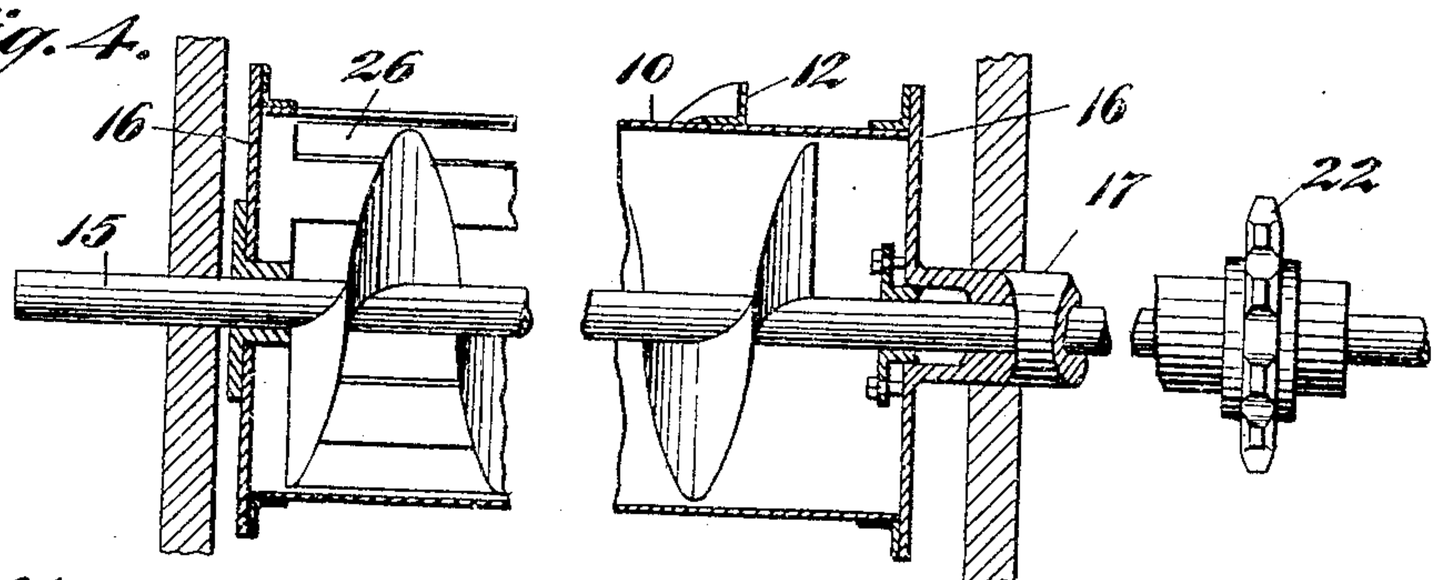


Fig. 4.



Witnesses,
Chas. E. Chapin.
J. R. Sowle

Inventor,
William D. Baney
By Geo. H. Strong.
Atty

UNITED STATES PATENT OFFICE.

WILLIAM DAVID BANEY, OF TONOPAH, NEVADA.

GOLD-SAVING APPARATUS.

No. 803,868. Specification of Letters Patent. Patented Nov. 7, 1905.

Application filed March 28, 1905. Serial No. 252,493.

To all whom it may concern:

Be it known that I, WILLIAM DAVID BANEY, a citizen of the United States, residing at Tonopah, in the county of Nye and State of Nevada, have invented new and useful Improvements in Gold-Saving Apparatus, of which the following is a specification.

My invention relates to an improved apparatus for removing gold and other precious metals and minerals from sands, gravels, and the like. Its chief object is to provide a convenient, simple, practical amalgamating-machine and washer of large capacity for use particularly in localities where water is scarce.

The invention consists of the parts and the combination of parts hereinafter described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section through my apparatus. Fig. 2 is an end view of same. Fig. 3 is a transverse section through same. Fig. 4 is a longitudinal section through agitator.

A represents a tank of suitable shape, capacity, and material, divided transversely into three compartments 2 3 4, compartment 2 being for the feed of material, compartment 4 for the discharge, and the middle compartment 3 containing water and filled normally above the level of the two compartments to prevent leak from the latter around the submerged hollow open-ended amalgamating-cylinder 5, which extends across compartment 3 and into both the end compartments 2 4.

The cylinder 5 is suitably packed in the partitions between the several compartments and is supported to turn on rollers 6. It is driven from shaft 7 by means of a pinion on the shaft engaging a peripheral gear 8 on the cylinder. The interior of the cylinder is provided with suitably-spaced annular riffles or rings 9, which keep the quicksilver and amalgam in the cylinder. The cylinder is made of suitable material, as copper, which will become amalgamated over its entire interior surface when the cylinder is revolved, and so present an extended and continuous amalgam surface to the material which is made to travel from the feed-compartment 2 through the cylinder into the compartment 4.

Any suitable means may be employed to agitate and advance the material through the cylinder so as to insure all the values, whether as coarse particles or floating slimes, to come in contact with some part of the amalgam surface.

As here shown I employ an open-ended slotted cylinder or cylindrical agitator 10, of lesser diameter than the amalgam-cylinder, preferably disposed eccentrically to the latter and extending from the front end of the amalgam-cylinder through and beyond the latter into the discharge-chamber 4.

The exterior of the agitator 10 is provided with parallel or spiral ribs or angle-iron projections 12, arranged to move close to the riffles and designed to keep the sands and other material in a continuous state of agitation and suspension and prevent their settling.

The slots or holes 13 in the agitator and adjacent to the ribs or blades 12 allow the heavier sands and particles that are picked up as the agitator revolves to fall back through the agitator to be again lifted and thrown against the inside surface of the amalgam-cylinder.

Within the agitator and extending practically from end to end thereof is a screw conveyer 14, whose shaft 15 is suitably journaled in the ends of tank A, the agitator being supported by the disks or heads 16, which turn free about shaft 15, but in an opposite direction thereto.

The head 16 of the agitator at the feed end of the apparatus has a sleeve projection 17 concentric with the shaft 15 and extending out through the head of the tank, and the sleeve and shaft exterior to the tank are suitably connected to the shaft 7 for the purpose of giving coördinate motion to the cylinder, agitator, and conveyer. The sleeve is suitably packed in the head of the tank to prevent leak and likewise and for a similar purpose the shaft is packed in the sleeve, though both the shaft and sleeve are free to turn, but in directions opposite to each other.

Any appropriate form of drive connections between the shafts 7 and 15 and the shaft 7 and sleeve 17 may be employed to cause them all to rotate in unison. As shown, the shaft 15 carries a gear 18, engaging a gear 19 in shaft 7, while the latter and sleeve 17 are connected by means of the chain 20 passing over respective sprockets 21 22 on shafts 7 15. Thus it will be observed that the amalgam cylinder and conveyer will revolve in the same direction and both will revolve opposite to the agitator. The speed at which these several parts will run varies and is regulated according to each particular case. Assuming the cylinder 5 to have a speed of five feet, or one and one-half revolutions, a minute, the agitator may revolve approximately thirty

revolutions per minute and the screw twenty-five revolutions per minute. The speed of the cylinder should be such only as to prevent the sands from settling and at the same time keep the quicksilver in the bottom of the cylinder between the riffles. The speed of the agitator is such as to keep the sands in circulation, but not sufficient to throw over the quicksilver. The screen will carry the material that falls in through the openings 13 out to the feed end of the agitator and discharge it through the openings 26 into the compartment 4, where the worthless matter is taken up by suitable means, as the pump 27, and deposited outside the apparatus. The water taken up by the pump is easily separated from the barren sands and gravels, settled and returned to the apparatus to be used over and over again.

The bottoms of the compartment 2 to 4 are made semicircular and that of compartment 2 is substantially flush with the end of the cylinder, so that feed to the latter will be easy, being facilitated by the spiral peripheral blades 12 on the agitator 10.

The agitator is preferably disposed eccentric to and below the center of the cylinder to afford a sufficient space above for the current created by the agitator, so that it will not continue clear around the agitator and the sands that are lifted on one side by the agitator will have a chance to settle back again through the agitator and be mixed with the fresher material.

The apparatus is particularly adapted for amalgamating the values of tailings, slimes, fine sands of placer-mines, or the finely-pulverized ore and pulp of stamp-mills. Its use is advantageous in localities where water is scarce, since it permits practically no water to go to waste. It works without a current to carry away the finer values, which by ordinary methods flow off on the surface of the water. The ore can be crushed to any degree of fineness, and the value will still be saved, since at some stage in the process and usually several times the values must come into intimate contact with the amalgamated surface of the cylinder. The revolving of the cylinder keeps the quicksilver equally distributed and the surface of the cylinder always bright. The central compartment 3 of the tank being filled above the level of the two end compartments acts as a liquid seal against escape of water from the end compartments, which leak would likely be considerable otherwise, owing to the large area of the cylinder running in the partitions of the tank.

It is possible that various modifications in my invention may be made without departing from the principle thereof, and I do not wish to be understood as limiting myself to the construction as herein shown and described.

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

1. In a gold-saving apparatus, the combination of a tank divided transversely into three water-containing compartments, an open-ended amalgamating-cylinder rotatable in said tank, the ends of said cylinder communicating with the end compartments of the tank, means for rotating the cylinder and conveyer means operating in the cylinder.

2. In a gold-saving apparatus, the combination of a tank divided transversely into three water-containing compartments, an open-ended amalgamating-cylinder rotatable in said tank, the ends of said cylinder communicating with the end compartments of the tank, means for rotating the cylinder and conveyer means operating in the cylinder, said conveyer means including an eccentrically-disposed agitator.

3. In a gold-saving apparatus, the combination of a tank divided transversely into a plurality of water-containing compartments, an amalgam-cylinder in the tank and extending into a plurality of said compartments, said cylinder having an inlet at one end and an outlet at the other, means for rotating the cylinder, a cylindrical agitator in the cylinder, means for rotating the agitator and a spiral conveyer operating in the agitator.

4. In a gold-saving apparatus, the combination of a tank divided transversely into a plurality of water-containing compartments, an amalgam-cylinder in the tank and extending into a plurality of the compartments and having a feed-inlet at one end and a discharge-outlet at the other, an eccentrically-arranged cylindrical agitator in the cylinder, a conveyer in the agitator and means for operating the agitator, the cylinder and the conveyer simultaneously.

5. In a gold-saving apparatus, a tank having end compartments and an intermediate compartment, an amalgam-cylinder extending across said intermediate compartment and opening into said end compartments, the portion of the cylinder in said intermediate compartment adapted to be submerged to prevent leak from the end compartments around the cylinder, a cylindrical agitator in said amalgam-cylinder, a conveyer in the agitator, and means for giving the cylinder, the agitator and the conveyer a coördinate movement.

6. In a gold-saving apparatus, the combination of a tank having end compartments, and an intermediate water-containing compartment, a hollow amalgam-cylinder extending across said intermediate compartment and opening into the end compartments, the portion of said cylinder in the intermediate compartment being submerged to prevent leak from the end compartments around the cylinder, means for revolving the cylinder and means for causing material to progress through the cylinder.

7. In a gold-saving apparatus, the combination of a horizontally-disposed rotatable amal-

gam-cylinder having an ingress-opening at one end and an egress-opening at the other end, an eccentrically-disposed cylindrical agitator passing through the cylinder, said agitator being perforated and having peripheral ribs, a spiral conveyer extending through the agitator, means for operating the amalgam-cylinder and said conveyer in the same direction and means for operating the agitator in the opposite direction.

8. In a gold-saving apparatus, the combination of a horizontally-disposed amalgam-cylinder having ingress and egress openings at opposite ends, an eccentrically-disposed cylindrical agitator extending through the amalgam-cylinder and projecting beyond the discharge end thereof, a conveyer in the agitator, means for revolving the cylinder and the agitator in opposite directions.

9. In a gold-saving apparatus, the combination of a tank, a horizontally-disposed amalgam-cylinder supported to rotate in said tank and having ingress and egress openings at opposite ends, a cylindrical agitator extending through the cylinder and supported to rotate independently thereof, a screw conveyer operating in the agitator and means for rotating the cylinder, the agitator and the conveyer.

10. In a gold-saving apparatus, the combination of a tank, a horizontally-disposed amalgam-cylinder supported to rotate in said tank and having ingress and egress openings at opposite ends, a rotary cylindrical agitator extending through the cylinder supported in the ends of the tank and rotatable independently of the cylinder, said agitator having a cylindrical sleeve projection at one end passing through the end of the tank, a screw conveyer journaled concentrically with the agitator and having its shaft passing through said sleeve, means exterior to the tank to operate the agitator and conveyer, and means for operating the amalgam-cylinder in unison with the agitator and conveyer.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM DAVID BANEY.

Witnesses:

THOMAS POYNTON,

J. P. GIBSON.