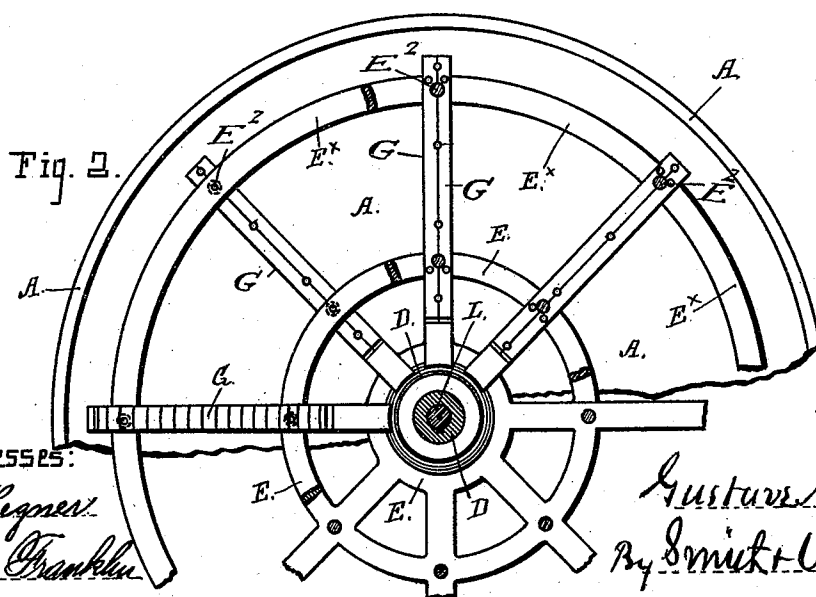
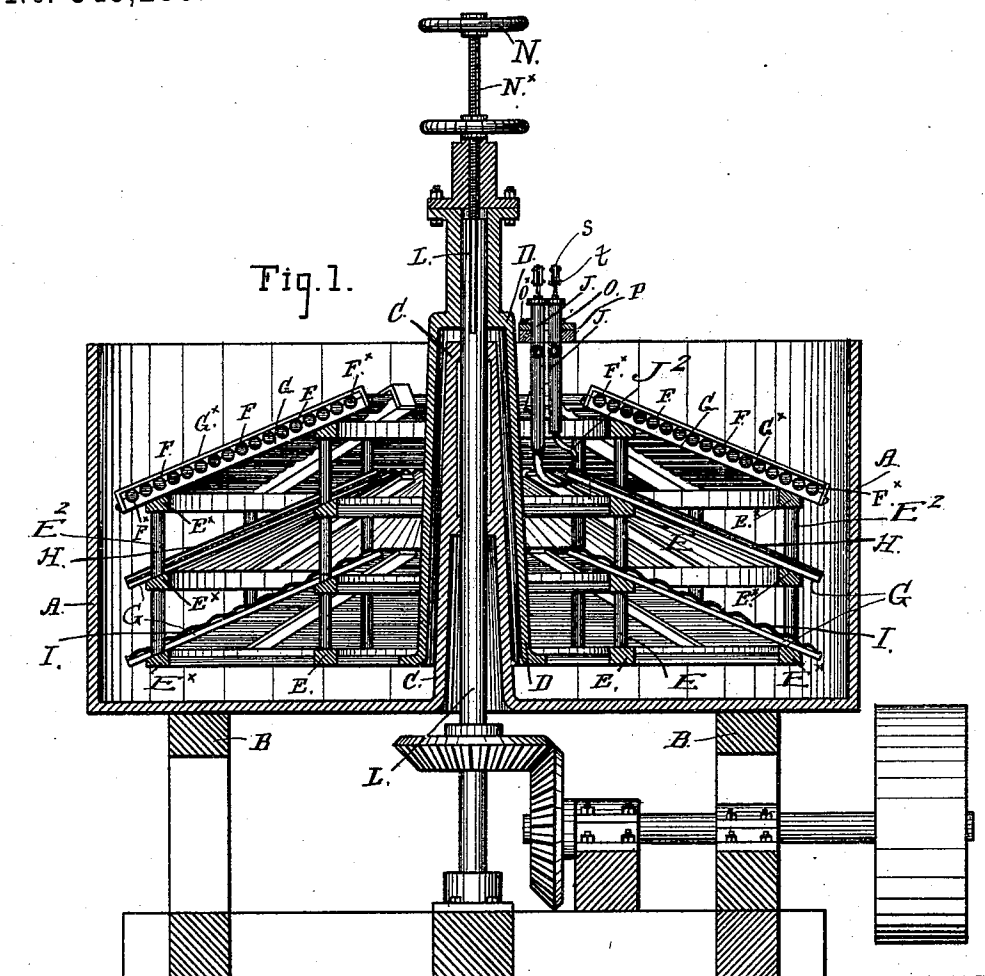


G. A. GELIEN.
AMALGAMATOR.

No. 549,236.

Patented Nov. 5, 1895.



Witnesses:
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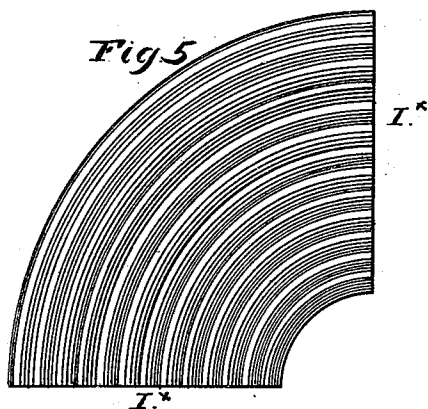
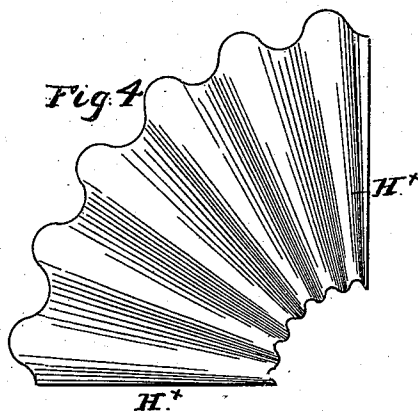
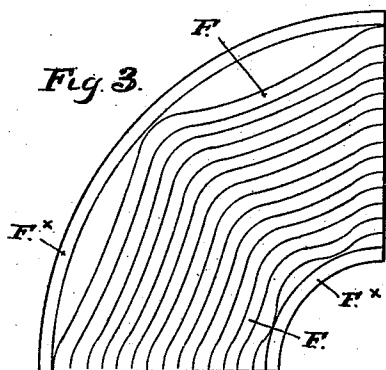


Fig 6

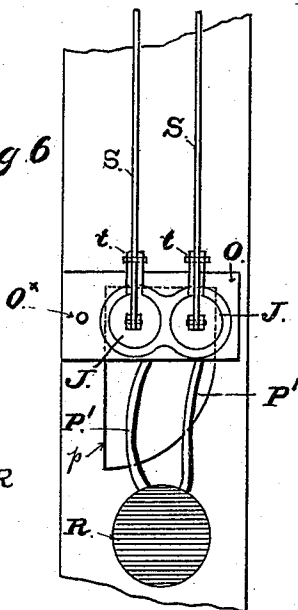
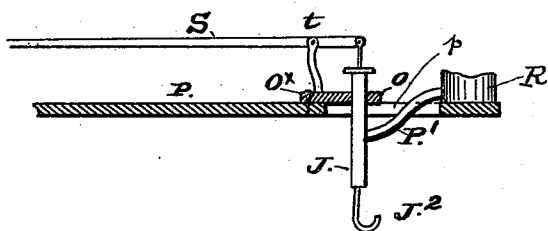


Fig 7



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UNITED STATES PATENT OFFICE.

GUSTAVE A. GELIEN, OF SAN FRANCISCO, CALIFORNIA.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 549,236, dated November 5, 1895.

Application filed February 27, 1893. Serial No. 463,847. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE A. GELIEN, a citizen of the United States, residing in the city and county of San Francisco, in the State of California, have invented certain new and useful Improvements in Amalgamators, of which the following is a specification.

My invention consists in certain improvements in ore-amalgamators, which will first be fully described with reference to the accompanying drawings and then pointed out in the claims.

In said drawings, Figure 1 represents a transverse vertical section taken through center line of my amalgamator. Fig. 2 is a plan or top view of parts of the same, the amalgamator-surfaces being omitted to show more clearly the construction of the muller, part of which is shown in section. Fig. 3 is a plan of a section of the uppermost amalgamating-surface consisting of a series of curved pipes. Fig. 4 is a plan of a corrugated plate forming part of the amalgamating-surfaces. Fig. 5 is also a plan of a plate forming part of the amalgamating-surface. Fig. 6 is a plan of pump for distributing quicksilver to the amalgamating-surfaces. Fig. 7 is an enlarged sectional view of the cross-bar and pump.

Like letters wherever they occur indicate corresponding parts in all of the figures.

The pan A is constructed with a flat bottom, perpendicular sides, and a standing pillar C in the center, in which are bearings for the upright driving-shaft L. Upon this pillar is fitted the cone D, to which is attached a skeleton frame composed of circular rings and radial arms, as described below. Rotary motion is given to this frame through the medium of the upright shaft L, to which is keyed the cone before mentioned, such connection being made by a key or feather on one part and a slot in the other part, so that the cone can be moved and adjusted longitudinally upon the shaft. The object of this adjustment is to regulate the distance of the bottom of the frame above the bottom of the pan, and such adjustment is made by a screw N^x, working through the head of the cone and against the end of the shaft L. The screw N^x is furnished with a hand-wheel N for turning it and a nut setting upon the closed head or top of the cone for locking the screw.

The skeleton frame before mentioned is constructed of the inner and higher rings E and the outer and lower rings E^x, united by the downwardly-inclined arms G G.

The vertical distance between the rings for one shelf and the other series next above and below is maintained by posts E², set between the rings and held in place in any suitable manner.

Upon the skeleton-frame supported by the cone a number of amalgamating-surfaces are arranged in a stack or series one below and about parallel with another and all having a pitch or inclination from the center and highest point outward to the rim or lowest point. The topmost one of these plates is constructed of concentric rings F F, formed of copper tubes laid in close order in contact with one another, the smallest ring forming the highest end of the shelf and the rings increasing uniformly in diameter outward to the rim.

Instead of being laid in true circles, however, these rings are bent in alternate and regular manner in an upward and a downward direction, with the exception of the inner ring at the highest end and the outermost ring at the lower end. By this construction a corrugated shelf is produced having greater area or extent of amalgamating-surface over a plane surface and with upper and under faces alike corrugated. This corrugated surface I prefer to form in separable sections or segments, so that one or more can be readily taken out for cleaning or making repairs, and in such case the ends of the clamps are of proper length to extend from the top to the bottom of the shelf and rest upon the inner and the outer ring of the skeleton frame, and the sections are held in place by straps g², standing over and secured to the fixed bar G beneath. Any section of this amalgamating-surface can be removed from the skeleton-frame by first removing its straps, before mentioned.

A second table or concentrating-surface H is fixed in the skeleton frame under and at some distance below the before-mentioned corrugated surface F F, resembling such surface in its corrugated form, but unlike that surface in being constructed of sections of metal plates instead of tubes. This amalga-

mating-table H is divided into several parts or sections in the same manner as the top table F, and usually into four parts, each of which is secured by screws to the members of the skeleton frame and is separately removable from its place in the operation of cleaning up.

In the present construction the skeleton frame is adapted to carry a third table or amalgamating-surface below the table H. This table I is constructed in like manner in sections separately removable; but the corrugations in the plates are concentrically arranged instead of running radially from the inner end to the outside rim, as in the upper tables.

In working thin grades of pulp and grades composed largely of slimes and light particles, I omit either one of the tables H I and use the other jointly with the top table, the number of tables in the frame being reduced or increased in such case according to the depth of the pan used and also according to the quality or condition of the ore being worked.

As each table is constructed in sections, so that it may be taken out of the frame without disturbing the others, the work of cleaning can be done without difficulty, and the tables can be reduced or increased in number by raising the driving-cone off the pillar and elevating the frame in the pan to a suitable height for reaching the tables. The opening in the center of each one of these tables is designed to leave a clear passage all around the cone D from top to bottom of the open frame, so that a free circulation of the pulp in a perpendicular direction from bottom to top or from top to bottom, as well as between the plates, will be produced by the rotary motion of the tables around the pillar. By this means the whole contents of the pan is brought to and maintained in such a state of motion that the metallic particles therein cannot fail to come in contact with the amalgamated surfaces of the tables. Quicksilver is applied to the corrugated surfaces of these tables from time to time, as required, either by removing the sections from the skeleton frame and cleaning and replacing them, or, in a better way, by flowing quicksilver over the surfaces of the tables from the highest to the lowest end of the table. For this purpose I have provided in this machine or apparatus a mechanical means for applying a quantity of quicksilver to any one of the tables in the frame, the same consisting, chiefly, of a stationary quicksilver tank or holder R, mounted on the pan over the tables, and a hand-pump J, also mounted in the same position and furnished with a nozzle J² of proper length to deliver the quicksilver upon any one of the tables, and of such construction, also, that the under surface as well as the upper surface of the plates can be reached and coated with the quicksilver.

I have arranged two single-acting plunger-pumps J J in connection by flexible pipes P'

with a single quicksilver-reservoir, as I have represented in Figs. 1, 6, and 7 of the drawings, for the purpose of applying quicksilver to both the under and the upper surfaces of the plates or tables at the same operation.

The pump-barrels are mounted on a common bed-plate O, Figs. 6 and 7, set upon a plank P, that rests at its ends upon the rim of the pan and is of proper length to extend across the middle of the pan to one side of the central cone of the rotating frame. This bed-plate O rests upon the plank directly over an opening p, through which the lower ends of the pump-barrels extend into the pan beneath, and the bed-plate is pivoted to the plank at O^x, so that the pumps may be shifted on the plank either into or out of working position. The first-mentioned position is shown in the top view, Fig. 6, in which case the lower ends of the pumps are brought out close to the inner edges of the table or plate to be amalgamated, and one of the nozzles on the lower end can be set against the upper surface while the other one is set against the bottom surface or under side of the same plate. In the other position, however, the pumps are set more closely toward the center cone, so that they do not interfere with the movement of the rotating frame. These positions are obtained by swinging the bed-plate O on its center O^x.

All portions of the surfaces of a plate or table are reached and coated by slowly turning the skeleton frame while the pumps are being operated, and the lowest as well as the highest one of the tables in the frame is brought into position to be amalgamated simply by elevating or by lowering the frame a suitable distance to bring the required table within operating distance of the nozzles on the pump. These nozzles are best constructed of flexible tubes, as I have represented in Figs. 1 and 7.

The pumps are operated by hand-levers S, pivoted to brackets t on the top of the pump-barrels on the frame and attached to the plungers at the shorter ends, the handle portion of each lever extending backward from the pivot a suitable distance to bring it within reach of the person operating the pumps outside the pan.

The shaft L is geared into a counter-shaft set in boxes on the framework of timbers B B, upon which the pan is fixed, and carrying a pulley on the outer end for a driving-belt.

In the operation of this amalgamator pulp is introduced into the pan until the plates are submerged, and motion is given to the shaft L. Quicksilver is supplied by the pumps at such time as the character or condition of the ore requires.

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

1. The combination with a suitable pan having a central pillar; of a frame mounted for rotation thereon and consisting of inner

and outer rings and a series of radial arms inclined downwardly away from the center of the pan and secured upon said rings, and independent series of amalgamating surfaces comprising segment-plates secured at their edges upon said arms, the different surfaces being differently corrugated, as and for the purpose set forth.

2. The combination with a suitable pan having a central pillar; of a frame mounted for rotation thereon and consisting of inner and outer rings and a series of radial arms inclined downwardly away from the center of the pan and secured upon said rings, independent series of amalgamating surfaces comprising segment-plates secured at their edges upon said arms, and straps lying over and secured to the uppermost arms and covering the joints or seams between the edges of the upper segments, the different surfaces being differently corrugated, as and for the purpose set forth.

3. The combination, with a suitable pan having a central pillar, of a carrying-frame mounted on said pillar, means for rotating said frame, and a circular amalgamating surface having a pitch or inclination downward from the center out to the rim, and composed of separable plates or sections each formed of tubes laid concentrically and bent in vertical directions producing a fluted or corrugated surface, substantially as described.

4. In an amalgamator, the combination with a pan, a rotating frame therein, and a series of annular amalgamating plates carried by said frame and having an open center; of a plank resting on the pan and having an opening in its body, a bed plate piv-

oted on said plank at one side of the opening, a pair of upright pumps carried by the bed plate with their lower ends extending into the open center of the amalgamating plates and directed toward the upper and lower faces thereof, a quicksilver reservoir connected with said pumps, and means for operating the latter, as and for the purpose set forth.

5. In an amalgamator, the combination with a pan, a rotating frame therein, and a series of annular amalgamating plates carried by said frame and having an open center; of a plank resting on the pan, a bed plate on said plank, a pair of upright pumps carried by the bed plate with their lower ends extending into the open center of the amalgamating plates and directed toward the upper and lower faces thereof, a quicksilver reservoir connected with said pumps, and means for operating the latter, as and for the purpose set forth.

6. In an amalgamator, the combination, with a circular, revolving amalgamating surface composed of plates, of the quicksilver pump and a quicksilver reservoir mounted on the amalgamator, means for operating said pump, and tubes with nozzles connected to said pump to apply the quicksilver to the upper and lower surfaces of the amalgamating-plates, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

GUSTAVE A. GELIEN. [L. S.]

Witnesses:

C. W. M. SMITH,
CHAS. E. KELLY.