

No. 835,457.

PATENTED NOV. 6, 1906.

D. McKELVEY.
AMALGAMATOR.

APPLICATION FILED NOV. 15, 1905.

3 SHEETS—SHEET 1.

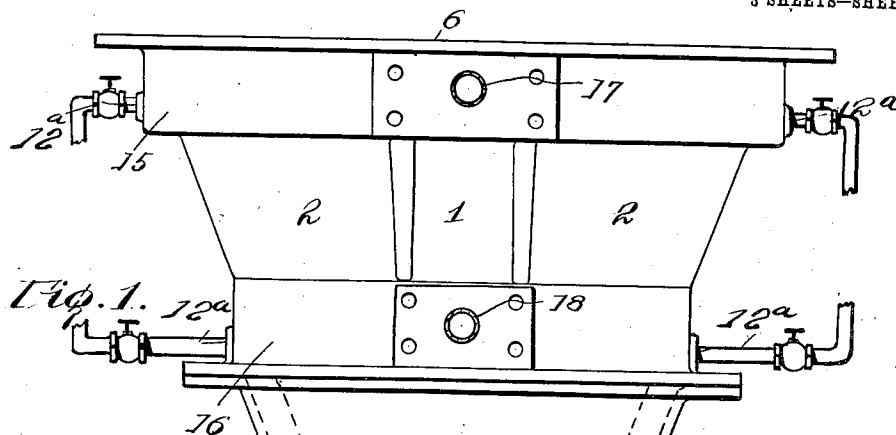


Fig. 1.

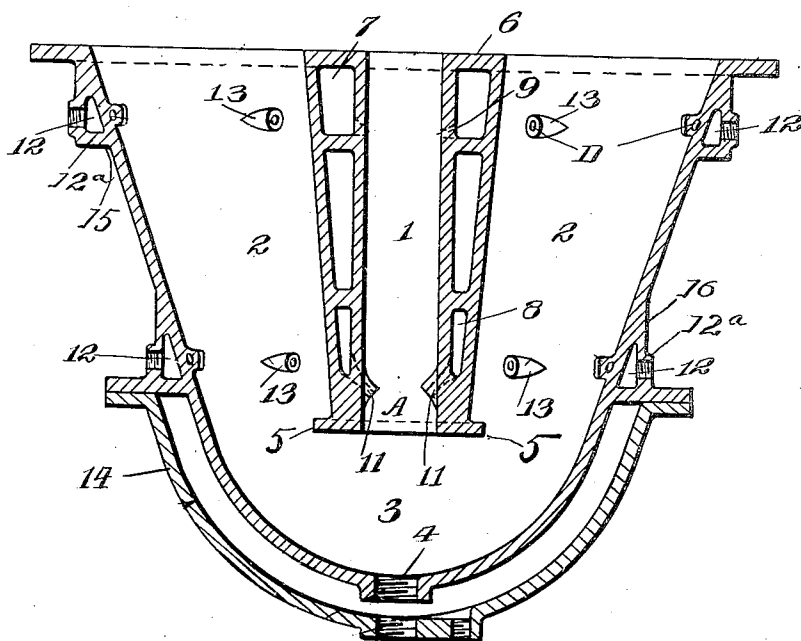


Fig. 2.

Inventor

David McKelvey

Witnesses

W. A. Woodson
McMinn

By

Phad Racy, Attorneys

No. 835,457.

PATENTED NOV. 6, 1906.

D. McKELVEY.
AMALGAMATOR.

APPLICATION FILED NOV. 15, 1905.

3 SHEETS—SHEET 2.

Fig. 3.

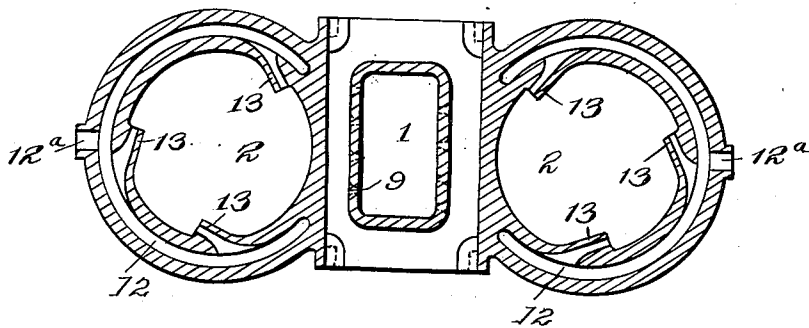
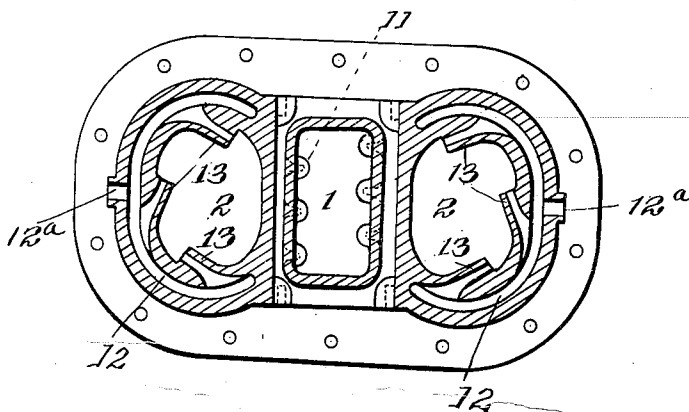


Fig. 4



Inventor

David McKelvey

Witnesses

W. J. Woodson
J. M. Mice

By

W. A. Racy, Attorney

No. 835,457.

PATENTED NOV. 6, 1906.

D. McKELVEY.
AMALGAMATOR.

APPLICATION FILED NOV. 15, 1905.

3 SHEETS—SHEET 3.

Fig. 5.

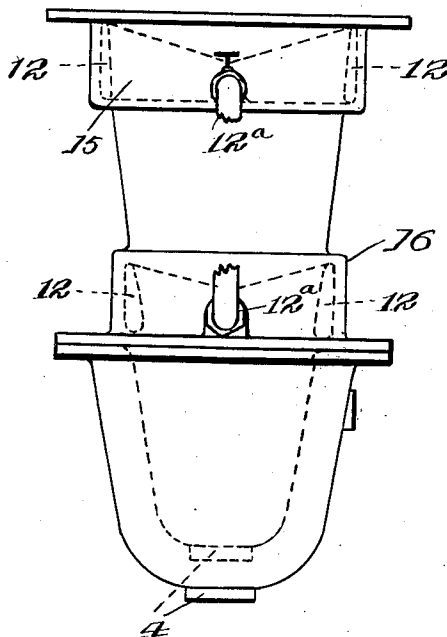
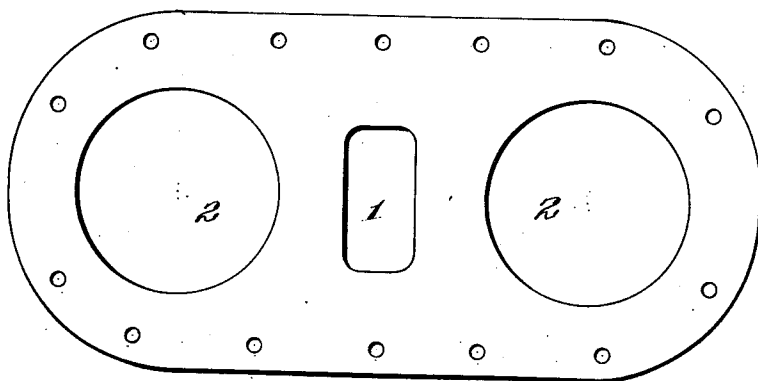


Fig. 6.



Inventor

David McKelvey

Witnesses

W. A. Woodson,
J. M. M. M. M.

By

R. A. Racy, Attorney

UNITED STATES PATENT OFFICE.

DAVID McKELVEY, OF NEW YORK, N. Y.

AMALGAMATOR.

No. 835,457.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed November 15, 1905. Serial No. 287,466.

To all whom it may concern:

Be it known that I, DAVID McKELVEY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Amalgamators, of which the following is a specification.

The object of my invention is to provide an improved construction of amalgamator which will operate efficiently to separate free gold from auriferous bearing material and which will thoroughly intermingle the gold with mercury under such pressure that all of the particles of the gold will effect an amalgamation with the mercury.

More specifically, it is the object of my invention to provide an improved amalgamator in which the auriferous material as it is fed to the mercury bath will be caught by streams containing a solution or agent for destroying any slime that may be present in the pulp which will subsequently by the action of other streams of water, steam, air, or gas or any similar agent drive the pulp into the mercury and cause it to be thoroughly commingled with the mercury to form a high per cent. amalgam and which will finally discharge the pulp upwardly through whirling streams, which will keep the side walls of the discharge-passage clear of pulp after the gold has been extracted; and a further object of the invention is to provide an amalgamator of the essential characteristics above set forth with an improved jacket for steam, hot air, or any hot liquid or gas that will keep the mercury bath warm.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a longitudinal section. Figs. 3 and 4 are horizontal sections taken on different planes. Fig. 5 is an end elevation. Fig. 6 is a top plan view.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

My improved amalgamator comprises a

casting or suitable metallic structure which may be made in one, two, or any convenient number of parts, according to the size of the apparatus; and it consists, essentially, of a central vertical sluice 1, located intermediate to two pulp-discharge columns 2, in which the sluice-column 1 opens at its lower end, both the sluice-column and the two pulp-discharge columns extending approximately in a vertical direction and all of them at their lower ends communicating with a mercury-chamber 3, which is provided at its lower end with a draw-off port or passage 4. Preferably the structure in cross-section tapers in a downward direction, so that the pulp-discharging columns 2 are contracted at their lower ends where they meet the lower end of the sluice-column 1, and the walls of the latter are provided with an outwardly-extending flange 5, the function of which will be described in connection with the other parts when the operation of the amalgamator is set forth. The sluice-column 1 is formed by a central hollow structure 6, which, as shown, is of frusto-conical shape inverted and is hollow, so as to provide upper and lower chambers 7 and 8, which are separated from each other by solid partition-walls, as clearly shown in the drawings. In those portions of the walls of the central structure 6 which constitute the upper chamber 7 are a plurality of ports or jets 9, which open inwardly from the chamber 7 into the sluice-column near the upper end of the latter. From the chamber 8 downwardly-extending jets or nozzles 11 extend into the lower end of the sluice-column 1. The outer walls of the structure which bound the two vertical pulp-discharging columns 2 are provided with independent or distinct upper and lower chambers 12, and at suitable points or intervals around said chambers 12 there are located non-radial outlet jets or openings 13. As best seen in Figs. 1 and 5, the upper chamber 12 is provided with a boxing 15, having inlet-openings 12^a communicating with the chamber, said boxing 15 also being provided with a middle section formed with an inlet-opening 17, designed to communicate with the interior of the chamber 7. In a similar manner the boxing 16 is provided for the lower chamber 12, said lower

boxing being also formed with inlet-openings 12^a and with inlet 18 for the lower chamber 12 and the lower chamber 8, respectively. By this provision of separate boxings, as described, the supply of fluid to the
 5 respective chambers may be independently controlled. These independent inlet-openings for the respective chambers may be provided with globe-valves or other similar devices for the independent control.
 10

The pulp is fed into the amalgamator by means of the sluice-column 1. As it is admitted to the sluice 1 it is caught by streams containing a solution or agent for destroying
 15 any slime that may be in it, said streams issuing out of the ports or jets 9. Further on in the sluice the pulp meets other streams, which are of water, steam, or any similar agent, issuing forcibly out of the jets or nozzles 11,
 20 and owing to the downward deflection of said jets the pulp will be forcibly impelled through the mercury which is in the chamber 3, preferably to a height just above the flange 5, and will be caused to thoroughly commingle with
 25 the mercury to form the amalgam. The pulp by means of its relative specific gravity will rise in the side columns 2, and the flange 5 by its projecting location will prevent the pulp from hugging the interior walls of the
 30 apparatus when passing through the mercury. As the pulp after the gold has been extracted therefrom rises into the side columns 2 it will be caught by whirling streams, which issue out of the two sets of jets or nozzles and owing
 35 to the whirling motion set up will be carried upwardly and out of the amalgamator without clinging to the sides of the same.

In order to keep the mercury bath sufficiently warm, I have provided a jacket 14,
 40 which fits around the bottom of the apparatus, being secured thereto by bolts or the like, and by its connection keeps the mercury sufficiently warm by means of steam, hot air, or any other hot liquid or gas that may be used
 45 for the purpose.

From the foregoing description, in connection with the accompanying drawings, it will be seen that I have provided an amalgamator in which the pulp will be thoroughly treated
 50 to effect a separation of the gold therefrom.

Having thus described the invention, what is claimed as new is—

1. An amalgamator provided with a bottom mercury-chamber and with upwardly-discharging columns opening thereinto and
 55 with a central structure providing one wall of said columns and a vertical sluice-column between said side columns, said central structure being provided with upper and lower
 60 chambers separated from each other, means for supplying the upper end of said sluice with a slime-destroying agent issuing from

said upper chamber, downwardly-deflected jets or nozzles issuing from the lower chamber of the sluice, and non-radial jets in said
 65 side columns.

2. An amalgamator provided with a bottom mercury-chamber and with upwardly-discharging columns opening thereinto and with a central structure providing one wall
 70 of said columns and a vertical sluice-column between said side columns, said central structure being provided with upper and lower chambers separate from each other, the upper chamber being provided with ports opening
 75 into the sluice-column and the lower chamber being formed with downwardly-extending nozzles also opening into the sluice-column near the bottom thereof, and means for supplying the said upper and lower chambers
 80 with fluid independently.

3. An amalgamator provided with a bottom mercury-chamber a discharge-column opening upwardly therefrom, and a sluice with its lower end opening into the mercury-chamber, and an upper and a lower set of jets
 85 opening into said sluice, the lower set of jets extending downwardly into the sluice and both sets of jets being arranged for independent control.
 90

4. An amalgamator provided with a bottom mercury-chamber, a central sluice opening thereinto and two upwardly-discharging slime-columns on opposite sides of said sluice
 95 and opening at their lower ends into the mercury-chamber, the amalgamator being also provided with upper and lower distinct chambers 12 provided with non-radial jets opening into the slime-discharge columns, and each chamber being designed for independent connection
 100 to the source of fluid-supply, and two sets of jets opening into the sluice-column one set above the other, the lower set extending downwardly, both sets of jets being arranged for independent connection to
 105 different sources of fluid-supply, as and for the purpose set forth.

5. An amalgamator provided with a bottom mercury-chamber, and a central structure constituting two side discharge-columns and central vertical sluice-column, said structure being provided with an upper and a lower
 110 chamber surrounding the sluice-column said chambers being separate from each other; the upper chamber being formed with jets opening into the sluice-columns, and the lower chamber being provided with jets opening in a downwardly direction in said sluice-column
 115 near the bottom thereof, the amalgamator being also provided with two distinct chambers 12 one above the other and surrounding the discharge-columns and provided with non-radial jets opening into said discharge-columns, upper and lower boxings for said chambers
 120

bers 12 respectively, the upper boxing being provided with an inlet-opening for the discharge of fluid into the upper chamber 12 and with openings 17 for the passage of fluid
5 into the upper chamber of the central structure and the lower boxing being also provided with inlet-openings for the lower chamber 12 and with independent openings 18 for

the lower chamber of the central structure, as and for the purpose set forth. 10

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

DAVID McKELVEY. [L. s.]

Witnesses:

SAMUEL F. McKELVEY,
JOHN PETERS.