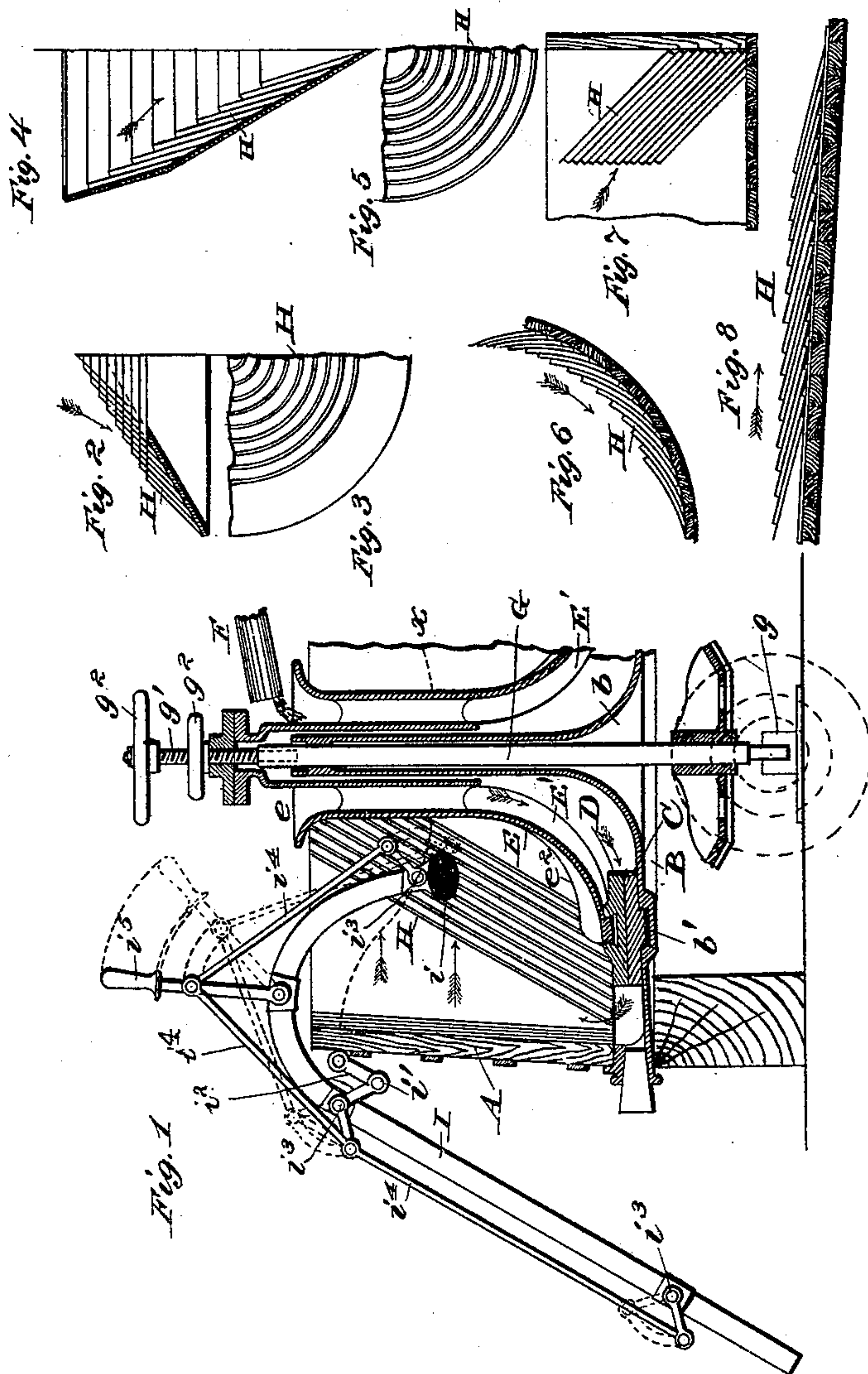


(No Model.)

F. G. JORDAN.  
AMALGAMATOR.

No. 582,745.

Patented May 18, 1897.



Witnesses.

J. F. Coleman  
J. H. Truett

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Att'y.



# UNITED STATES PATENT OFFICE.

FREDERICK GEORGE JORDAN, OF SPOKANE, WASHINGTON.

## AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 582,745, dated May 18, 1897.

Application filed July 6, 1896. Serial No. 598,207. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK GEORGE JORDAN, a citizen of England, residing at Spokane, in the county of Spokane, State of Washington, have invented certain new and useful Improvements in Amalgamators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in amalgamating devices.

The invention will first be described in connection with the accompanying drawings, and then particularly pointed out in the claims.

In the drawings, Figure 1 is a central sectional view of an amalgamator embodying my invention, a part being removed. Figs. 2 to 8, inclusive, are detail views illustrating various modifications of one part of my invention.

Referring to Fig. 1 of the drawings, A is an amalgamator-casing secured in any suitable manner to a bottom B, which has an upward-extending central bearing *b* and a dovetailed annular groove *b'*. A lower annular mulling-disk C is dovetailed into the bottom B, and on this said mulling-disk C moves an upper annular mulling-disk D, which is secured to a runner-frame E, preferably by the dovetail connection shown in Fig. 1, though any other suitable connecting mechanism may be employed. The runner-frame E surrounds the bearing *b* and has a flaring mouth *e* at the top, into which mouth empties a supply-pipe F. Through the central bearing *b* a shaft G extends, said shaft being stepped at its lower end in a step-bearing *g*, supported on any suitable foundation.

The shaft G is rotated from any desired source of power through the medium of a pair of bevel-wheels, as shown in Fig. 1. The runner-frame E is attached to the upper end of the driving-shaft G by means of a screw *g'*, whereby the runner-frame E may be adjusted up and down by turning the hand-wheel *g''*, thus permitting the adjustment of the distance between the two mulling-disks. The runner-frame E also has a series of radial vanes *E'*, vertical at the upper ends and curving outward coincident to the curvature of the runner-frame.

The operation of the device thus far described is as follows: The pulp is fed into the mouth of the runner-frame E through the pipe 55 F. The runner-frame is rotated by suitable power, and the pulp flows down into the spaces between the wings or vanes *E'*, which vanes by their orbital movement carry the descending streams of pulp with them, and thus create 60 a circular motion of the pulp, whereby when it reaches the lower end of the runner-frame E it tends to fly outward by centrifugal force and passes between the two mulling-disks, which bring the coarser particles to a suitable 65 degree of fineness and then discharge the pulp at the outside into the space between the casing A and the outside of the runner-frame. The latter is provided with exterior vanes *e''*, which in revolving assist in producing a cir- 70 cular motion of the pulp outside the runner-frame, whereby said pulp is thrown against the inner surface of the casing, the level of the liquid pulp being highest at the casing, the level of said liquid pulp being indicated by 75 the dotted line at *x*.

To the inner surface of the casing A are attached a plurality of amalgamating-plates H, which are made of copper plates amalgamated or prepared on both sides or faces and one 80 edge by any known process, these plates being arranged to overlap one another in the manner of the leaves of a book when partly opened or like shingles on a roof. By this construction the projecting edges readily intercept the 85 precious metal, and the latter is readily amalgamated and, as I have found, works its way between the plates. This part of my invention is applicable to various kinds of amal- 90 gamators, and in Figs. 2 to 8, inclusive, I have illustrated the manner in which this part of my invention could be employed in connection with some of the ordinary forms of pans indicated.

For instance, Figs. 2 and 3 of my invention 95 are readily applicable to a cone-table amalgamator. Figs. 4 and 5 indicate its application to an inverted-cone amalgamator. Fig. 6 shows its application to a barrel-amalgamator, Fig. 7 to a pan, and Fig. 8 to a plate-amal- 100 gamator or mortar-box amalgamator-plates.

Another feature of my invention consists in the application to an amalgamator of a siphon discharge device which is illustrated in



Fig. 1. Referring to that figure, I is a siphon-pipe bent in the usual manner with the outside leg longer than the inside leg, the latter having a mouthpiece *i*, which is funnel-shaped and projects in the direction opposite to the direction of the movement of the circulatory water. This mouthpiece is arranged to project into the inside of the amalgamator at a point close to the runner-frame E, whereby it takes that water whose circulatory motion is the slowest, and therefore the siphon will not carry off any particles of precious metals. The siphon-pipe I is held to the outside of the casing by a knuckle-joint *i'* and levers *i''*, whereby the mouth of the siphon may be adjusted at any desired position in the pan. The siphon-pipe I is also provided with valves *i'''*, one in each end of the long leg and one in the lower end of the short leg, whereby when all the valves are closed the action of the siphon will be stopped, and at the same time a certain amount of water will be retained in the siphon, so that it will be ready for use at any moment. The said valves *i'''* are connected by rods *i''''* to a hand-lever *i'''''*, whereby all the valves may be opened or closed simultaneously.

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

1. In an amalgamator, the combination, with a casing provided with overlapping plates, a runner-frame rotatable in the casing and provided with a flaring mouth, means for

supplying pulp to said mouth, and radial vanes upon the interior and exterior of the runner-frame, of a bottom secured to the casing, a pair of mulling-disks, one carried by the runner-frame and the other secured to the bottom, means for rotating the runner-frame and a siphon discharge-pipe located partly within and partly without the casing, substantially as shown and described.

2. In an amalgamator, a siphon arranged to discharge the liquid from the pan, valves located in the siphon, whereby the liquid in the latter is retained when the siphon is not in use, means for opening or closing all the valves simultaneously, and means for adjusting the siphon in any desired position, substantially as described and shown.

3. In an amalgamator, the combination, with a casing for containing the pulp, means for imparting a rotary motion to the said pulp, and a siphon arranged to discharge the liquid from the casing, of a knuckle-joint connection between the casing and the siphon, valves in said siphon, a hand-lever connected to the siphon and rods connecting all the valves to the hand-lever, all substantially as described and for the purpose set forth.

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

FREDERICK GEORGE JORDAN.

Witnesses:

H. BAXTER,  
P. E. FISHER.