

(No Model.)

J. L. DEAM.
ORE WASHER.

No. 354,104.

Patented Dec. 14, 1886.

Fig. 1.

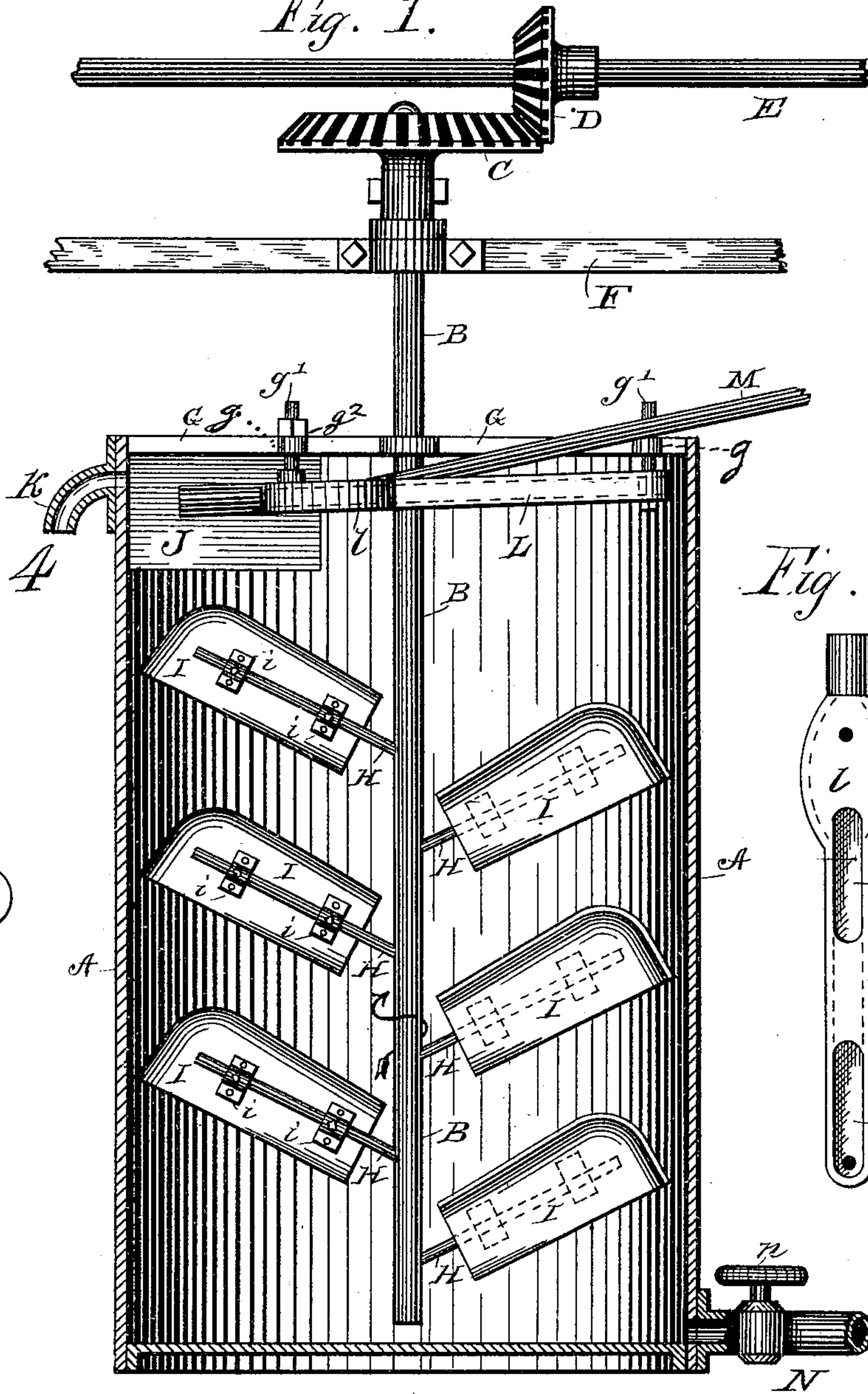


Fig. 4.

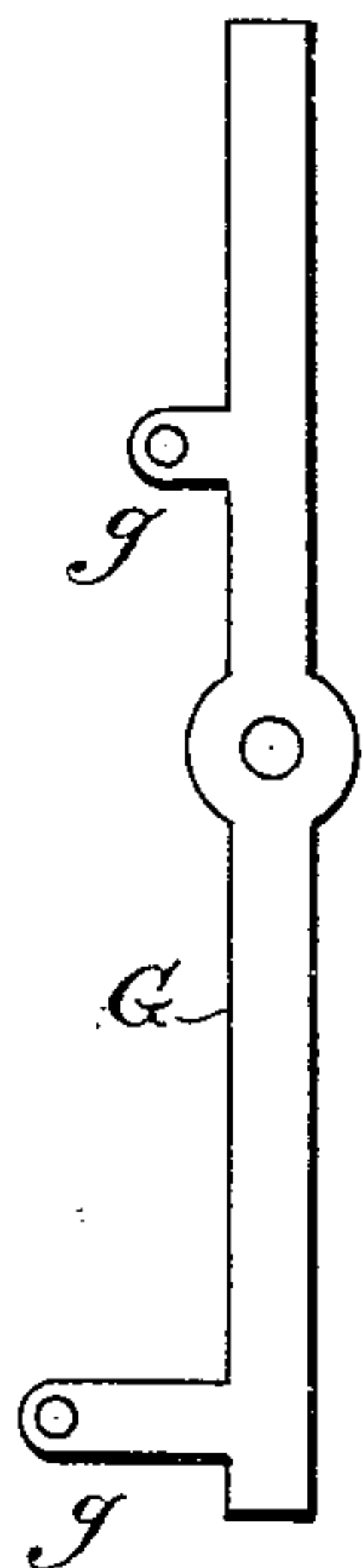


Fig. 3.

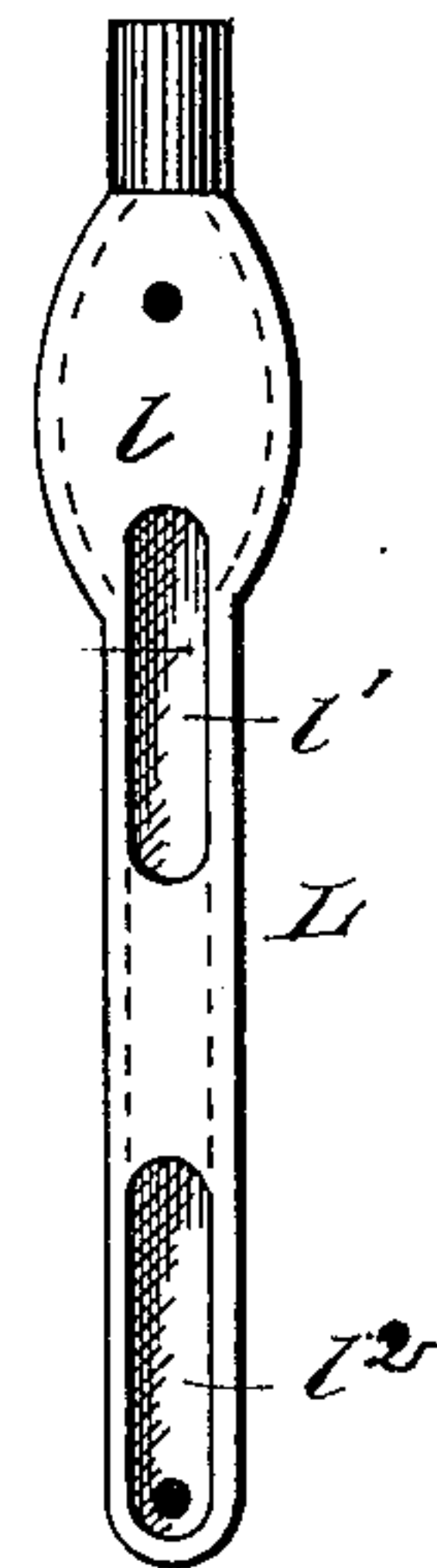
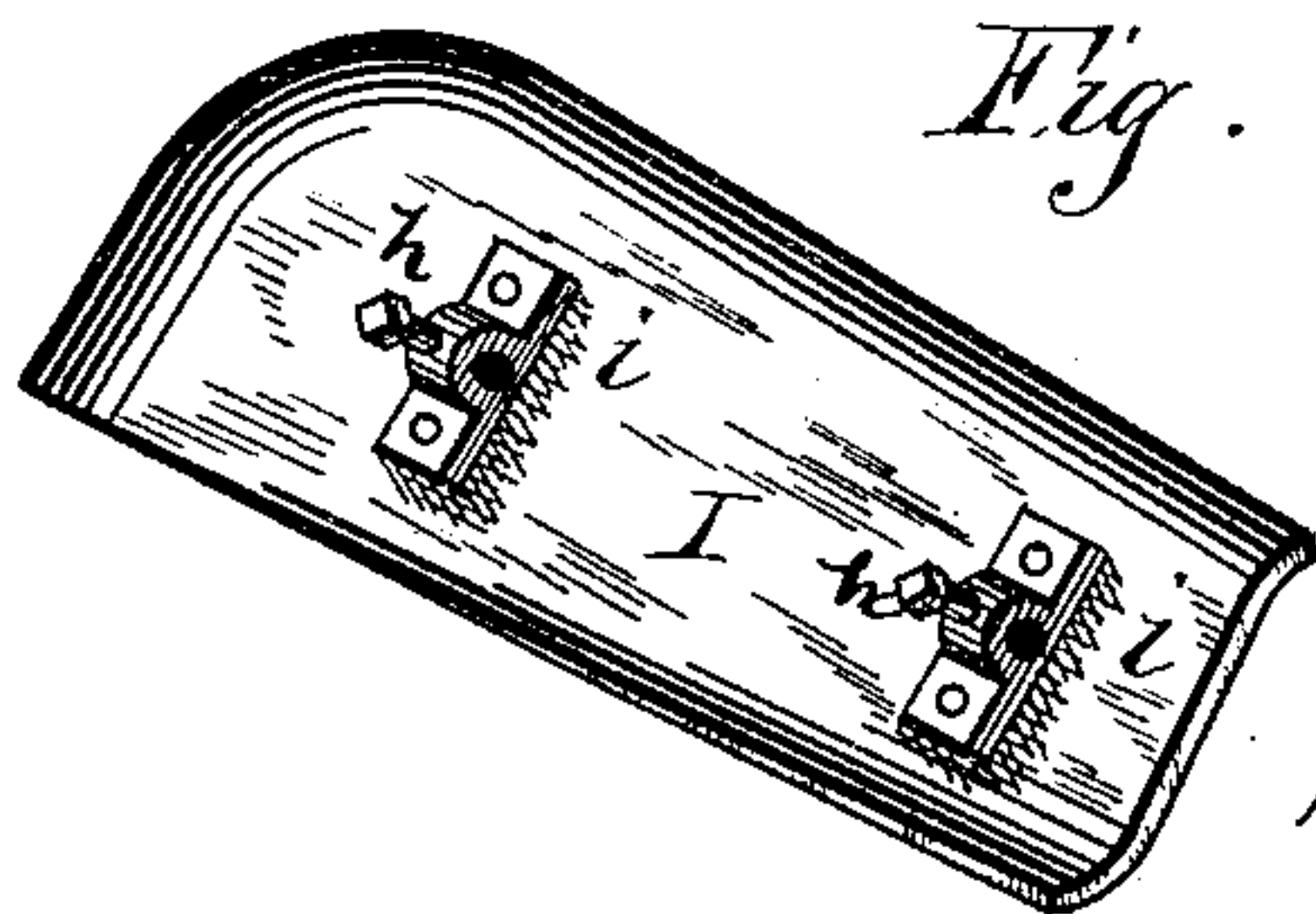


Fig. 2.



Witnesses
John C. Miller,
Percy White.

Inventor
John L. Deam
By *Wm. Hunter Myers*
Attorney.

UNITED STATES PATENT OFFICE.

JOHN L. DEAM, OF COLUMBIA, COLORADO.

ORE-WASHER.

SPECIFICATION forming part of Letters Patent No. 354,104, dated December 14, 1886.

Application filed March 30, 1886. Serial No. 197,223. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. DEAM, a citizen of the United States, residing at Columbia, in the county of San Miguel and State of Colorado, have invented certain new and useful Improvements in Ore-Washers; 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 ore-washers for washing crushed ores; and it has for its object the production of a machine for this purpose, to be used in connection with concentrators and amalgamators, by which a greater saving of the fine floating metallic particles can be effected than is practicable with machines used in the present modes of concentration and amalgamation.

The invention consists in certain details of construction and combinations of parts, which will be hereinafter described and claimed.

Referring to the accompanying drawings, Figure 1 is a view, partly in vertical section and partly in elevation, of my improved ore-washer. Fig. 2 is a perspective view of one of the agitator-blades. Fig. 3 is a plan view of the inspirator. Fig. 4 is a plan view of the cross-bar at the top of tank, from which the inspirator is suspended.

In the drawings, A represents a tank of any desired dimensions, three feet high and three feet in diameter being a convenient size.

B represents the agitator-shaft, provided at its upper end with a bevel-wheel, C, gearing with another bevel-wheel, D, on a horizontal shaft, E, driven by any suitable motor.

Shaft B is suspended from a cross-bar, F, of any suitable frame-work rising above the top of the tank, and passes down through the center of the tank, but does not quite reach the bottom, being steadied by a cross-bar, G, at the top of the tank.

H represents agitator-arms secured to shaft B obliquely to its axis, the arms on one side of the shaft being so arranged as to travel in paths intermediate the paths traveled by the arms on the opposite side, as shown in the drawings, to which arms agitator-blades I are secured by clevises *i*, so that they may be readily adjusted to any desired inclination and be held by the set-screws *h*. The blades are at-

tached to their shafts in an inclined position, with their lower parts forward with relation to the direction of movement, which direction is indicated by the arrow, Fig. 1.

It will be observed on reference to Fig. 2 that the lower edge of each agitator-blade is rearwardly curved, and that the upper and outer end edges are rounded off and forwardly curved. This construction and arrangement of the blades is an important feature of my invention, the purpose of which will hereinafter appear.

J represents a head gate, consisting simply of a rectangular board secured to cross-bar G, and parallel therewith, in rear of and in close proximity to the discharge-orifice K at the top of the tank.

L represents what I term an "inspirator," consisting of a flat pipe having an enlargement, as *l*, near its outer end, and two openings in its top, as shown at *l'* *l''*. It is designed that the outer end of the inspirator should lie close to the side of the head-gate, and therefore, in order to avoid the necessity of bending the inspirator to pass shaft B, I have provided cross-bar G with two lateral arms, *g g*, from which the inspirator is suspended by rods *g'* *g'*, which pass through openings in said arms, and are held in position therein by the screw-threaded nuts *g''* on the screw-threaded ends of said rods. This arrangement permits also the adjustment, as to inclination, of the inspirator.

M represents a conduit for conveying pulp and water from the battery or other ore-pulverizing machine to the interior of the tank, the said conduit consisting of a pipe of any suitable size, one end of which enters the inspirator through the opening *l'*.

N is a conduit at the bottom of the tank, provided with a stop-cock, *n*, for delivering the heavier particles, which have gravitated to the bottom, to an amalgamator or concentrator.

The operation of my improved machine is as follows: Power is first applied to the agitator, which is kept in constant motion. The tank is next filled up to the discharge-pipe K with pulp and water, when stop-cock *n* in conduit N is opened just enough to allow the floating particles to pass over at K, it being understood that the flow from the battery

through conduit M into the tank must equal the discharge at both K and N. The remaining contents of the tank will then flow continually through conduit N to the concentrator or amalgamator. The revolving agitator-blades thoroughly stir the pulp and water, and thus throw the refuse and lighter particles of metal—those not heavy enough to gravitate to the bottom of the tank—toward the surface.

Owing to the forward inclination of the lower portion of each blade, such refuse and light metallic particles as come in contact with its rearwardly-curved edge will pass up over that edge and along the front of the blade, and will be carried upward and outward until they encounter the currents induced by the forwardly-curved upper and outer end edges, which currents meet at the rounded corner of the blade, and over this rounded portion the refuse and metallic particles will flow into the path of the next succeeding blade, by which they are carried still higher, until finally they are brought to the surface. All substances brought to the surface in front of the head-gate will be stopped by it and carried off through the discharge-orifice to a conveniently-located settling-tank. Such particles of metal and other substances as may be brought to the surface of the water in rear of the head-gate will be floated about half-way around the tank, when they will be in the immediate vicinity of opening ⁷ in the inspirator, when, owing to the current induced by the flowing pulp and water from the battery, they will be drawn into the inspirator through that opening and delivered at the front side of the head-gate, and finally discharged to the settling-tank, as before stated, room being provided by the enlargement ⁷ for free passage of water, and the said substances past the point where the inlet from the ore-crushing mechanism enters the inspirator.

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

1. In a machine for washing crushed ores, the combination, with a tank and an agitator-shaft having arms arranged obliquely to its axis, of a series of blades adjustably secured to the arms, each of said blades having a rearwardly-curved lower edge and forwardly-curved and rounded upper and outer end edges,

substantially as described, and for the purpose set forth.

2. In a machine for washing crushed ores, the combination, with a tank for receiving pulp and water from an ore-crushing machine, the said tank being provided with a discharge-orifice at the top, and mechanism for agitating the pulp and water, of a head-gate for arresting floating particles in front of said discharge-orifice, substantially as described.

3. In a machine of the class described, the combination, with a tank having the discharge-orifice, of an inspirator located near the top of the tank for gathering floating particles and conveying them to a point near the discharge-orifice, substantially as described.

4. In a machine of the class described, the combination, with a tank, of an inlet-pipe and an inspirator, consisting of a pipe having an open enlargement near its outer end and two openings in its top, substantially as described, and for the purpose set forth.

5. In a machine for washing crushed ores, the combination, with a tank having a discharge-orifice at its top, of a head-gate and an inspirator, the latter being arranged to discharge at the side of the former, and the gate being arranged to arrest floating substances and direct them to said orifice, substantially as described.

6. The improved ore washer above described, consisting of a tank having a discharge-orifice at its top and a conduit at its bottom, an agitator-shaft having arms set obliquely to its axis, blades mounted on said arms and having rearwardly-curved lower edges and forwardly-curved and rounded upper and outer end edges, a head-gate located just in rear of the discharge-orifice, an inspirator arranged to discharge at the side of the head-gate, and an inlet-pipe arranged to convey pulp and water from the ore-crushing machine to the interior of the inspirator, the whole arranged and operating in the manner hereinbefore set forth.

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

JOHN L. DEAM.

Witnesses:

GEORGE ROHWAR,
JOHN WALTON.