G. O'BRIEN.

Amalgamator.

No. 199,095. Patented Jan. 8, 1878.

Fig. 1.

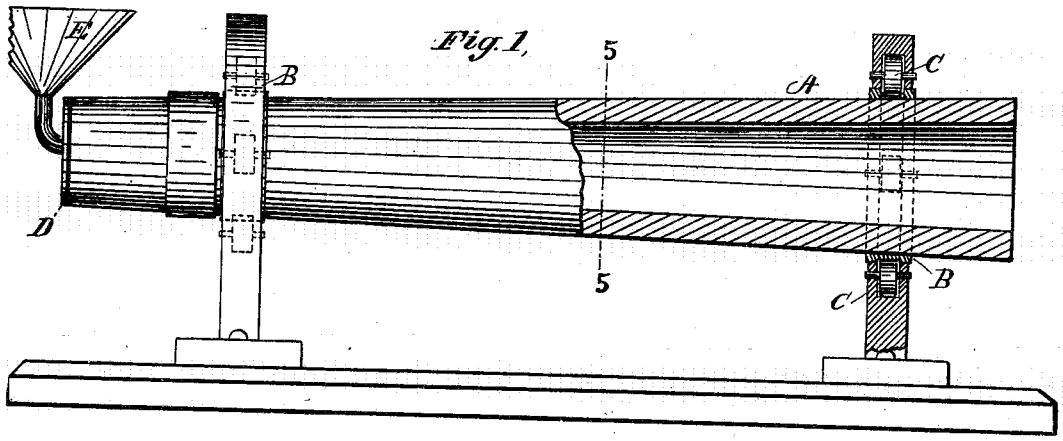


Fig 2

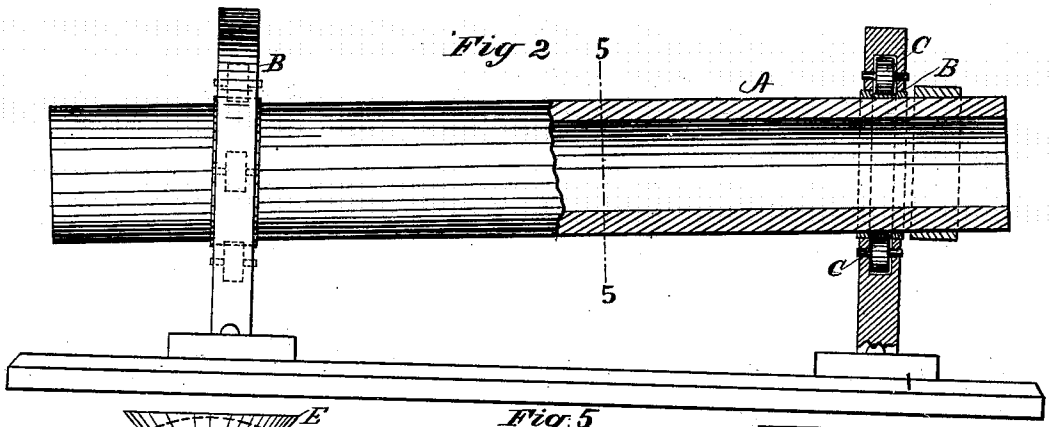


Fig. 3.

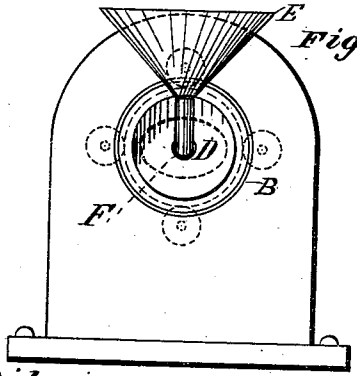


Fig. 5.

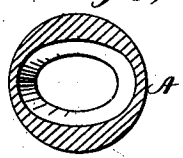


Fig. 6.

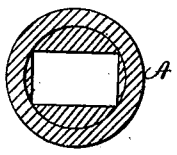
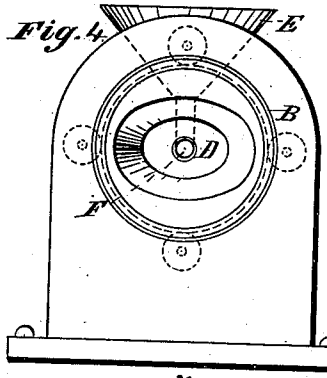


Fig. 4.



Witnesses

Chas J. Cooch

W. R. Edelin

Fig. 7.

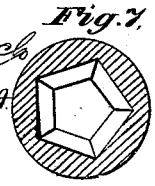


Fig. 8.

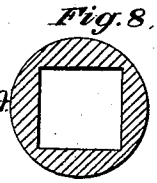
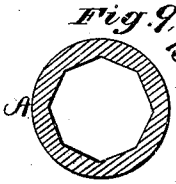


Fig. 9.



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UNITED STATES PATENT OFFICE.

GEORGE O'BRIEN, OF LONDON, ENGLAND.

IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **199,095**, dated January 8, 1878; application filed September 17, 1877.

To all whom it may concern:

Be it known that I, GEORGE O'BRIEN, of London, in the county of Middlesex, England, have invented certain new and useful Improvements in Archimedean Eccentric Amalgamators, of which the following is a specification:

This invention relates to that class of amalgamators in which the ore is brought in contact with a surface, which may be provided with a coat of amalgam by centrifugal force.

My improvement consists in a cylinder or tube, of conical, pyramidal, or cylindrical form, and of any suitable material. The inner surface of the tube is either elliptical, rectangular, polygonal, or other non-circular form in cross-section, and is open at both ends. The tube is mounted in bearings of such construction as to adapt it to be turned by any suitable machinery. The ore is inserted at either end of the tube.

The object of the present invention is to provide means for brightening or "touching" with quicksilver the metal in the ore as it is passed over the inner surface of the tube, and thereby prepare the metallic particles for final absorption in the quicksilver bath.

In the accompanying drawing, Figure 1 is a side elevation of my improved amalgamator, having a conical tube, and being shown partly in section with a funnel attached. Fig. 2 is a like view of an amalgamator provided with a straight tube. Figs. 3 and 4 are end views of that form shown in Fig. 1. Figs. 5, 6, 7, 8, and 9 are transverse sections of tubes whose inner surfaces are of different forms in cross-section.

A represents a tube, which may be of conical, pyramidal, or cylindrical shape, and formed of any suitable material capable of being amalgamated with quicksilver. The inner surface of the tube may be of any non-circular form in cross-section, such as elliptical, polygonal, or rectangular. The tube is mounted in circular bearings B, whose inner surfaces are provided with anti-friction rollers C, which embrace the tube. The inner surface of the tube is free from all obstruction. The tube is revolved at a high rate of speed by any suitable mechanism.

When a conical or pyramidal tube is used the ore is passed in from the crusher or stamp at either the larger or the smaller end, as the case may require. The ore is thrown, by the rapid rotation and shape of the tube, against the inner surface or amalgam lining, and carried by a spiral motion to the other end, where it is discharged into an ordinary mercury bath.

When a tube having parallel sides is used, one end is supported higher than the other, and the ore is fed in at the higher end, passing through, as in a conical tube. The preferred form of tube being non-circular in cross-section, the axis on which the tube rotates being in the direction of its length, and in the center of gravity of the cross-section, thereby causes eccentricity of motion and a consequent progressive spiral rotation in the current of water flowing from the crushers, or the deposit containing the metallic substances, the centrifugal force driving the liquid pulp into violent contact with the inner surface of the tube.

If there is a declivity in the ground on which the device is located, or other motive rendering the conical form unnecessary, I sometimes use the straight tube, but still form the inner surface of non-circular shape in cross-section.

In Figs. 1, 3, and 4, I show the form of funnel that I use to start the spiral movement of the liquid, as the moment the water enters the tube it has no spiral progressive motion.

I provide a flange, D, at the point of entry, to keep the liquid in until it has acquired action. E is the funnel, which fits loosely into the hole F.

I make the following distinction between my invention and existing machines for a similar purpose, namely: I do not use blades, rims, or other projections in my tubes, which are clear in their section throughout their length.

I depend upon the form of my tubes, as hereinabove described, to produce the desired effect of spreading the metallic or other substances in a continuous and agitated stream over the inner surface of the tubes, causing a rubbing action between the particles and the surface of the tubes, which either amalgammates or cleans them, as the case may require.

The process, in fact, removes extraneous substances, and brightens the metallic particles, thus preparing them by partial amalgamation or cleansing for the final process of absorption and separation.

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

An amalgamating-tube open at both ends, and having its inner surface non-circular in cross-section, as set forth.

GEORGE O'BRIEN.

Witnesses:
J. E. BOWE,
F. PEREZ Y H.