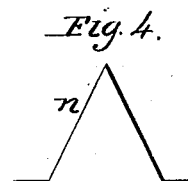
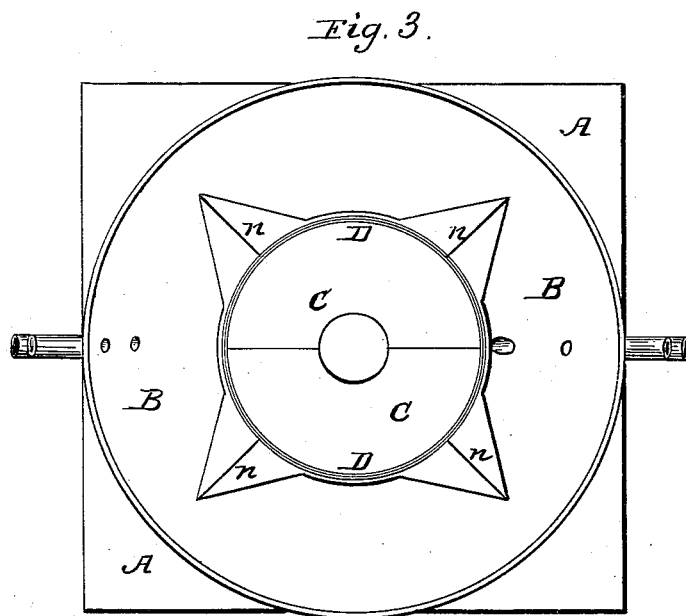
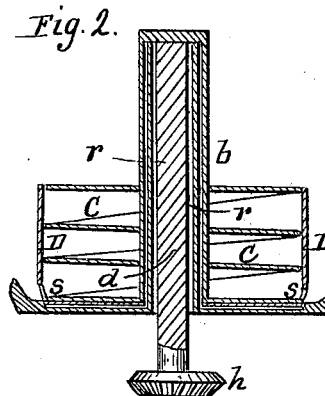
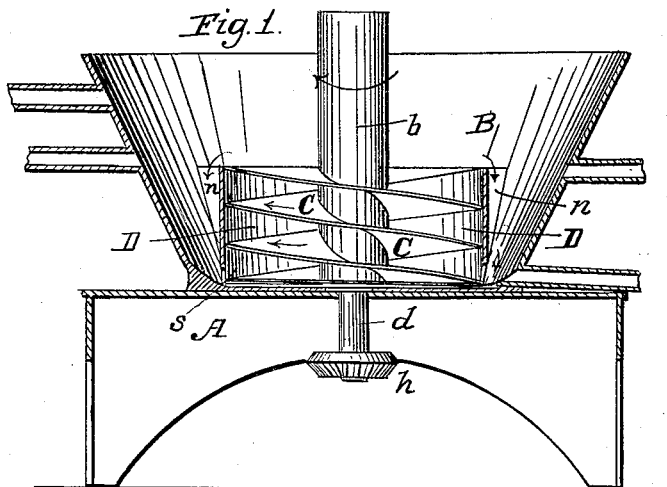


H. A. GASTON.

Amalgamator.

No. 53,435.

Patented March 27, 1866.



Witnesses:

*J. W. Cornaby*  
*A. Lellere*

Inventor:

*Henry A. Gaston.*

# UNITED STATES PATENT OFFICE.

HENRY A. GASTON, OF AUSTIN, NEVADA.

## IMPROVED AMALGAMATOR.

Specification forming part of Letters Patent No. 53,435, dated March 27, 1866.

*To all whom it may concern:*

Be it known that I, HENRY A. GASTON, of Austin, in the county of Lander and State of Nevada, have invented a new and useful Improvement in Machines for Grinding and Amalgamating Ores; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a central vertical section. Fig. 2 is a plan or top view. Fig. 3 is a detached central vertical section, showing the construction of the central portion of the apparatus. Fig. 4 is a vertical section of one of the inclined partitions.

Similar letters of reference indicate corresponding parts in all the figures.

This invention is designed for grinding metallic ores or pulp and for carrying on the process of amalgamating by which the precious metals are separated therefrom; and it consists in a rotary screw operating in connection with a case or cylinder surrounding the said screw and placed within the ordinary amalgamating-pan in such a way that when the screw is rotated in one direction it will grind or wash the ore or pulp in contact with the quicksilver placed in the bottom of the said pan, and when revolved in an opposite direction will cause a continuous agitation or circulation within the pan of the ore or pulp and the quicksilver intermixed therewith, by which means the thorough grinding of the ore and the amalgamation of the metals contained therein are effectually insured.

It also consists in a novel arrangement, with reference to the case or cylinder just mentioned and to the amalgamating-pan, of partitions with sloping sides, which insure the proper passage of the ore or pulp from the amalgamating-pan into the said case.

To enable those skilled in the art to understand the construction and operation of my invention, I will proceed to describe it with reference to the drawings.

A is a bed-plate or foundation, upon which is supported the amalgamating-pan B, which is of ordinary construction, with its sides sloping inward at the bottom, and is provided with suitable outlet-pipes and a false bottom, *m*, in the usual manner.

C is the rotating screw, the axis of which is arranged vertically in the center of the pan B, and which may have one, two, or more separate threads. In order to prevent water or grit from penetrating between the shaft of this screw and the bearing thereof the said shaft is made in the form of a tube or hollow cylinder, *b*, closed at the top but open at the bottom, as clearly shown in Fig. 2, and placed like a cap over a fixed tube, *r*, which extends vertically upward from the center of the bottom of the pan B.

Firmly secured to and extending downward from the closed upper end of the hollow shaft *b* is an internal shaft, *d*, which projects downward through the tubular stem *r* below the bottom of the pan B, and has a bevel-gear, *h*, upon its lower end, through which motion may be communicated to the screw C by any suitable means. If preferred, the said screw may be rotated by gearing applied directly to the upper end of its shaft, thus dispensing with the tube *r*.

D is the cylinder or case surrounding the screw C and secured to the bottom of the pan. This case D may be made of either wood or metal, and is provided around its lower edge, at suitable distances apart, with holes, *s*, through which the ore or pulp passes from the pan B into the case D, or vice versa, as required in the operation of the machine, as will be presently explained.

Between the holes *s* partitions *n* are placed across the space between the cylinder or case D to the sides of the pan B. These partitions extend up to the top of the cylinder D, and have their sides inclined or sloping, as shown in Fig. 4, so that their bases occupy the entire space between the said holes, thus causing the ore or pulp as it descends between them to be directed toward the holes *s*.

Instead of constructing the case D as just herein described, it may, if desired, be made of wire or of any suitable reticulated or perforated material which will permit the passage of the ore and the quicksilver mingled therewith from the pan B to the screen C.

The operation of the invention is as follows: The pan B is filled up to as great depth as desirable with ore which has been crushed or pulverized by any of the ordinary means and mixed with water to a proper consistency.

The screw C is rotated in the direction shown by the arrow in Fig. 1, and forces the pulp downward into close contact with the false bottom *m*, the lowermost end of the screw grinding and rubbing the pulp upon the said false bottom and reducing it to a suitable condition for the introduction of the quicksilver. When quicksilver has been introduced into the pan the motion of the screw is reversed, upon which, instead of forcing the ore downward and grinding it, as just described, it forces it upward through the case D. The pulp, entering the said case at the bottom through the holes *s* and passing out over the top thereof, is conducted back to the said holes *s* by the inclined or sloping sides of the partitions *n*, so that a continual circulation of the pulp is maintained, while portions of the quicksilver are carried up on the surfaces of the screw-threads, and thereby made to present a large surface to the circulating pulp. The opera-

tion is continued until the amalgamation of the metals contained in the ore have been amalgamated to as great a degree as desirable, when the rotation of the screw is again reversed for the purpose of collecting the quicksilver and amalgam at the bottom of the pan.

What I claim as new, and desire to secure by Letters Patent, is—

1. The rotating screw C, operating within a cylinder or case, D, situated within the amalgamating-pan B, substantially as herein described, for the purpose specified.

2. The inclined partitions *n*, arranged between the case D and amalgamating-pan B, and with reference to the openings *s*, substantially as herein set forth, for the purpose specified.

HENRY A. GASTON.

Witnesses:

HENRY T. BROWN,  
A. LE CLERC.