(No Model.)

H. P. MINOT.

ORE SEPARATOR.

No. 273,583. Patented Mar. 6, 1883.

Fig. 1

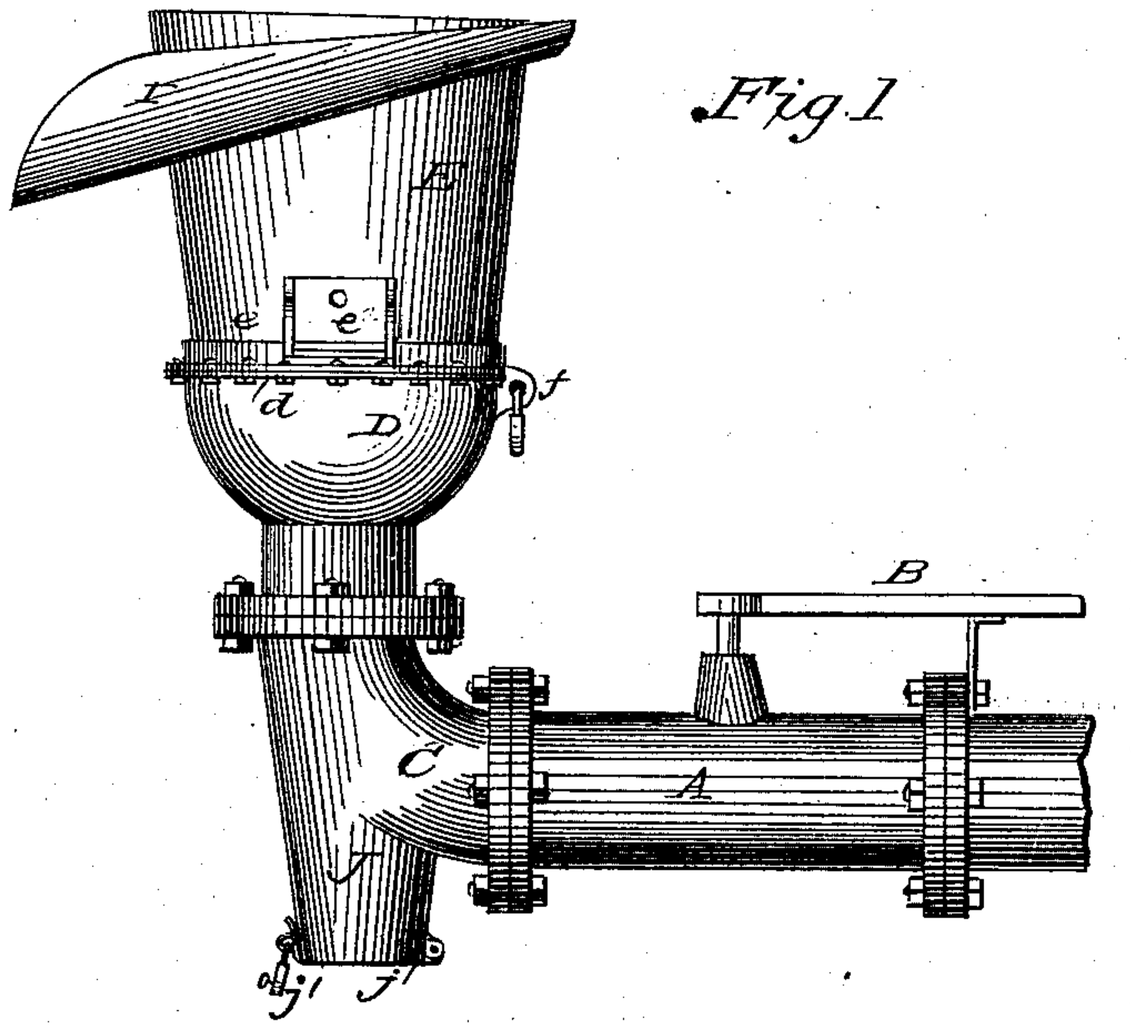


Fig. 2

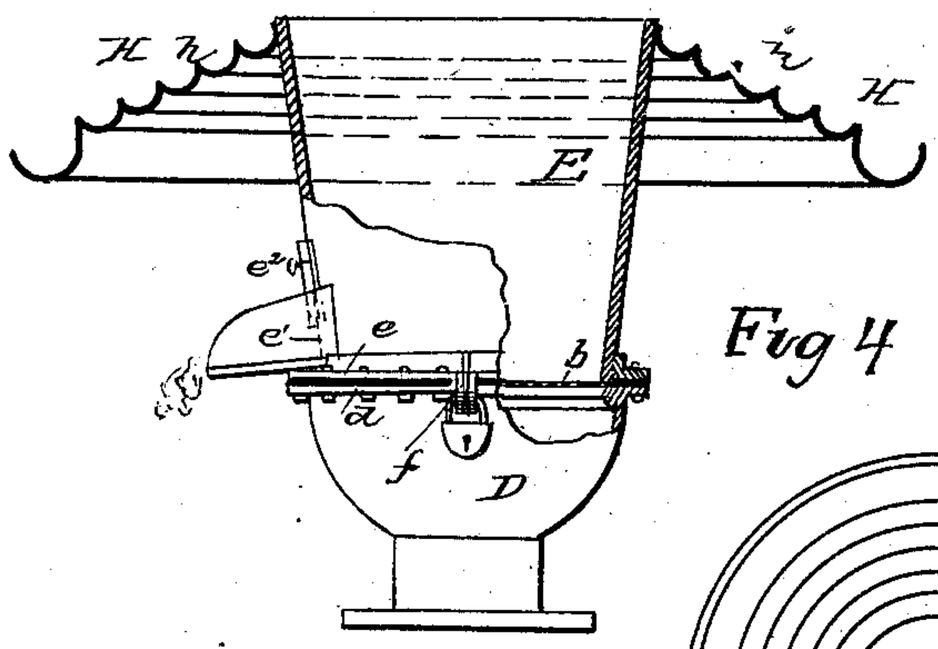
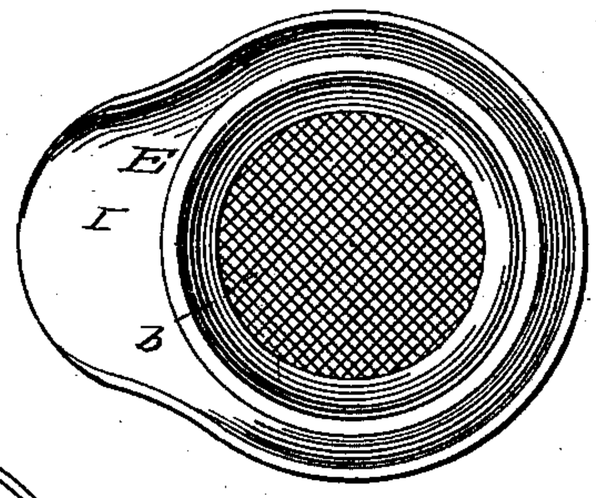
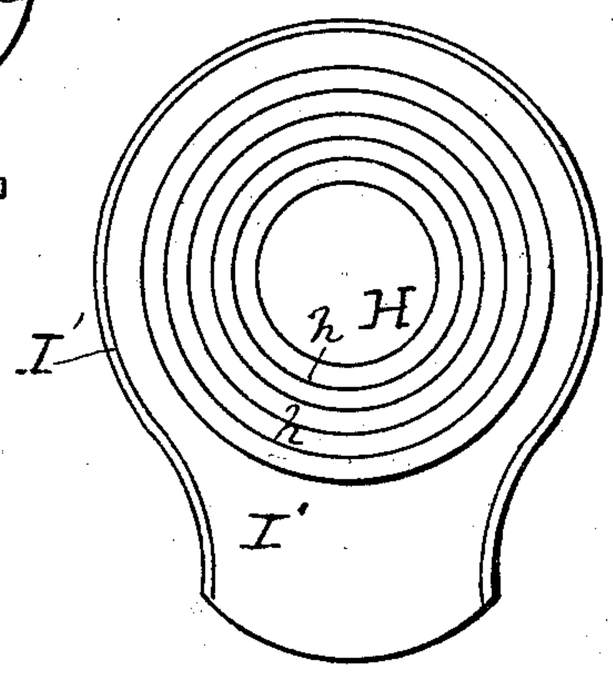


Fig 4

Fig. 3





WITNESSES:

Fred. L. Dieterich

Robert S. Tyler

INVENTOR.

Hiram P. Minot

by DeWitt C. Allen

ATTORNEY.

UNITED STATES PATENT OFFICE.

HIRAM P. MINOT, OF COLUMBUS, OHIO, ASSIGNOR TO CHESTER MINOT, OF SAME PLACE, AND SAM WATSON, OF CAMBRIDGE CITY, INDIANA.

ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 273,583, dated March 6, 1883.

Application filed November 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, HIRAM P. MINOT, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Ore-Separators; 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.

This invention relates to certain new and useful improvements in the class of ore-separators for separating granular substances of different specific gravities by the action of a current of fluid flowing up through a screen arranged in an expanding hopper having an overflow at the top thereof, in which the fluid required to agitate the granular particles at its entrance is gradually reduced in force to that necessary for the removal of particles of lighter specific gravities; and the invention consists in novel features of construction and combination and arrangement of parts, whereby I am enabled to make a more thorough and complete separation of the particles according to their specific gravities, while obviating the waste of any of the finer particles, all as will be hereinafter fully described, and set forth in the claims hereto annexed.

Referring to the accompanying drawings, Figure 1 is a side view of my improved ore-separator; Fig. 2, a detail sectional view with the spout I shown in Fig. 1 removed and an annular corrugated ring with an annular spout at its lower end substituted therefor. Fig. 3 is a top view or plan of the hopper and overflow-spout shown in Fig. 1, and Fig. 4 is a top view or plan of the corrugated ring and spout shown in Fig. 2.

In the drawings, A represents a tube, through which fluid is fed to the receptacle containing the granulated mass.

B is a handle for controlling a valve arranged in the tube A, for the purpose of feeding the fluid in any suitable quantities or with any desired rapidity.

C represents an elbow whereby the current of fluid is given an upward course into the enlargement D, which permits the fluid to enter the receptacle containing the granular mass through the whole surface of a screen or perforated partition, *b*. The enlargement D is provided at its upper end with an outer horizontal annular flange, *d*, upon which an outer horizontal flange, *e*, at the lower end of the hopper E rests, and which is secured thereto by lugs on one flange fitting into openings in the other flange, both flanges being provided with hasps *f f*, through which the shackle or bow of a padlock passes, and by which the hopper is securely locked in position. Between the flanges *d e* is also secured the screen or perforated partition *b*, with a suitable packing to form a water-tight joint.

The hopper E is provided at its lower end with an opening, e', closed by a slide, e^2, and said hopper gradually increases in size until it reaches the inclined overflow-spout, I, which entirely surrounds the upper end thereof. The object of having the overflow-spout extend entirely around the hopper is to get a larger overflow, as in the case of gold and silver, where some of the metal is very fine, too much of a rush of water or fluid at one place would be likely to carry over the finer particles of gold and silver. It will be observed that in Fig. 1 the overflow-spout I is arranged just around the upper edge of the hopper; but in Fig. 2 said spout is removed and an annular ring, H, substituted therefor, which is provided with a series of annular corrugations, *h*, arranged in step-like form, and provided with quicksilver for catching and retaining any fine gold or silver that may be carried over with the overflow of water or fluid from the hopper, said ring, however, having connected at its lower end an overflow-spout, I′, similar to the overflow-spout I shown in Fig. 1, said ring and spout H I′ being only intended for use when separating fine gold and silver.

The tube A, at the elbow C, is provided with a vertical receptacle, J, closed at its lower end by a pivoted valve or door, *j*, locked when closed by a padlock, *j′*. This receptacle is for the purpose of collecting and retaining any particles that may pass through the screen or perforated partition, which, by the flow of the water, might be forced up against the under

side of the perforated partition and have a tendency to clog up the openings or perforations therein.

The receptacle J and locking devices are to be used only in working valuable metals, such as gold and silver. The slide e^2 is to be used in working less valuable metals—such as iron, copper, &c.—to let the metal run out by raising the slide far enough to let it pass out, as may be found expedient, by which operation I get the material to be cleaned close to the screen or perforated partition, and therefore in a very clean condition. In this last operation the annular corrugated ring H may be removed.

The several parts of my improved device being arranged as before described, and the hopper sufficiently filled with the granular substances to be separated, the tube A is connected by any suitable means with a fluid-supply and the valve in said tube opened, when the fluid will flow through the tube, the screen or perforated partition, the mass to be separated, and escape at the overflow-spout I. By means of the valve and the tapering hopper or receptacle the speed of the water or fluid is caused to decrease as it reaches the overflow, and is so regulated that as the water or fluid passes through the receptacle containing the granular mass to be separated it lifts and subjects it to a lively agitation, allowing the lighter and finer parts to escape at the overflow and be caught and retained by the quicksilver in the corrugated ring H, while the heavier portions remain in the hopper or receptacle, and in this way the heavier matter is separated from the lighter. When the mass has been sufficiently agitated and the separation effected the current of water or fluid is stopped by the valve and the contents remaining in the receptacle removed.

The object of the locking devices for the hopper or receptacle and the valve or door of receptacle J is to prevent persons taking away any of the gold, silver, or other precious metals, except those authorized to do so, and who are provided with the necessary keys for unlocking the locks.

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

1. The combination, with the hopper or receptacle, a perforated surface through which water or fluid can enter the hopper or receptacle to agitate the granular mass contained therein, and a water or fluid supply tube, of the annular corrugated ring H, surrounding said hopper or receptacle, and having an overflow spout, I′, at its lower end, substantially as and for the purpose herein shown and described.

2. The hopper or receptacle provided with an opening, e', and slide e^2 at its lower end, in combination with the perforated surface arranged in the lower portion thereof directly below said opening e', and a supply-tube by which water is forced up through said perforated surface and hopper or receptacle, substantially as and for the purpose herein shown and described.

3. The herein-described ore-separator, consisting of the hopper or receptacle E, having a surrounding overflow-spout, opening e', slide e^2, and perforated surface b, and the supply-tube A, having a vertical receptacle, J, at its bend C, provided with a valve or door, and the enlargement D above said receptacle J, the several parts constructed and arranged substantially in the manner as and for the purpose specified.

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

HIRAM P. MINOT.

Witnesses:
J. F. HOFFMAN,
J. S. GOLD.