

(No Model.)

J. D. COPLEN.

COMBINED SEPARATOR AND CONCENTRATOR.

No. 397,585.

Patented Feb. 12, 1889.

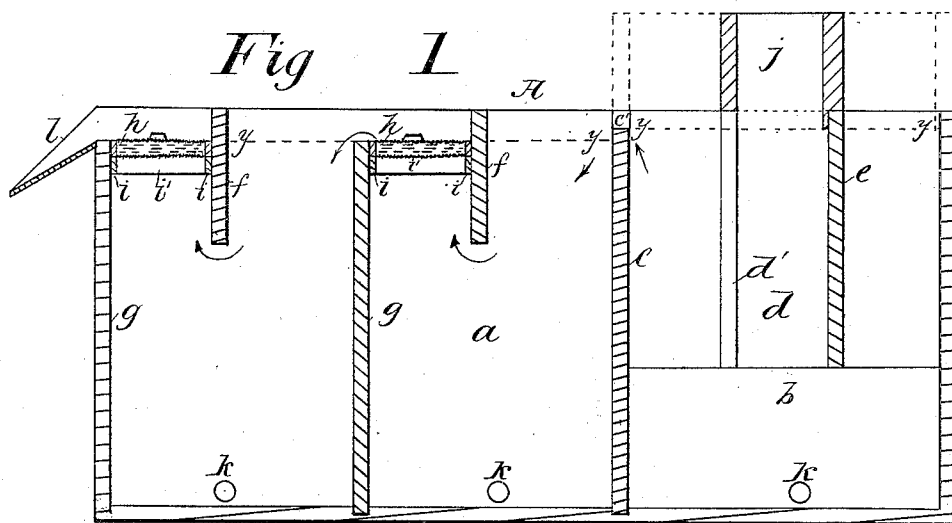


Fig 2

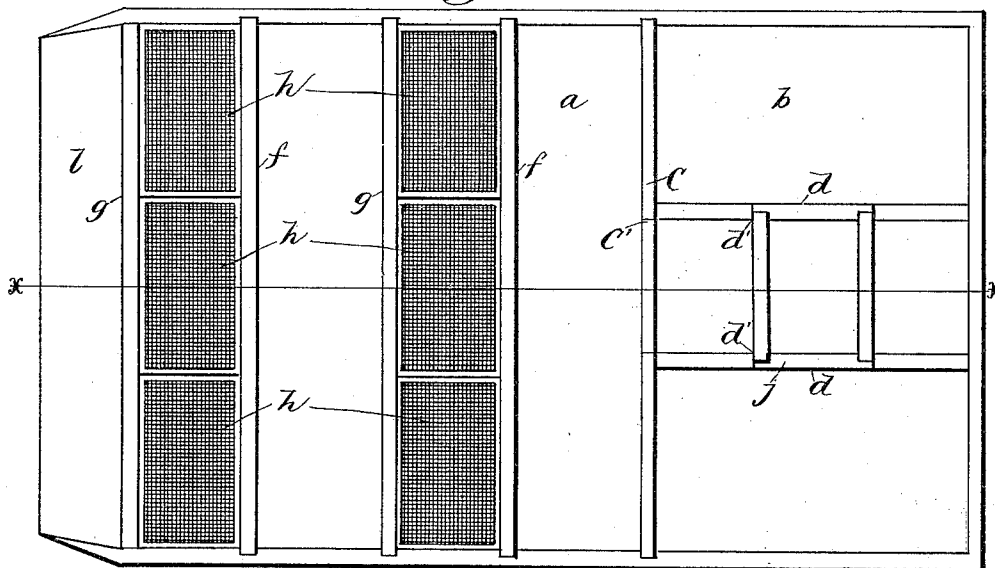


Fig 3



WITNESSES:

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JOHN D. COPLEN, OF DENVER, COLORADO.

COMBINED SEPARATOR AND CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 397,585, dated February 12, 1889.

Application filed April 15, 1887. Serial No. 234,872. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. COPLEN, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Combined Separators and Concentrators; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to ore concentrators and separators.

The objects of my invention are, first, to provide a simple, inexpensive, yet durable and effective, separator and concentrator for treating ores and mineral slimes, and separating from them the valuable portions which float, from any cause, on or in the water, and which will then concentrate and collect the same for further treatment; second, to provide a combined separator and concentrator for saving the floating values contained in the water from stamp or other ore-treating mills and placer-slucies and filtering the water before being discharged, thus preventing a contamination of the stream into which it is discharged. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a section on the line *x x*, Fig. 2. Fig. 2 is a top view of the entire device. Fig. 3 is a view in perspective of one of the screen-frames with the under gauze in place, but with the upper gauze removed.

Similar letters refer to similar parts throughout the several views.

A represents the main case, which is preferably rectangular in form and divided into two main compartments, *a* and *b*, by the partition *c*, which extends from the top to the bottom of the case. This partition is cut away in the center, making a way, *c'*, for the passage of water and valuable slimes from compartment *b* to compartment *a*.

Compartment *b* has two semi-partitions, *d d'*, which extend from the top of the case about

two-thirds the distance to the bottom. In these semi-partitions are formed rectangular grooves or recesses *d' d'*, in which the adjustable cross-partition *e* may be placed. There may be two or more pairs of these grooves, as may be required.

Compartment *a* is divided into two or more smaller compartments by the semi-partitions *f f g g* and the filtering-screens *h h*, which latter rest on sleepers *i i*, which are firmly fastened to the semi-partitions *f* and *g*. The filtering-screens are constructed by firmly fastening wire-gauze over the top and bottom of a rectangular frame, between which top and bottom any suitable filtering material is placed. The filtering-screens are made to entirely fill the openings between the partitions, so as to prevent anything escaping without passing through the filtering material, and to assist in accomplishing this object a strip of rubber may be fastened to the under side of the filtering-screens where they come in contact with the sleepers *i*. The screens may be held in position by screws or buttons, and should be provided with small handles to facilitate lifting them out and otherwise handling them.

j is a movable hopper, which conducts the slimes and water and all materials fed to the machine, carrying the same in front of the adjustable semi-partition *e*, from whence the valuable floating particles pass with the water through the way *c'* into compartment *a*, where they will remain behind the semi-partition *f* until a sufficient mass has accumulated, when it will sink to the bottom of the compartment, where it will remain. Any of the valuable particles carried beneath the surface and forced on by the current will be carried underneath the semi-partition *f* and to the screen *h*, where they will be checked or lodged in the filtering materials, which will retain them with other matter not in solution, and deliver the water into the next compartment, through which it passes in the manner described, and is finally discharged through the spout *l*.

In operating, if the worthless matter is of much greater specific gravity than water, the adjustable partition *e* and the hopper *j* should be placed near the way *c'*; but as the worth-

less matter decreases in specific gravity the partition *e* and the hopper *j* should be placed farther away, so that the worthless matter may be afforded a longer time and space in which to settle. This must be strictly observed in operating, for the reason that if the worthless particles which should not pass beyond compartment *b* are light and should be discharged near the way *c'* they may be carried into compartment *a*; but if they are discharged into compartment *b* at a proper distance they will readily settle from natural causes, and the result will be a perfect separation. Should the valuable mineral tend to rapid precipitation or settling, then the partition *e* and hopper *j* should be placed in the pair of grooves or recesses nearest the way *c'*; or if the valuable minerals are slow to settle then the movable partition *e* may be entirely removed and the hopper *j* placed as far from the way *c'* as possible, to allow the silica and other worthless matter as much time and space as possible for settlement in compartment *b*. Both of these changed positions of the hopper *j* are indicated by dotted lines in Fig. 1, while the water-level in the various compartments is indicated by the lines *yy* in the same figure.

The sediment in any of the compartments may be removed either through the outlets *k* or through the top of the case. Should the filters become choked, they may be removed and replaced by others.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is— 35

1. The combination, in a separator and concentrator, of a receiving-chamber having grooved semi-partitions, a movable hopper located therein, one or more float-saving chambers, each having an upwardly-extending semi-partition and downwardly-extending semi-partitions, and screens located between such semi-partitions, consisting of upper and lower gauzes with an interposed packing of filtering material, whereby the water is caused to pass upward through the screens, leaving its suspended material below the screens, substantially as set forth. 40 45

2. A combined concentrator and separator, consisting of compartment *b*, provided with grooved semi-partitions *d d*, a movable hopper, *j*, sustained thereby, compartment *a*, having one or more upwardly-extending semi-partitions, *g*, one or more depending semi-partitions, *f*, and screens *h*, located between partitions *f* and *g*, and formed each of an upper and a lower wire-gauze with an interposed filtering material, substantially as set forth. 50 55

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

JOHN D. COPLEN.

Witnesses:

SANFORD HOAG,
B. L. POLLOCK.