

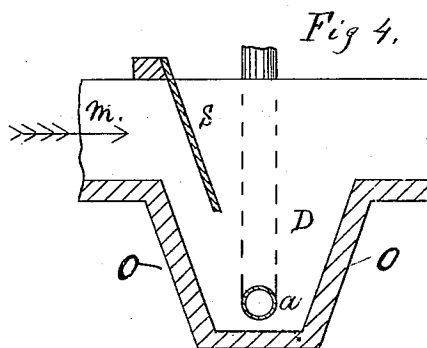
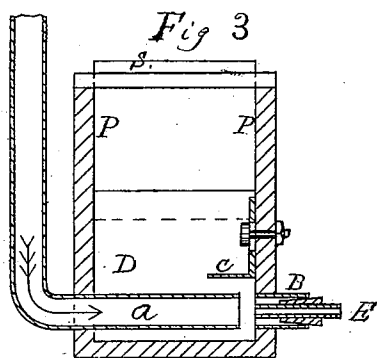
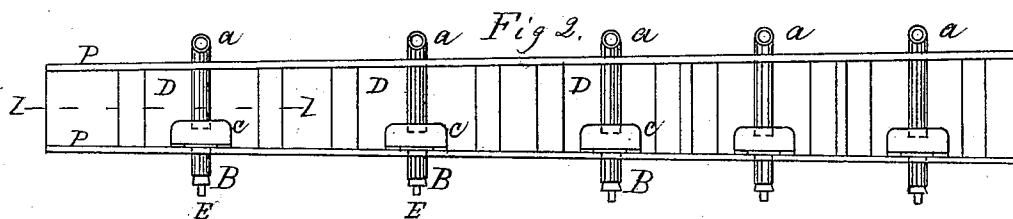
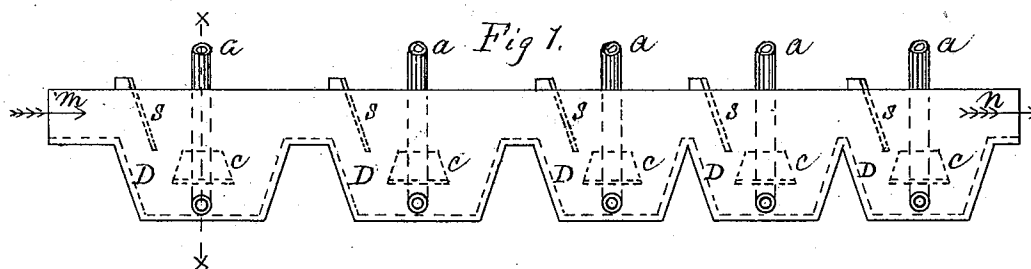
(No Model.)

R. H. RICHARDS & F. G. COGGIN.

ORE AND MINERAL SEPARATOR.

No. 271,657.

Patented Feb. 6, 1883.



Witnesses
Abas A. French
Otto Palmann

Inventors.
Robert H. Richards
F. G. Coggin

UNITED STATES PATENT OFFICE.

ROBERT H. RICHARDS, OF BOSTON, MASSACHUSETTS, AND FREDERICK G. COGGIN, OF LAKE LINDEN, MICHIGAN.

ORE AND MINERAL SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 271,657, dated February 6, 1883.

Application filed June 19, 1882. (No model.)

To all whom it may concern:

Be it known that we, ROBERT H. RICHARDS and FREDERICK G. COGGIN, citizens of the United States, residing respectively at Boston, in the county of Suffolk and State of Massachusetts, and at Lake Linden, in the county of Houghton and State of Michigan, have invented new and useful Improvements in Ore and Mineral Separators, of which the following is the specification.

Our invention relates to improvements in that class of machines known as "hydraulic separators," water being the means employed for the purpose of separating and washing the ore or mineral.

The object of our invention is to more effectually separate, classify, and cleanse that portion of the ore or mineral suitable for jigging from that which is unfit to jig, technically called "slime." We attain these objects in the separator shown in the accompanying drawings, in which—

Figure 1 is a front elevation of a complete separator; Fig. 2, a plan of the same; Fig. 3, a cross vertical section on line *xx*, Fig. 1; and Fig. 4, a longitudinal vertical section on line *zz*, Fig. 2.

Similar letters refer to like parts.

D D, &c., are the separating-boxes, of which the sides *PP* are vertical, or nearly so, but the ends *OO* of which should be inclined, as shown, leaving the bottom of the box flat.

a a, &c., are clear-water pipes, which enter the boxes *D D* from the rear and extend nearly across to the front side. These pipes may pass through a stuffing-box, or be fitted nicely in the wood, so as to admit of an easy adjustment out or in, as the case requires.

B B, &c., are fixed spouts which receive the plugs or spigots *E*, Fig. 3, for the purpose of reducing the size as desired.

c c are shields extending over the ends of the pipes *a* more or less, and having a greater or less length in the direction of the length of the separator. These shields have a vertical adjustment, as shown in Fig. 3, and under some circumstances that part extending over the pipe *a* may be arched more or less in the direction extending around the pipe *a*, instead of being straight, as shown.

S S are stops to deflect the water and mineral into the separating-boxes.

The operation is as follows: The ore to be washed and separated entering the separator

at *m*, Fig. 1, mingled with water, settles into the box *D* around the pipe *a*, seeking egress through the spigot *E*. Clear water enters through the pipe *a* with a force required by the circumstances, which is regulated by any convenient means outside the separator. The amount of clear water being in excess of what will go through the spigot *E*, the office of that excess is to wash and separate the mineral; but to make this operation effectual the clear water must come in contact with all the particles of the material, and yet not with sufficient force to carry with the slime the coarser but light particles. This is the most delicate part of the operation of washing and separating minerals, for in the escape of the excess of water absolute uniformity of pressure and velocity of current is necessary to the most perfect washing and separation; otherwise the most rapid current will carry away some of the coarse particles which should be allowed access to the spigot *E*, while the slower current would admit some of the fine particles which should be kept back, and an imperfect separation would be the result. To prevent this is the object of the shield *c*, which causes the excess of water to react around the water-pipe *a* with a uniform pressure over the area covered by the shield, presenting a uniform resistance against the mineral seeking egress through the spigot *E*. This reaction constitutes, also, what is technically called a "boil," which effectually washes the mineral, the excess of water carrying away the slime and allowing only that which is fit for jigging to pass through the spigot *E*. This operation is repeated in each successive box as far as desired, but with varying conditions of water-pressure and position of pipe *a* and shield *c*.

We claim—

The separating-box *D*, having vertical sides and inclined ends, in combination with the shield *c*, clear-water pipe *a*, and spout *B*, said pipe and spout being opposite to and near each other, whereby the excess of water is caused to react around said pipe with a uniform pressure over the area covered by said shield, substantially as described.

ROBERT H. RICHARDS.
F. G. COGGIN.

Witnesses:

CHAS. A. FRENCH,
OTTO STALMANN.