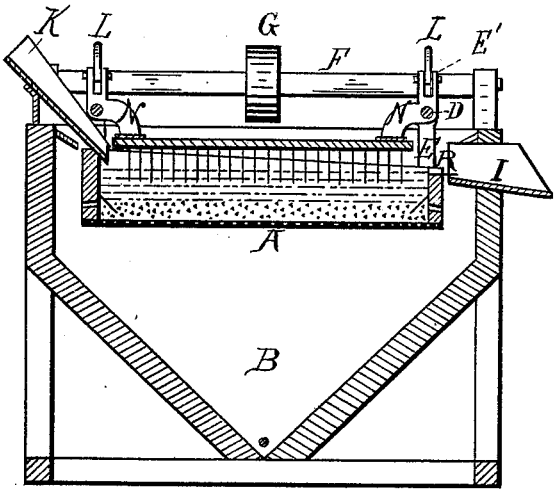
W. B. FRUE & W. McDERMOTT.

Ore-Washer.

No. 196,651. Patented Oct. 30, 1877.

Fig. 1.



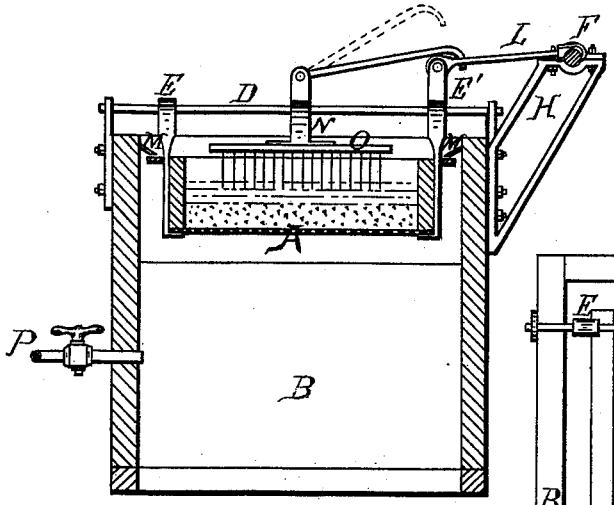
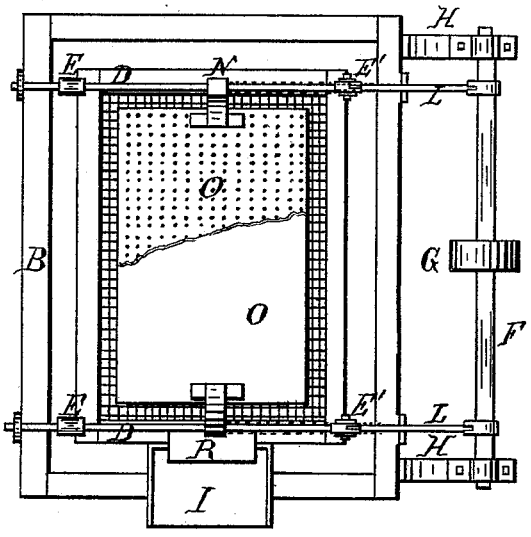


Fig. 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM B. FRUE AND WALTER McDERMOTT, OF DETROIT, MICHIGAN.

IMPROVEMENT IN ORE-WASHERS.

Specification forming part of Letters Patent No. **196,651**, dated October 30, 1877; application filed March 15, 1877.

To all whom it may concern:

Be it known that we, WILLIAM BELL FRUE and WALTER MCDERMOTT, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Ore-Washers, of which the following is a specification:

Our invention relates more particularly to the two classes of ore-separating devices known as "vanning" and "jigging" machines, having for its object to combine the essential features of both in one machine or apparatus, for the rapid and economical separation of heavy metallic ores from accompanying rock or waste material when in a pulverized condition.

Our invention consists in the employment of a vibrating working-table having a perforated bottom, suspended within an outer box having a continual supply of water, either as a steady stream or by intermittent action. In addition to the lateral motion of the table, we employ a fixed agitator, the fingers of which serve to keep the bed of pulverized rock from packing by continuous stirring. The heavy metallic particles, gravitating to the bottom of the working-table, either fall through the perforations thereof, or escape by covered discharges at the ends, as may be most convenient, in either case being collected at the bottom of the outer water-box.

Figure 1 is a longitudinal vertical section. Fig. 2 is a transverse section. Fig. 3 is a plan of the machine.

In the drawings, B is the outer water-tight box, with sloping interior sides, to facilitate the collection of the mineral at one point. This box is supplied by the pipe P with a regulated supply of water, or is connected with a second compartment, containing a plunger, arranged to give intermittent supplies of water. A is the inner suspended and sliding ore table or tray, with a bottom of perforated sheet metal or wire-cloth. This table is suspended from the fixed guides D D above the box by the hangers E E E′ E′, which slide freely on the rods D. The hangers E′ E′ are continued above their guides, forming open heads, in which the ends of the connecting-rods L from the crank-shaft F are pivoted. The small crank-shaft F is journaled in brackets H H, bolted to the sides of the box, and is provided with a pulley, G, by which it is driven. The agitator O is a flat plate or board, a little smaller than the inside of the table A, with a number of fingers or stirrers pendent from its under surface, and which dip down into the bed of rock and ore below. This agitator is hung from the guide-rods D D by means of the bent hangers N N, which are rigidly secured to such guide-rods.

The discharge of waste rock and excess of water is from the mouth R of the table. The mouth has an extended lip of sheet-iron, which overlaps the bottom of the sheet-iron spout I in the end of the box D.

M M are sloping slats to prevent the splashing up of the water from the motion of the table A.

The practical operation of the machine is as follows: The crushed rock and ore is fed on regularly at one end of the table A by the hopper (seen at K) or in a stream of water. The table receives a gentle steady vibration from the crank-shaft, which spreads the material evenly on the bed, and effects a steady discharge over the spout I. The sides of the table A being at all points higher than at the mouth R, and the discharge from the box B being only at the spout I, it follows that a current of water, either continuous or intermittent, will flow up through the bottom of the table A and escape at the mouth R. This upward pressure or current of water keeps the material on the table A lightly suspended, and, in connection with the shaking motion, effects a settling of the heavy metallic particles to the bottom of said table, where they are discharged either by regular openings in the end or through the bottom perforations, as in an ordinary jigging-machine.

The lips of the mouth R being of thin sheet-iron, and sliding in close contact with the bottom of the spout I, the difference in level between the small portion of I uncovered and the mouth R is not enough to cause any appreciable escape of water direct from the box B over spout I; but the water, as already described, has to rise through the perforated bottom of the table, in order to escape by the mouth R.

The table A sliding gently backward and

forward, while the agitator remains stationary, the fingers of the latter rabble the ore on the table, and further assist the separation of the metallic particles from the lighter rock.

What we claim as our invention is—

In a machine for washing and separating ores, the combination, with the box B, of the perforated ore-table A, reciprocating horizontally in the said box, and the stationary agitator O, suspended over the said ore-table, substantially as and for the purposes set forth.

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