

R. EDWARDS.

Ore Washer.

No. 10,282.

Patented Nov. 29, 1853.

Fig. 1.

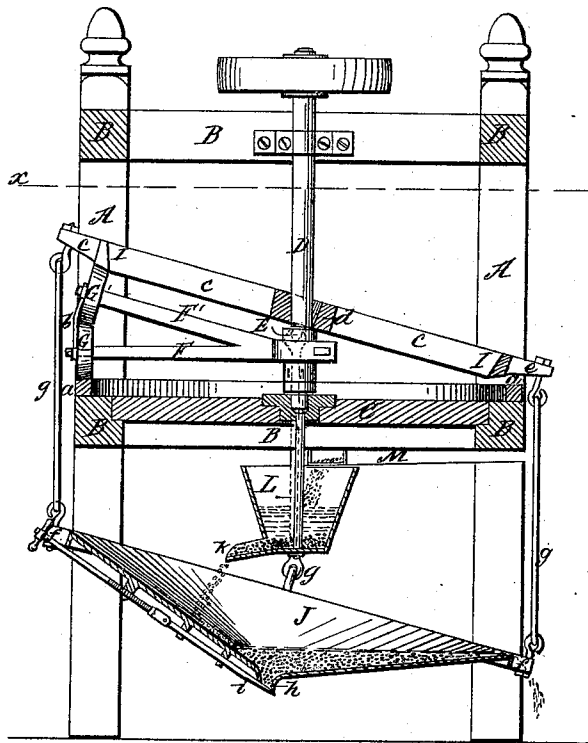


Fig. 3.

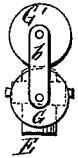


Fig. 2.

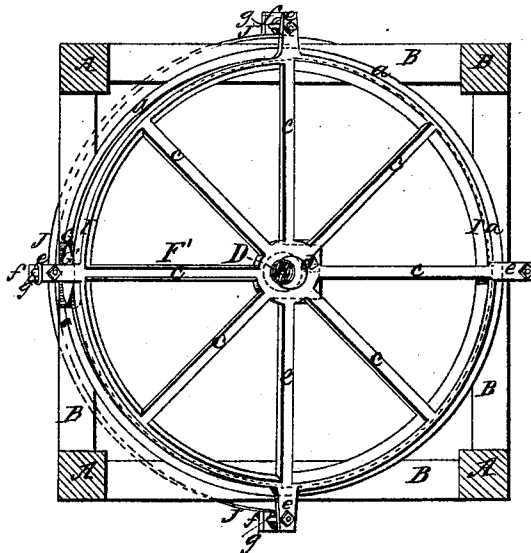
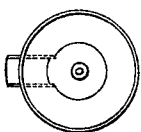


Fig. 4.



UNITED STATES PATENT OFFICE.

RICHARD EDWARDS, OF EAGLE RIVER, MICHIGAN.

MACHINE FOR WASHING ORES.

Specification of Letters Patent No. 10,282, dated November 29, 1853.

To all whom it may concern:

Be it known that I, RICHARD EDWARDS, of Eagle River, in the county of Houghton and State of Michigan, have invented certain
5 new and useful Improvements in Machinery for Washing 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, forming
10 part of this specification, in which—

Figure 1, is a vertical section through the center of an ore-washing machine, constructed according to my improvements. Fig. 2, is a horizontal section of the same,
15 in the plane indicated by the line, *x, y*, in Fig. 1. Fig. 3, is a side view of the wheels, by which motion is given to the basin. Fig. 4, is a top view of the revolving hopper.

Similar letters of reference indicate corresponding parts, in each of the several figures.

This invention is applicable, more particularly, to the washing of copper ore upon a large scale, but may also be employed in
25 any ore washing operations. The invention consists in the employment of a rotating hopper and a suspended oscillating basin, arranged and operated as will be hereinafter described.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The machine is all supported by a frame, which consists of upright posts, *A, A*, and
35 suitable cross-timbers, *B, B*, and is provided with a table, *C*, about half way up, which forms a bed for the horizontal circular track, *a, a*. It is also furnished with suitable bearings for a vertical shaft, *D*, which
40 is the main or driving shaft of the machine and receives rotary motion through any suitable agent. This shaft is concentric to the track, *a, a*, and has firmly secured to it a boss, *E*, to which are attached two arms,
45 *F F¹*, of which, the former is placed in a horizontal position below the latter, and forms the axle of a wheel, *G*, which rests upon the track, *a, a*, and runs around it, when rotary motion is given to the shaft.
50 The upper arm, *F¹*, is inclined so as to stand at about the desired inclination of the pan, and forms the axle of a wheel, *G¹*, upon which the under side of the ring or circular frame, *I*, from which the pan, *J*, is suspended, rests. The outer ends of the two axles
55 are connected by a link, *b*, which serves to

stiffen them and preserve their proper relative positions, which should be as close to each other as possible without touching. The ring, *I*, is of nearly the same diameter
60 as the track, *a, a*, and is faced on its under side, where it rests on the wheel, *G¹*; it is furnished with arms, *c, c*, and a hub, *d*, like a wheel, and the latter is bored conically,
65 to allow it to move freely, as required, upon the shaft, *D*, and is faced to rest on the top of the boss, *E*, the height of which, relatively to the top of the wheel, *G¹*, must be such as to give the ring the proper inclination. On the outside of the ring, *I*, there
70 are four lugs, *e, e*; (but this number is not arbitrary,) and the pan, *J*, is furnished with a corresponding number of lugs, *f, f*, arranged in positions to correspond with,
75 *e, e*. The lugs *e, e*, and *f, f*, are furnished with hooks, for the purpose of connecting them, by the rods or links, *g, g*, by which the pan is suspended in such a way as to be free to oscillate. The place of these rods or
80 links may be supplied by chains or cords. The pan is in the form of an inverted cone, and has the opening, *h*, for the withdrawal of the washed ore, at its apex. This opening is furnished with a sliding gate, *i*. The
85 revolution of the shaft *D*, causes the wheel *G*, to run continuously around the track, *a, a*; and the wheel, *G*, running under the ring, *I*, elevates all parts of its circumference, in regular succession; and by this
90 means, every portion of the circumference of the basin is the highest in its turn. The motion thus produced, is a movement around an imaginary fixed vertical axis in line with the shaft, *D*, and is well calculated to perform the washing operation
95 effectively.

The hopper, *L*, through which the ore is introduced to the basin, is of the form of an inverted frustum of a cone, and is furnished on one side, close to the bottom, with
100 a spout, *k*. It is secured to the lower end of the shaft, *D*, and consequently stands nearly over the center of the pan. I consider the best position for the spout to be opposite the highest side of the pan; as the
105 ore, when delivered on that side, will receive a greater amount of agitation. It may, however, be desirable to place it slightly in advance, or in the rear, of this position; but its position may be varied. In
110 whatever position it is placed relatively to the pan, it will remain; as it makes one rev-

olution for every complete movement of the pan produced by the revolution of the wheels, G, around the track, *a, a*. It therefore may be set in such position as is found
5 to answer best.

The ore, before being washed, is crushed by any of the usual modes employed; and is introduced to the hopper, together with a stream of water, by means of a spout, M,
10 leading from the crushing apparatus, or from any other place in which the ore may be contained. The agitation the ore receives in the basin is the means of separat-

ing the foreign matter, which, by reason of its less specific gravity, is washed away by 15 the overflow over the lowest part of the edge of the pan.

What I claim as my invention, and desire to secure by Letters-Patent, is—

The rotating hopper and the suspended 20 oscillating basin, arranged and operated as herein described.

R. EDWARDS.

Witnesses:

O. D. MUNN,
L. F. COHEN.