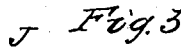


Ore Crusher.

Patented Nov. 8, 1864.



INVENTOR
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN ORE-CRUSHERS.

Specification forming part of Letters Patent No. 44,989, dated November 8, 1864.

To all whom it may concern:

Be it known that I, J. D. WHELPLEY, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Whirling Table for Crushing Copper Ores; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical central section; Fig. 2, a top view of the whirling table and its appendages; and Fig. 3, a vertical cross-section through one of the blades or cutters and the table.

Like parts are indicated by the same letters in all the drawings.

The nature of my invention consists in crushing copper ores, by means of a rotating circular table, H, provided with radial blades or cutters J, said table forming the bottom of a suitable vertical cylinder or hopper, and effectually preventing any particles of ore or free metal from getting in between the working parts of the machine, and thereby rupturing or breaking the same or producing unnecessary friction, my invention being in this respect a great improvement over any other in use for a similar purpose.

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

A is the foundation or platform of the machine.

B is a cast-iron table resting on the foundation A, and provided, as shown in Fig. 1, with a circular opening in its center about one-half the diameter of the whirling table.

C and D are a cylindrical box, of cast iron or other suitable material, united by means of flanges and bolts *f*, as shown in Fig. 1, and resting on the table B, being confined thereto by means of screws or bolts. The cylinder D is full of perforations *e*, through which the comminuted particles of the substances broken by the whirling table are driven by centrifugal force. The perforations *e* may be round, square, or otherwise shaped, and of any size from one-eighth of an inch to two or more inches in diameter, according to the size to which the substances are to be broken. The perforations flare outward from the inside, as represented in Fig. 1, so as not to be clogged

by the particles driven through them from the whirling table.

F is a disk, of iron, forming a cover to the cylinder D, to which it is confined by means of screws or bolts *g*, as represented in Fig. 1.

G is the hopper, through which the materials to be broken are dropped into the mill.

H is the circular whirling-table, about three feet in diameter, of cast-iron, with four (more or less) radial ribs, I, raised on its upper surface in the casting. The periphery of the table may also be furnished with an inclined flange, *h*, as seen in Fig. 1, to assist in throwing upward and back upon the cutters J the materials to be broken as they are driven outward by centrifugal force. This flange *h*, however, may be dispensed with, the inclined surface *t* of the cylinder C accomplishing the same object. The flange *h* on the periphery of the table H should come as near as possible, without touching, to the sides of the cylinder C, so that nothing of any considerable size can possibly get between. Indeed, when the table H is in a state of rapid rotation, so strong an upward current of air is generated thereby as to effectually prevent any small particles from ever passing down between the table and the cylinder.

J are the blades or cutters, of hardened steel or chilled cast-iron, shaped as clearly shown in the drawings, being securely attached to the radial ribs I by means of screws *n*. The ends S of the blades J are curved, as shown in Fig. 1, to prevent the materials broken from crowding between them and the incline *t* of the cylinder C.

K is a vertical spindle passing through the center of the table H, to which it is fast, the bottom of the spindle resting in a suitable step in the hanger L, which is bolted to the bottom of the table B, the upper end turning in a suitable bearing in the center of the cover F, as represented in Fig. 1.

M is a drum or pulley, by means of which the table H is made to revolve with great rapidity, say, fifteen hundred times a minute.

The material to be broken, being cast into the mill through the hopper G, drops until its lowest point receives a cutting, shivering blow from the upper edges of the rapidly-whirling blades J, by which it is constantly thrown forward and outward against the flange *h* and the sides of the cylinder C D, to be thereby

deflected back upon said blades until it is broken into pieces small enough to be driven outward through the perforations *e*.

My improvement is more particularly useful for breaking copper ores, in which the metal is free, these ores being peculiarly difficult to reduce in any other mills extant, on account of their liability to clog and break or rupture the machine. My invention may, however, be obviously applied to any of the purposes for which breaking-mills are ever employed.

Having thus described the construction and operation of my invention, what I claim as

new, and desire to secure by Letters Patent, is—

The employment of a whirling table, *H*, provided with radial blades or cutters *J*, and forming a bottom to the cylinder, in which it revolves, in combination with the flange *h*, the inclination *t*, and the curvature *s*, all constructed and arranged substantially as set forth.

JAMES D. WHELPLEY.

Witnesses:

N. AMES,

A. F. BADGER.