

J. WATSON.  
APPARATUS FOR WASHING ORE.

No. 47,884.

Patented May 23, 1865.

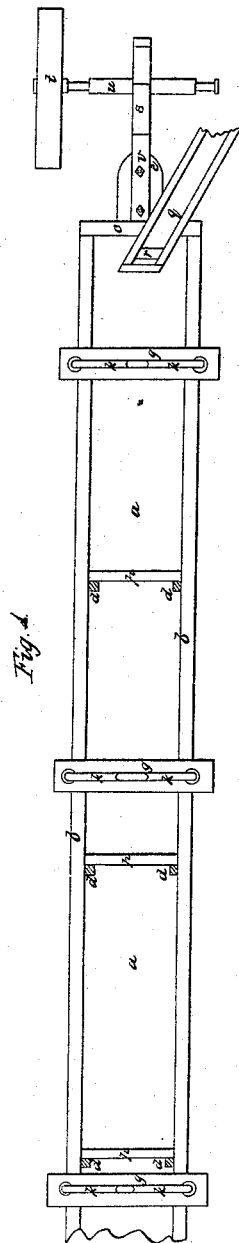


Fig. 1

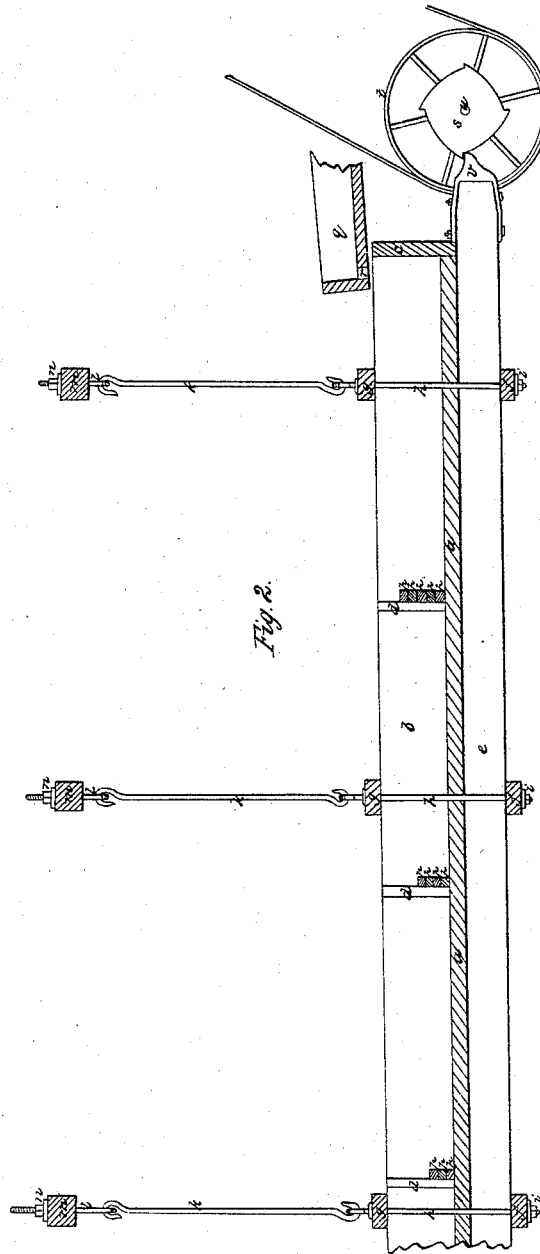


Fig. 2

Witnesses:  
B. B. Campbell  
Allan & Bakewell

Inventor:  
James Watson  
by his attorney W. Bakewell

# UNITED STATES PATENT OFFICE.

JAMES WATSON, OF CLIFF MINE, MICHIGAN.

## IMPROVED APPARATUS FOR WASHING ORES.

Specification forming part of Letters Patent No. 47,884, dated May 23, 1865.

*To all whom it may concern:*

Be it known that I, JAMES WATSON, of Cliff Mine, in the county of Keweenaw and State of Michigan, have invented a new and useful Improvement in Apparatus for Washing Ores; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top view of my improved machine. Fig. 2 is a side elevation thereof.

Like letters of reference denote similar parts in both of the figures.

To enable others skilled in the art to construct and use my improved ore-washing machine, I will proceed to describe its construction and operation.

My machine consists of a long rectangular wooden trough, called a "tie," which is about eighteen inches wide, and of any convenient length, say, twenty or thirty feet.

It consists of a bottom, *a*, two sides, *b b*, which need not be over a foot in height, and an end piece, *c*, with side posts, *d*, at suitable intervals framed into the bottom. These side posts are placed inside the trough, and are situate opposite to each other. The trough is open at top, and is rendered staunch by a beam or sill, *e*, extending longitudinally under the bottom, and which projects from its rear end. There are cross-sills *f f*, placed at intervals under the trough, and corresponding cross-ties, *g g*, rest on the top of the sides *b b*, which, projecting beyond the sides and bottom of the trough, are connected together by bolts *h h*, secured by screw-nuts *i*. At the upper end of each bolt *h* is a hook, with which is connected a suspension-rod, *k*, by means of which the tie is suspended to a frame-work erected over the machine for that purpose. The screw-bolts *l*, to which the suspension-rods *k* are attached, pass through holes bored in the frame-work overhead, so that by means of the nuts *n* on top of the cross-pieces *m* of the frame the tie may be raised or lowered so as to give it the proper degree of inclination. Inside the trough at intervals of three or four feet apart I place stops *p*, which are strips of wood about an inch square and as long as the width of the trough. They are placed immediately above and resting against

one of the side posts, *d*, on each side, the side posts serving to keep them in place. At the rear end of the machine is a launder or shoot, *q*, into which the slime or crushed ore is thrown, from which it passes through the hole *r* into the tie. At the rear end of the machine is situate a cam-wheel, *s*, having several eccentric cams, which is made to revolve on its axis by means of power applied to the driving-wheel *t*, fixed to the shaft *u* of the cam. To the extremity of the beam *c*, which projects from the rear end of the tie, is attached a metallic plate, *v*, with a rounded end, which rests against the face of the cams on the wheel *s*, so that as the cam-wheel revolves the eccentric cams push the tie forward and leave it to fall back against the face of the cam-wheel, thus producing a vibrating motion attended with a constant succession of shocks like the percussion produced by the stroke of a hammer.

The operation of my machine is as follows: The tie or trough, being suspended, as before described, is inclined slightly from a horizontal position, the rear end, or that at which the ore is introduced, being higher than the other end. A stream of water is allowed to flow, not too rapidly, however, through the trough or tie and the slime or crushed ore is introduced into the tie through the launder or chute. As the water runs down the inclined trough it carries with it the crushed ore, and the continually recurring vibrating shocks of the trough cause the heavy particles of ore to fall to the bottom, where they are retained in the first division of the trough by the first stop *p*. The lighter particles being carried over are many of them retained in the second division of the trough, and so on, until at the end of trough nothing passes out that is worth retaining. As the several divisions of the trough get filled up with ore to the level of the stop another stop is added on top of that previously inserted, the stops being added one above the other until the first division of the trough is full of ore.

This mode of construction and operating ore-washing machines is found to work admirably in washing copper slime, thoroughly separating the metallic particles from the earthy and other lighter matter mixed therewith and retaining all that is worth working. It is simple in its construction and requires no at-

tention other than to feed in the ore and add the stops as the divisions in the trough get filled up to the level of those previously inserted.

Having thus described my improvement in ore-washing machines, what I claim as my invention, and desire to secure by Letters Patent, is—

The use of a long tie or trough suspended so as to vibrate against a revolving cam or

other device for giving to it a vibrating shock, in combination with a series of movable stops, constructed and arranged substantially as and for the purposes hereinbefore set forth.

In testimony whereof I, the said JAMES WATSON have hereunto set my hand.

JAMES WATSON.

Witnesses:

W. BAKEWELL,

A. S. NICHOLSON.