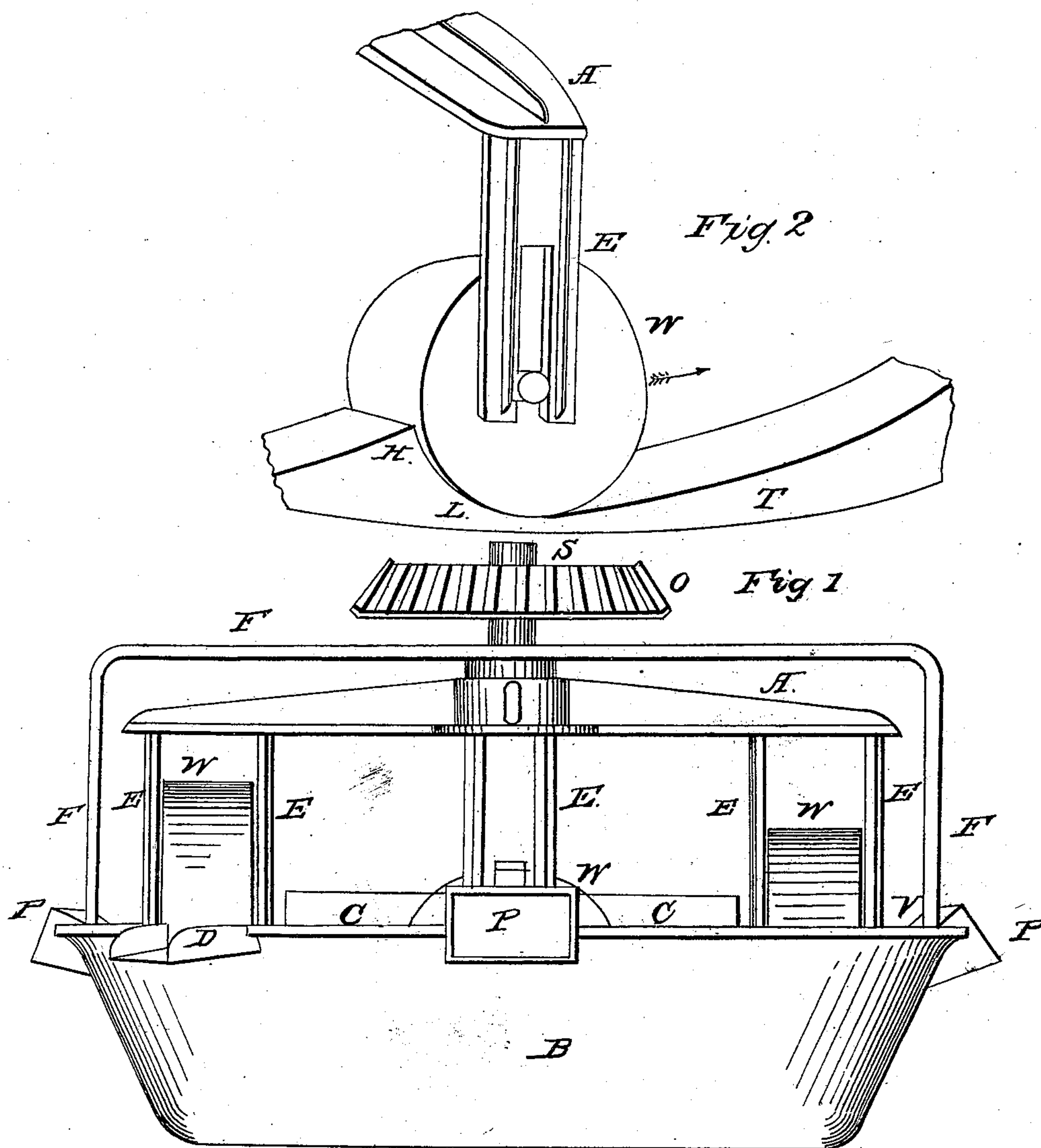


L. W. WILLIAMS.

Ore Mill.

No. 20,012.

Patented April 20, 1858.



UNITED STATES PATENT OFFICE.

LORING W. WILLIAMS, OF NEVADA CITY, CALIFORNIA.

IMPROVEMENT IN QUARTZ-MILLS.

Specification forming part of Letters Patent No. 20,012, dated April 20, 1858.

To all whom it may concern:

Be it known that I, LORING W. WILLIAMS, of Nevada City, in the county of Nevada and State of California, have invented a new and useful Improvement in Mills for Crushing Quartz-Rock; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in constructing the inside bottom of a circular battery (in which quartz or other rock or ore is to be crushed) of a series of inclined planes or curves commencing at a common base and produced to any required height, and over and in contact with which the stampers or wheels move, and by which means they are alternately raised and let fall, the action of such stampers or wheels being alternately one of stamping and grinding.

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

The battery is of cast-iron, in the form of a circle, having in its center an upright shaft, to which is attached a wheel or cross having at certain points slotted arms projecting downward, which embrace, support, and keep in their places the stampers. These stampers are alternately raised and let fall by passing over and in contact with a series of slightly-curved inclines or planes. At the termination or drop-off of these inclines the operation of stamping is performed, while in ascending the incline that of grinding is carried on—that is, the power expended in raising the stamper at the same time assists in still further pulverizing the rock to be crushed.

The figure of the accompanying drawing is a perspective view of the machine to be described.

B is a circular battery, in the center of which is the upright shaft S, supported by the frame F F F.

O is a bevel-wheel. A is a cross hung through its center upon shaft S, and to which are attached the slotted arms E E E E E E E, which embrace and support the wheels W W W W, the axis of said wheels being placed within the slots in the arms in such manner as to permit the wheels being raised perpen-

dicularly, the slots in the arms embracing the journals of the wheels W W W W and operating as guides, whereby the wheels are kept in their places.

C C is the inner circle of battery B, and forms a support for shaft S. The distance of the inner from the outer circle at the bottom of the battery is but little more than the breadth of the face of the wheels W W W W. At the top the space between them is sufficient to allow the wheels, together with their arms, to revolve without touching.

P P P are ports for feeding the machine. D is the discharge, through which the quartz, after being reduced to sufficient fineness, escapes in the form of muddy water. A stream of water is constantly entering the battery at some point, as V, and flowing out at D.

T, Fig. II, is a section of the inside bottom, over which the wheels W W W W move, and by means of which they are alternately raised and let fall. L is the common base, at which the inclines commence.

H is the highest point of elevation to which the inclines are produced, being somewhat less than one-half the diameter of the wheels W W W W. The form of the drop-off from H to L is the same as a segment of the circumference of the wheels W W W W, reaching from the highest to the lowest point.

When this machine is in operation and the wheel W has arrived at the point H and begins to fall, it must move forward in the direction of the arrows a distance equal to one-half its diameter before it has fallen the distance from H to L. Therefore if this machine is made to revolve at the same speed with which a free body would fall in space a distance equal to that which the wheel falls then the blow produced by the fall of the wheel W would be the same as if it were raised and let fall when the machine was at rest and the wheel in the position shown in Fig. II. The wheels W W W W are made of such size in relation to the surface they travel over in a revolution of the machine that the wear from stamping is brought a short distance farther back at each revolution, thus keeping them equally worn. If the wheels tend to wear more upon the outside edge than the inside, they can be reversed and the outside edge placed on the inside. The inside

bottom or track, consisting of the inclines T T, a section of which is shown in Fig. II, may be cast in sections and laid in a battery in such manner that when worn they can be easily removed and replaced by others.

I do not confine the number of inclines to three. In a large machine more might be used to advantage. Their number should be either one more or one less than the number of wheels used.

I do not claim the circular battery, that being by no means new; but

What I do claim as new, and desire to secure by Letters Patent, is—

Constructing the inside bottom of circular batteries, (in which quartz is to be crushed,) of a series of inclined planes or curved surfaces commencing at any desired base and produced to any required height, and over and in contact with which stampers or wheels are made to revolve, and by their revolution over such inclines are alternately raised and let fall, substantially in the manner and for the purpose hereinbefore described.

LORING W. WILLIAMS.

Witnesses:

JOHN WILLIAMS,
EZRA B. FOOTE.