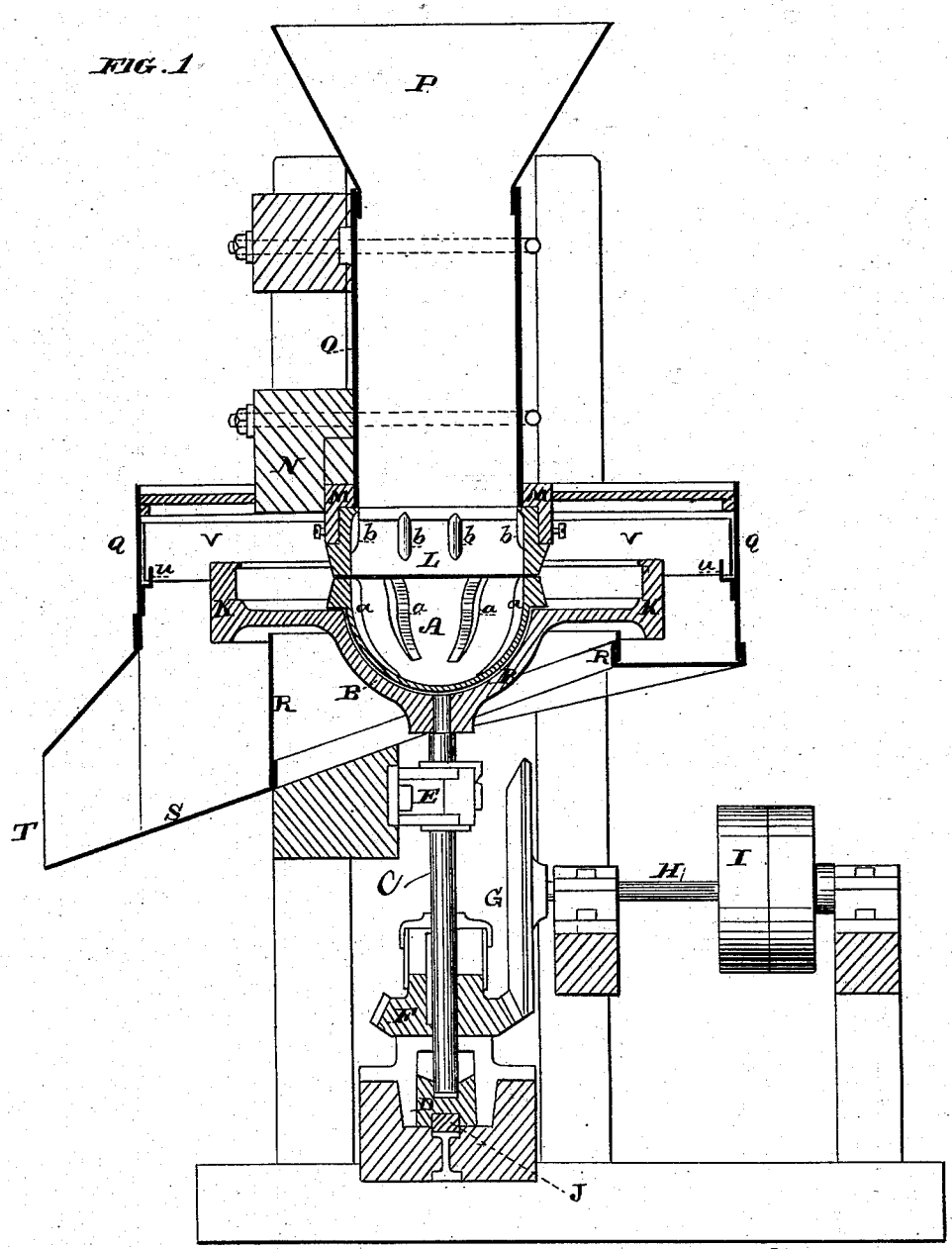
(No Model.) 2 Sheets—Sheet 1.

J. J. NEWSOM.

ATTRITION MILL.

No. 288,724. Patented Nov. 20, 1883.

FIG. 1



Witnesses,
Geo. H. Strong.
J. Stanton

Inventor,
John J. Newsom
By Dewey & Co.
Attorneys

N. PETERS. Photo-Lithographer, Washington, D. C.

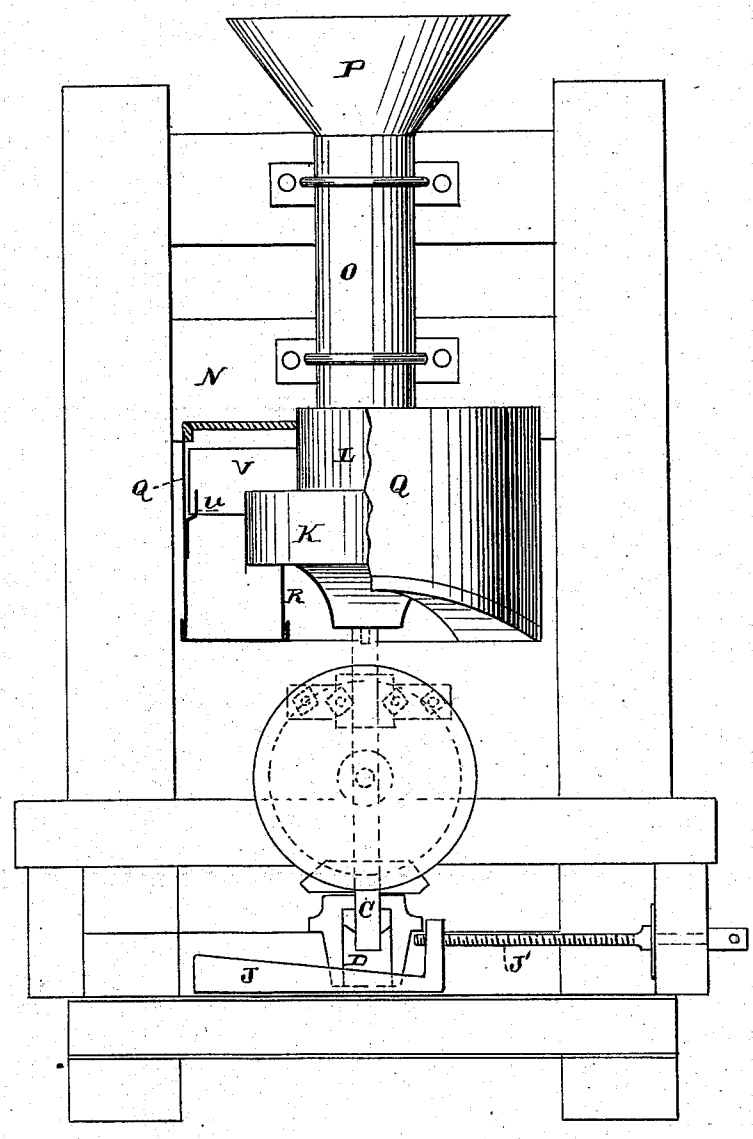
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FIG. 2.



Witnesses;
Geo. H. Strong.
J. Stroure

Inventor,
John J. Newsom
By Dewey & Co.
Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN J. NEWSOM, OF OAKLAND, ASSIGNOR OF ONE-HALF TO JAMES C. PLUNKETT, OF SAN FRANCISCO, CALIFORNIA.

ATTRITION-MILL.

SPECIFICATION forming part of Letters Patent No. 288,724, dated November 20, 1883.

Application filed February 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. NEWSOM, of Oakland, county of Alameda, State of California, have invented an Improved Attrition-Mill; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in apparatus for reducing and pulverizing quartz-rock or other similar hard substances by attrition between the stationary and the movable portions of the mass; and it consists in certain details of construction and combinations of devices, as hereinafter fully explained, and particularly pointed out in the claims.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical sectional view through my improved mill. Fig. 2 is a front elevation with the side of the outer casing broken away.

A is a die, which in the present case is shown with a concave or cup-shaped interior depression, into which ore may be received. Ribs *a* are formed around the interior of this die, so that when it is filled with rock the latter will be prevented from slipping within the die, and will partake of its motion; or the same result may be accomplished by making the die with polygonal sides. This die is fixed to a suitable plate or disk, B, which is secured to the upper end of a vertical spindle, C, the foot of which turns in a step, D, while a box, E, supports the spindle just below the die. A bevel-gear pinion, F, is fitted to a feather upon this spindle, so that the latter may be moved vertically to raise or adjust the die when desired. This pinion is engaged by a bevel-gear wheel, G, upon the horizontal shaft H, and a pulley, I, upon this shaft receives a belt, by which it is driven. It will be manifest that the shaft may be driven without the intervention of the gearing by means of a belt-pulley fixed directly to it.

The vertical adjustment of the shaft or spindle C is effected by a wedge, J, which may be moved beneath the step D for that purpose by means of a screw, J′, or an equivalent adjusting device, and this regulates the opening between the die and shoe, through which the pulp or dust escapes.

The disk B has a flange or rim, K, around its circumference, which is considerably larger than the die.

Above the die A is a hollow cylindrical shoe, L, also provided with ribs *b* in its interior, or made of a polygonal shape. This shoe is secured within a band, M, the whole being fixed to and supported by a stationary frame-work, N. From the upper part of the band M a tube, O, which may be made of boiler-iron, extends up to a sufficient height, and has a receiving-hopper, P, upon the top.

Around the disk B and the band M, with their shoe and die, I fix a case, Q, of sheet metal or other suitable material, this case being closely covered above, and having a central aperture, through which the vertical shaft C passes, and a flange, R, around this aperture extends up near to the bottom of the disk B, so as to prevent the escape of dust. Around this flange, and between it and the outer wall, Q, is an inclined channel or floor, S, which receives the pulverized material after it escapes over the rim K of the disk B, and conducts it to the point of discharge at T. Cleats or lugs *u* are fixed around the interior of the case Q, to receive and support the amalgamated copper plate V, against which the finely-pulverized pulp will be thrown by the centrifugal action of the rotating disk.

The operation of my machine is as follows: Ore or rock in sufficiently small fragments is placed in the hopper P, and fills the tube O, the hollow cylindrical shoe L, and the revolving die A. The ribs upon the interior of this die cause the fragments of rock contained in it to revolve with the die, while the ribs in the shoe above hold the rock within it nearly or quite stationary. The die is set with its periphery sufficiently near that of the shoe by means of the wedge-key below the step in which the shaft turns, and the space between the die and shoe thus formed serves for the escape of the pulverized material as fast as it is formed. The pulp or dust escapes between the shoe and die when pulverized finely enough, and passes into the space within the rim K, from

which it eventually escapes over the top into the exterior casing, Q, and passes down the inclined floor or chute S to the escape E. The amalgamated copper plates or rims V are fixed within the case Q, to arrest any free gold which may be thrown in contact with them. When the rock is crushed dry, it will be necessary to employ a scraper within the rim K, to prevent the dust from packing; or the rim may be omitted altogether. The disk and rim are made sufficiently heavy to act as a fly-wheel, and by its momentum keep up the motion under the irregular strain of the work.

I am aware that attrition-mills have been made in which one portion of the mass to be ground remains passive, while another portion revolves in contact with the first, and I do not claim, broadly, such a mill, but confine myself to such a construction as to bring the weight of a stationary body of ore in a vertical line directly upon the moving mass in the rotary die below.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an attrition-mill, the rotating die A, the hollow stationary shoe L, and the feed-tube O, in combination with the disk B, provided with rim K, the exterior stationary case, Q, and inclined chute S, substantially as herein described.

2. An attrition-mill comprising the hollow stationary shoe L, vertical feed-tube O, rotating disk B, provided with the die A, the exterior inclosing-case, Q, chute S, and the amalgamated copper plate V, substantially as described.

3. In an attrition-mill, the combination of a stationary hollow shoe, feed-tube, revolving disk, provided with die A, the vertical driving-shaft, step D, and an adjusting mechanism, substantially as set forth.

In witness whereof I hereunto set my hand.

JOHN J. NEWSOM.

Witnesses:
G. W. EMERSON,
S. H. NOURSE.