

W. J. Menzies
Improvement in apparatus for grinding rock &c.

2 Sheets--Sheet 1.

[79.]

No. 119,469.

Patented Oct. 3, 1871.

Fig. 1.

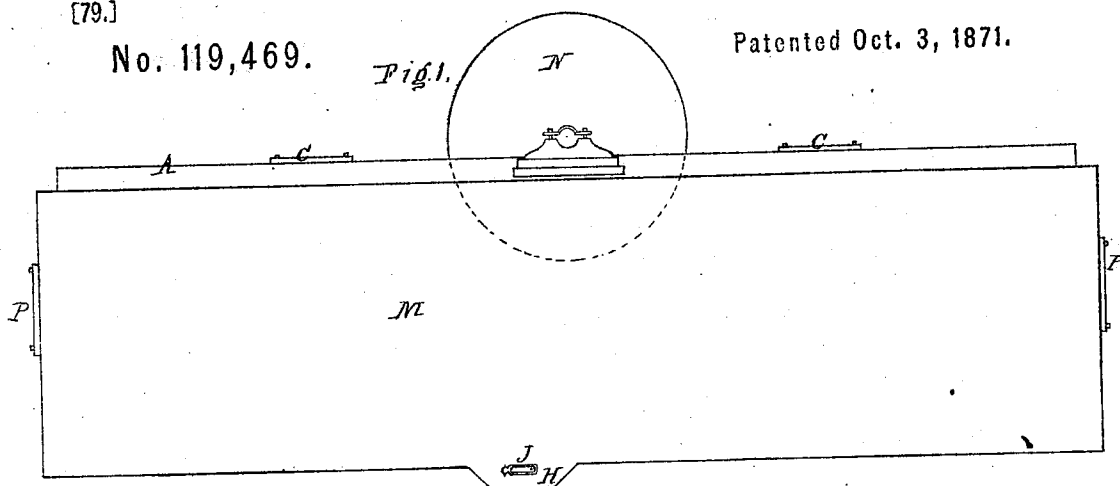
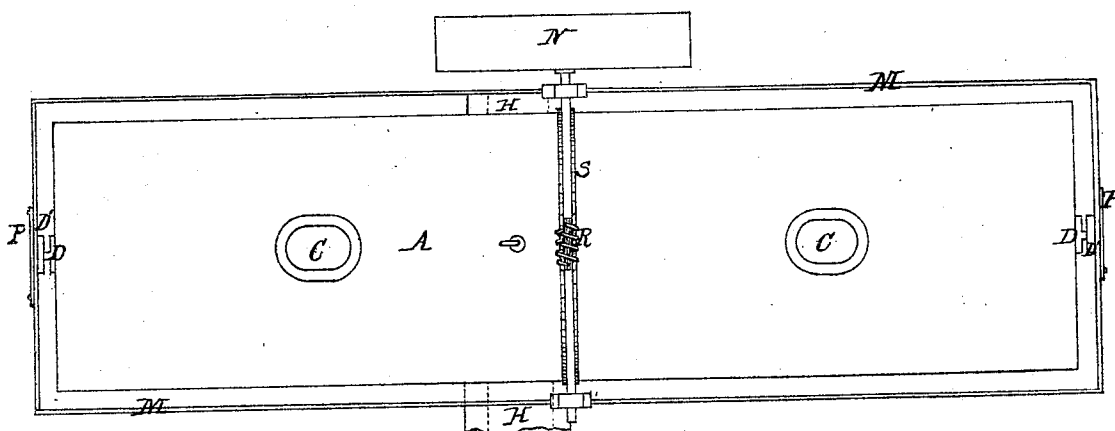
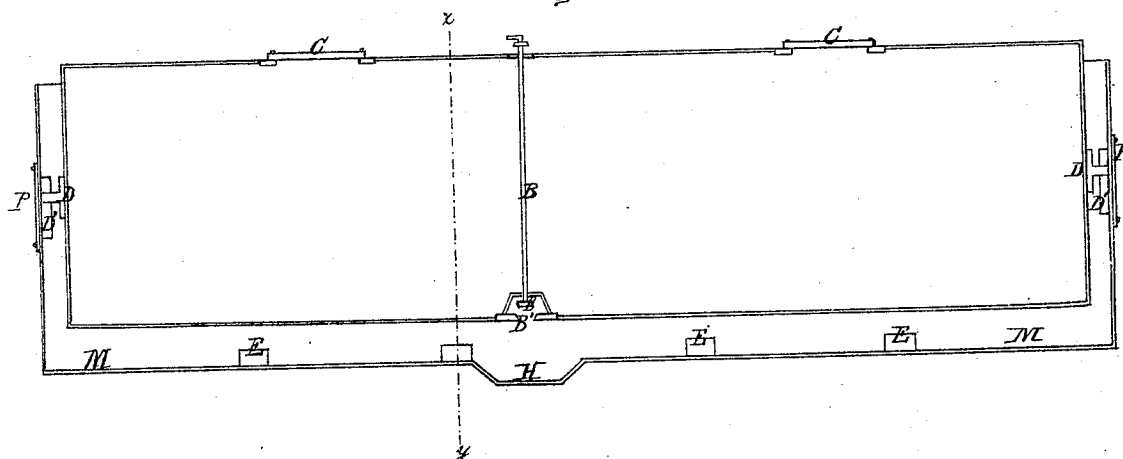


Fig. 2.



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Fig. 5.

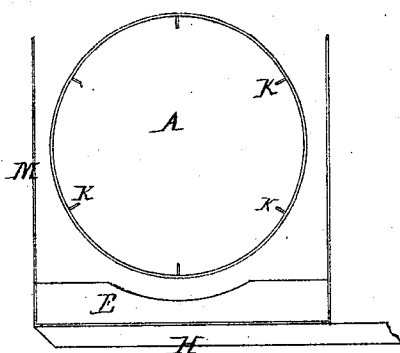


Fig. 4.

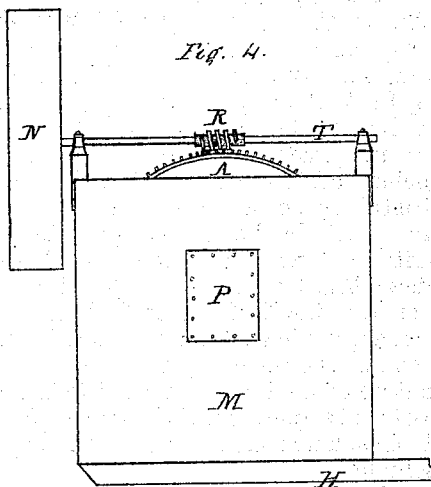
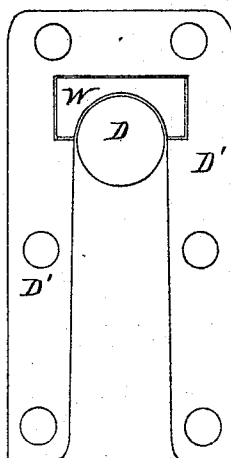


Fig. 6.



Witnesses.

Wm. R. Wright
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UNITED STATES PATENT OFFICE.

WILLIAM J. MENZIES, OF ST. HELENS, ENGLAND.

IMPROVEMENT IN APPARATUS FOR GRINDING ROCK, QUARTZ, &c.

Specification forming part of Letters Patent No. 119,469, dated October 3, 1871.

To all whom it may concern:

Be it known that I, WILLIAM J. MENZIES, of St. Helens, Lancashire, England, have invented a new and useful Improvement in Apparatus for Grinding Rock, Quartz, Mineral Phosphate, &c.; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing making part of this specification, in which—

Figure 1 is a side view of my apparatus; Fig. 2, a longitudinal vertical section; Fig. 3, a plan or top view; Fig. 4, an end view; Fig. 5, a cross-section on the line X Y of Fig. 2; Fig. 6, a detached enlarged view of the inverted bearings at each end of the revolving cylinder.

The nature of my invention consists in an apparatus which I employ for grinding rocks, quartz, mineral phosphates, &c., so as to render them easily soluble.

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

A in the drawing represents a cylinder of wrought-iron half-inch plate or other suitable material, and constructed with centers D D arranged in the line of its axis. M is a tank, (which may be a tank of wood or metal,) with transverse walls E E recessed to fit the cylinder A. H is a gutter across the bottom of the tank and immediately under the opening B' in the cylinder A. This gutter is provided with a door, J. D' D' are plates bolted or otherwise secured to the interior of the tank, and constructed with slots for the reception of the centers D D. The bearings W of the centers are arranged at the top of the slots. The plates P P cover openings in the tank, through which, when the plates are removed, access may be had to these bearings and centers. The opening B' in the cylinder is closed by the valve B, to which is connected a screw-handle or equivalent device for lifting it from its seat or replacing it, so as to open or close B', as may be desired. K K are longitudinal ribs arranged within the cylinder A. S is a spur-wheel,

bolted round the cylinder in segments, and gearing into the worm R, whose shaft T is mounted in suitable bearings on the tank M, and carries a band-pulley or water-wheel, N; this, or any other suitable device to give motion to the cylinder A, may be used. C C are man-holes in the top of the cylinder.

The operation is as follows: The substances to be ground are thrown into the cylinder A through the man-holes C until it is rather less than half full, after which the man-holes C are closed and water enough run into the outer tank to lift the cylinder from the supporting-walls E and float it upward till the centers are firmly pressed against their inverted bearings or caps of the boxes. Power is then communicated to the pulley N, and the cylinder A is revolved by the revolution of the shaft and worm meshing into this gear, and the material is ground by attrition of the particles or grinding upon itself. The operation is assisted by the longitudinal ribs K K lifting up portions of the material being ground and letting them fall on the mass within. Power may be applied to turn the cylinder A in many other ways.

I do not confine myself to the one described. A chain or belt may be passed around it, connecting it with a pulley; or one of the centers D D may be extended through the end of the tank and have a pulley attached to it, and the cylinder turned in that way. This cylinder may also be used as a washer for washing mud and dirt from materials to be ground, or for washing mud and dirt from any minerals.

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

The revolving cylinder, supported in a water-bath so as to relieve the pressure on the bearings, substantially as described.

WILLIAM J. MENZIES.

Witnesses:

WM. R. WRIGHT,
GEORGE E. BUCHLEY.