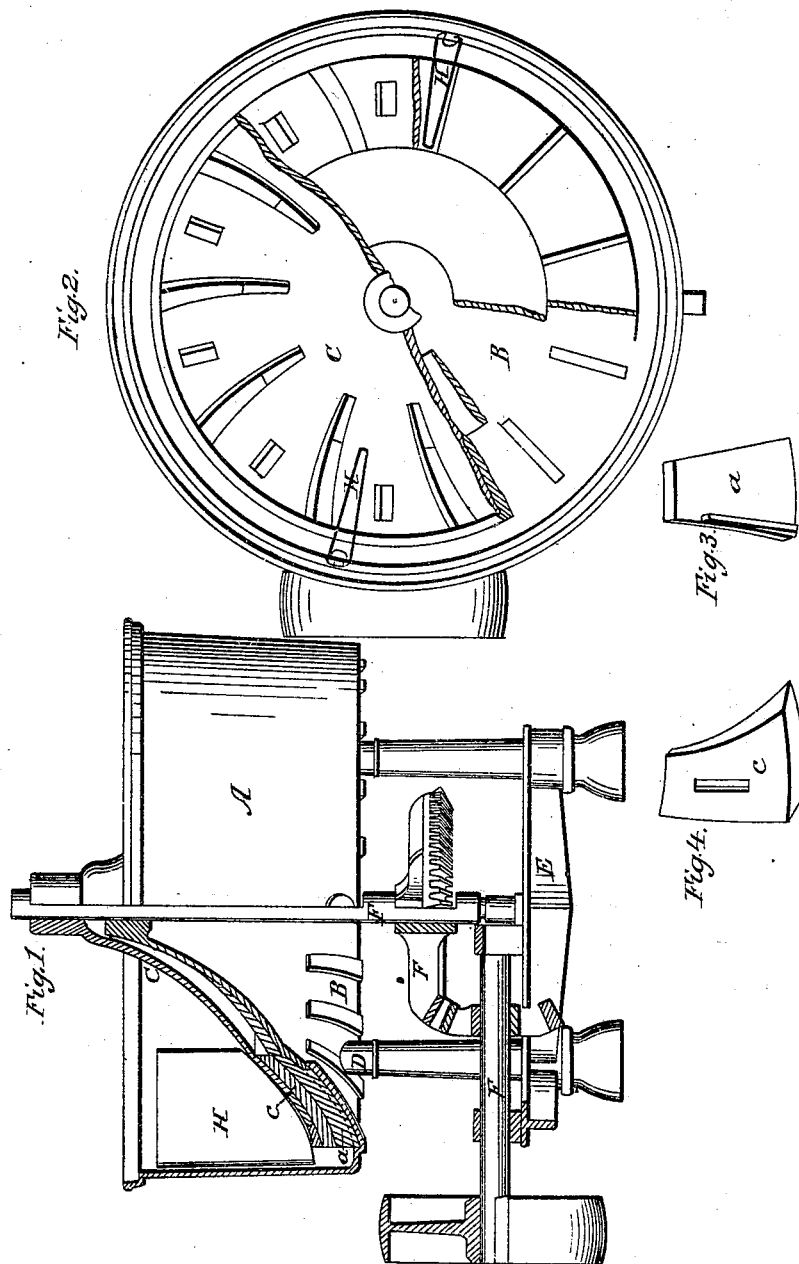


WHEELER & RANDALL.

Quartz Grinding Mill.

No. 51,637.

Patented Dec. 19, 1865.



Attest.  
Wm. N. Bradshaw  
Comm. Smit

Inventors.  
Zenas Wheeler  
Samuel No. Randall.

# UNITED STATES PATENT OFFICE.

ZENAS WHEELER AND PHINEAS MUNSEL RANDALL, OF SAN FRANCISCO,  
CALIFORNIA.

## IMPROVEMENT IN QUARTZ-GRINDING MILLS.

Specification forming part of Letters Patent No. **51,637**, dated December 19, 1865.

*To all whom it may concern:*

Be it known that we, ZENAS WHEELER and PHINEAS MUNSEL RANDALL, of the city and county of San Francisco, State of California, have invented a new and improved grinder and amalgamator for grinding and amalgamating the precious metals, called "Wheeler & Randall's Excelsior Grinder and Amalgamator;" and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of our invention, partly in section. Fig. 2 is a plan or top view of the same, also partly shown in section. Fig. 3 is a die in perspective. Fig. 4 is a shoe, also shown in perspective.

Similar letters of reference indicate corresponding parts in each of the figures.

Our invention relates to a new and improved device for grinding and amalgamating in order to separate the precious metals contained in ores from the foreign substances.

A represents the rim of the pan; B, the bottom and hub of the same; C, the muller-frame or runner, provided with openings *o o o* to admit the substances to be treated to the grinding-surfaces of the shoes *c* and the dies *a*; D, the legs on which the pan rests; E, the cross-frame to support the gearing and shafts F F F; F F F, the gear-wheels, also the driving-shaft and muller-shaft; H, dash-boards for assisting the rotary currents of the pulp when the machine is in operation; *a*, dies to be secured to the pan bottom or hub B by wooden keys or otherwise, the form of the grinding-surfaces of which dies is of double curvature, convex toward the axis of revolution. *c* are shoes, to be secured to the muller-frame or run-

ner C by wooden keys or otherwise, the form of the grinding-surfaces of which shoes is of double curvature, convex toward the axis of revolution and corresponding to the grinding-surfaces of the dies *a*. *o o o*, &c., are openings through the muller-frame or runner C, and also through or between the shoes *c*, &c., to admit the ore to the grinding-surfaces of the shoes and dies.

The operation of our machine is as follows: A quantity of water is put into the pan and the muller or runner put in motion. Sufficient ore is then added to form with the water a mass of the consistency of thin paste. Enough quicksilver is next added to the mass to thoroughly amalgamate and take up all of the precious metals in the ores or substances treated. The muller or runner is kept revolving until the ore is reduced to any desired fineness, and the amalgamation completed, when the mass is let into separators and the pans cleaned and recharged.

Having thus described our invention, we will proceed to state what we claim and desire to secure by Letters Patent, to wit:

1. The conical muller or runner C, constructed substantially as described—that is, with openings *o o* to admit the substance to be treated and also with openings to secure the shoes *c*.

2. In combination with the runner or muller C, the stationary conical bottom B, fitted to receive the dies *a*, substantially as described.

In witness whereof we have hereunto set our hands and seals this 30th day of June, A. D. 1865.

ZENAS WHEELER. [L. S.]  
PHINEAS M. RANDALL. [L. S.]

Witnesses:

HENRY HAIGHT,  
EDWIN L. PECKHOME.