H. Blystell.

Ore Mill.

No. 8,670. Patented Jun. 20, 1852.

Fig. 1.

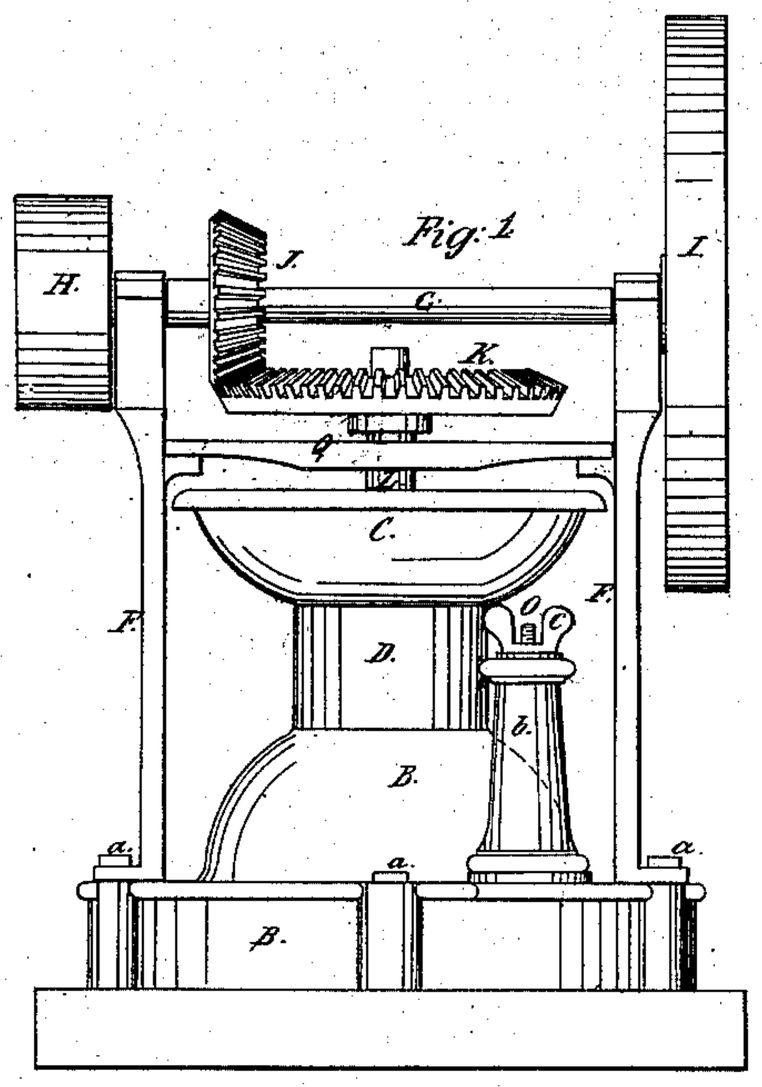


Fig. 2.

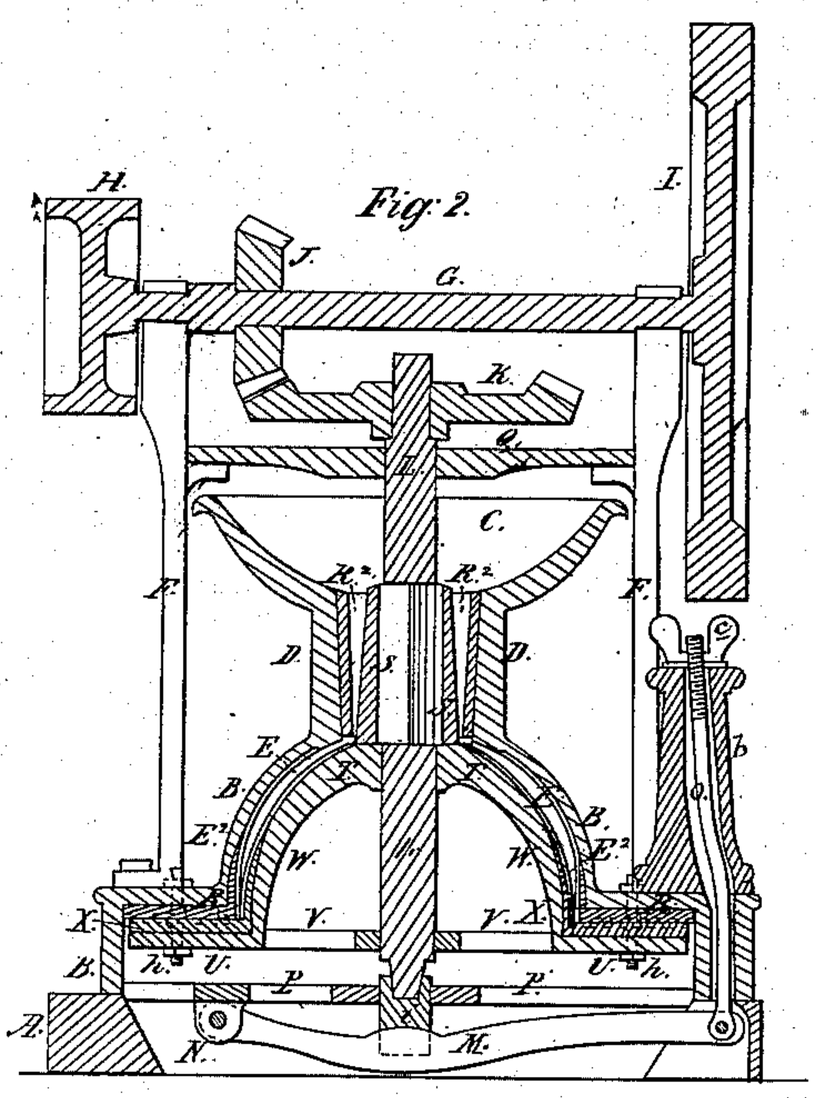


Fig. 3.

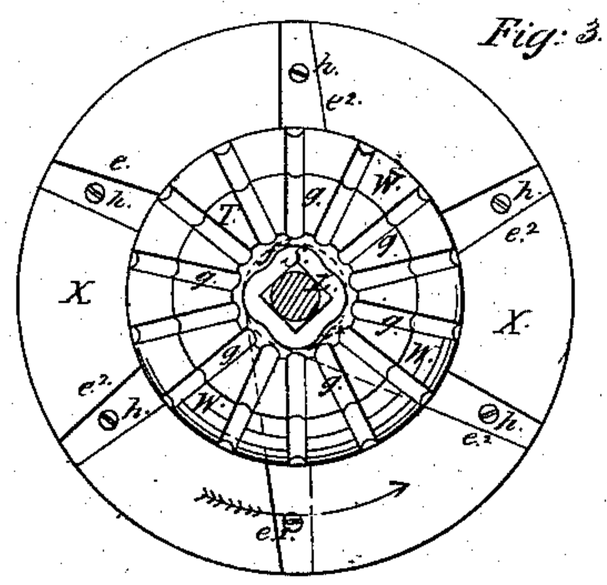


Fig. 4.

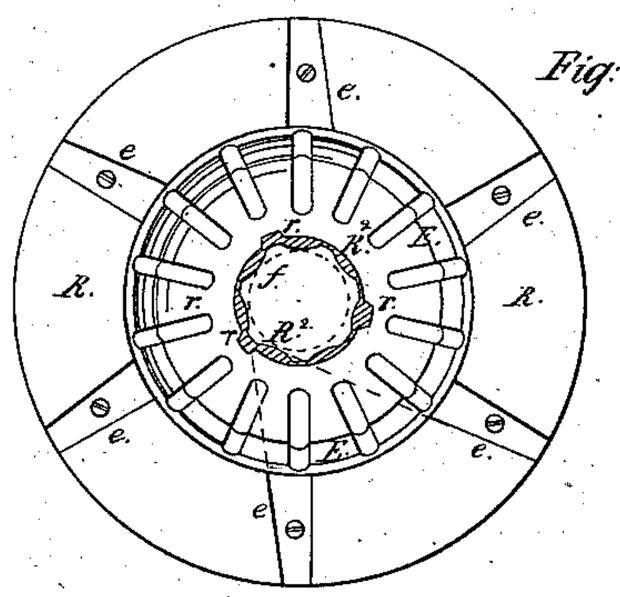


Fig. 5.

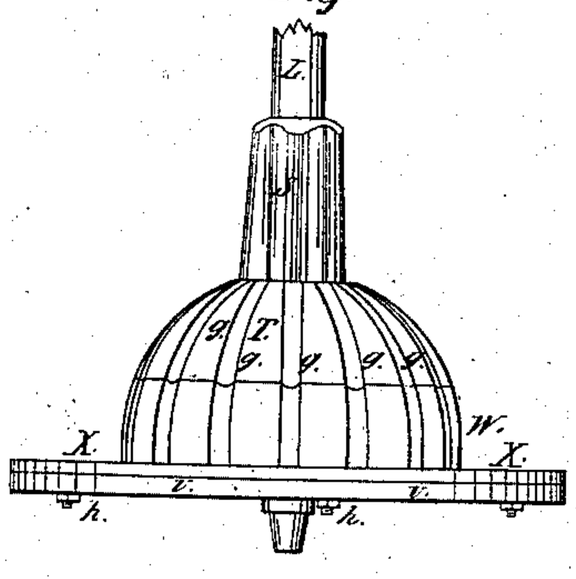
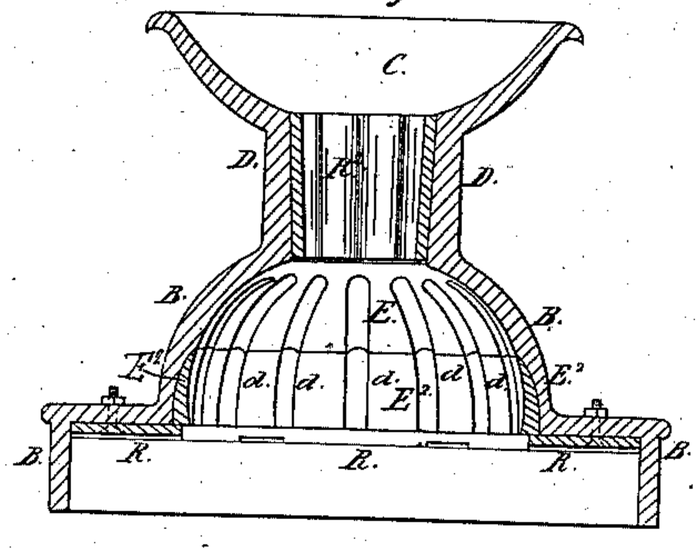


Fig. 6.



UNITED STATES PATENT OFFICE.

H. BLASDELL, OF NEW YORK, N. Y.

MILL FOR GRINDING QUARTZ.

Specification of Letters Patent No. 8,670, dated January 20, 1852.

To all whom it may concern:

Be it known that I, HORATIO BLASDELL, of the city and county of New York and State of New York, have invented a new and useful Improvement in Metallic Mills for Reducing Gold-Quartz Rock to a Flour, called "Blasdell's Gold-Quartz Flourer;" and I do hereby declare the following to be a full and clear description of the construction and operation thereof, reference being had to the annexed drawings, making part of this specification.

Figure 1 represents a side elevation of the mill. Fig. 2 is a vertical central section through the same. Fig. 3 is a top view of the semispherical runner, with its channeled circular ring plate. Fig. 4 is an inverted view of the stationary concave, and channeled circular ring plate. Fig. 5 is an elevation of Fig. 3. Fig. 6 is a vertical section of the case or shell—showing the hopper, throat, and grooved concave.

Where the same letters of reference occur on the several figures they indicate the same parts.

The arrow Fig. 3 shows the direction of the turning of the runner.

The distinguishing feature of improvement consists in so constructing and combining the several parts of the mill, that the quartz rock shall be received and cracked or reduced so as to pass between the grooved surfaces of the semi-spherical runner, and concave, wherein the quartz is held and the particles thereof made to act by friction directly upon each other, and thus effect its own pulverization, and allowed to descend gradually to circular channeled rings, between whose surfaces the quartz is reduced to the fineness of flour. This complete pulverization is effected without the use of grinding surfaces such as ribs, and other projections, and I have found by experience that in this consists the success of my mill.

Description.—Upon a suitable wooden bed piece A there is mounted a shell or case B, constituting the hopper C, neck D, and semi-spherical concave E, cast in one piece and secured by screw bolts (*a*). Upon this shell or case is mounted a frame F, in the upper portion whereof are the journal boxes of a horizontal shaft G, on one end of which is a pulley H, from which the band leads to the driving power, and on the opposite end is a fly or balance wheel I, for equalizing the motion of the mill. Near the pulley H, on the shaft G, is a bevel pinion J, matching with a horizontal bevel gear wheel K, on the upper end of the spindle or shaft L.

M is a lever having its fulcrum in the spider frame at N, and furnished with a screw rod O, projecting through a pillar *b* and provided with a screw nut (*c*) whereby the wrought iron step or ink (*i*) for the shaft L, and mounted upon the lever M, is raised or lowered for adjusting the semi-spherical runner to the concave.

P is a spider frame attached to the bed piece A, for retaining the wrought iron step or ink (*i*) in a vertical position. Q is a horizontal plate for retaining the upper end of the shaft in an upright position. The throat of the case or shell is furnished with a chilled iron throat or hollow cylinder R^2 having its inner surface cast with vertical channels and convex swelling as shown in Fig. 4, and having ribs *r* on its circumference which fit corresponding recesses in the throat and thus prevent the hollow cylinder from turning. The semi-spherical concave E, is furnished with a separate chilled iron ring E^2 being a section of a sphere near the diameter thereof, and fitted securely into a corresponding recess cast around the larger diameter of the concave E, and held in its place by ribs fitting recesses in the shell. This separate chilled ring is provided with grooves *d* on lines drawn from the vertex to the base, and coincident with similar grooves formed in the upper portion of the concave—each groove being of a concave form.

R is a flat chilled iron ring plate bolted to the under surface of the horizontal flange of the shell or case B, and fitting against the lower edge of the grooved ring E^2 and by which the latter is held in its place. This ring plate R, is channeled radially on its under surface Fig. 4 to a sufficient depth the sides (*e*) of said channels being tangential to the dotted circle *f* Fig. 4. These channels are made slightly wider next to the concave chilled grooved ring E^2 than at the circumference of the ring plate, for receiving the pulverized quartz as it descends from the concave. The heads of the screw bolts which confine the chilled ring plate R are flush with the bottoms of the channels and the nuts are screwed down upon the flange of the case B.

S is a chilled iron nut fitted to the square portion of the shaft L, and turning in the throat of the neck D, and is of a larger

diameter at its base than at the upper portion thereof. The exterior of this nut is of a concave convex form and serves in connection with the hollow cylinder in the throat to crack and break the quartz.

T, is the semi-spherical runner mounted on the shaft L, and cast with a horizontal flange U, and crossed arms V, by which it is secured to the shaft. This semi-spehrical runner is furnished with a series of grooves *g* in a similar manner to the semi-spherical concave, and is provided with a convex chilled iron ring W, fitted into a recess in the runner T, and held securely thereon by projections and having grooves coincident with those in the runner. On the projecting flange U of the runner there is confined by screw bolts *h* a flat chilled iron ring X having radial channels in its upper surface one of the sides e^2 being tangential to the dotted circle f^2 Fig. 3—and of the form of the channels of the stationary ring R. The inner or smaller diameter of the ring plate X, fits against the periphery or larger diameter of the convex grooved ring W, whereby the latter is held securely in its place on the runner. There is a space between the outer diameter or periphery of the ring plate X and interior of the case or curb B for the passage of the quartz after being reduced to a flour. The channeled surfaces of the flat ring plates R X, are nearly in contact with each other—and the channels of one plate cross those of the other diagonally during the rotation of the runner, whereby the tangential sides (e e^2) of said channels are made to have the effect of checking the passage of the quartz through the channels and working or whirling the quartz centrifugally between the ring plates R X and allow it to pass over the edge of the rotating ring plate X.

The employment of the separate chilled iron grooved rings E^2 W, and the horizontal circular channeled plates R X in combination with the semi-spherical runner and concave enables the operator to renew these portions when worn away without the necessity of renewing any other part of the mill, and by which arrangement of parts a mill may be used a long time, the difficulty of removing a worn out ring and replacing it with one not worn being quite inconsiderable.

Operation of my mill.—The gold quartz rocks in suitable pieces are put into the hopper, and the mill being put in motion by steam or other adequate power descend to the annular space in the throat between the hollow cylinder R^2 and nut S, where the pieces are broken up into smaller pieces, which then descend into the grooves of the semi-spherical cast iron runner, and concave, by which they are conducted to the grooves of the chilled concave and convex rings E^2 W, wherein the prisms and other shaped pieces of gold quartz are held and whirled around with great speed and force against each other, until reduced to such a degree of fineness as to permit the same to pass into the radial shallow channels of the flat rings R X which revolve nearly in contact with each other, wherein the fine gold quartz prisms are rubbed against each other until the particles of gold therewith mixed, shall be reduced to a fine powder, and thrown gradually from the periphery of the revolving ring or plate X against the interior diameter of the circular curb B from whence it descends to a receiver to be removed and the gold separated from the quartz flour in the usual manner.

From the foregoing description it will be perceived that the pulverization of the gold quartz rock is not performed by ribs, projections, or edges of the iron runner, concave, rings or plates, but is effected by holding the pieces or particles of gold quartz in the grooves of the semi-spherical concave E E^2, and runner and between the horizontal circular rubbing ring plates R, X, thus producing great frictional resistance, and rubbing quartz against quartz until reduced to a fine dust powder or flour—the grooves in the upper portion of the cast runner and concave are designed to conduct the pieces of quartz to the grooves of the chilled rings as they are reduced to the proper fineness. In order to reduce the gold quartz to a still finer powder it is only necessary to turn the thumb screw *c* to the right which will have the effect of raising the lever M, and with it the lower circular plate X toward the upper plate R, between whose surfaces the operation of powdering the gold quartz takes place.

Having thus described my mill for reducing gold quartz rocks to a powder or flour, what I claim as new and desire to secure by Letters Patent, is—

The combination of the chilled hollow cylinder R^2, and nut S of the form represented, and the grooved chilled rings W E^2, and horizontal circular channeled chilled ring plates R X, with the grooved concave E and runner T for breaking, pulverizing and powdering gold quartz rock—the said chilled rings and plates being arranged and operating in the manner and for the purpose herein fully set forth.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

H. BLASDELL.

Witnesses:
P. F. PRUCKNEY,
A. E. H. JOHNSON.