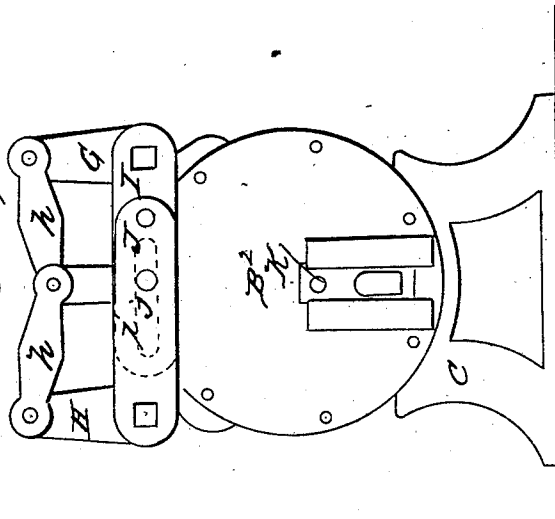
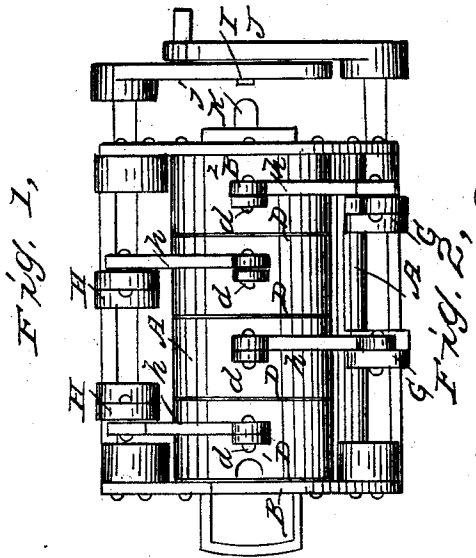
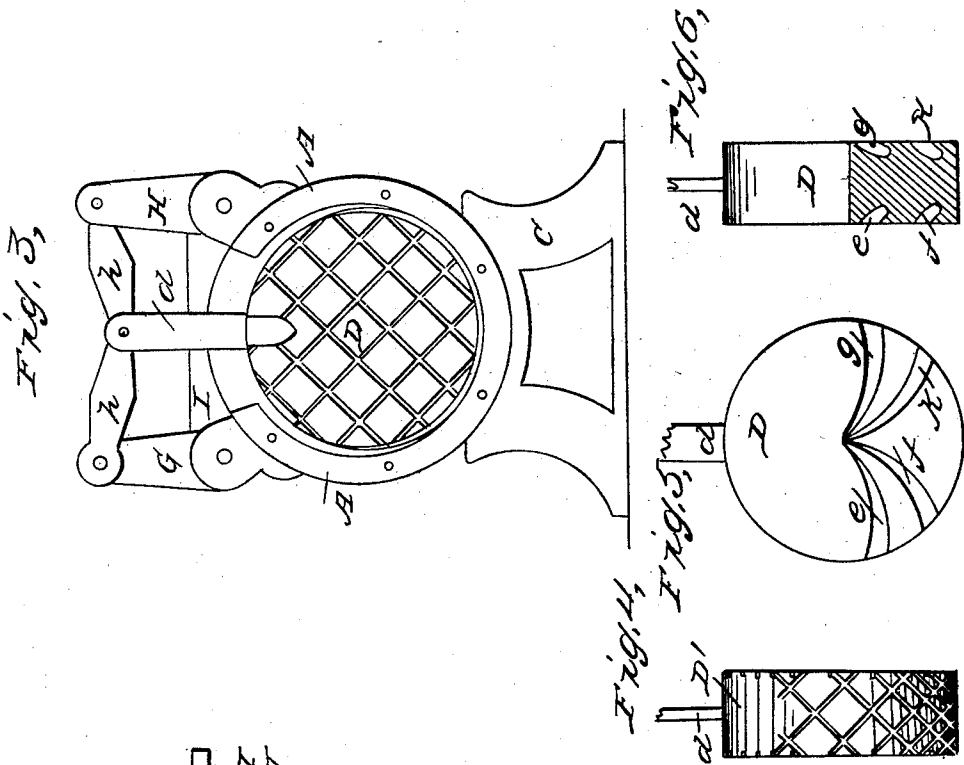


S. & G. E. MILLS.  
Mineral Pulverator.

No. 24,570.

Patented June 28, 1859.



WITNESSES'

Edw F Brown  
G. R. Woodruff

INVENTOR

Samuel Mills  
George E Mills

# UNITED STATES PATENT OFFICE.

SAMUEL MILLS AND GEORGE E. MILLS, OF NEW YORK, N. Y.

## MACHINE FOR PULVERIZING MINERALS.

Specification of Letters Patent No. 24,570, dated June 28, 1859.

To all whom it may concern:

Be it known that we, SAMUEL MILLS and GEORGE E. MILLS, of the city of New York, in the State of New York, have invented new and useful Improvements in Machinery for Pulverating Minerals, and the following is an exact description of the same, reference being had to the accompanying drawings, making part of this specification.

The nature of our invention consists in a series of thick metal plates or mullers, of cylindrical form working side by side, in a trough, or hollow cylinder composing about three fourths of a circle which being larger than the diameter of the plates, leaves an opening at the top on both sides to receive the lumps of the minerals in between the cylinder and the plates, which by their alternate reciprocating motion are drawn in and crushed, and by the action of the water and the circular grooves in the flat surfaces of the plates, are finely pulverized under and between them.

In order to enable others skilled in the arts to make and use our improved pulverator, we will describe it, referring to the drawings, and the letters thereon which indicate the same parts in the several figures.

Figure 1 shows a top view, or plan. Fig. 2 is an end elevation. Fig. 3 is an end elevation with the end detached. Fig. 4 is an edge view of the plate (D'). Figs. 5 and 6 are a face and edge view of the plates (D, D, D).

As seen in Fig. 1, (A) represents a strong cast iron concave cylinder, being open at the top about one-fourth of the circle, with ends (B' and B<sup>2</sup>) bolted on to it firmly in the usual manner, (c c) are brackets to support the cylinder (A,) (D' D<sup>2</sup> D<sup>3</sup> D<sup>4</sup>) are thick hard iron plates with strong levers (d, d, d, d,) extending upward from the top of each, by which the motion and power is communicated.

The heavy cast iron trough or cylinder (A,) which forms a portion of the inner grinding surface, also the main body of the machine, and support for the rock shafts (G and H) to give motion to the plates or crushers (D', D<sup>2</sup>, D<sup>3</sup>, D<sup>4</sup>), which are all of considerable less diameter than the inner

circle of the trough or cylinder (A,) so that the opening on each side is of wedge shape, and will readily admit the minerals and ores to work in, which by their gravity find the bottom as their particles become finer, the plate (D') as seen in Figs. 3 and 4 may be some smaller than the others if desired, the rest (D<sup>2</sup>, D<sup>3</sup>, D<sup>4</sup>), may increase in size, the action of the water on the finer particles of the ores will force them into the circular cavities or grooves (e, f, g, h,) as seen in Figs. 5 and 6, and thus they come between the flat surfaces of the plates, and are finely pulverized.

To each of the levers (d, d, d, d,) connections are made by the pieces (h, h, h, h,) to the arms on the rock shafts, (G and H,) which are mounted on the cylinder (A,) and to one end of the rock shafts (G and H) are attached levers (I, and J,) working together by having a slot (i) in one of them, and a pin or roller (j) in the other thereby communicating positive motion and power to the plates by a single pitman. On the end (B<sup>2</sup>) there is an adjustable discharge pipe (K,) for the purpose of drawing off the pulverized minerals, and ores, and owing to the difference of their specific gravity, some requiring more, and some less water this arrangement becomes very necessary.

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

A series of circular grooved and roughened metallic plates working upon their edges side by side in a trough or cylinder the circle being larger than the plates, which having an alternating motion in combination with each other and the cylinder, and in connection with the rock shafts and levers for operating the same substantially as described and for the purposes set forth.

SAMUEL MILLS.

Witnesses:

DAVID STRAUS, JR.,  
L. PITKIN.

GEORGE E. MILLS.

Witnesses:

EDM. F. BROWN,  
J. B. WOODRUFF.