

J. T. ROBERTSON.  
Triturating Mill.

No. 230,660.

Patented Aug. 3, 1880.

FIG. 1.

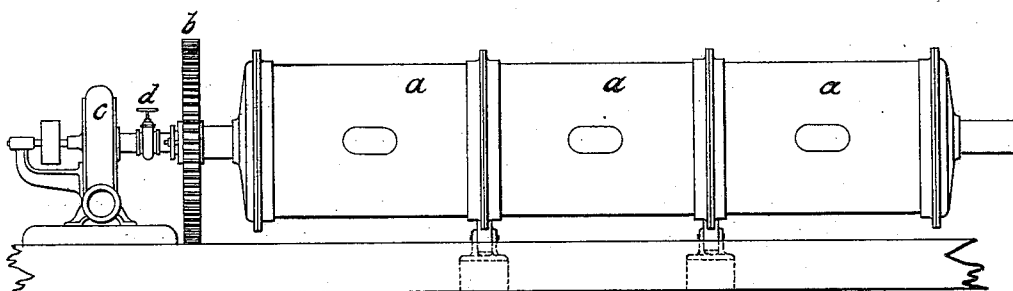


FIG. 2.

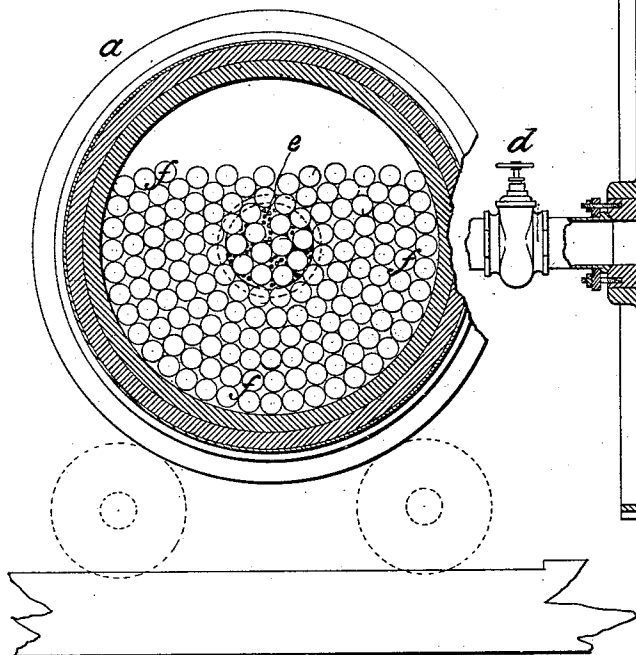
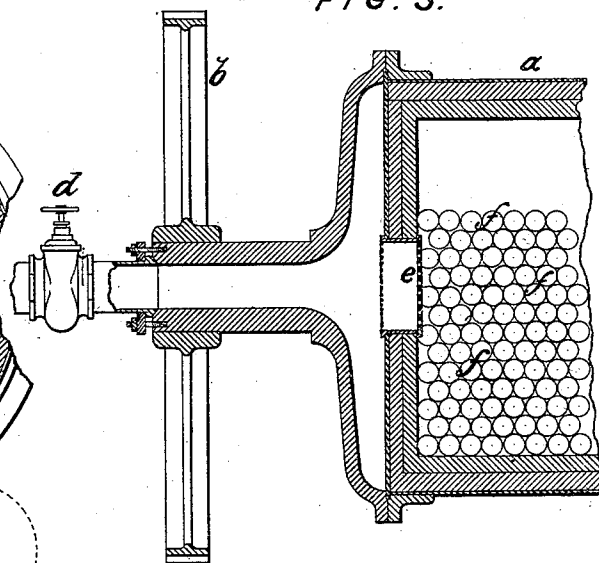


FIG. 3.



WITNESSES.

Walter Pell  
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INVENTOR.

Judah Touro Robertson

# UNITED STATES PATENT OFFICE.

JUDAH T. ROBERTSON, OF NEW YORK, N. Y.

## TRITURATING-MILL.

SPECIFICATION forming part of Letters Patent No. 230,660, dated August 3, 1880.

Application filed October 16, 1879.

*To all whom it may concern:*

Be it known that I, JUDAH TOURO ROBERTSON, of New York, in the county and State of New York, have invented a new and useful improvement in Pulverizers or Triturating-Mills, of which the following is a specification.

My invention relates to machinery for reducing minerals and other material to a finely-divided condition, in which the material is inclosed in a revolving cylinder and subjected to the grinding and triturating action of a number of balls.

The object of my invention is to effect the grinding more rapidly than is usual by acting upon a smaller portion of the material at a time, and to render efficient the action of an atmospheric current to charge and discharge the mill.

To this end my invention consists of a cylinder separated into a series of sections with openings in the division-plates, which are so arranged that the blast of a blower will draw or force the material through or among the balls before it can be discharged from the mill. By this means a blast may be used to afford a continuous action of the machine without losing time to fill and empty the mill, and the material will be removed as fast as it becomes sufficiently pulverized, without remaining in the mill to absorb the power in unnecessary grinding, and to impede the reduction of that part of the material that requires to be further operated upon. The draft of air not only keeps the mill cool and prevents the injury by discoloration or otherwise of those kinds of material that are injured by heat, but the current also tends to keep clean the surfaces of the balls and the linings of the cylinder, so that they will remain in the most efficient condition for performing their work.

To enable others skilled in the arts to which it appertains to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

Figure 1 is a side elevation of the mill, showing the cylinder *a a a* and the spur-wheel *b*, by which it is revolved on its hollow journals, and the blower *c* and the valve *d*, by which the suction is regulated. Fig. 2 is a transverse section of the cylinder, in which supporting-rollers are indicated by dotted lines under the

flanges; and Fig. 3 is a longitudinal section of one end of the same, both figures being on an enlarged scale, and showing the porcelain lining and wood backing with which such cylinders are usually made.

The ends of the cylinder and the partitions between the sections are fitted with plates at the line of the axis, which are perforated with small holes. If the balls *f* filled the cylinder, the grinding action would be imperfect, and if they did not cover the holes the material would be liable to pass through unground with the draft. It is therefore better that they should cover the holes without filling the sections. The ground or crushed material to be triturated is carried with the current through the open journal at one end, by means of a hopper or other suitable arrangement, into the first section, where it is subjected to the action of the balls, and it is then carried into the middle section, and then into the last section at the other end, whence it passes through the blower and is delivered by a spout into a suitable receptacle.

The rapidity of the passage of the material through the mill is dependent upon the blower, the action of which is also regulated by the valve placed between it and the cylinder. In their passage through the sections the finest particles most readily pass above the balls between the division-plates and escape with the least action, while the larger particles remain among the balls and receive the grinding they require, and the repetition of the operation through the several sections insures the perfect trituration of the whole.

The drawings represent the revolving cylinder divided in three sections; but it may be made with more sections, if desirable, and it would also answer a useful purpose in some cases if it were made with but one chamber and supplied with balls that covered the escape-opening continuously, and thus admitted of operation with a blower, in the manner herein described. In a similar manner, although the cylinder is represented horizontal, it may be placed in an inclined position with the escape covered with balls, to insure the grinding of the material that is admitted at the end above them.

Fine wire screens may be placed over the

orifice on the last division, out of contact with the balls, so that only the finest material can pass through.

5 The cylinder may be fitted with man-holes and linings and other appliances, and be driven by belts or gearing in any of the ways known to mechanics that may be suitable. Where perforated plates are used they should be made of as thin metal as practicable, and the holes  
10 should be countersunk on the discharge side.

Having thus described a mill made with my improvements, I claim as my invention and desire to secure by Letters Patent—

The triturating-cylinder having hollow journals and made in sections *a a*, separated by 15 division-plates having central perforations, *e*, said perforations being covered by balls *f*, in combination with blower *c*, substantially as described.

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Witnesses:

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