

(No Model.)

J. L. HAYWARD.

ROCK PULVERIZER.

No. 323,674.

Patented Aug. 4, 1885.

FIG 1.

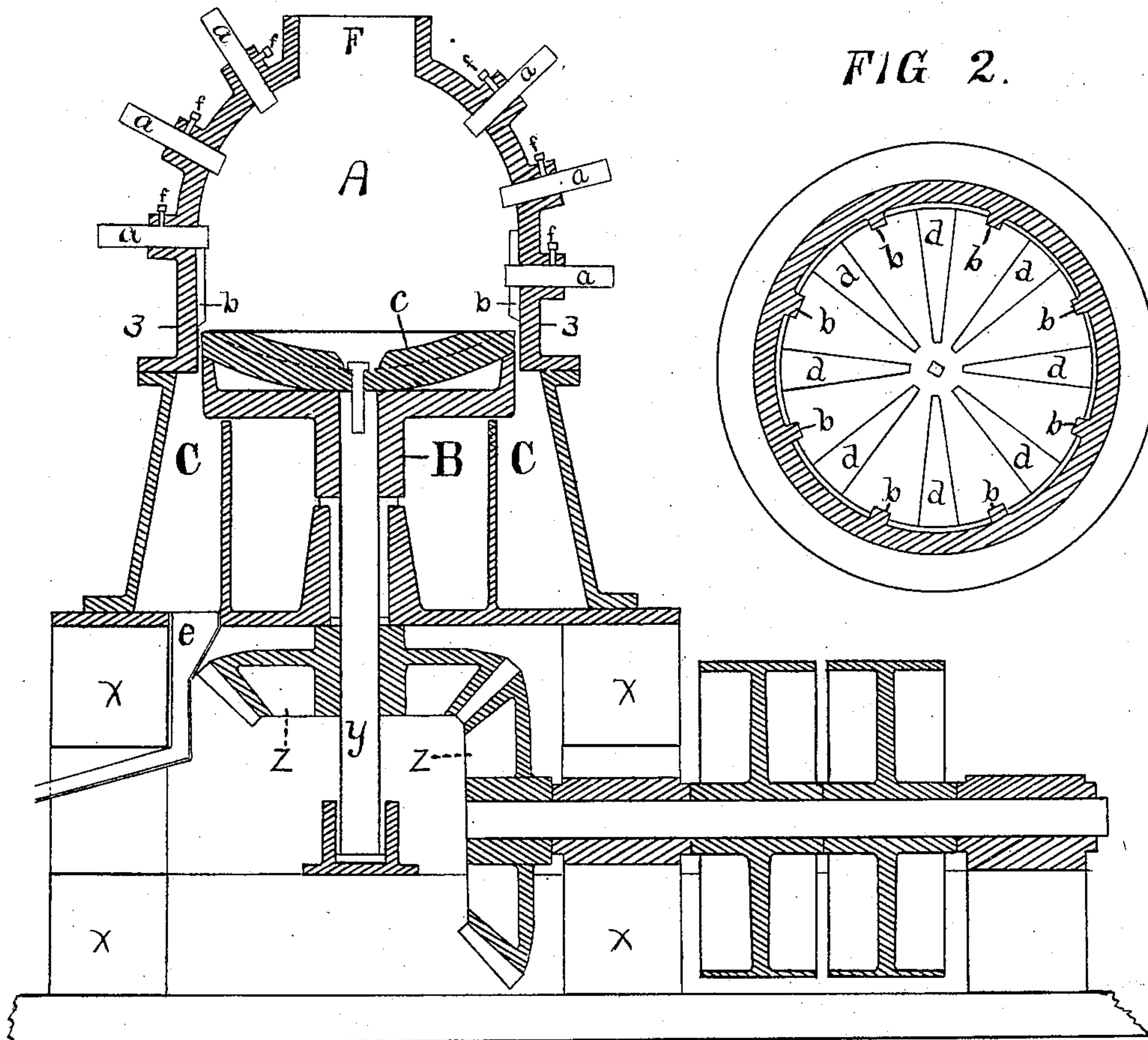
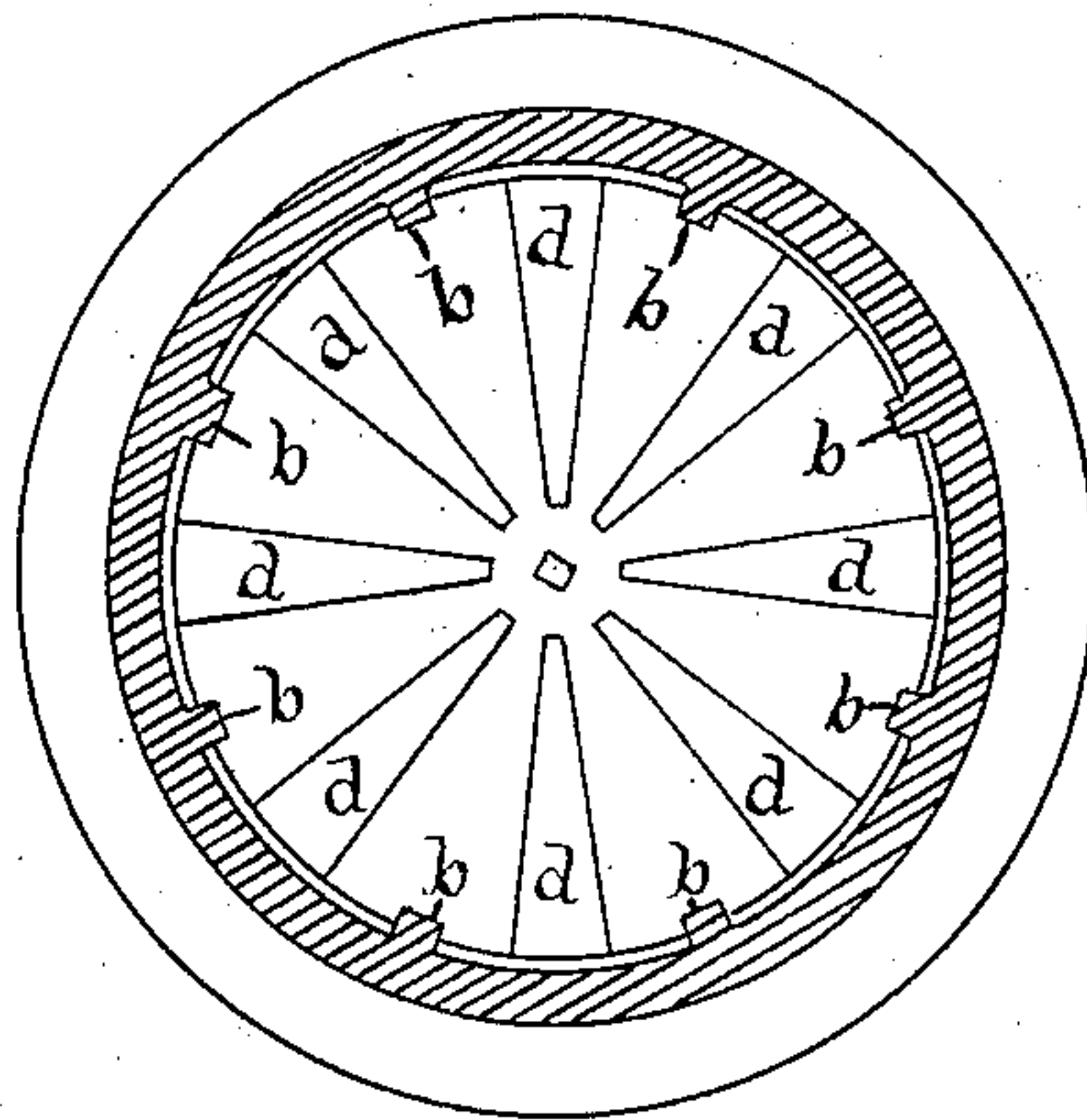


FIG 2.



WITNESSES

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ROCK-PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 323,674, dated August 4, 1885.

Application filed March 7, 1885. (No model.)

To all whom it may concern:

Be it known that I, J. L. HAYWARD, a citizen of the United States, residing at Framingham, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Rock-Pulverizers, of which the following is a specification.

My invention relates to improvements in rock-pulverizers, in which I provide a disk revolving horizontally in conjunction with a casing, the inner surface of which is protected by steel bars against which the rock is thrown until pulverized.

The object of my invention is to thoroughly, effectually, and rapidly pulverize and reduce any and all substances, but more particularly quartz and other mineral-bearing rocks with little wear upon the substantial parts of the pulverizer.

To carry my invention into effect I have provided suitable mechanism to give the rocks or other substances a rotary motion of sufficient speed to throw them by their centrifugal force against the points and edges of the steel bars projecting from the inner surface of the casing from whence they are dashed back, striking against others while passing to and fro, thus pulverizing by attrition as well as by direct contact with the steel bars. I attain this result by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the entire machine supported by a timber frame, *x x x*. Fig. 2 is a horizontal section on line 3 3, showing plan view of revolving disk and projections *d d d d*.

Rotary motion is given to the vertical shaft *y* by means of the bevel-gears *z z* driven by a horizontal shaft.

Upon the top of frame-work *x x x x*, Fig. 1, is a circular base with an annular chamber, *C C*, supporting a cylinder or casing, *A*, with a dome-shaped top having a circular orifice, *F*, for feeding.

Through the casing *A* are numerous openings, through which are placed, tangent to the curve, movable steel bars *a a a a a*, held in

position by set-screws *f f f f f*. These bars should be from one to two inches square, and project beyond the inner surface of the casing about two inches, and must be of sufficient number and near enough together so as to fully protect the inner surface of the casing *A* from direct contact with the rock. These bars present sharp points and edges against which the rock is continually hurled by the revolving concave plate *c* until broken and pulverized. As they wear off, they may be moved into the casing, so as to project as far therein as may be found necessary to do the best work, and when worn out replaced.

In the lower portion of casing *A* may be placed perpendicular bars or projections *b b b b b*, Figs. 1 and 2, in addition to bars *a a*.

Within the bottom of casing *A* is a revolving disk, *B*, Fig. 1, keyed to the vertical driving-shaft *y*, having a removable concave plate, *c*, Fig. 1, with radial arms or projections *d d*, Fig. 2. Plate *c* is made removable, so that it may be replaced when worn out. This disk *B* and plate *c* being a fraction smaller in diameter than casing *A*, I provide an annular opening through which the pulverized material may escape into the circular chamber through openings, one of which is shown in *e*, Fig. 1, and thence through suitable spouts to the discharge.

The operation of the machine is as follows: Rock is fed into the chamber *A* through the opening *F* to a depth of one foot, more or less. The disk *B* and curved plate *c* revolving at a high speed throw the rock or other hard substances to be pulverized with great force against the points and edges of steel bars *a a* placed within the casing, as aforesaid, where it is broken by the contact, and, rebounding, encounters other rock or material also thrown in the same manner, and thus the rock or material treated is rapidly reduced to a powder, thus obtaining a maximum quantity of pulverized material with a minimum of wear upon the interior surface of the mill.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The casing *A*, provided with opening *F*,

and movable bars *a a*, substantially as and for the purposes set forth.

2. In a rock-pulverizer, the horizontal disk B, and removable concave plate *c*, provided
5 with arms *d d*, in combination with the casing A, provided with the movable bars *a a*, substantially as and for the purpose set forth.

3. The casing A, provided with opening F,

and bars *a a*, the disk B, the plate *c*, having arms *d d*, the chamber C, having openings *e*, 10 and shaft *y*, in combination, substantially as and for the purpose set forth.

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Witnesses:

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