

J. A. MOORE.  
GRINDING-MILL.

No. 180,149.

Patented July 25, 1876.

Fig. 1.

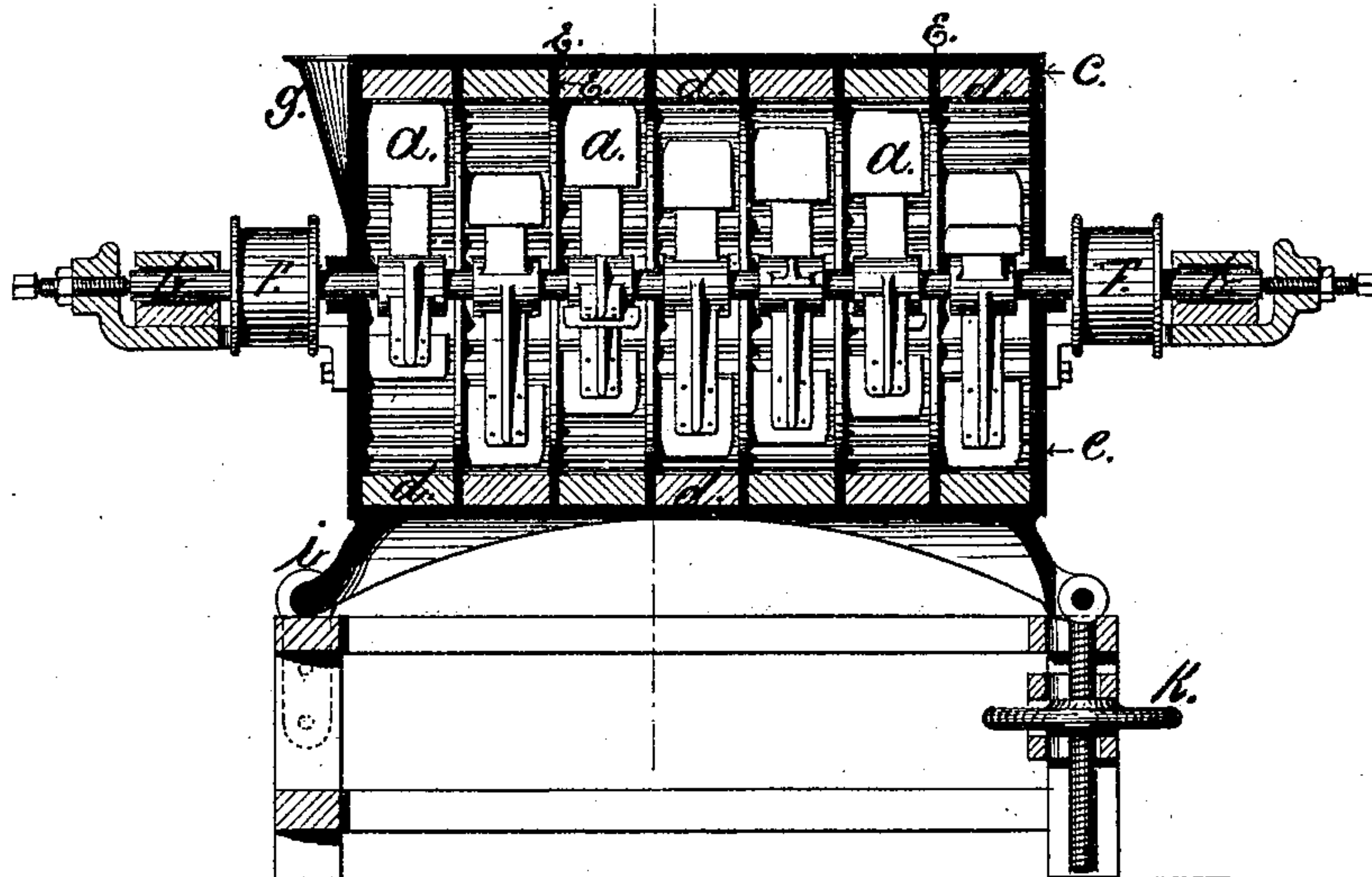


Fig. 2.

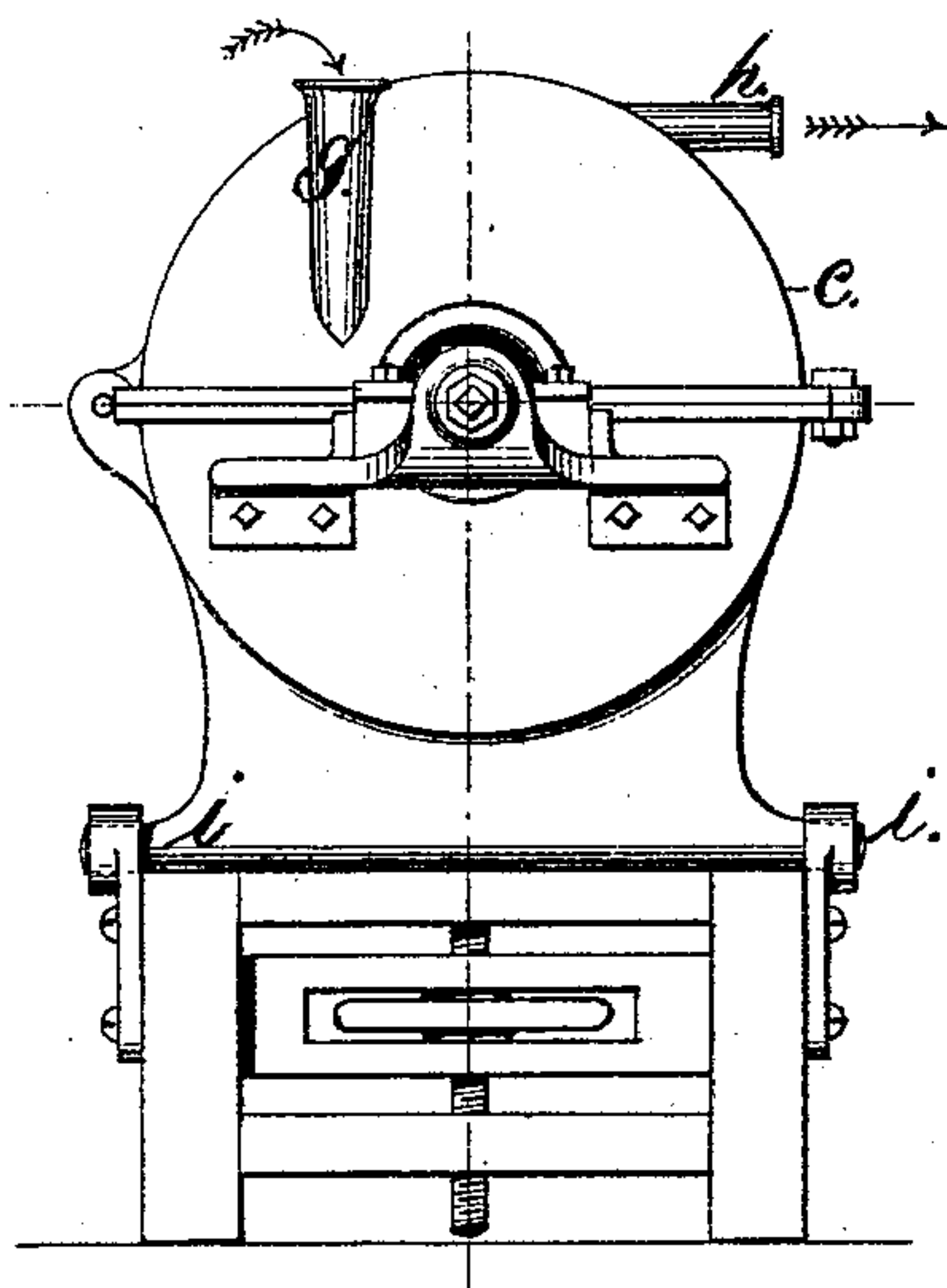
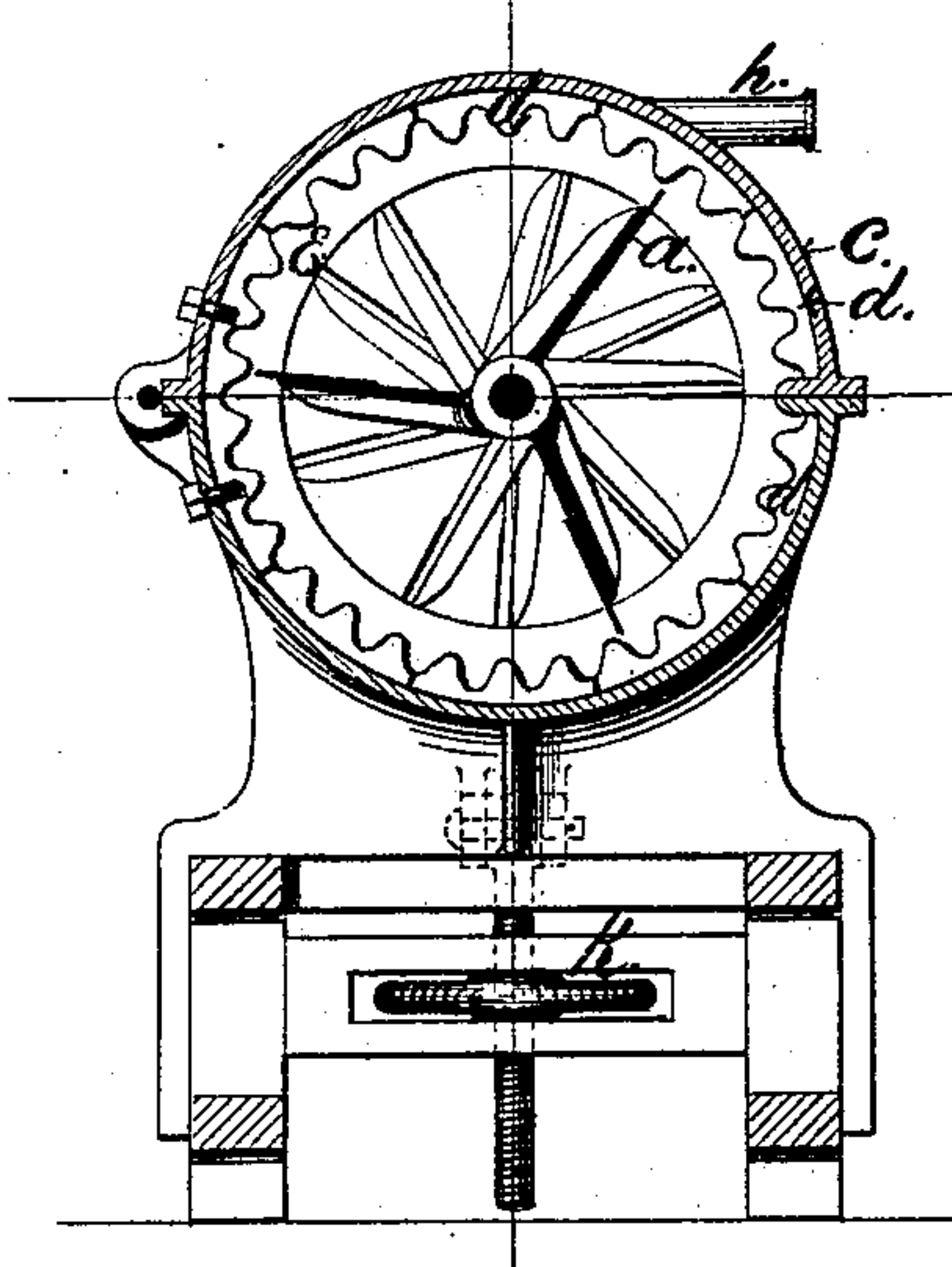


Fig. 3.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

JOHN A. MOORE, OF PROVIDENCE, RHODE ISLAND.

## IMPROVEMENT IN GRINDING-MILLS.

Specification forming part of Letters Patent No. **180,149**, dated July 25, 1876; application filed July 10, 1875.

*To all whom it may concern:*

Be it known that I, JOHN A. MOORE, of the city of Providence, State of Rhode Island, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a sectional elevation, showing the interior of my improved mill. Fig. 2 is an end view of the same. Fig. 3 is a cross-section, showing the arrangement of the beaters, the partitions, and the corrugated lining.

My invention has reference to that class of mills known as disintegrators, in which the material is broken into fine dust by beaters driven at high velocity within a cylindrical case by percussion.

In the drawings, *a a* are the beaters, faced with hard metal, and secured to the shaft *b*, which is driven at a high velocity. *C* is the cylindrical case, which, for convenience of inspection and repairs, is made in two halves, being hinged on one side, and secured by means of bolts or other fastening on the other. *d d* are chilled iron or steel corrugated blocks, secured to the cylindrical case *C*. Against these the material to be ground is driven by the beaters. *E E* are partitions secured to the cylindrical case, and projecting inwardly into the same, thus separating each set of beaters from the others. The object of these partitions is to prevent the lateral spreading of the material to be ground, and keep the same in the path of the beaters, and particularly so when the material is to be ground into an impalpable dust, in which case the end near the discharge-funnel is more or less raised, as will be more fully described hereinafter.

*F F* are the pulleys by which rotation is imparted to the beaters. *g* is the inlet-funnel, delivering the material near the center of the cylinder, where the same is caught by the revolving beaters, and thrown violently against the corrugated lining of the cylinder, and is thus broken by percussion. *h* is the outlet from which the powdered material is forced by the blast created by the revolution of the beaters. *i i* are journals, in which one end of the mill is secured to the frame-work; and *K*

is a hand wheel or nut, by which the other end of the mill can be raised or lowered, so as to graduate the fineness of the powder or grain produced.

The invention consists, first, in dividing the cylindrical case of a disintegrator, by the partitions *E E*, into compartments, in each of which a beater revolves; second, in the arrangement for elevating or depressing one end of the mill, so as to facilitate or retard the exit of the material ground; third, in lining the cylindrical case with hard-metal corrugated blocks, against which the material to be ground is driven by the beaters.

The operation of the mill is as follows: The material being delivered to the mill through the funnel *g*, it is caught by the beaters and acquires a circular motion, and by the centrifugal impulse it is driven with great force against the corrugated lining. The curved lines of this corrugated lining cause the material to rebound in different directions, for each grain or particle will rebound from the surface against which it is thrown on the same angle as that in which it meets the surface. By using a curved or corrugated surface the particles will rebound in different directions, and are again caught by the beaters. The material to be ground is thus made to run the gantlet between the beaters and the projections on the corrugated lining, and giving the maximum of violent percussion.

From the first compartment the material is gradually delivered to each of the succeeding compartments until it is forced out of the discharge-funnel at *h*. When, now, the end of the mill at which the discharge-funnel is located is depressed, the material will be delivered more readily from one compartment to the other, and a larger quantity will be ground in the same unit of time than when the mill is on a level; but the material will not be ground as fine. If the end of the mill is, however, raised, the same will grind still less than when on a level, but such material will be much finer. By thus raising one end of the mill, or depressing it, any degree of fineness may be produced, and always of uniform quality.

In a disintegrator the rapid revolution of the beaters produces a vertical air-draft from the inlet-opening toward the exit or discharge



opening, and the material ground is liable to be carried laterally with the air. By dividing the cylindrical horizontal case into compartments by the rings or partitions E E, this lateral air-draft is prevented near the periphery of the beaters and cylinder, as the annular partitions or rings project inwardly, as is shown in the drawings, and only the material, passing within the line of the projecting rings or partitions E E, is caught by the air and carried to the next compartment, and here again subjected to the action of the beater and the corrugated surface until it is finally discharged.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a grinding-mill operating by percussion and centrifugal force, the horizontal case

C, divided by the partitions E E into compartments, in combination with the shaft *b* and beaters *a a*, one set to each compartment, substantially as and for the purpose set forth.

2. In combination with the case C, divided into compartments by the rings or partitions E E, the corrugated hard-metal lining *d*, substantially as described.

3. The combination, with the horizontal case C, which is divided into compartments by annular partitions or rings, of suitable mechanism, by which the axis of the mill may be inclined upward or downward, substantially as and for the purpose specified.

JOHN A. MOORE.

Witnesses:

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