

W. BANHAM.
MACHINE FOR GRINDING AND PULVERIZING QUARTZ AND
AMALGAMATING THE PRECIOUS METALS.

No. 26,555.

Patented Dec. 27. 1859.

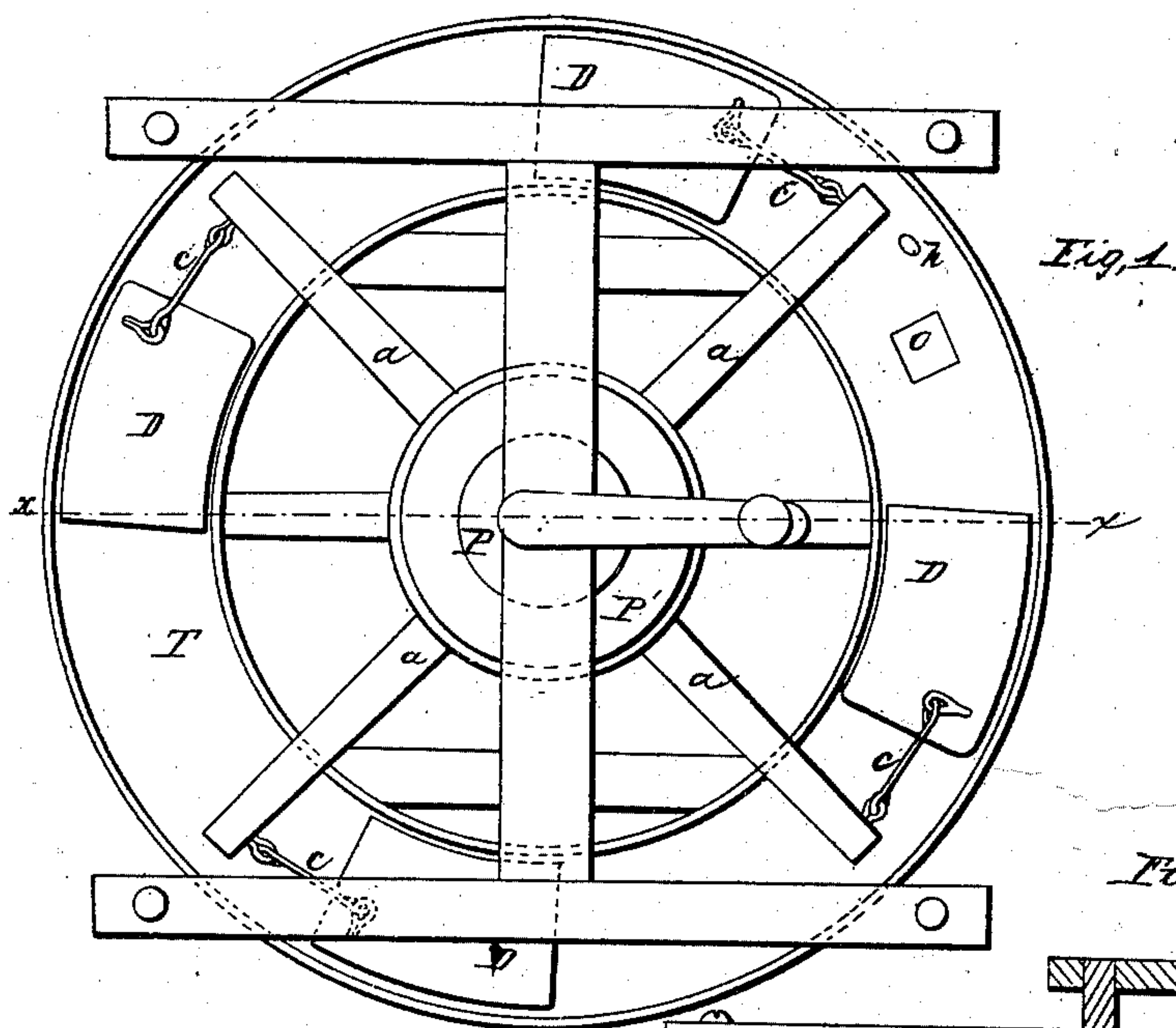


Fig. 1.

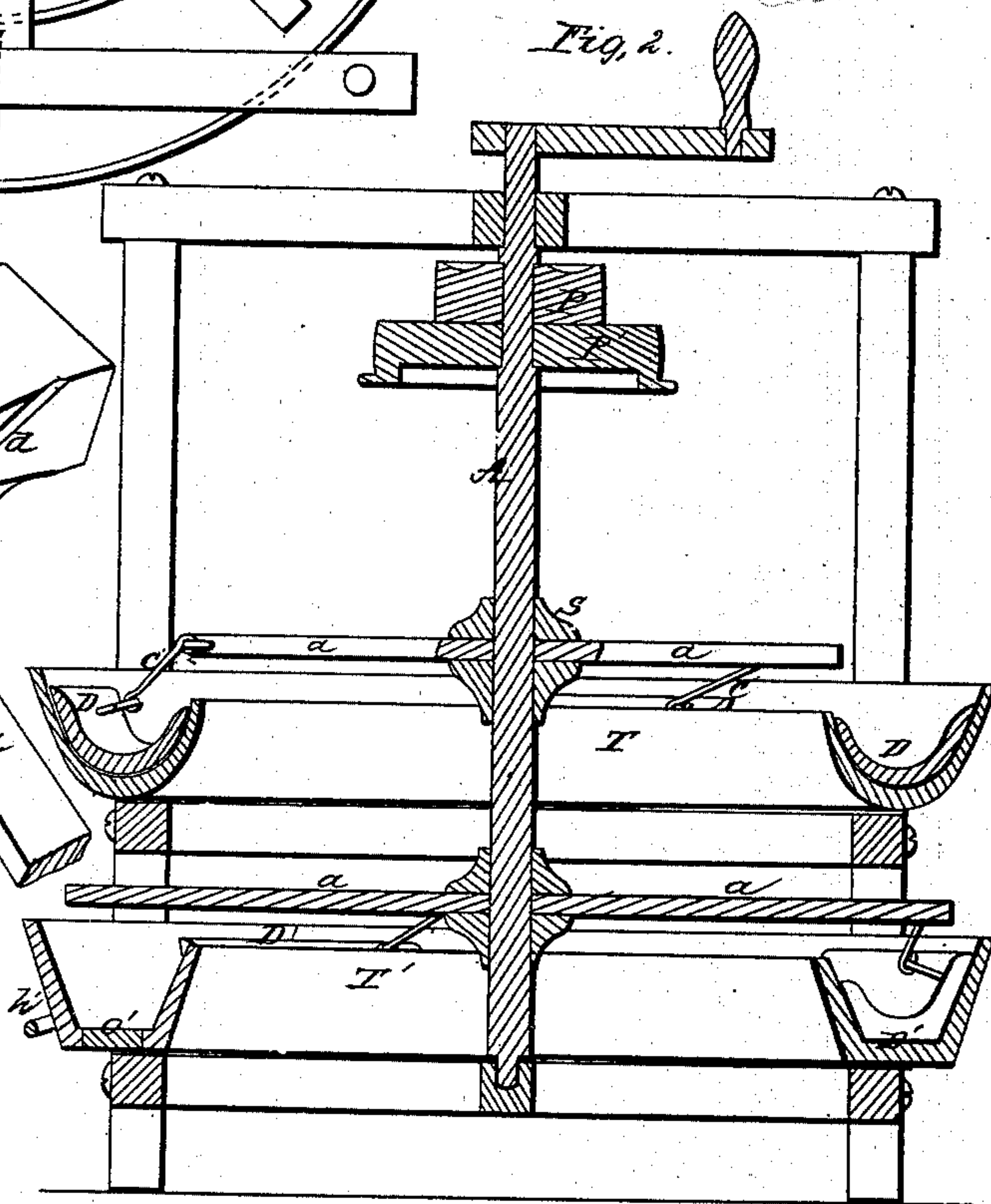


Fig. 2.

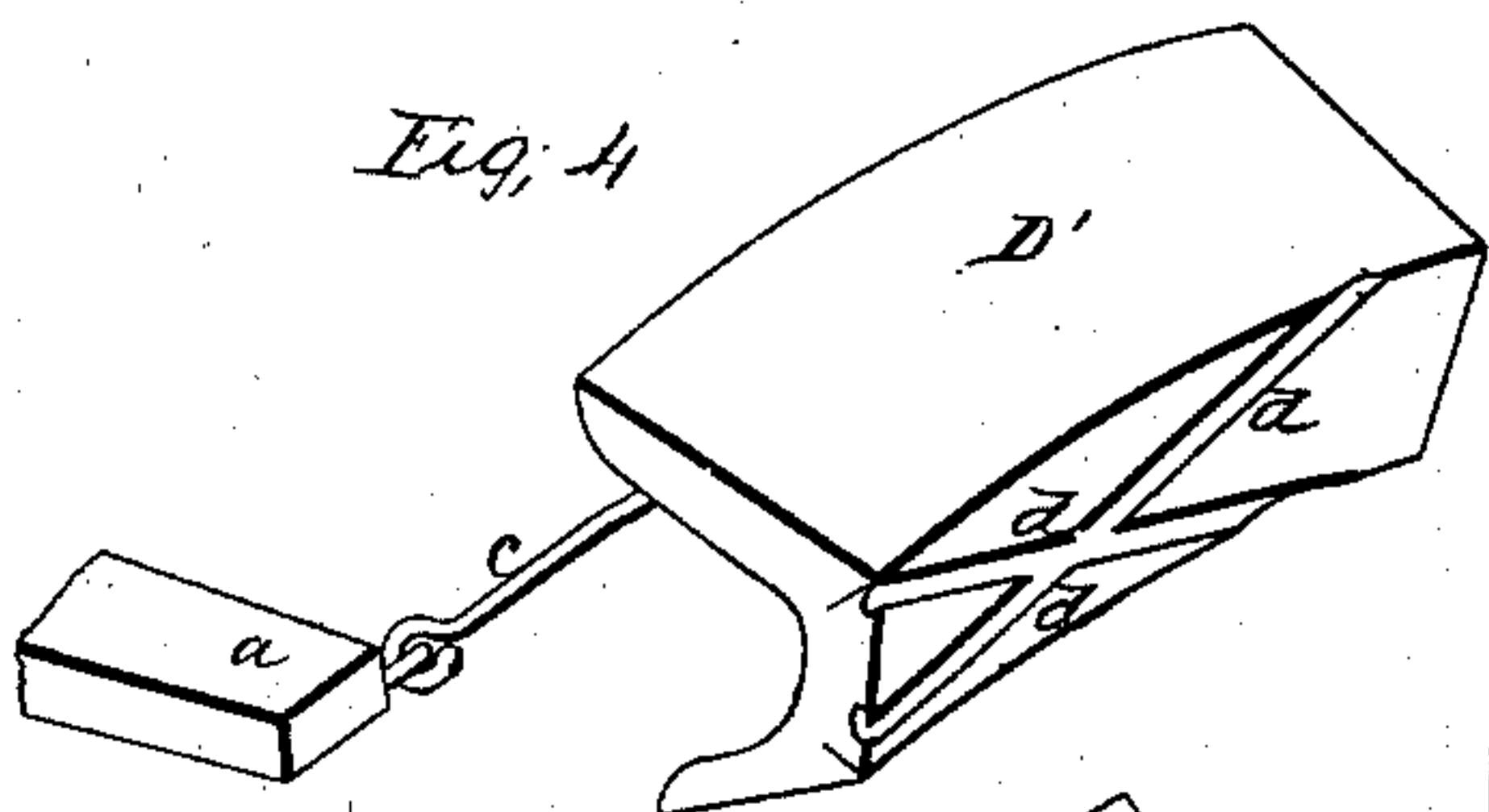


Fig. 4.

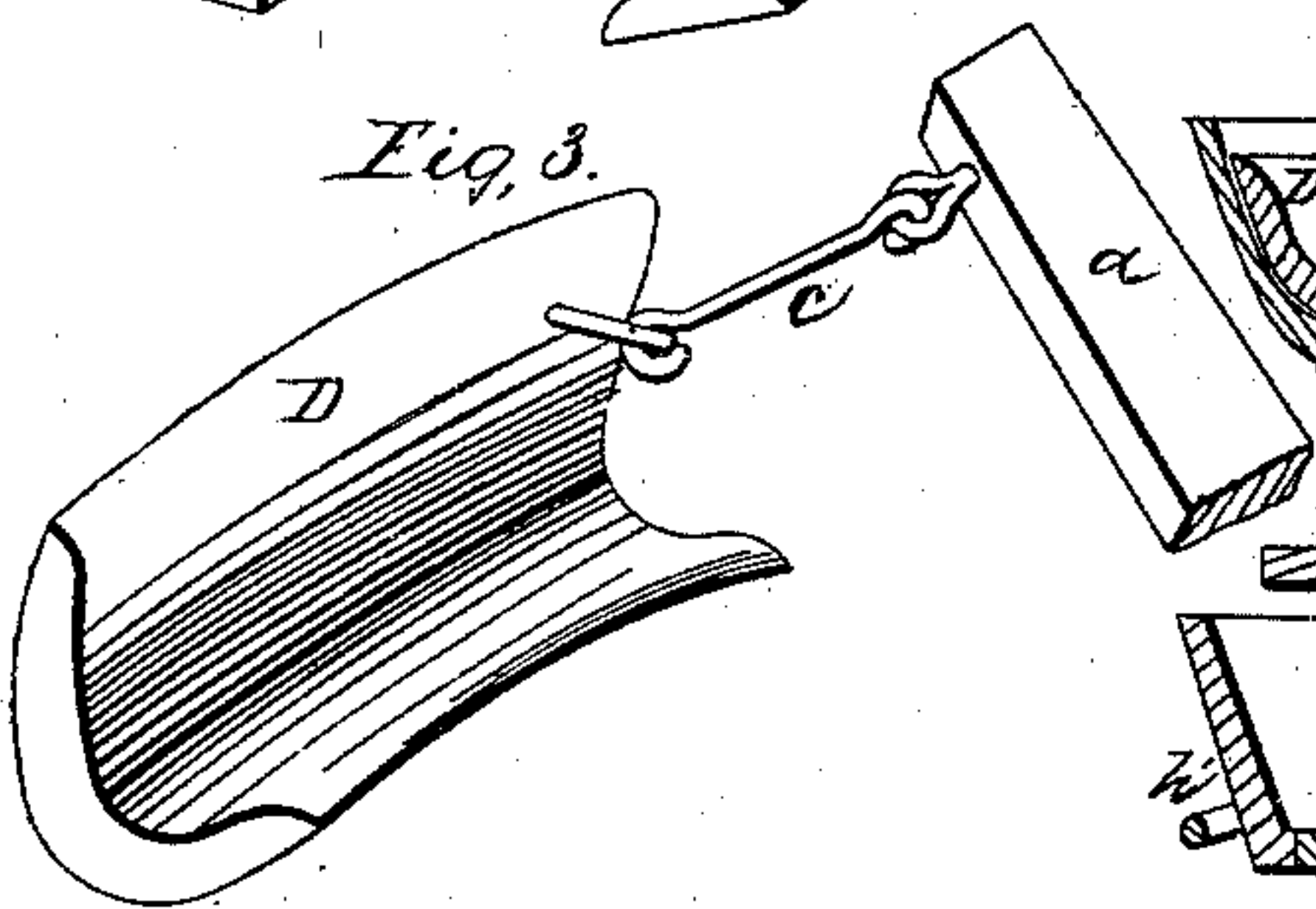


Fig. 3.

Witnesses;
Jacob L. Lang
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per Geo Patten
att

UNITED STATES PATENT OFFICE.

WILLIAM BANHAM, OF SAN FRANCISCO, CALIFORNIA.

MACHINE FOR PULVERIZING QUARTZ.

Specification of Letters Patent No. 26,555, dated December 27, 1859.

To all whom it may concern:

Be it known that I, WM. BANHAM, of San Francisco, in the county of San Francisco and State of California, have invented a new and useful Improvement in Machines for Grinding and Pulverizing Quartz and Amalgamating the Precious Metals; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing, forming part of this specification, in the several figures of which similar characters of reference denote the same parts.

Figure 1 is a top view of my quartz pulverizer and gold amalgamator. Fig. 2 is a vertical section of the same on line *x, x*. Fig. 3 is a perspective view of the pulverizing drag D. Fig. 4 is a perspective view of one of the amalgamating drags D'.

This invention has for its object the construction of a machine for pulverizing quartz and amalgamating gold, and its nature consists in a certain combination of devices to effect this object, the construction and operation of which are as follows.

The machine consists of a circular cast iron trough or dish, represented in the drawing by T, made in segments or sections, four or six segments completing the circle, having flanges on each end of each segment on the under side, by which they are bolted together forming one continuous circle without obstruction or unevenness on the inside; the latitudinal form of the trough being that of a true circle upon the bottom on the inside, and the line continued in an eccentric circle upon each side the outer flange being higher than the inner one. It has two square openings, O, in the bottom upon opposite sides of the trough, closed when the quartz is being ground or pulverized by means of square cast iron shutters similar to a trap door, exactly conforming to the shape of the openings, coming flush with the inside of the trough, and suited in form to correspond with the circle of the trough. It also has a spigot hole *h*, through the outer flange, above the opening, O, closed by a spigot when the machine is in operation.

Four cast iron drags or grinders D; made to conform upon the bottom with the inside of the trough, their sides coming nearly to the top of the flanges of the trough on each side, being heaviest on the outside of the trough, and having the forward end on the underside rounded sufficiently to admit

of a portion of the quartz being caught between the bottom of it, and the inside of the trough, thus reducing it to a powder; are attached by studs and chains *c*, to the ends of four arms *a*, of a spider S, which is firmly keyed to an upright shaft A. Upon this shaft is also another spider with four arms, lower down, to which are attached the drags of the amalgamator to be hereinafter described. The shaft has also two pulleys P, P', of different diameters by which to regulate its speed.

The above described trough with its attachments may be used either as a pulverizer or an amalgamator.

Motion being given to the upright shaft A, by means of the smaller pulley P, is thence communicated by means of the spider S, and its arms *a*, to the drags D, driving them around the trough at a speed sufficient to insure a thorough and rapid pulverization of the quartz. There may be two scrapers attached to the inner flange of the trough and extending over it, sufficiently high for the drags to pass under it, which serve to take from the top of the drags whatever may accumulate on them, and throw it on the bottom of the trough directly under the succeeding drag. When the quartz has been reduced to a powder, the shutters or trap doors of openings O, are opened, and the action of the drags in a few minutes transfers the contents of the trough to the amalgamator beneath. When this part of the machine is used as an amalgamator the larger pulley P', reducing the speed is employed, and drags of the same size and form of those described are used, differing only in having channels cut in the bottom to allow the passage of quicksilver, that it may not be broken and pass into the air in the form of vapor, as is the case when there is no point under the drag where it can concentrate itself.

The spigot hole *h*, is only used when amalgamating, and then to draw off the waste portion after amalgamation shall have been completed reducing the mass to the required consistency, when the hole is again closed and the trough charged with new matter to be operated upon. This grinding trough T, is capable of pulverizing as much quartz as two amalgamators will extract the gold from.

The lower trough T', is used only as an amalgamator. It is made the same diameter and in sections bolted together as in the one above described; but it is horizontal upon

the bottom, and the flanges on each side rise upon a circle of a larger diameter. The same number of drags D' , are used corresponding in shape to the bottom of the trough, but having longitudinal grooves or channels d , cut in the bottom to admit of the passage of quicksilver in concentrated masses passing under the drags, as shown in Fig. 4. It has the same number and shaped opening O' , in the bottom to draw off the mass when amalgamation is completed, and is arranged with spigots h' , to reduce the waste portion, as above described in the upper trough T .

The great advantage of this trough for amalgamating consists in having a much larger amalgamating surface obtained by forming the bottom horizontal instead of upon a circle.

The drags or amalgamators D' , are driven

by means of the larger pulley P' , at the reduced speed of about five revolutions per minute, which has been ascertained to be best suited for amalgamating.

Having thus fully described my invention, 25
I claim—

The circular troughs T, T' , constructed as described, in combination with the drags D, D' , at the extremities of the radial arms a , the whole constructed and operated substantially in the manner and for the purpose 30
set forth.

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

WM. BANHAM.

Witnesses:

J. D. STEVENSON,
WM. G. WOOD.