R. VOSE.

Ore Mill.

No. 13,892.

Patented Dec. 4, 1855.

Fig. 1.

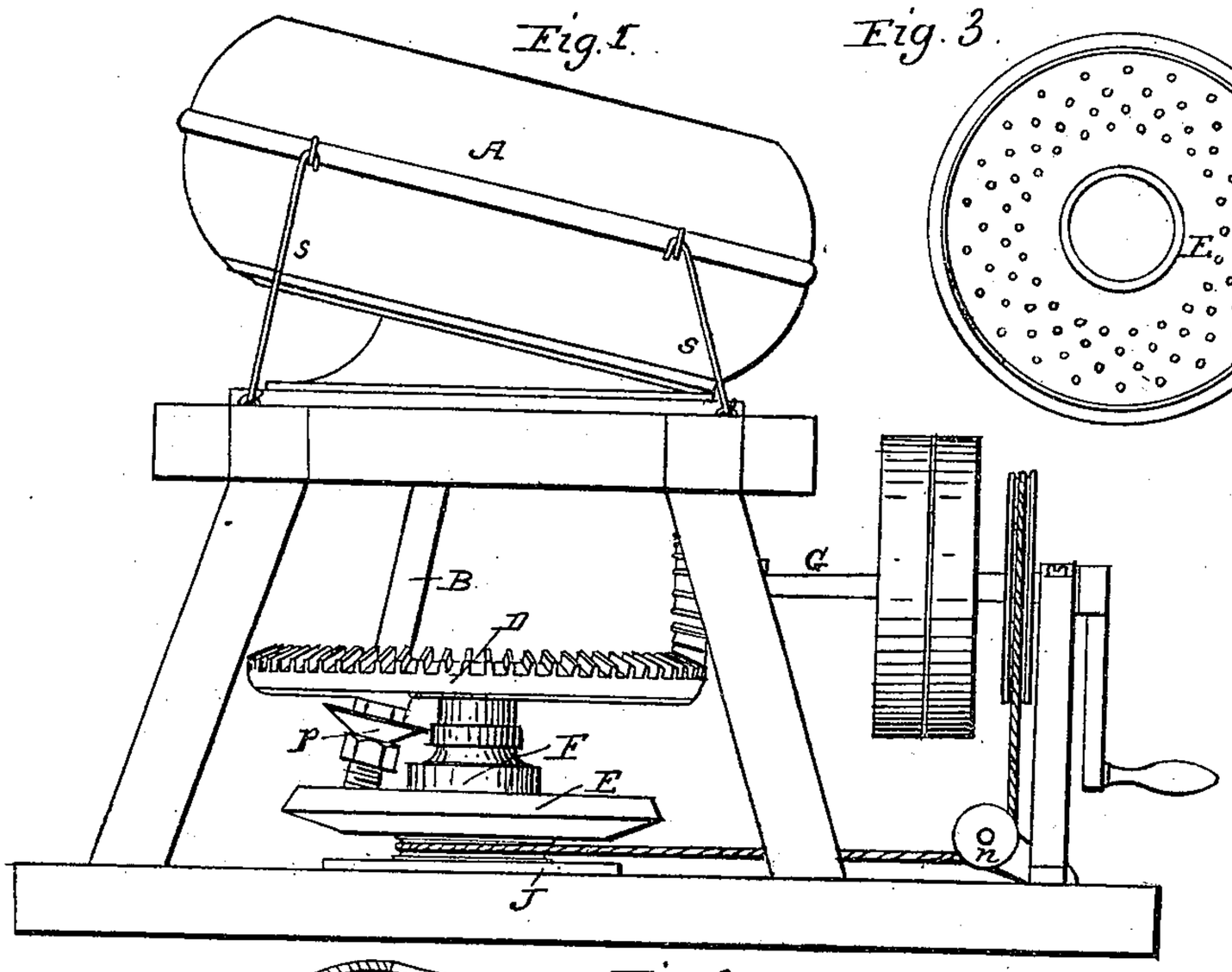


Fig. 3.

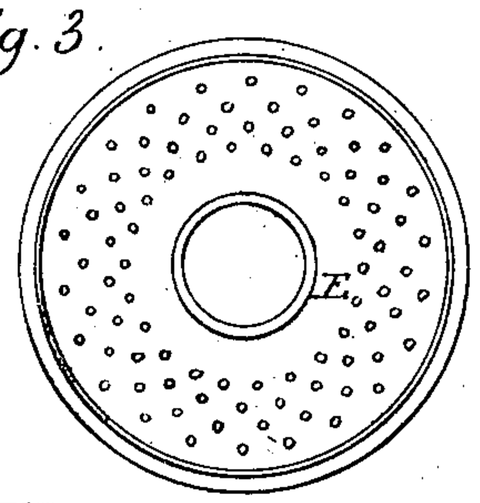
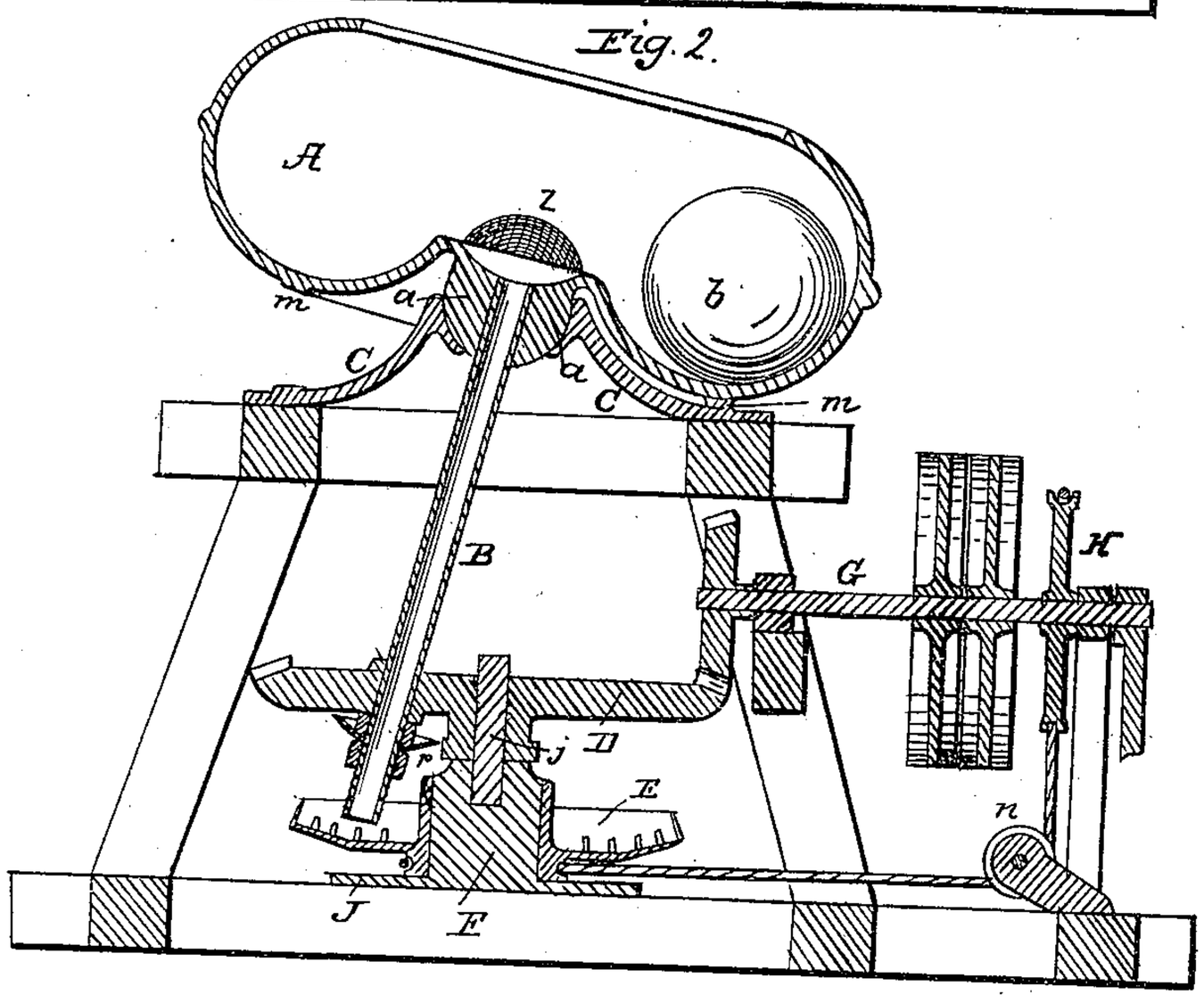


Fig. 2.



N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

RICHARD VOSE, OF NEW YORK, N. Y.

IMPROVEMENT IN QUARTZ-CRUSHING MACHINES.

Specification forming part of Letters Patent No. **13,892**, dated December 4, 1855.

To all whom it may concern:

Be it known that I, RICHARD VOSE, of the city, county, and State of New York, have invented a new and useful Improvement in Quartz-Crushing Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

Figure 1 is a side elevation of my improved quartz-crusher; Fig. 2, a vertical section in a line passing through the center of the machine, and Fig. 3 a top view of a portion of the machine detached.

Similar letters indicate like parts in all the figures.

The frame of my improved quartz-crusher may be made of wood or metal, and may be constructed in any manner that will give it sufficient strength and stiffness.

A circular bearing-plate C, having a raised central projection in which is a perforated socket, is secured to the top of the frame and supports the vessel A, in which the crushing operation is performed by means of a rolling metallic ball *b*. The vessel A swells upward around the perforation in its center, and thereby forms an annular channel between said central elevation and the periphery of the vessel for the ball *b* to roll in. A semi-spherical hub *a* descends from the lower side of said vessel A and fits into the socket in the raised central portion of the bearing-plate C, while the descending annular ledge *m*, near the periphery of said vessel, rests upon a corresponding ledge on the plate C. The downward projection of the hub *a* and the elevation of the socket that receives it causes a considerable inclination of the vessel A.

A tubular shaft B is secured within the hub of the vessel A, and descending passes through a bearing-aperture in one of the arms of a cog-wheel D, which is so located that the center of said wheel is directly under the center of said vessel A, so that the rotation of said cog-wheel will carry around the lower end of the said tubular shaft, and thereby cause the said vessel A to progressively change its position upon the plate C without turning upon its axis, which movement will cause the ball *b* by its own gravity to roll continuously around in the channel of said vessel and crush the quartz or other substance that may be placed therein.

When the machine is in operation, a stream of water is conducted into the vessel A, which as it rises in the vessel, mingled with finely-pulverized quartz, passes through the screen *l* into the upper end of the tubular shaft B, and is discharged into the rotating amalgamating pan E, which is placed a short distance below the cog-wheel D. The bottom of the amalgamating-pan is armed with a series of points, and its rotation is in an opposite direction to that described by the movements of the lower end of the hollow shaft B. Consequently the mingled water and pulverized quartz will be powerfully and thoroughly agitated at the movement of entering the pan, which will enable the quartz to be readily taken hold of by the mercury. The lower extremity of the hub of the amalgamating-pan rests upon the base-plate J, and it rotates upon the journal F, which rises from said plate. The cog-wheel D rests upon the top of the aforesaid journal F, and the journal *j*, upon which the said cog-wheel rotates, is secured within an aperture in the center of the journal F.

The rotation of the cog-wheel D may be produced by a pinion on the driving-shaft G, or by any other means that may be deemed preferable. The amalgating-pan E may be driven by a band passing from the pulley H on the driving-shaft G vertically to the auxiliary pulleys *n*, and thence horizontally to a pulley on the lower extremity of the hub of said pan, as shown in the drawings.

A cup *p* incloses and is secured to the tubular shaft B below the cog-wheel D for the purpose of preventing any oil which may escape from the bearings of said shaft from getting into the amalgamating-pan.

The rotation of the vessel A upon its axis is prevented by the springs *s s*, which connect opposite sides of said vessel with the supporting-frame, and which also serve to steady the movements of the vessel.

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

1. Supporting the center of the inclined vessel A upon a semi-spherical hub *a*, which works in a raised perforated socket in the plate C, while the depressed portion of the periphery of said vessel is supported upon a horizontal

plane or track, by which I am enabled to impart the requisite movements to the said vessel through the medium of a shaft descending from its hub *a*, and, in connection with the said method of supporting and operating the inclined vessel A, discharging the contents of said vessel through an aperture in its descending operating-shaft, substantially as herein set forth.

2. In connection with the within-described peculiar manner of supporting and operating the vessel A, the combining of the periphery of said vessel with the supporting-frame by means of the springs *s s*, or their equivalents, for the purpose of steadying the movements of said vessel and preventing it from turning upon its axis, substantially as herein set forth.

The above specification of my new and useful improvement in quartz-crushing machines signed and witnessed this 4th day of October, A. D. 1855.

RICHARD VOSE.

Witnesses
T. D. STEWART,
GEO. C. RIPLEY.