

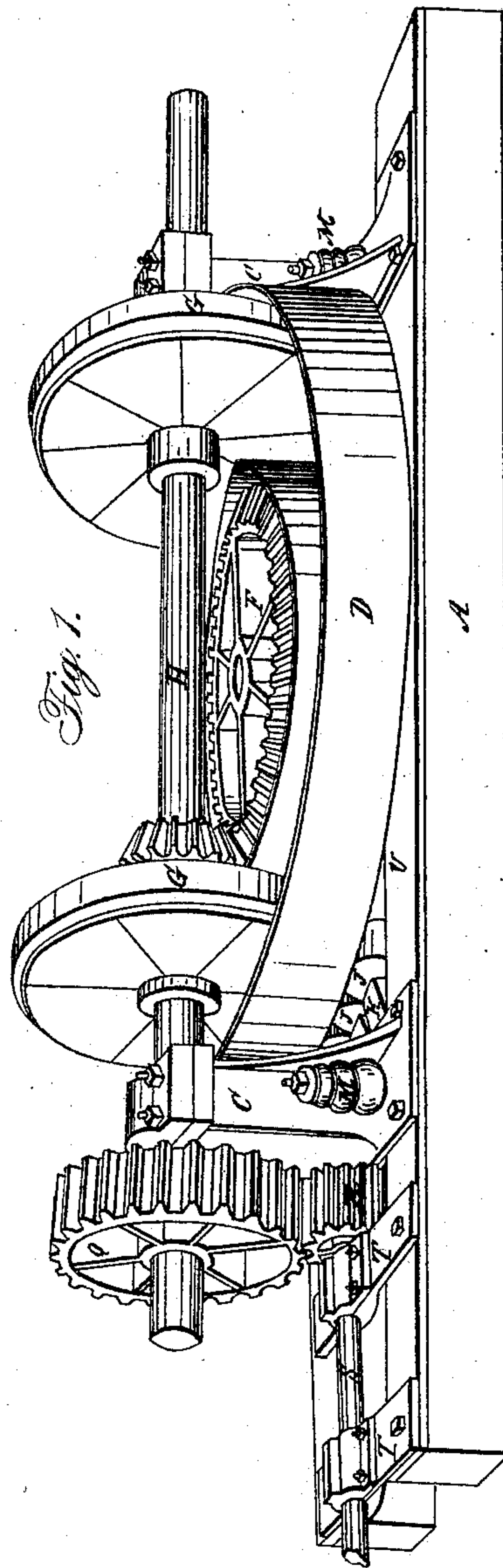
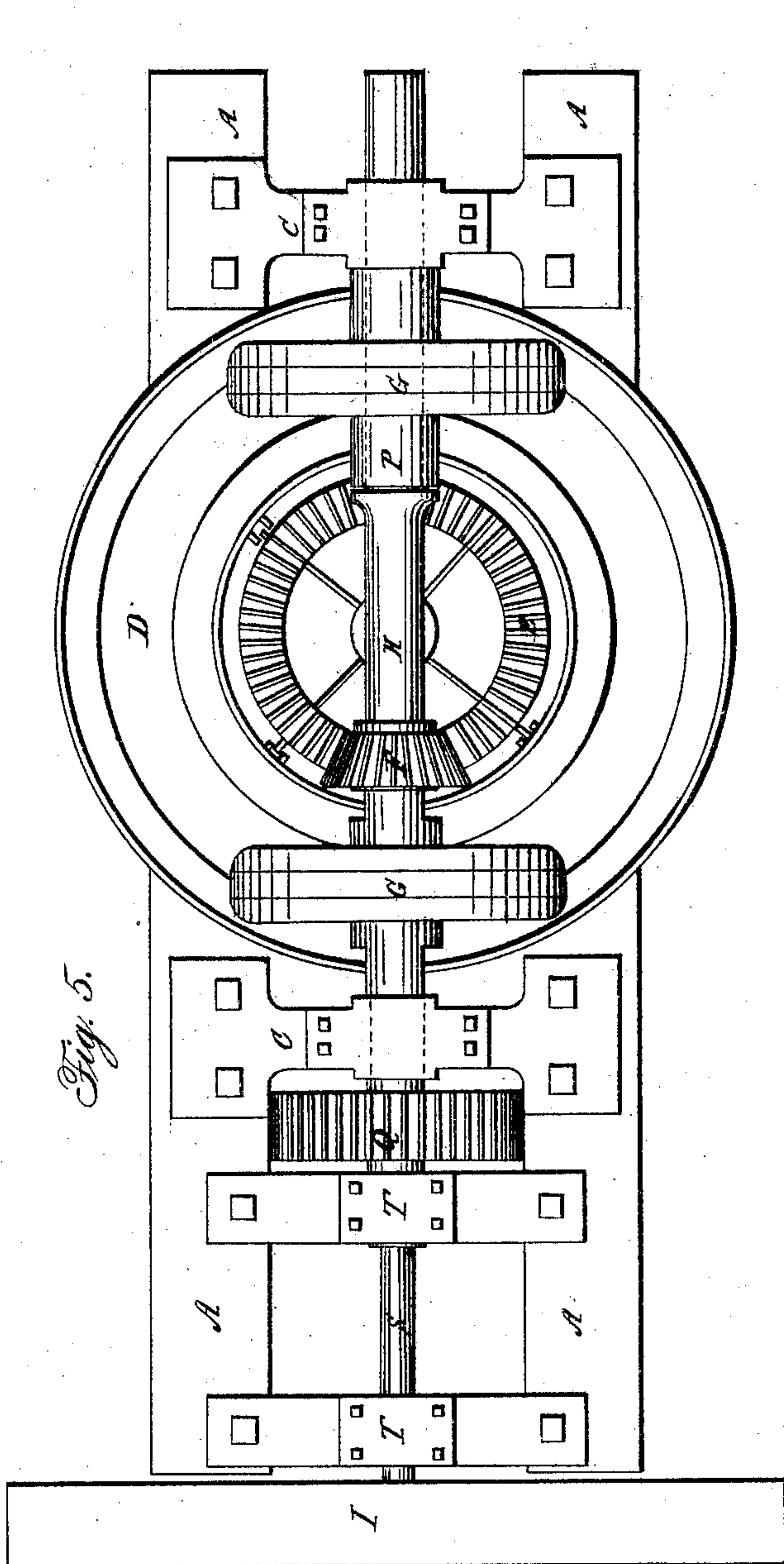
S. W. BULLOCK.

Ore Mill.

2 Sheets—Sheet 1.

No. 56,487.

Patented July. 17, 1866.



Witnesses:

*Wm. J. Allen*  
*Frederick N. Wash*

Inventor:

*Smith W. Bullock*

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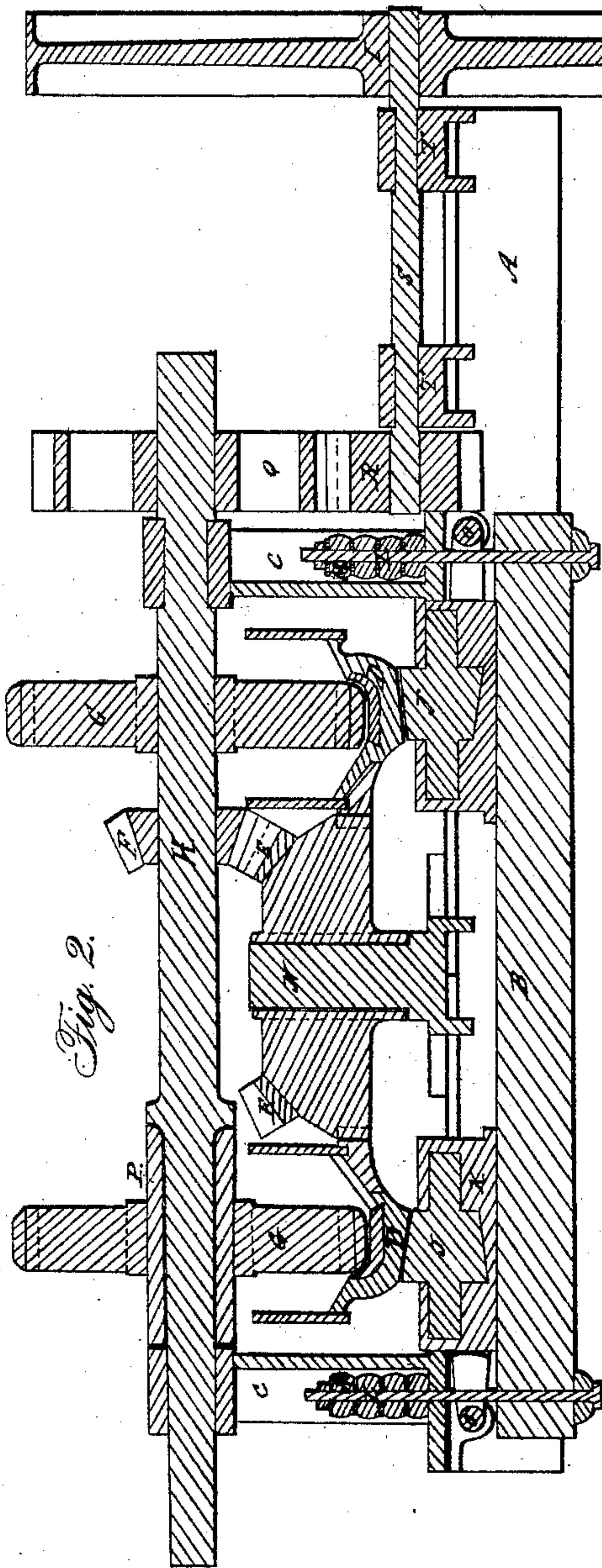
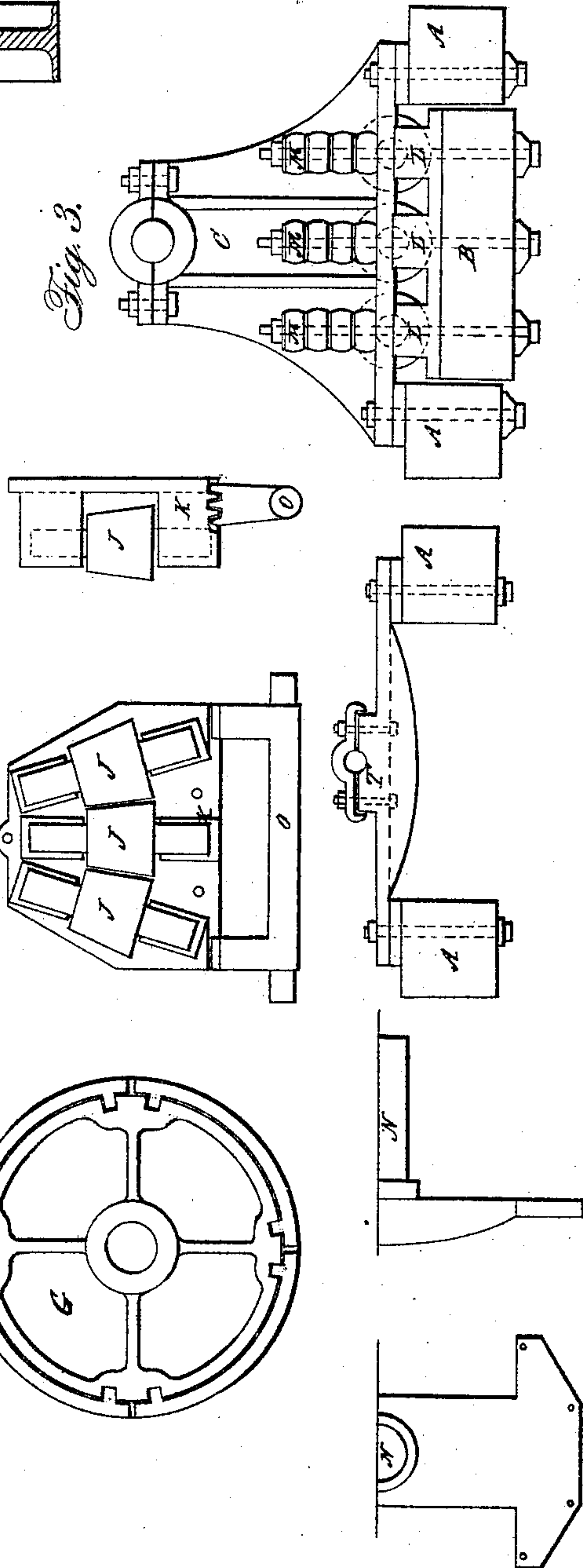


Fig. 2.

Plate 4.

Fig. 3.



Witnesses:

*Wm. J. Allen*  
*Frederick Hoback*

Inventor:

*Smith W. Bullock*



# UNITED STATES PATENT OFFICE.

SMITH W. BULLOCK, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE  
BULLOCK ORE DRESSING MACHINE COMPANY, OF NEW YORK.

## IMPROVEMENT IN QUARTZ-MILLS.

Specification forming part of Letters Patent No. **56,487**, dated July 17, 1866; antedated July 3, 1866.

*To all whom it may concern:*

Be it known that I, SMITH W. BULLOCK, of Elizabeth, in the county of Union, State of New Jersey, have invented a new and Improved Mill for Crushing Quartz-Rock and other Hard Substances; and I do hereby declare the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, reference being had to the accompanying drawings, in which like letters represent like parts in each.

Figure 1 is a perspective view. Fig. 2 is a cut section through the center vertically. Fig. 3 is an end elevation; Plate 4, details showing various parts detached. Fig. 5 is a top or bird's-eye view.

In all the figures like letters represent like parts.

A A are two bed-timbers, upon which all the stationary parts of the mill are erected; B, one bed-timber, upon which the movable parts of the mill are erected; C C, cast-iron stands or pillow-blocks fitted with journal-boxes at top; D, cast-iron circular trough or basin; E, bevel-wheel; F, bevel-pinion; G G, two crushing-wheels; H, main shaft; I, driving-pulley; J J, anti-friction rollers; K K K K, journal-boxes for rollers; L L, bolts for springs; M M, rubber springs; N, center-pin and stand; O O, two rock-shafts; P, cast-iron sleeve; Q, spur-wheel on main shaft; R, pinion on counter-shaft; S, counter-shaft; T T, journal-boxes for counter-shaft.

I prepare two bed-timbers, A A, say twelve by twelve, ten feet long, dressed straight and square; also, one bed-timber, B, six by twenty-four inches, say seven feet long, dressed straight and flat. I prepare all the various pieces as seen on Plate 4 in the accompanying drawings, secure the stands C C and the pin N to the bed-timbers A A and B, as marked, by common screw-bolts, the timbers A A being two feet apart and the timber B between them. Place the journal-boxes K K K K upon the timber B equidistant from the center, so as to describe a circle of the same

diameter of the trough D on its bearing-surface. I place the rollers J J in the boxes K K, and the trough D upon the rollers J J, and the bevel-wheel E upon the pin N, with the points of the arms of the wheel fitting into the lugs *a a* on the trough D. I place the wheel G upon the sleeve P, and then place the sleeve P and the wheel G and the pulley I and the pinion E in their respective places upon the shaft H, and then place the shaft H in the journal-boxes upon the stands C C. Put the bolts L L through the stands C C and through the timber B, with nuts on the lower end, then put the rubber-springs upon the upper end of the bolt, so as to rest them upon the bottom part of the stands C C. Put nuts upon the upper end of the bolts L L and screw them down upon the springs, so as to bring the trough D hard up against the wheels G G. Place the rock-shafts O O in common journal-boxes in the bed-timbers A A in such a position as to bring the cog-gear upon the shafts O O and the cog-gear upon the boxes K K K K in mesh with each other, so as to work free, and the mill is ready for use.

Operation: Attach the pulley I to a motive power through the medium of a belt, so as to cause the shaft H to revolve forty times per minute. This sets the whole mill in operation. The ores to be crushed may now be fed into the trough D at any convenient point, which will be carried immediately under the wheels G G by the rotating of the trough, where it will be crushed. A constant supply of water must be run into the trough while the crushing is going on, and the ground quartz drawn off with the water by means of siphons. This feeding and drawing off may continue *ad libitum*. By the springs upon the bolts L L any pressure desired may be brought upon the trough to press it against the crushing-wheels, and at the same time admit of any substance which may be too hard to be crushed to pass through without breaking the mill. The springs also accommodate the trough to the wear of the wheels or any unevenness that may occur in the trough by irregular feeding. The lugs *a a*, attached to the trough D, are slotted vertically, so as to admit the points of the arms of the wheel E and allow the same to pass up and down freely.



The relative diameters of the gear-wheels E and F and the crushing-wheels G G and the trough D are such as to cause a rubbing or slipping of the crushing-wheels G G upon the inside bottom of the trough D, by which the effective crushing power is greatly increased. The rock-shafts O O prevent the bed-timber B from tipping or canting sidewise, and this keeps the trough D in its proper position when in use or working, and at the same time allows each end of the bed-timber B to move up and down freely and independently of each other.

The centers of the gear-wheels being immovable, the teeth of the wheels are always in mesh at the proper point of contact, while the trough moves up and down to accommodate itself to whatever is passing between it and the crushing-wheels, and at the same the trough is compelled by the slotted lugs, in connection with the points of the arms of the wheel E, to rotate with it, and thereby cause a rubbing or slipping between the crushing-wheels G G and the trough D.

The connection binding the trough D and the crushing-wheels G G together, being adjustable and elastic, avoids the necessity of great weight in the crushing-wheels.

I do not claim the application of gear-wheels to a stationary trough and to the crushing-wheels running around in such trough for the purpose of causing the wheels to slip upon the bottom of the trough, as that has already been patented by me.

What I do claim herein as new, and desire to secure by Letters Patent, is—

1. The combination of the rotating trough D with the crushing-wheels G G and gear-wheels E and F, so as to govern the rotary motion of the trough, while its vertical action is independent of and disconnected from the gear-wheels.

2. The application of springs to the adjustable bed so arranged as to form a binding link or tie between the supports of the crushing-wheels G G and the supports of the trough D, each of the several features being arranged and operating substantially as and for the purposes herein set forth.

SMITH W. BULLOCK. [L. S.]

Witnesses:

THEO. J. ALLEN,  
THOS. L. DALTON.