

No. 633,511.

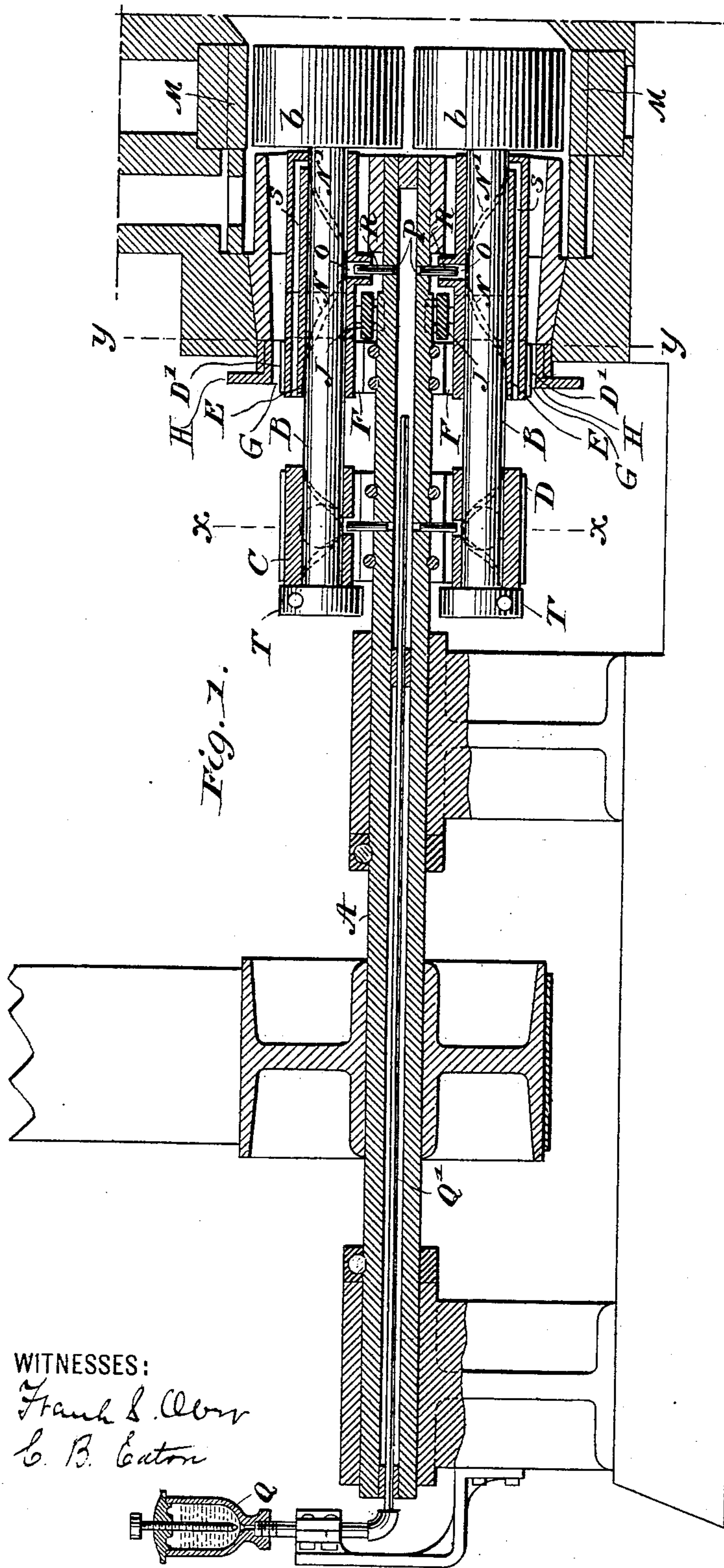
Patented Sept. 19, 1899.

G. FRISBEE.
PULVERIZING MACHINE.

(No Model.)

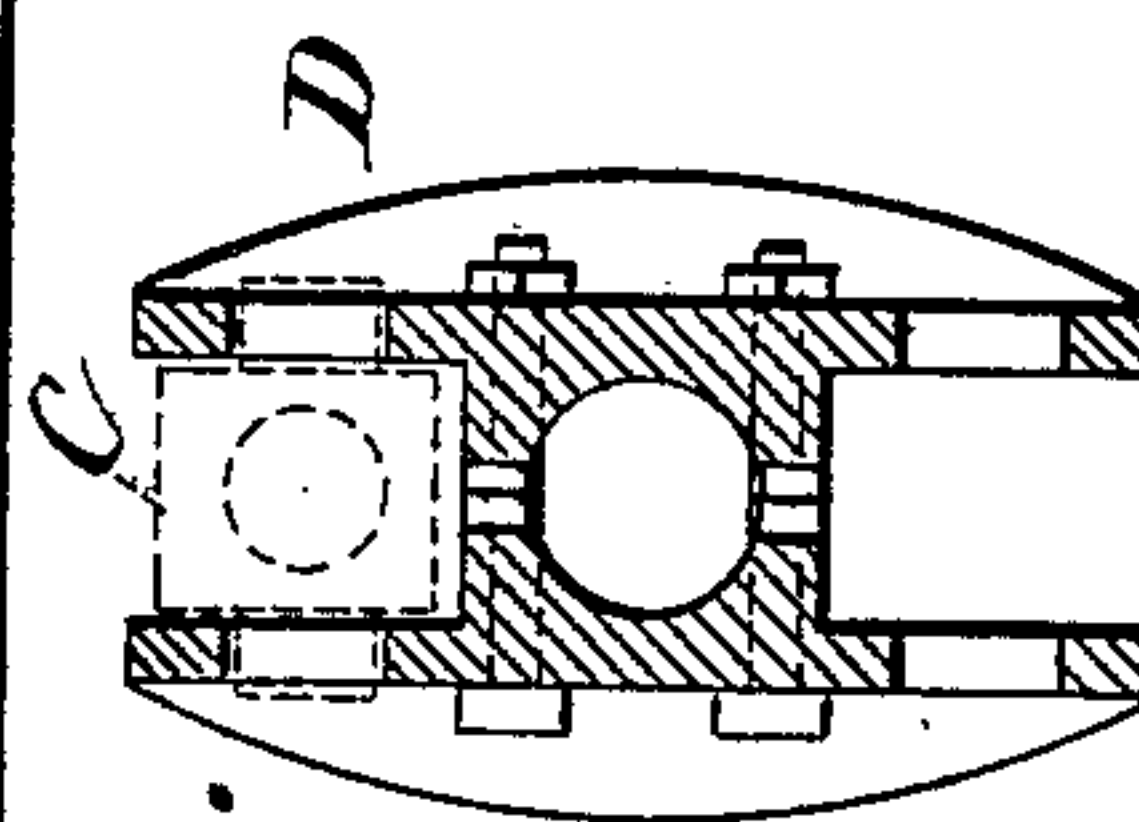
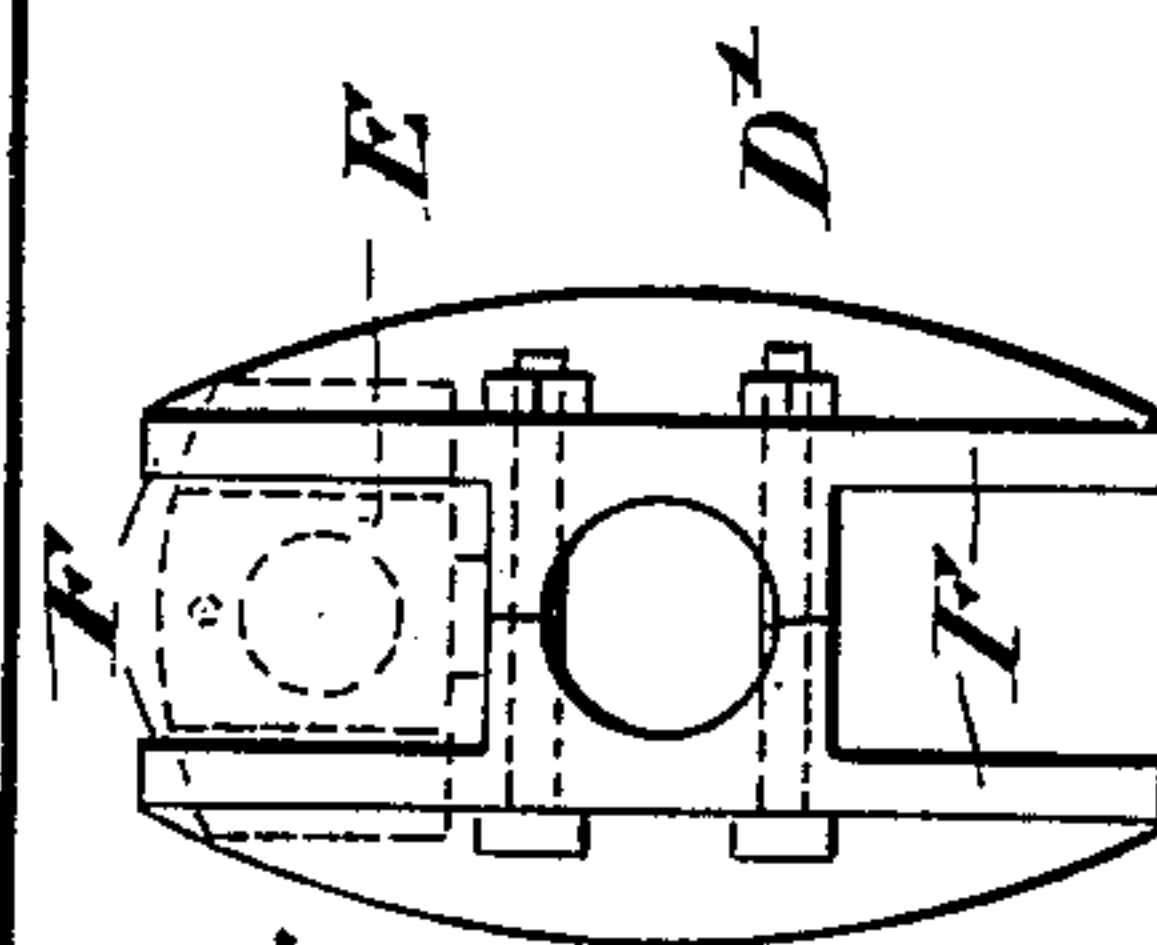
(Application filed June 9, 1898.)

2 Sheets—Sheet 1.



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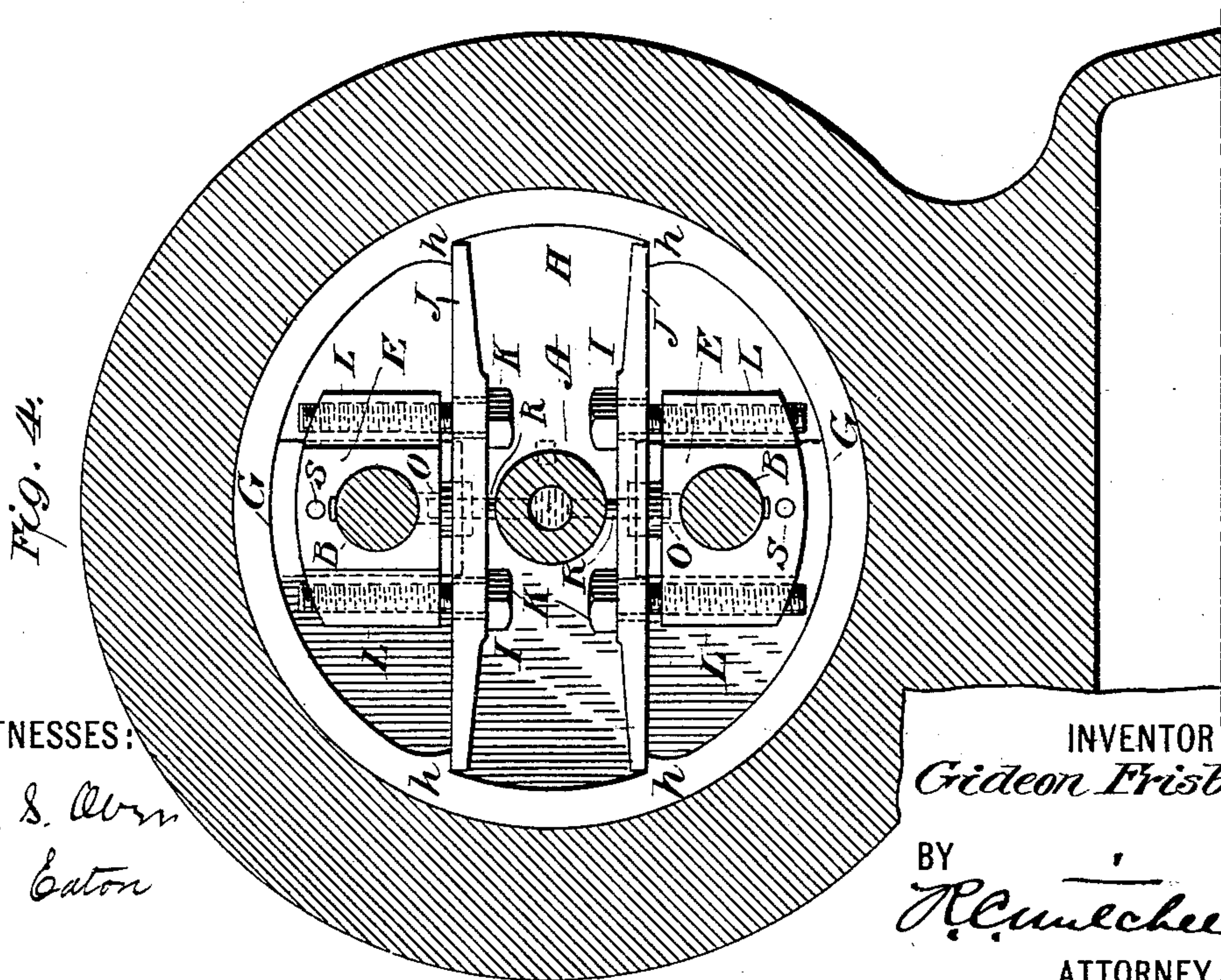
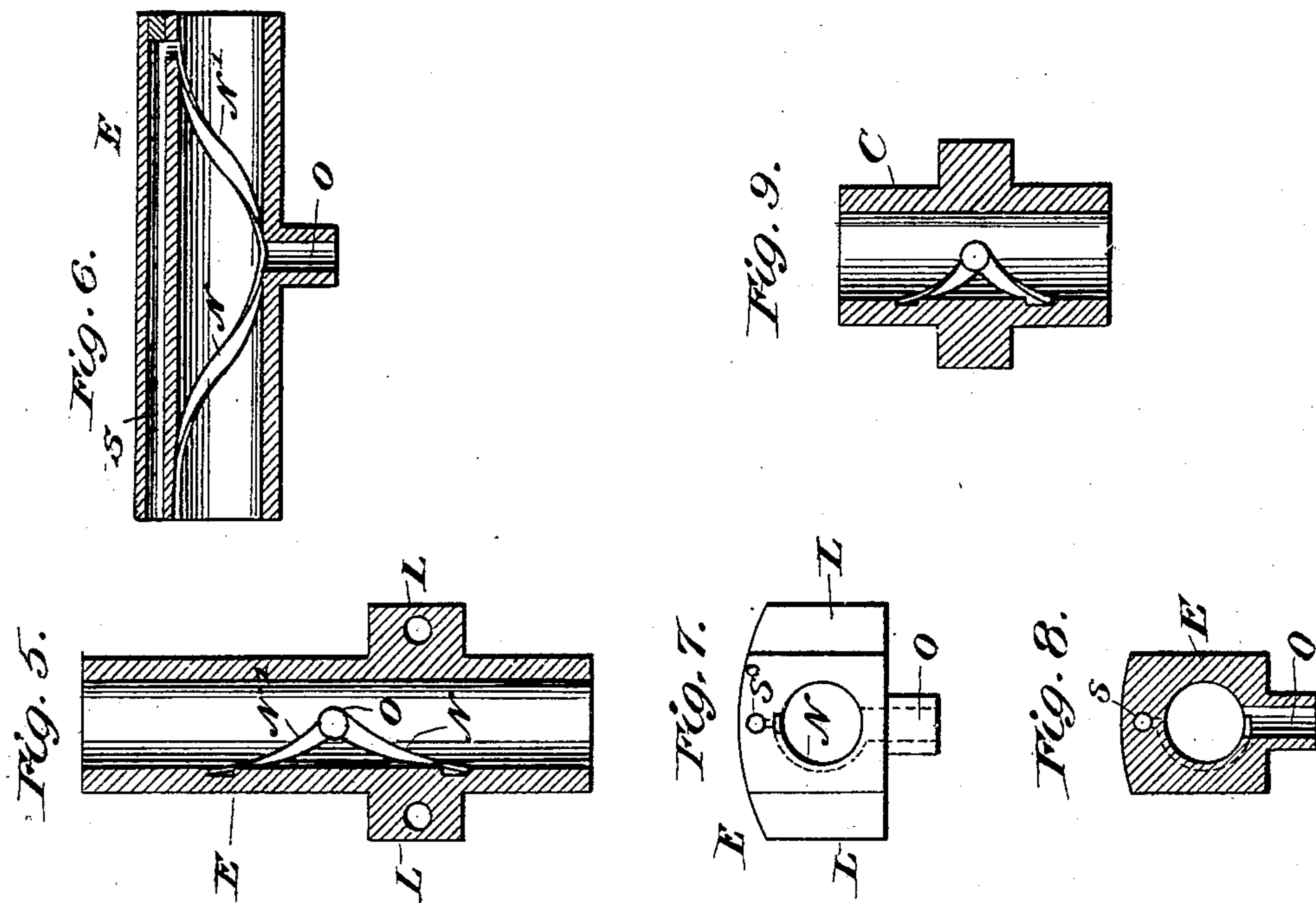
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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PULVERIZING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 633,511, dated September 19, 1899.

Application filed June 9, 1898. Serial No. 682,993. (No model.)

To all whom it may concern:

Be it known that I, GIDEON FRISBEE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pulverizing-Machines, of which the following is a full, clear, and exact specification.

My invention relates to an improvement in pulverizing-machines; and it consists in the novel mechanical construction hereinafter fully set forth.

The particular class of machines to which my invention is of great value is that in which there is a main shaft and two or more supplemental shafts carried thereby and parallel thereto, the said supplemental shafts being provided at their outer extremities with suitable pulverizing-rolls, said shafts and rolls being adapted to rotate independently of the main shaft.

The objects of my invention are twofold—first, to provide a simple and efficient means for adjusting the throw of the pulverizing-rolls carried by the supplemental shafts, and, second, to provide a means whereby a thorough and even lubrication of the supplemental-shaft bearings is effected.

My invention is illustrated by the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view disclosing my invention. Fig. 2 is a detailed sectional view on line *x x*, Fig. 1. Fig. 3 is an end elevation of one of the details. Fig. 4 is an enlarged sectional elevation on the plane of the line *y y*, Fig. 1. Figs. 5, 6, 7, 8, and 9 are views of details.

Similar letters refer to similar parts.

A is a main shaft driven in any suitable manner.

B B are supplemental shafts carrying suitable rollers at their forward ends, said rollers being designated by the letters *b b*. The said supplemental shafts B B are mounted in suitable bearing-blocks C. These bearing-blocks have pivotal extensions therefrom, which in turn find their bearings in a suitable frame D, rigidly fixed on the main shaft A.

E E are bearing-blocks forward of the

blocks C C. These blocks E E guide the supplemental shafts B B and are confined between the flanges F F (see Fig. 3) on the frame D', the latter being rigidly mounted on the main shaft.

G G are openings through which the forward bearing-blocks E E pass, the said openings being formed in a disk H, which is by preference also rigidly attached to the main shaft A. It will thus be observed that the blocks E E form a floating bearing for the shafts B B. By this means the supplemental shafts may swing on their pivotal bearings in the frame D, so that by the means hereinafter described the pulverizing-rollers *b b* may be adjusted to move in a greater or smaller arc, as desired, as the main shaft is revolved.

In order to limit the outward swing of the supplemental shafts B B, I provide each bearing-block E with a yoke I, consisting of a cross-beam J, adapted to abut against projections *h h* on the disk H, said beams being supported by bolts K K, which pass loosely through said cross-beams and engage threaded perforations in lugs L L on the blocks E E. Thus by manipulating the bolts K K the throw of the supplemental shafts B B is regulated.

As it is common in this class of machines to use the crushing or pulverizing rolls *b b* in connection with a ring-die M, it will be seen that a particular advantage is obtained by providing a means for regulating the throw of said rolls caused by the centrifugal force tending away from the axial center of the revoluble main shaft A.

Another feature of my invention is the means referred to for permitting the constant and even lubrication of the revoluble supplemental shafts B B, carried around by and parallel with the main shaft A. This means comprises a pair of grooves N N', formed in each bearing-block E E and extending spirally away from a point substantially midway in the length of each of said blocks. At the point of junction of each of such spiral grooves N N' an opening O is provided, which registers with a passage P, leading to the center of main shaft A, which, as illustrated in Figs.

1 and 4, is hollow, said chamber containing oil, which may be fed thereto by any suitable means.

Q is an oil-cup, and Q' is a pipe leading from said oil-cup into the oil-chamber in the center of said shaft A. If desirable, short radial pipes R R may be provided to conduct the oil from the source of supply in the center of the shaft A to the revoluble supplemental shafts, which as they revolve take up the oil, and by means of the spiral grooves N N' the oil is distributed evenly over substantially the whole bearing-surface. To prevent any oil from passing directly into the pulverizing-chamber, I have provided an offset or return passage S in each of said blocks E, so that the oil which is moved toward the pulverizing-rolls will upon reaching the return passage or passages S be checked from further advancing and find its way back through the passage to the opposite end of the bearing-block, where it may be caught in any suitable drip-pan. While I have described this novel means for lubricating bearings of supplemental shafts with reference only to the floating bearing-blocks E E, nevertheless it is obvious that the same may be applied to the pivotally-mounted bearing-blocks C C, and the same is so illustrated, although in the latter case it is obvious that no return-passages S for the oil are needed. In fact, it is desirable that the oil be permitted to flow entirely through the bearing-blocks C C, thereby permitting the lubrication of the regulating-collars T T.

Obviously in carrying out my invention the spiral grooves may be formed in the shafts instead of in the bearing-blocks, as shown, whereby the same effect would be produced in lubricating the bearing throughout its length. If desirable, also, the offset or return conduits S, formed in the bearing-blocks E, may find their opening in the outer surface of the bearing-blocks rather than in the end, as shown, and both spiral grooves N N' may lead to an offset or return pipe similar to those illustrated.

In carrying out my invention certain changes in the specific construction illustrated and described may be desirable. I would therefore have it understood that I do not limit myself to the specific form herein shown and described, but leave myself at liberty to make such alterations and changes as are fairly within the spirit and scope of my invention.

Having thus described my invention, what I claim is—

1. In a pulverizing-machine, a die, a driving-shaft, supplemental revoluble shafts carried by the driving-shaft, pulverizing-rolls carried thereby, means for regulating the spread of said supplemental shafts, comprising bearing-blocks having adjustable stop mechanisms to engage with the inner periphery of a disk mounted upon the main shaft.

2. In a pulverizing-machine, a die, a main driving-shaft, supplemental revoluble shafts pivotally supported and carried thereby, pulverizing-rolls carried by said supplemental shafts, means for regulating the throw of said supplemental shafts comprising floating bearing-blocks toward the forward end of said supplemental shafts and adjustable stop mechanisms carried by said floating bearing-blocks adapted to engage with the inner periphery of a disk mounted on the main shaft, substantially as described.

3. In a pulverizing-machine, a die, a main driving-shaft, supplemental revoluble shafts pivotally supported and carried thereby, pulverizing-rolls carried by said supplemental shafts, means for regulating the throw of said supplemental shafts, comprising a disk, bearing-blocks, cross-beams, bolts loosely passing through said cross-beams and entering lug extensions on said floating bearing-blocks, and openings in the disk for permitting said bearing-blocks to move toward and away from said driving-shaft, substantially as described.

4. In a pulverizing-machine, a die, a main driving-shaft, supplemental revoluble shafts carried thereby, pulverizing-rolls carried by said supplemental shafts, the connection between said main shaft and supplemental shafts comprising a pivotal support toward the rear ends of said supplemental shafts, floating bearing-blocks toward the opposite ends of said supplemental shafts, a disk mounted on said shafts, and openings in said disk for permitting said blocks to move laterally with respect to the main shaft, and means for limiting the movement of said bearing-blocks.

5. In a pulverizing-machine comprising, a die, a main driving-shaft and revoluble supplemental shafts carried thereby and adjacent thereto, rolls carried by said supplemental shafts, an oiling mechanism comprising an oil-chamber within the main shaft, and conduits leading from said chamber to the inner surface of the bearing-blocks supporting said supplemental shafts.

6. In a pulverizing-machine comprising, a die, a main driving-shaft and revoluble supplemental shafts carried thereby and adjacent thereto, rolls carried by said supplemental shafts, an oiling mechanism comprising an oil-chamber within the main shaft, conduits leading from said chamber to the inner surface of the bearing-blocks supporting said supplemental shafts, and spiral grooves extending in opposite directions and away from the oil-openings in the inner surface of the supplemental-shaft bearing-blocks.

7. In a pulverizing-machine comprising, a die, a main driving-shaft and revoluble supplemental shafts carried thereby and adjacent thereto, rolls carried by said supplemental shafts, an oiling mechanism comprising an oil-chamber within the main shaft, conduits

leading from said chamber to the inner surface of the bearing-blocks supporting said supplemental shafts, spiral grooves extending in opposite directions and away from the
5 oil-openings in the inner surface of the supplemental-shaft bearing-blocks, and a return-conduit formed in one or more of the bearing-

blocks, the opening in said conduit communicating with one of the spiral grooves.

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