

No. 775,069.

PATENTED NOV. 15, 1904.

A. RAYMOND, DEC'D.

M. M. BARTELME, ADMINISTRATRIX.

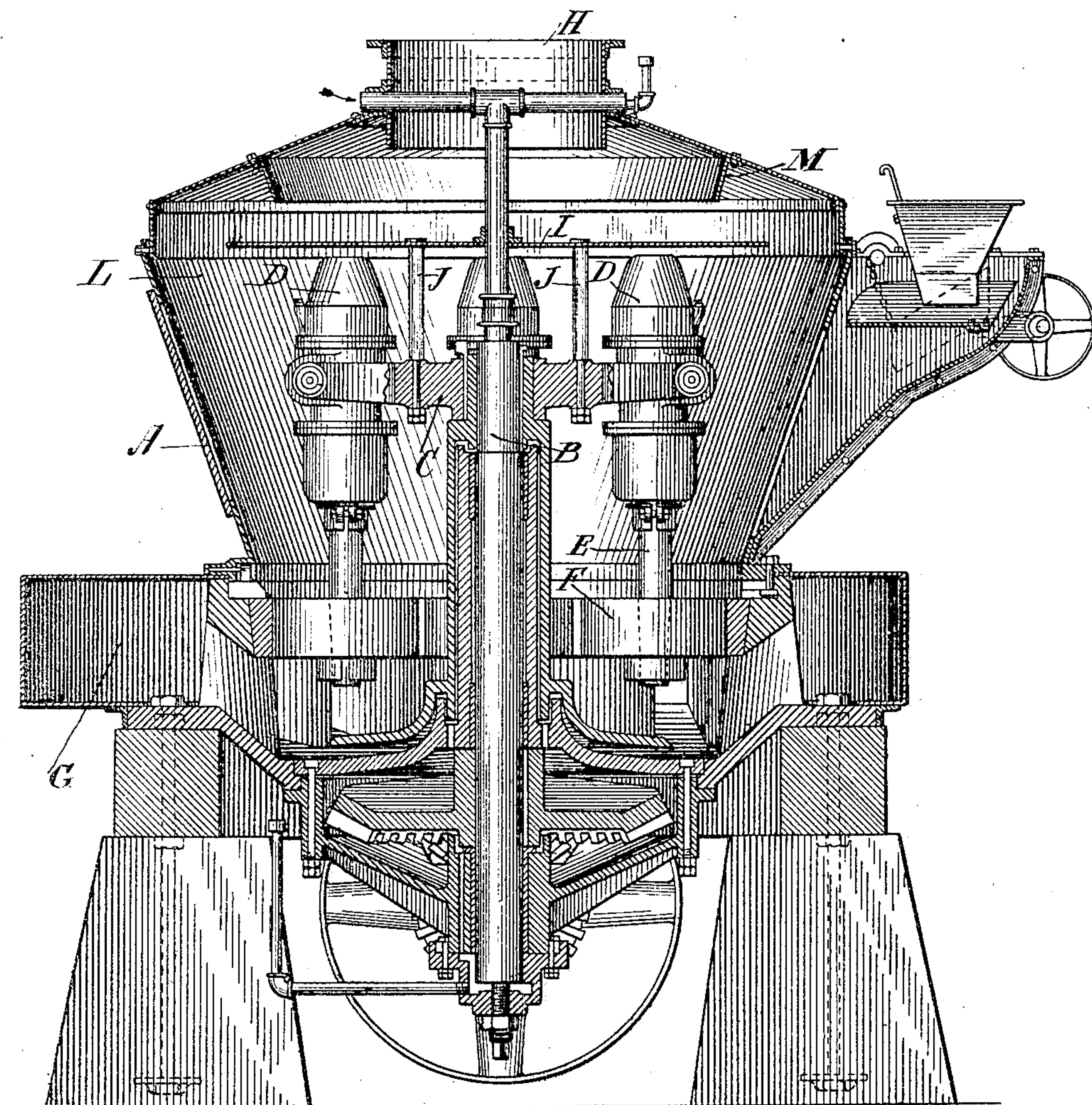
CENTRIFUGAL PULVERIZING MILL.

APPLICATION FILED MAY 19, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

Geo. M. Mayer
E. H. Sney

INVENTOR

Albert Raymond
BY
Raymond W. Barnett
ATTORNEYS

No. 775,069.

PATENTED NOV. 15, 1904.

A. RAYMOND, DEC'D.

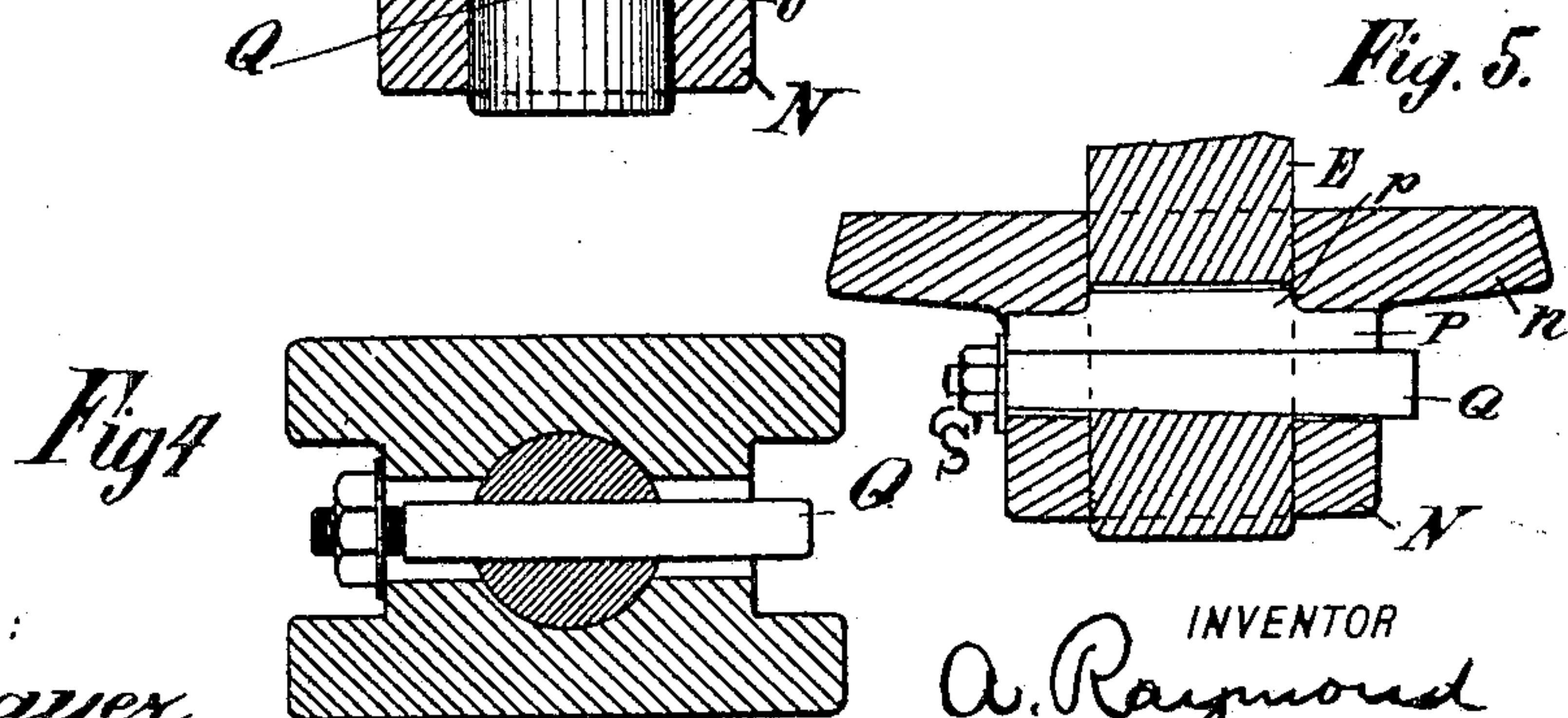
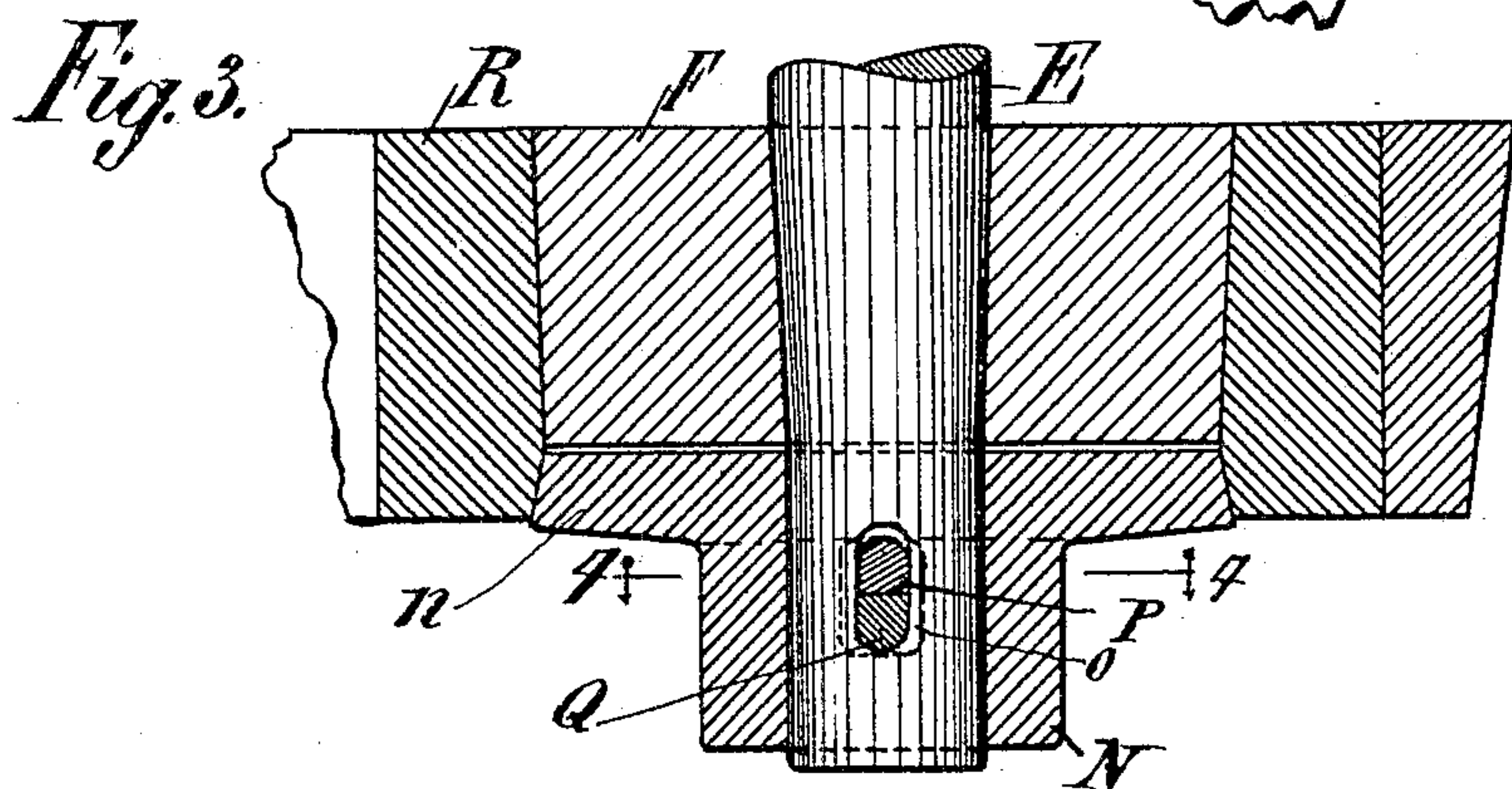
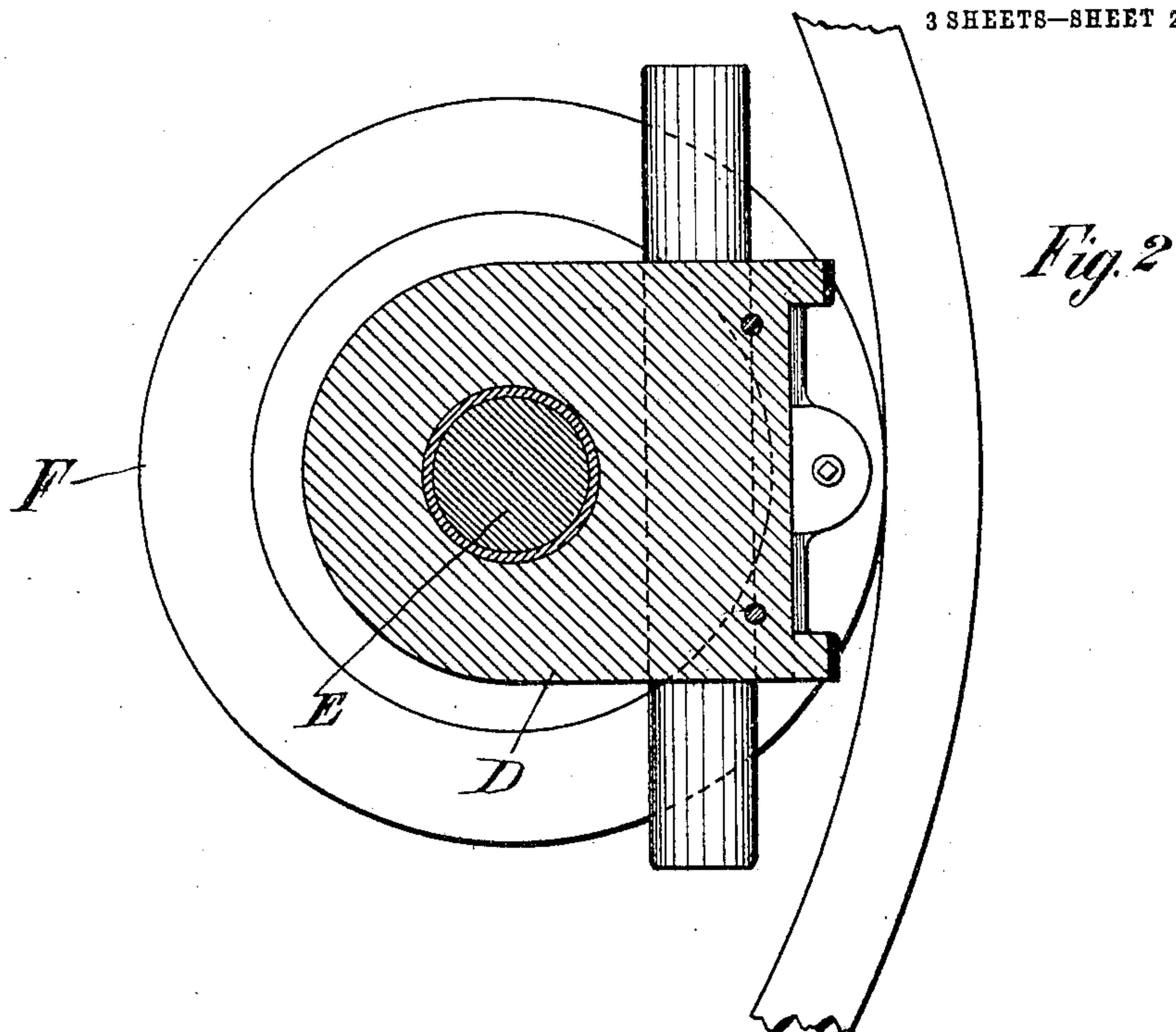
M. M. BARTELME, ADMINISTRATRIX.

CENTRIFUGAL PULVERIZING MILL.

APPLICATION FILED MAY 19, 1902.

NO MODEL.

3 SHEETS—SHEET 2.



WITNESSES:
Geo. M. Mayer
C. H. Drury

INVENTOR
A. Raymond
BY *Raymond & Bennett*
ATTORNEYS.

No. 775,069.

PATENTED NOV. 15, 1904.

A. RAYMOND, DEC'D.

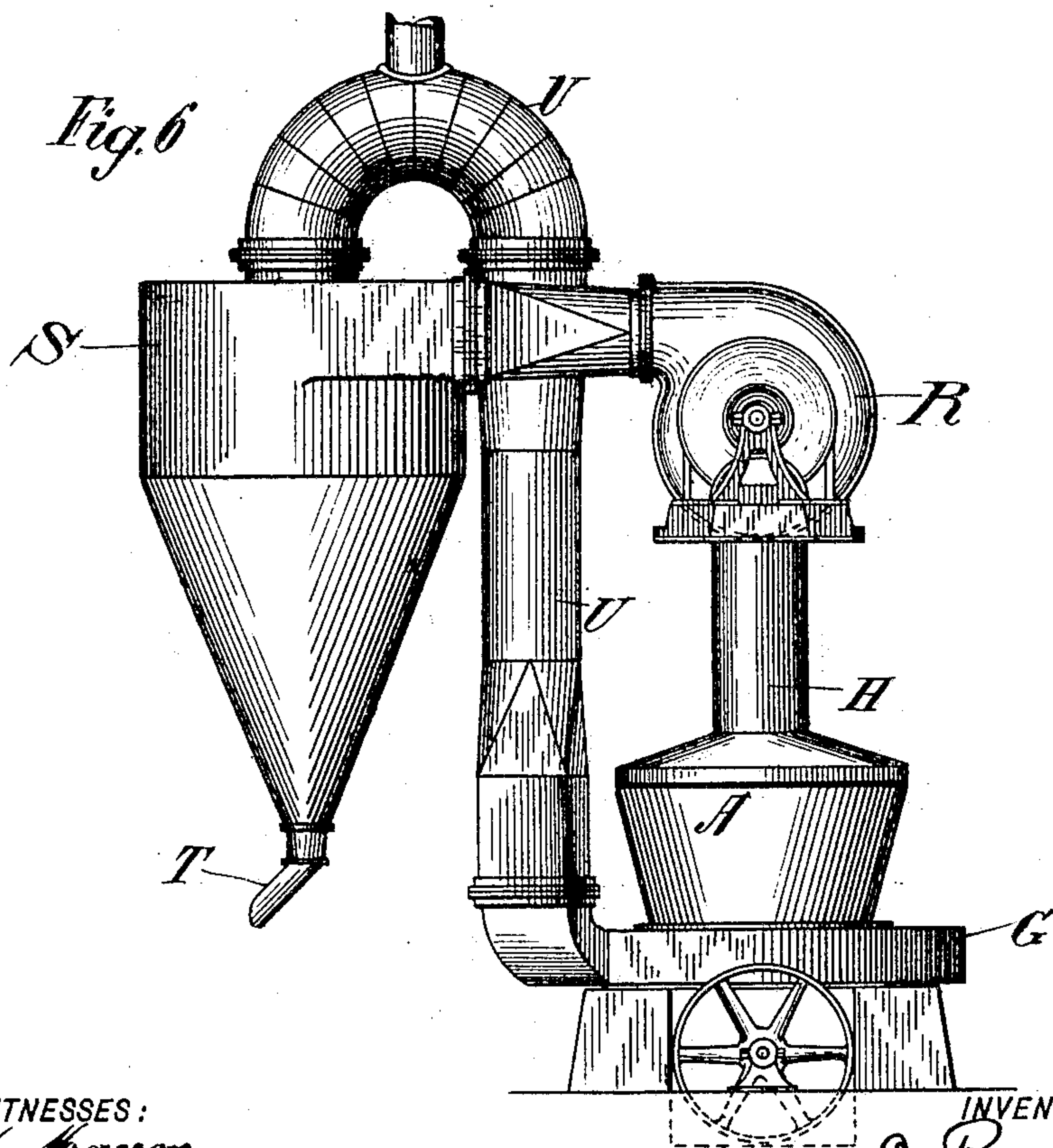
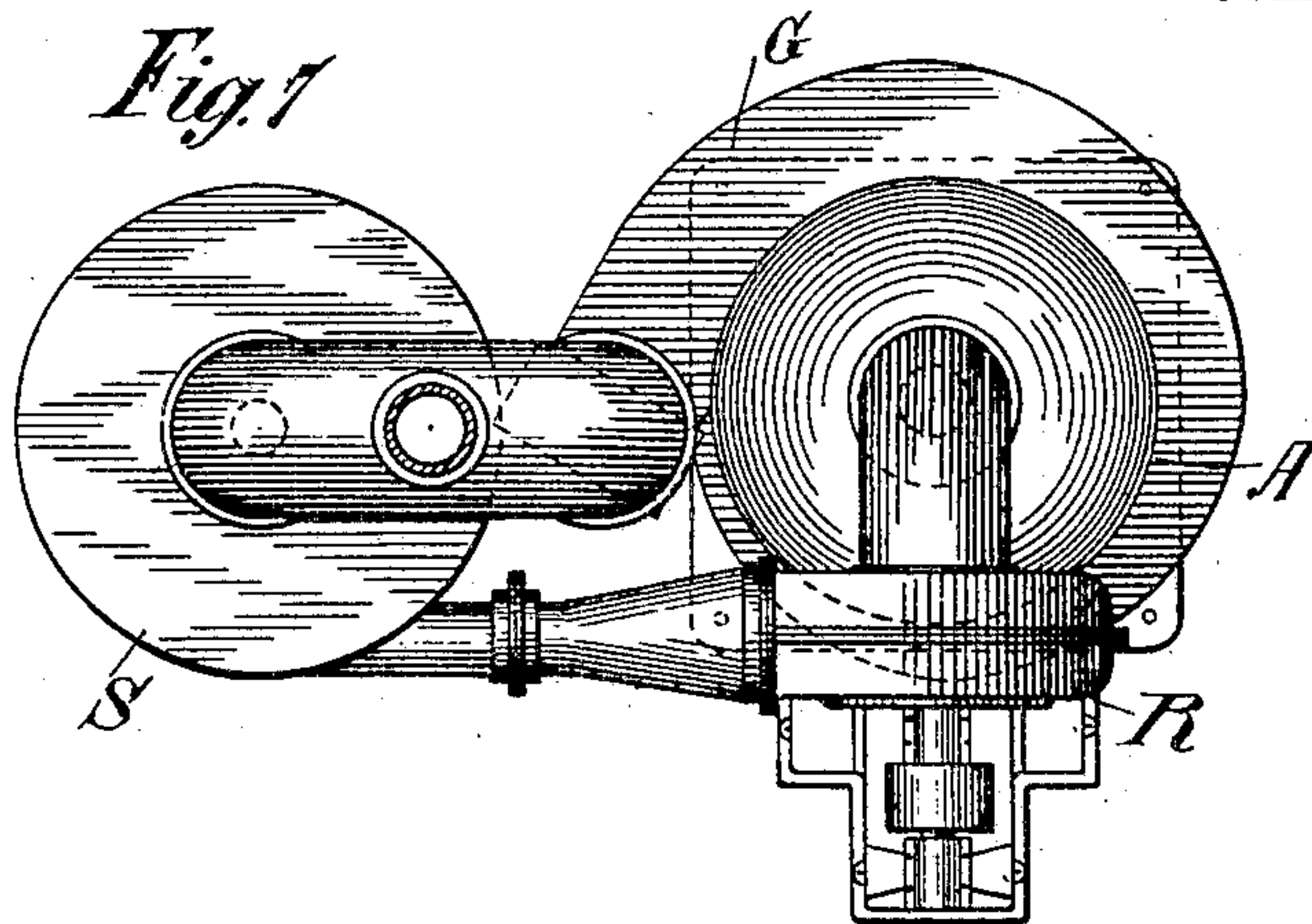
M. M. BARTELME, ADMINISTRATRIX.

CENTRIFUGAL PULVERIZING MILL.

APPLICATION FILED MAY 19, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES:

Geo. M. Mayer
E. H. Drury

INVENTOR

A. Raymond
BY *Raymond Bennett*
ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT RAYMOND, OF CHICAGO, ILLINOIS; MARY M. BARTELME ADMINISTRATRIX OF SAID RAYMOND, DECEASED.

CENTRIFUGAL PULVERIZING-MILL.

SPECIFICATION forming part of Letters Patent No. 775,069, dated November 15, 1904.

Application filed May 19, 1902. Serial No. 108,040. (No model.)

To all whom it may concern:

Be it known that I, ALBERT RAYMOND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have
5 invented certain new and useful Improvements in Centrifugal Pulverizing-Mills, of which the following is a specification.

The object of my invention is to provide a pulverizing-mill of the centrifugal roller type
10 in which the usual inner cone used to facilitate the separation of the pulverized material from the coarser material, as shown in my Patent No. 642,717, may be dispensed with, thereby
15 permitting of the construction of mills of greatly-reduced height—a point of considerable importance in many situations.

Another object of my invention is to provide means for simply and effectively attaching the crushing-rolls to the roll-shafts, as
20 well as providing simple and effective means for attaching and removing the crushing-ring or outer surface of the crushing-rolls where sectional rolls are used, while at the same time attaching the roll to or removing it from the
25 roll-shaft.

These and such other objects as may hereinafter appear are attained by the devices illustrated in the accompanying drawings, in which—

30 Figure 1 is a vertical section through my improved mill. Fig. 2 is a view, partly in section, through my journal-box. Fig. 3 is a vertical section showing an enlarged detail through a part of the crushing-roll and lower
35 end of the roll-shaft. Fig. 4 is a transverse section on the line 4 4 of Fig. 3. Fig. 5 is a detail showing the two keys. Fig. 6 is an elevation of a complete pulverizing and separating plant embodying my invention, and Fig.
40 7 is a plan view of the same.

Like letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A is the outer casing, within which
45 rotates the main shaft B, which carries the spider C, upon the arms of which are mounted the journal-boxes D, within which in turn are supported the roll-shafts E, carrying the crushing-rolls F. An induced current enters

the casing A through the casing G, whence it
50 passes upward between the rolls and out at the exhaust H. Instead of providing the casing A with the usual inner cone, around and over which the dust-laden air passes, I provide a disk I, which is supported upon and
55 attached to the spider C by means of suitable supports J. The disk I is less in diameter than that part of the casing A within which the disk is mounted, thereby providing an annular air-passage L around the disk I. The
60 induced dust-laden current of air passing upwardly within the casing A and past the edge of the disk I is guided downwardly in the direction of the disk I by the cone M. It then
65 passes upwardly toward the exhaust H and escapes. The heavier uncrushed particles of matter which have been carried upwardly by the air-current fall upon the upper surface of
70 the disk I, while the dust or powder remains in suspension and is carried away through the exhaust H by the air-current. The disk I being mounted upon and attached to the spider C rotates therewith, with the result that the
75 particles deposited upon the upper surface of the disk I are thrown off of the same by centrifugal force and drop back to the crushing-rolls.

In order to readily attach the crushing-roll to the lower end of the roll-shaft, I provide the crushing-roll with a centrally-arranged
80 opening shaped like the frustum of a cone, a portion of the roll-shaft adjacent to its lower end being correspondingly tapered to fit within said conical opening. Upon the under surface of the crushing-roll I provide a recess or
85 seat having outwardly-tapered walls.

Having fitted the roll-shaft E into the coned opening through the roll F, I fit over the lower end of the shaft E and below the roll F a
90 block N, which is provided with an enlarged disk-like upper portion n, having a tapered periphery and arranged to partially fit within the seat formed in the under surface of the roll F, so that while the periphery of the upper portion of the block N is brought into
95 close contact with the coned inner wall of the seat provided therefor the upper surface of the block N and the under surface of the roll

F will not be brought into contact with each other. The lower end of the shaft E is provided with an elongated slot O, which slot extends upwardly within the disk-like portion 5 of the block N.

In order to obtain a key for locking the shaft to the roll which shall have sufficient strength to withstand the strain put upon a key in this position and at the same time to 10 provide a shoulder against which a locked nut upon the end of the key may abut, all without increasing the length of the shaft, I provide an auxiliary key P, which has an upwardly-extending shoulder *p*. This key is 15 fitted within the slot O, so that the shoulder *p* extends into the upper portion of the slot O and abuts against the wall of the perforation through the block N. The auxiliary key P is held in this position by inserting the 20 tapered key Q through the slot O and below the key P. The key Q being now driven home will be tightly wedged against the bottom of the auxiliary key P, so that the two keys constitute virtually one compound key 25 P Q, which sustains the strain of locking the shaft E, the roll F, and the block N together. At the same time the key P affords a shoulder above the key Q and the block N affords a shoulder below the key Q, against which 30 shoulders the locked nut S' abuts.

Where a sectional roll is used, the outer section of the roll consists of a separable ring R, having a centrally-arranged opening there- 35 through with oppositely tapered walls, as shown in Fig. 3, within which the roll F is inserted from one side and the block N from the other side, the outer peripheries of the roll F and the block N being tapered to cor- 40 respond with the oppositely-disposed tapering portions of the wall of the central opening through the ring R. The result is that when the roll F and the block N are wedged toward each other by tightening the key Q they are tightly wedged within the ring R, 45 which is thereby rigidly secured to the periphery of the crushing-roll F.

In Fig. 6, R is the fan; S, the separator, from which the separated dust escapes at T and the air-current returns through the return air- 50 pipe U to the casing G.

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

1. In a machine of the class described, the

combination with the roll-shaft, a crushing- 55 roll core wedged thereon, a locking-block and a key, of an auxiliary key seated within an opening through the lower end of said shaft and above and in contact with the key, said 60 auxiliary key being provided with shoulders which abut against the walls of a central opening through the locking-block, substantially as described.

2. The combination with the casing having its upper portion formed with an opening, an 65 approximately conical ring encircling the said opening, and the main shaft, journaled in the said casing, of the spider mounted to rotate with the said shaft, and a disk secured to the 70 said spider, the said disk being arranged below the said conical ring, substantially as described.

3. The combination with the roll-shaft having its end formed with an elongated slot, of 75 a crushing-roll comprising an inner section or member mounted on the roll-shaft, a ring encircling said inner section or member and having the lower portion of its interior tapered, a block having a disk-shaped upper end, said 80 disk-shaped upper end having its periphery tapered and received in the lower portion of the said ring, and said block having apertures registering with the slot in the shaft, a key projecting through said apertures and having 85 its central portion enlarged and engaging the slot of the shaft, and an auxiliary key engaging the first-named key, substantially as described.

4. The combination with the casing formed in its upper end with an opening and a de- 90 flector arranged adjacent to the said opening, of grinding mechanism, and a disk of greater proportions than the said deflector carried by the said grinding means and being arranged di- 95 rectly below the said deflector.

5. The combination with the roll-shaft, of a crushing-roll comprising an inner section or 100 member having its periphery tapered and a ring encircling the said member, of a disk-shaped block arranged in said ring, said block being formed with an apertured extended portion, and a key extending from the aperture of the said extended portion of the block and through an aperture in the said shaft.

ALBERT RAYMOND.

Witnesses:

O. R. BARNETT,
M. E. SHIELDS.