

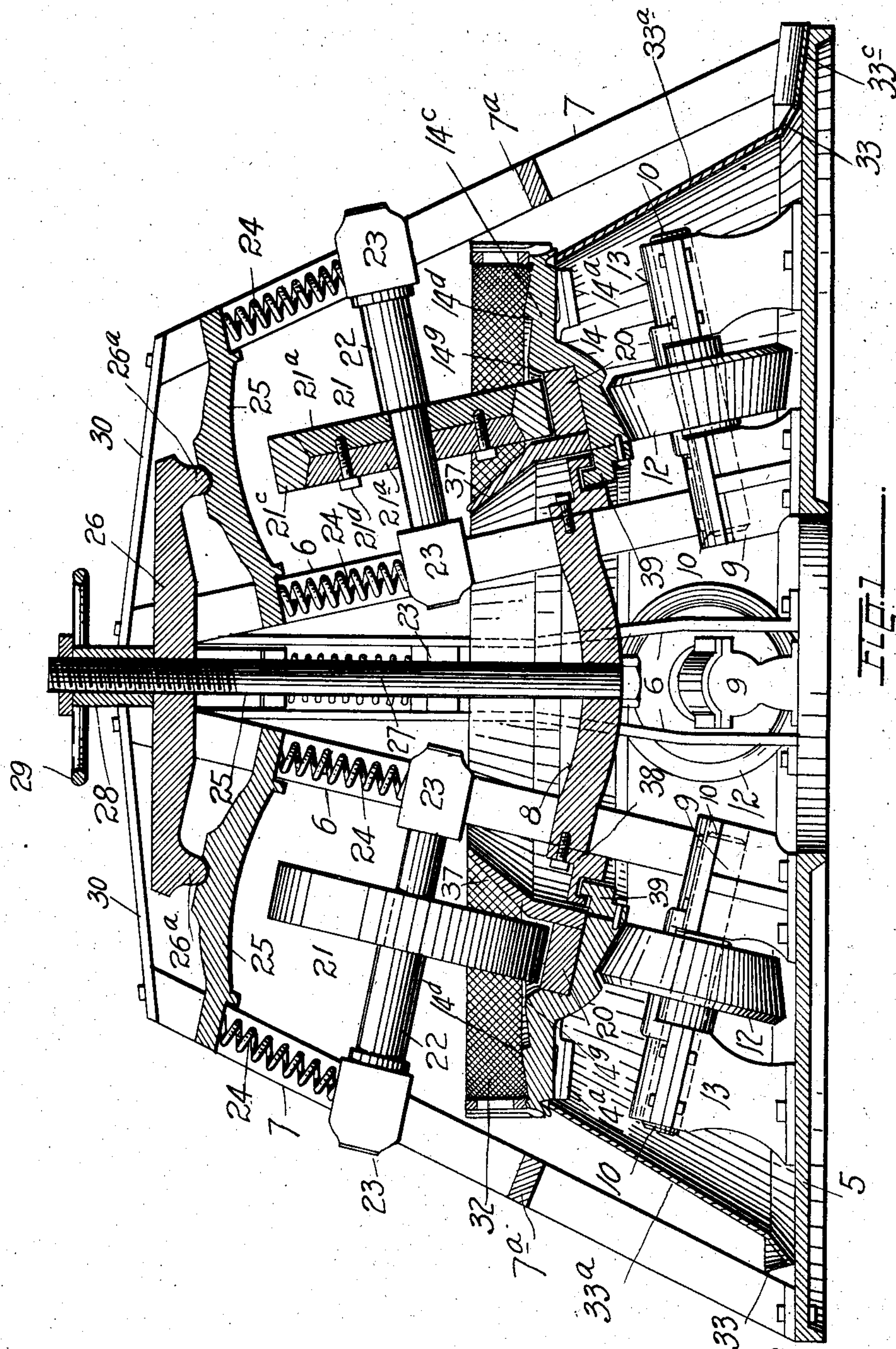
No. 835,104.

PATENTED NOV. 6, 1906.

J. H. ELSPASS.
PULVERIZING MILL.

APPLICATION FILED JAN. 29, 1903.

4 SHEETS—SHEET 1.



Witnesses
[Signature]
Dena Nelson.

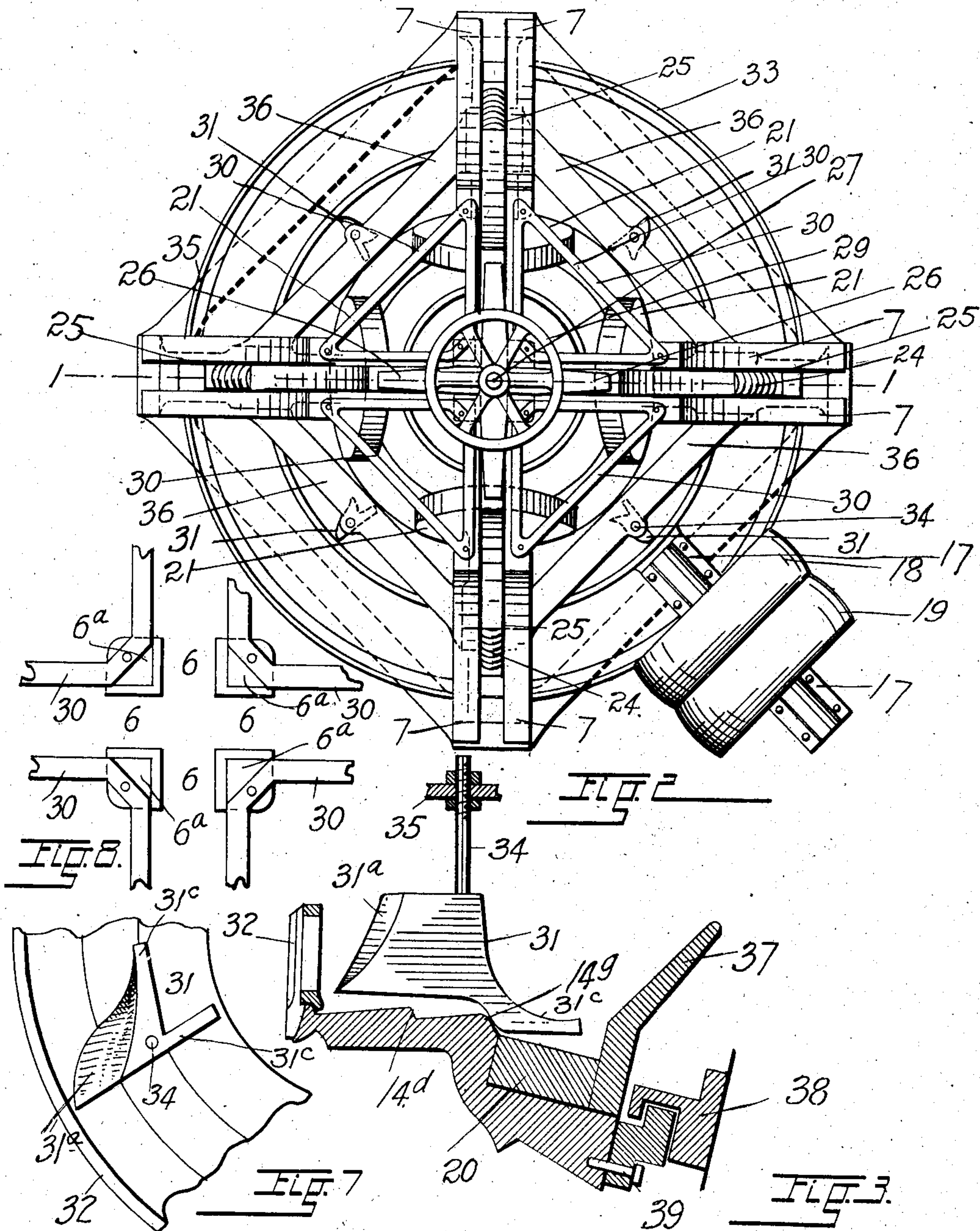
Inventor
John H. Elspass.
By *[Signature]*
Attorney

No. 835,104.

PATENTED NOV. 6, 1906.

J. H. ELSPASS.
PULVERIZING MILL.
APPLICATION FILED JAN. 29, 1903.

4 SHEETS—SHEET 2.



Witnesses
J. J. Coleman
Dena Nelson

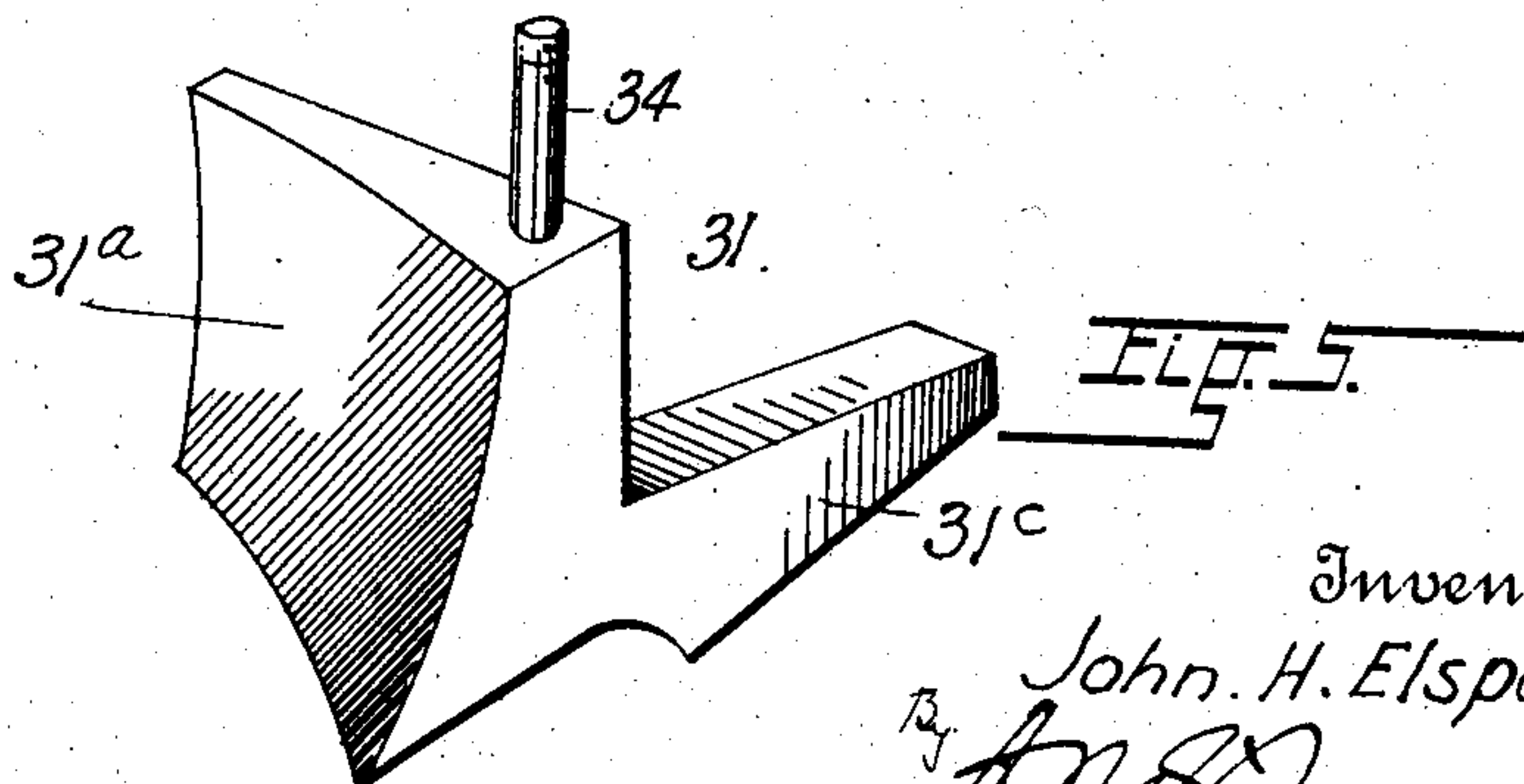
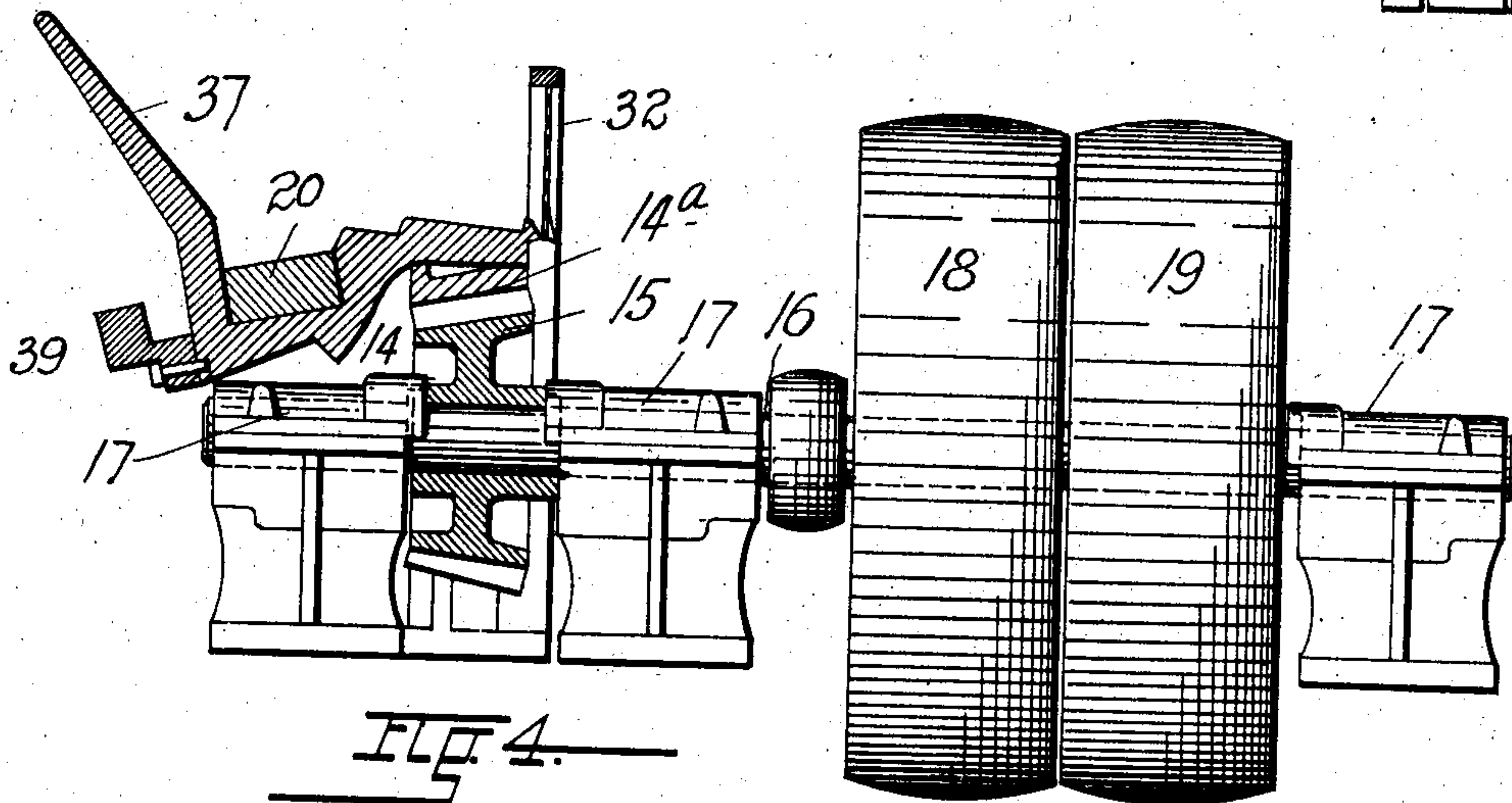
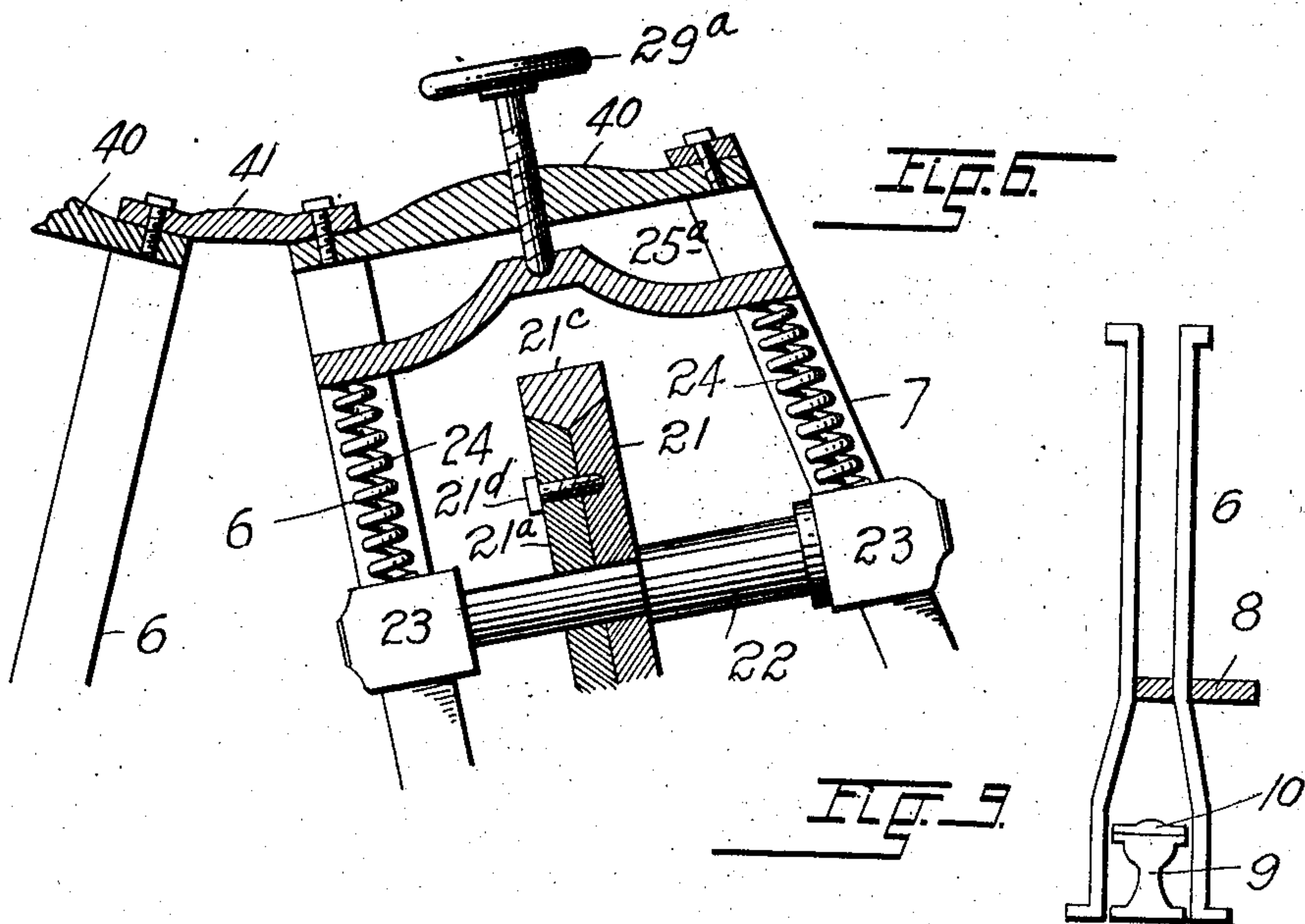
Inventor
John H. Elspass
By *A. J. [Signature]*
Attorney

No. 835,104.

PATENTED NOV. 6, 1906.

J. H. ELSPASS.
PULVERIZING MILL.
APPLICATION FILED JAN. 29, 1903.

4 SHEETS—SHEET 3.



Witnesses
W. J. Bellamy
Dena Nelson

Inventor
John H. Elspass
By *[Signature]*
Attorney

No. 835,104.

PATENTED NOV. 6, 1906.

J. H. ELSPASS.
PULVERIZING MILL.
APPLICATION FILED JAN. 29, 1903.

4 SHEETS—SHEET 4.

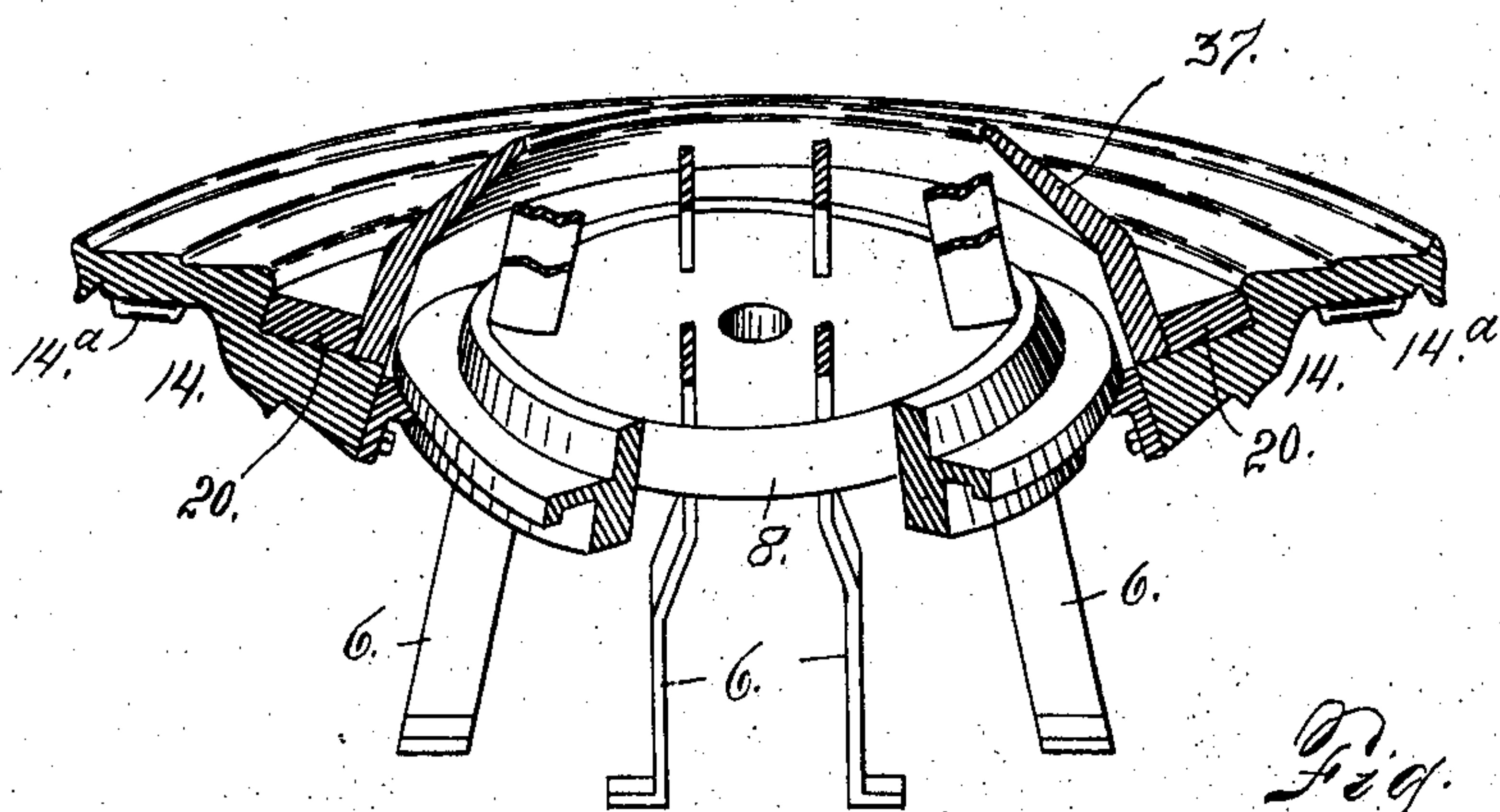


Fig. 10.

Witnesses

Otto E. Hoddeck
Dena Nelson

J. H. Elspass.

Inventor

By A. J. [Signature]

Attorney

UNITED STATES PATENT OFFICE.

JOHN H. ELSPASS, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO THE
ELSPASS ROLLER QUARTZ MILL AND MANUFACTURING COMPANY,
OF PUEBLO, COLORADO.

PULVERIZING-MILL.

No. 835,104.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed January 29, 1903. Serial No. 141,075.

To all whom it may concern:

Be it known that I, JOHN H. ELSPASS, a citizen of the United States of America, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Pulverizing-Mills; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in pulverizing-mills, my object being to produce a construction of the roller class which shall effectually perform the pulverizing function.

The subject-matter of Patent No. 775,130, dated November 15, 1904, having been divided out of this application under Rule 106, the application is now limited, so far as its novel features are concerned, to the mortar-centering means, consisting of two rings, one mounted on the stationary framework and the other on the rotary mortar, said rings having inclined opposing faces engaging in the surface of a right cone concentric with the mortar-axis. The general construction of the entire machine will, however, be briefly described in order that the said novel features may be fully understood.

Referring to the drawings, Figure 1 is a vertical longitudinal section taken through a mill equipped with my improvements. Fig. 2 is a top or plan view of the same. Fig. 3 is a fragmentary vertical section taken through the mortar, the parts being shown on a scale somewhat larger than in Fig. 2. Fig. 4 is a section taken through the mortar and the driving-gear of the operating-shaft. Fig. 5 is a perspective detailed view of the plow shown on a larger scale than in Fig. 3. Fig. 6 is a sectional view illustrating a modified form of construction. Fig. 7 is a fragmentary top view of the mortar, showing the plow in place. Fig. 8 is a top view illustrating the upper extremities of the four inner posts shown in detail. Fig. 9 is a detail view of one of the inner posts. Fig. 10 is a

fragmentary perspective view of the machine, illustrating the mortar-centering construction.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a suitable bed upon which are mounted two sets of inclined posts, one set being inner posts (designated 6) and the other set being outer posts, (designated 7.) As shown in the drawings, there are four posts of each set, the structure shown being a mill having four pulverizing-rolls. Of course in a mill having more rolls or rollers there would be two additional posts for each roller added—that is to say, one inner post and one outer post, since each roller requires a pair of posts. The inner posts are inclined or lean toward each other as they extend upwardly from the bed-plate. These posts are bifurcated or slotted and are connected intermediate their extremities by a plate 8, this plate and the four posts thus constituting an integral casting. The four posts 6 are each open from the top downwardly to the plate 8, where a web is located connecting the two members. Below the plate 8 each post is also open, the members being spread apart or widened to straddle the inner journal-box 9 of a shaft 10, upon which a bevel-faced or cone-shaped mortar-supporting roller 12 is mounted and made fast. The bevel or conical shape of each mortar-supporting roller is such as to give the roller a perfect rolling contact on the track or part of the mortar-bottom which the roller engages. The outer extremity of this shaft 10 is journaled in a box 13, somewhat more elevated than the box 9, whereby the shaft is inclined downwardly from its outer extremity and the weight of the mortar bearing on the bevel-faced roller is distributed on the shaft to better advantage and the injurious results ordinarily incident to the outward thrust of the mortar are neutralized and overcome. Hence the advantage of the inclined axis over the horizontal axis for these supporting-rollers. The under surface of the rotary mortar 14 is beveled to fit the face of the rollers 12, of which there is a suitable number properly distributed to give

the traveling mortar the desired or necessary support. The journal-box 9 is closed at its inner extremity to hold the lubricating material.

5 The mortar is rotated by a bevel-gear 15, which meshes with a gear 14^a, formed on the under surface of the mortar. This gear 15 is fast on a shaft 16, (see Fig. 4,) journaled in suitable boxes 17, and is provided with suitable fast and loose pulleys 18 and 19, whereby
10 power may be transmitted to the shaft from any suitable motor.

The upper surface of the mortar is equipped with a steel die 20, whose face is inclined inwardly—that is to say, its outer edge is highest and its surface is gradually inclined downwardly toward its inner edge. The object of this inclination of the pulverizing-face of the die is to overcome the tendency of the material acted on by the centrifugal force of the machine to accumulate or become thickest at the outer edge or circumference of the die and cause the pulverizing-rollers to wear unevenly. The pulverizing rolls or rollers occupy an inclined position to fit the inclined face of the mortar-die. These rollers are fast on shafts 22, whose extremities are journaled in boxes 23, slidably mounted in the posts. The posts 7, as well as the posts 6, are bifurcated or open to receive the boxes 23 of the roll-shafts. The outer posts 7 are connected by webs 7^a, intermediate their extremities. Each shaft 22 occupies an inclined position, its outer extremity being highest. The journal-boxes 23 are engaged from above by coil-springs 24, the bifurcated post members forming housings for the springs.

Each pair of posts 6 and 7 is provided with a cross-head 25, whose extremities are slid-
40 able in the post and bear against the upper extremities of the springs. These cross-heads are adjustable from above by screw-pressure. Thereby the springs 24 are made to bear on the boxes with sufficient tension to give the
45 rolls 21 the desired pressure on the die, or rather on the material lying on the die, for pulverizing purposes. In the preferred form of construction shown in Fig. 2 a centrally-located spider-shaped device 26 is slidably
50 mounted in the upper portion of the four posts 6 and is provided with four arms whose outer extremities engage the respective cross-heads 25, each of which is provided with a central semispherical recess which is engaged
55 by a depending projection 26^a, of counterpart shape, formed on the spider-arm. The function of this spider is to apply an equal pressure to all the cross-heads, and therefore it may be termed a "pressure-equalizing device," whereby the tension of the springs acting on the boxes of the roll-shafts is made equal and uniform.

A central vertical shaft 27 is made fast at

its lower extremity to the plate 8, connecting and formed integral with the four posts 6, as
65 heretofore explained. This shaft 27 passes upwardly through an opening formed in the center of the spider 26 and protrudes above the same, its upper portion being threaded to receive a tension-nut 28, provided with a
70 hand-wheel 29. This nut is arranged to bear against the spider 26 from above, and its adjustment determines the tension of the springs 24 through the instrumentality of the pressure-equalizing spider and the spring-engaging cross-heads.

At their upper extremities the posts 6 are close together and are open, as above stated, to receive the spider. At each corner the upper extremities of two post members form a
80 right angle, and those two members are connected by a horizontal flange or web 6^a. The posts 6 and 7 are connected and securely braced at the top by four triangular members or brace-bars 30, which are bolted to the
85 post members, the arrangement being such that each of these braces engages a flange of two outer posts and a connecting corner-flange 6^a of two inner posts.

The inner edge of the mortar is surrounded
90 by an upwardly-projecting flange 37, which is inwardly inclined to catch any adhering material which may fall from the rolls being carried upwardly from the mortar.

The outer edge of the plate 8 and the inner
95 edge of the mortar are provided with engaging rings 38 and 39, whereby the mortar is properly centered and made to rotate in a true circle. These rings have inclined opposing faces engaging each other in the surface
100 of a right cone concentric with the axis of the mortar.

As shown in the drawings, the ring 38 has a flange 38^a overlapping the ring 39. This flange prevents the entrance of dust or other
105 foreign matter to the engaging surfaces of the rings.

Having thus described my invention, what I claim is—

1. The combination in a pulverizing-mill,
110 of an outer and inner series of posts, an annular revoluble mortar located between said series of posts, rollers supporting the same, means for rotating the mortar, and annular mortar-centering rings carried respectively
115 by the mortar and the inner series of posts, said rings having opposing edges in the surface of a right cone concentric with the mortar-axis.

2. The combination in a pulverizing-mill,
120 of outer and inner series of posts, an annular revoluble mortar located between said series of posts, said mortar provided on its under surface with a ring gear, a driving-gear operating in connection therewith, means for op-
125 erating said driving-gear, rollers upon which

said mortar revolves, said mortar provided
with an inwardly-extending mortar-center-
ing ring, said ring provided with an inner
face inclined with respect to the mortar-axis,
5 and an annular flange extending out from
said inner series of posts and provided with a
bearing-face oppositely inclined with respect
to said inclined face of said mortar-centering

ring, and against which the same is adapted
to bear.

In testimony whereof I affix my signature
in presence of two witnesses.

10

JOHN H. ELSPASS.

Witnesses:

A. J. O'BRIEN,
DENA NELSON.