

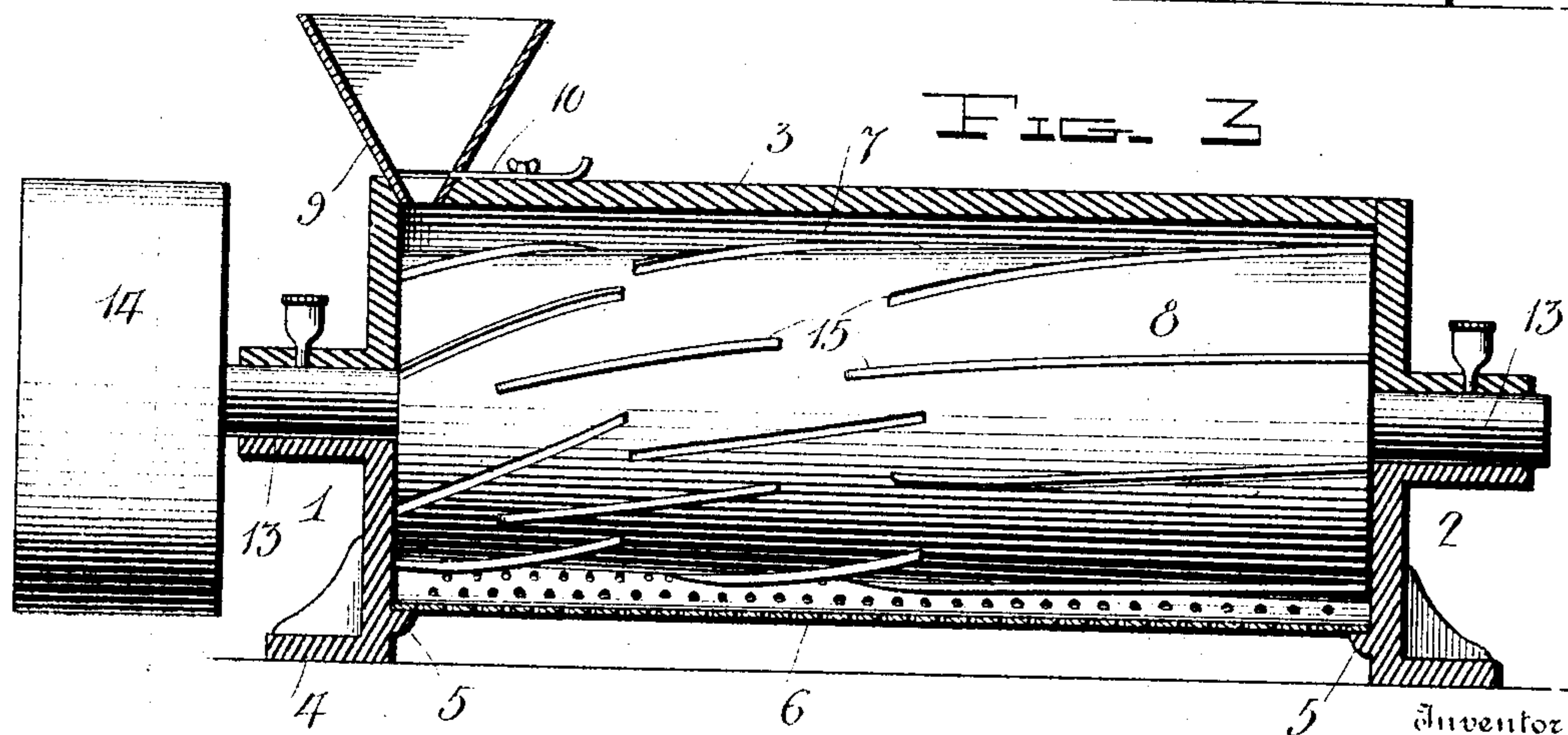
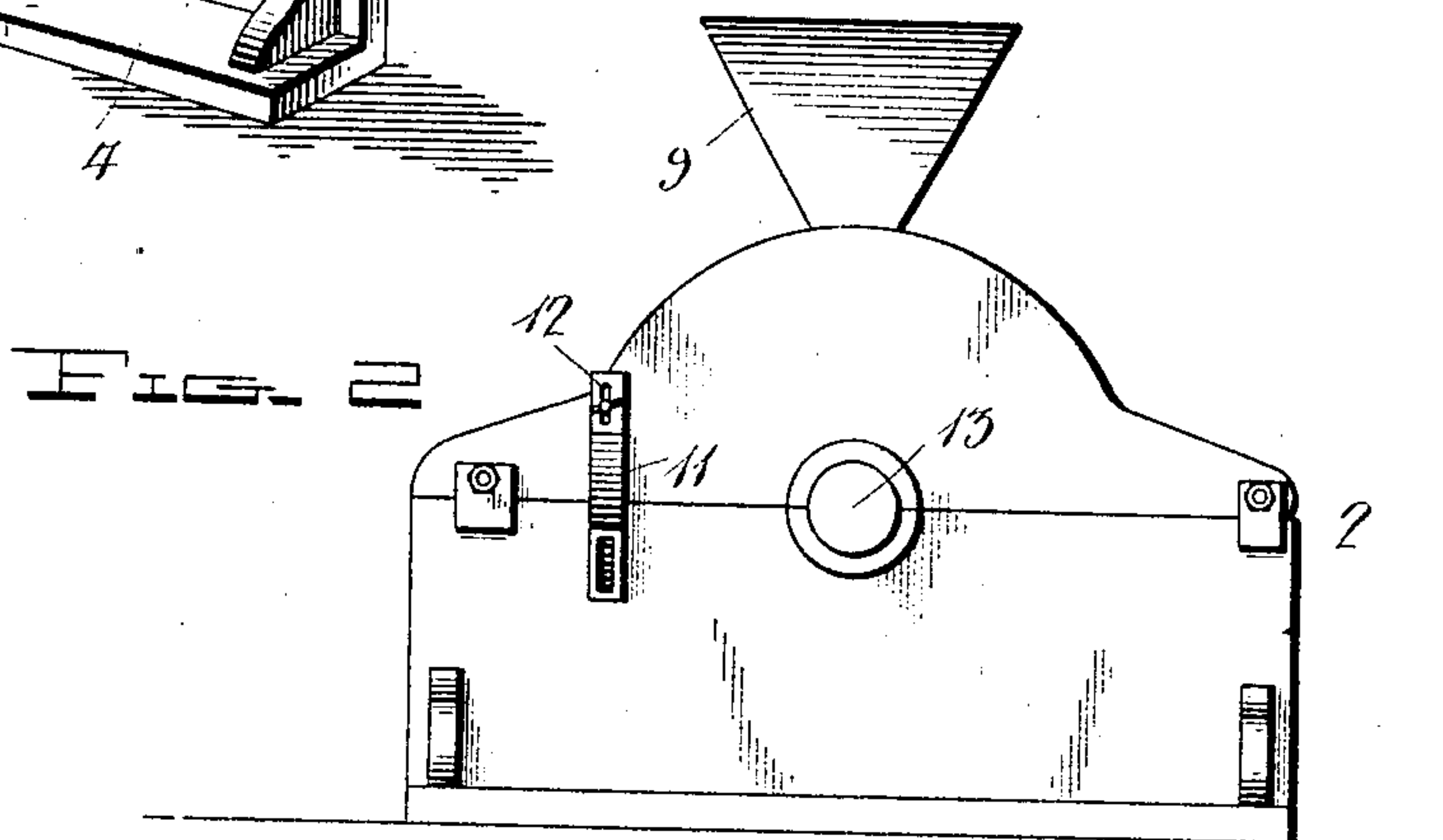
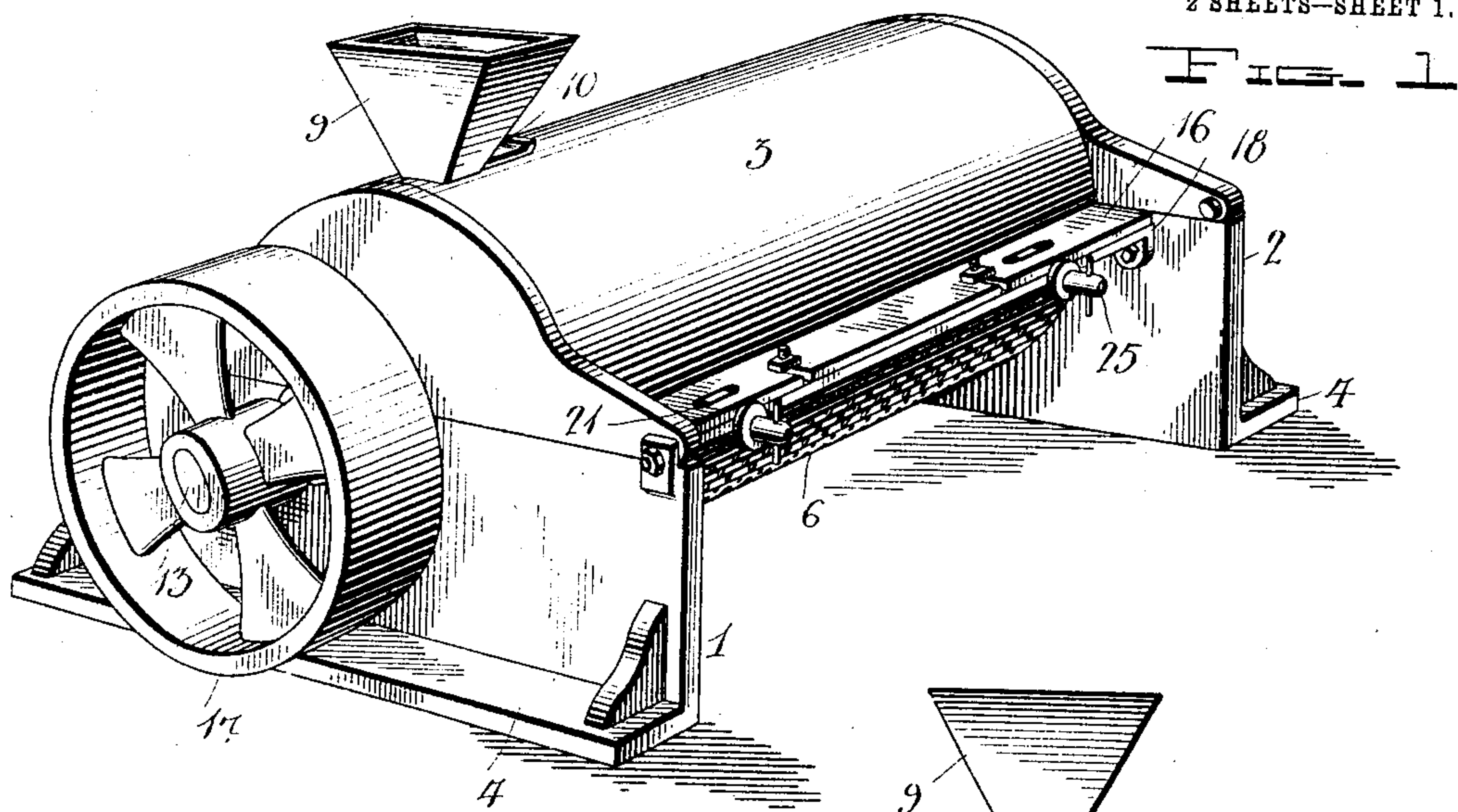
No. 764,992.

PATENTED JULY 12, 1904.

J. F. DUNLAP.  
RICE MILLING MACHINE.  
APPLICATION FILED DEC. 16, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
J. L. Sullivan  
John E. Burch.

By

Joseph F. Dunlap  
His Attorney

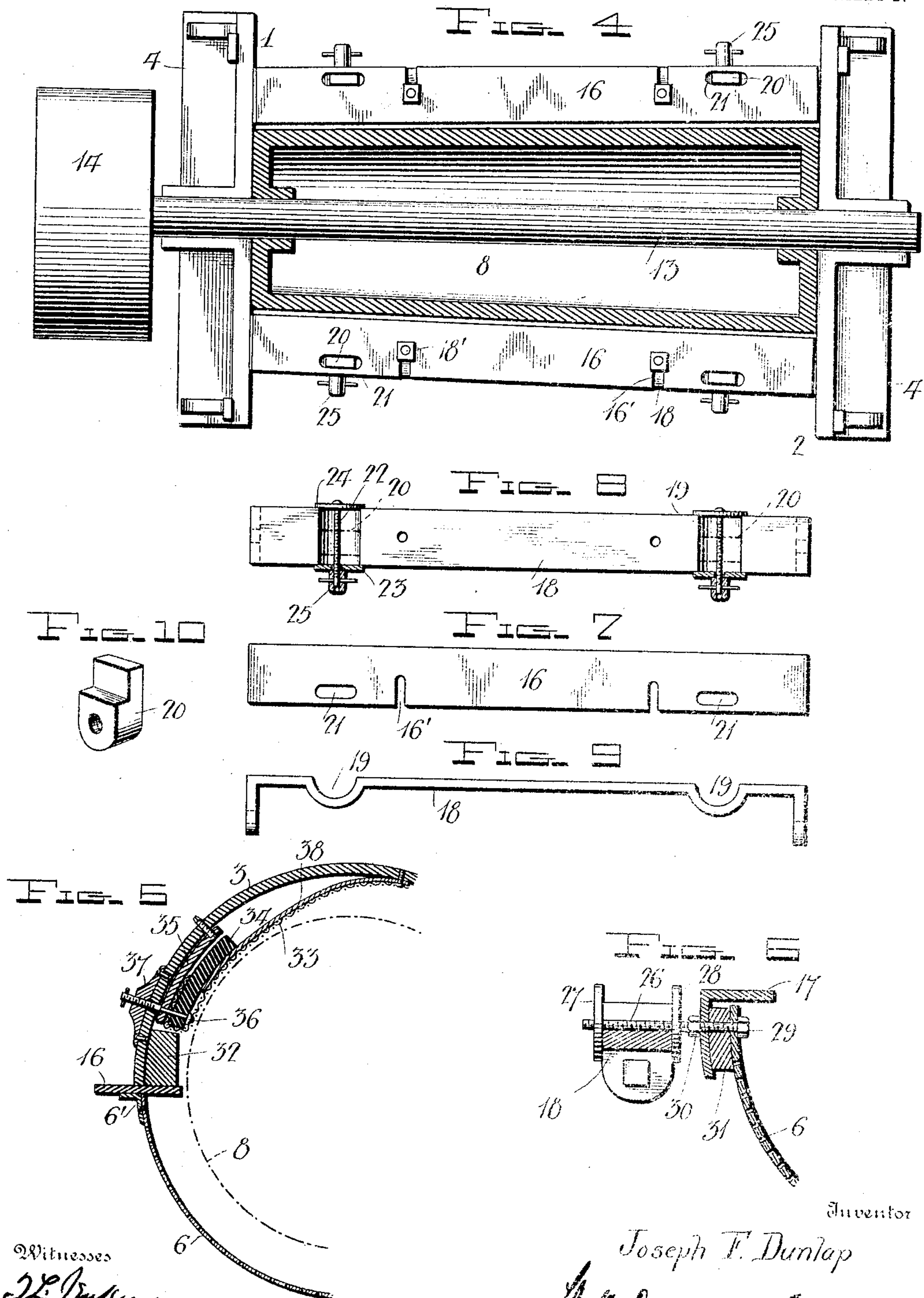
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2 SHEETS—SHEET 2.



Witnesses  
*J. L. Jenkins*  
*John E. Burch.*

By

Inventor  
*Joseph F. Dunlap*  
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his Attorneys



# UNITED STATES PATENT OFFICE.

JOSEPH F. DUNLAP, OF RICEVILLE, LOUISIANA.

## RICE-MILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 764,992, dated July 12, 1904.

Application filed December 16, 1901. Serial No. 86,096. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH F. DUNLAP, a citizen of the United States, residing at Riceville, (formerly Dixie P. O.) in the parish of Vermilion and State of Louisiana, have invented certain new and useful Improvements in Rice-Milling Machines, of which the following is a specification.

My invention relates to milling-machines, and is directed more particularly to improvements in the class of machines employed in the milling of rice.

The nature of my invention will be readily comprehended, reference being had to the following detailed description and to the accompanying drawings, illustrating my invention in its preferred form, it being understood that various modifications may be made therein without departing from the spirit of the invention defined by the concluding claims.

In the drawings, Figure 1 is a perspective view of a milling-machine embodying my invention. Fig. 2 is an end view. Fig. 3 is a vertical longitudinal sectional view, the cylinder being in elevation. Fig. 4 is a horizontal longitudinal sectional view. Fig. 5 is a detail sectional view showing a form of breaking-bar and cushioned abrading-wall. Fig. 6 is a detail sectional view showing another form of breaking-bar. Fig. 7 is a plan view of the breaking-bar shown in Fig. 5. Figs. 8 and 9 are respectively plan and side views of the support for the breaking-bar. Fig. 10 is a detail view of a follower forming part of the breaking-bar-adjusting means.

Referring to the drawings by numerals, 1 2 denote the ends of the housing of the mill. Each of said ends is formed in sections, and extending between the upper sections thereof is a housing-cap 3, forming a cover which is removable, the upper housing-sections, to which the cap is secured, being hinged to the lower sections, as shown. Any suitable means, such as that illustrated, may be employed to secure the upper sections and the cap in closed position. The lower sections are each provided with a foot 4, suitably braced, and at the inner side thereof is a curved flange 5, forming the support for a screen 6, which is reinforced at its upper edges by angle-ribs 6'

and is curved in the same arc as the cap 3, the screen and cap forming a cylindrical chamber 7, in which is a cylinder 8 of conical form, the shortest diameter being at that end of the machine having the inlet for the material. At said inlet is a hopper 9, provided with a gate 10, by which the feed of material is regulated, and in the upper section of the opposite housing 2 is a discharge-opening at which is a spout 11, having a regulating-gate 12. By the provision of the regulating-gates the feed of material through the machine is readily controlled. The cylinder is provided at its ends with spiders having fixed connection with a shaft 13, whereby the cylinder is driven by the revolution of the shaft, this being accomplished by any suitable means—as, for instance, the pulley 14—which has belt connection with a suitable source of power. (Not shown.) On the cylinder are feed-ribs 15 15, which are spirally disposed. The ribs are arranged in overlapping and staggered series, the series toward the discharge end of the machine having a slight inclination or pitch, whereas the inclination or pitch of the other series of ribs increases gradually toward the inlet end of the machine. By this means the movement of the material through the machine while at first very rapid is gradually retarded, whereby the mass is uniformly treated before discharge. The staggered and overlapped arrangement of the ribs insures positive feeding and thorough agitation of the entire mass without danger of clogging, the material having more or less free passage between the ends of the ribs.

16 designates what I term a "breaking-bar," which extends into the path of the material and serves to break the hulls of the grain and to produce friction on the grains to remove the cuticle. In Fig. 6 the bar, which is numbered 17, is of angle form in cross-section, and in the other figures the bar 16 is shown as of flat form and extends through an opening at each side of the machine between the cap 3 and screen 6. The bar 16 is supported to be laterally adjusted to and from the feeding-cylinder upon a rest-bar 18, which has downturned ends bolted or otherwise secured to the housing ends. In each rest-bar



are a plurality of depressions 19, forming seats for followers 20 20, which have reduced upper ends engaging slots 21 21 in the bar. Each follower has a threaded opening engaged  
 5 by threads on a rod 22, loosely occupying holes in heads 23 24, which flank the rest-bar at the depression, and the outer end of the rod is equipped with means, such as 25, to permit of its being turned to cause the fol-  
 10 lower to move and carry the bar 16 into proper adjusted position, it being understood that the follower engages the rod 22 between the heads 23 24 and that the adjustment of the bar 16 is provided to compensate for wear at its in-  
 15 ner edge. The adjustment of the bar is maintained by clamping bolts and nuts 18', the bolts being passed through holes in the rest-bar and through slots 16' in the bar 16. The adjusting-rods 22 are rotatable, but are im-  
 20 movable longitudinally.

In Fig. 6 is shown an adjusting means, consisting of a threaded rod 26, seated in depressions in the rest-bar and having thereon nuts 27 28, which flank the latter and which upon  
 25 being turned move the rod forward or backward, dependent upon which nut is rotated, the other nut serving as a jam-nut to maintain the adjustment. The inner end of the rod 26 is passed through the screen 6 and has  
 30 a head 29 thereon, and 30 is a nut intermediately on the rod, which serves to clamp the screen and bar 17 together, the rod passing through an opening in the depending portion of the bar 17, as shown. A packing 31 is in-  
 35 terposed between the bar 17 and screen, a portion of which is removed at each forward adjustment of the bar. The breaking-bars are supported at their inner end against the impact of the material projected against it by  
 40 a beam 32, extending lengthwise of the machine and bolted or otherwise secured to the housing.

33 denotes what I term an "abrading-wall," which is adjusted the proper distance from the  
 45 feeding-cylinder to effect the removal of the hulls and cuticle which may adhere to the material after it has passed the breaking-bar. The wall, which may be of woven wire, is secured at its upper end to the inner side of the  
 50 cap, and its lower end is passed around a cushion 34, of rubber or its equivalent and clamped between said cushion and a plate 35 through the medium of a shouldered and headed rod 36. The outer end of the rod 36  
 55 is threaded and engages a threaded opening in a boss 37, provided on the outer side of the cap. The rod is equipped with means for turning it whereby to effect the adjustment of the lower end of the wall to and from the  
 60 feeding-cylinder, the wall being adjusted intermediately by set-bolts passed through threaded holes in the cap and secured to the plate 35. The wall is backed by an imperme-  
 forate sheet 38, whereby the passage of the

hull particles through the openings of the 65 wall is prevented.

In practice the breaking-bars and wall are properly adjusted with reference to plane of rotation of the ribs on the feeding-cylinder, and this may be accomplished while the ma- 70 chine is in operation or at rest. The hopper-gate is then withdrawn to the proper extent to effect the desired feed of material, and the machine being set in motion the material falls  
 75 onto the cylinder at its smallest end, and being caught by the first series of ribs is rapidly carried in a spiral direction of movement and engaged by the next series of ribs, when the feed of material toward the opposite end of the machine is somewhat retarded, the rate 80 of movement being lessened as each series of ribs are successively brought into action. In its passage through the machine the material is carried forcibly against the breaking-bar, which acts, as above stated, to break the hulls 85 and remove the cuticle, after which the material is conveyed between the cylinder and abrading-wall 33, where every particle of hull and cuticle is removed, the particles finding  
 90 their way to the bottom of the machine and discharging through the openings of screen 6. It will be understood that the ribs, in addition to feeding the material, cooperate with the bars and wall to effect the complete separation of the hulls and cuticle from the mate- 95 rial, and that, as above stated, by the peculiar construction and arrangement of said ribs the material is uniformly subjected to the hulling action, and the result is a perfectly clean product. The means employed for cushioning the 100 wall 33 insures by providing a yielding surface against breaking of the grains, whether large or small, and as the wall after extending for a portion of its surface concentric with the cylinder is thereafter arranged tan- 105 gential thereto, as shown, there is no liability of such a clogging action as would cause crushing or breaking of the grains by pressure against each other.

I claim as my invention— 110

1. In a machine of the class described, the combination of a horizontal housing having an inlet and outlet for the material, a feeding and hulling cylinder having on its outer sur- 115 face a plurality of series of spirally-disposed feeding and hulling ribs, the several spiral series overlapping one with the other and having a gradually-increased inclination toward the inlet end of the housing, a hulling-bar at each side of the cylinder, means for adjusting 120 said bars to and from the cylinder-ribs, rest-bars forming the supports for the hulling-bars, screw-rods at the rest-bars, followers on the screw-rods connected with the breaking-bar whereby the latter is adjusted by rotation 125 of the rods, and set-nuts for maintaining the adjustment.

2. In a machine of the class described, the



combination of a housing, a feeding and hull-  
ing cylinder therein, breaking-bars at each  
side of the cylinder, rest-bars forming the  
support for the breaking-bars, screw-rods at  
5 the rest-bars, followers on the screw-rods con-  
nected with the breaking-bar whereby the lat-  
ter is adjusted by rotation of the rods, and  
set-nuts screwed on bolts passed through slots  
in the breaking-bars for maintaining the ad-  
10 justment.

3. In a machine of the class described, the  
combination of a horizontal housing, a ribbed  
feeding and hulling cylinder therein, a rigid  
abrading-wall fixed at one edge and adjust-  
15 ably attached at its other edge and having a  
portion concentric with the cylinder and a  
portion tangential to the latter, and a cushion  
behind the concentric portion of the wall.

4. In a machine of the class described, the

combination of a housing, a feeding and hull- 20  
ing cylinder therein, an adjustable breaking-  
bar, and an adjustably-mounted cushioned  
rigid abrading-wall in close proximity to the  
breaking-bar.

5. In a machine of the class described, the 25  
combination of a housing, a feeding and hull-  
ing cylinder therein, an adjustable breaking-  
bar, a beam forming the support for the free  
end of the bar, and an adjustably-mounted  
cushioned rigid abrading-wall above the break- 30  
ing-bar.

In testimony whereof I have signed my name  
to this specification in the presence of two sub-  
scribing witnesses.

JOSEPH F. DUNLAP.

Witnesses:

MARTIN H. MANION,  
JNO. R. McMAHON.