

No. 750,610.

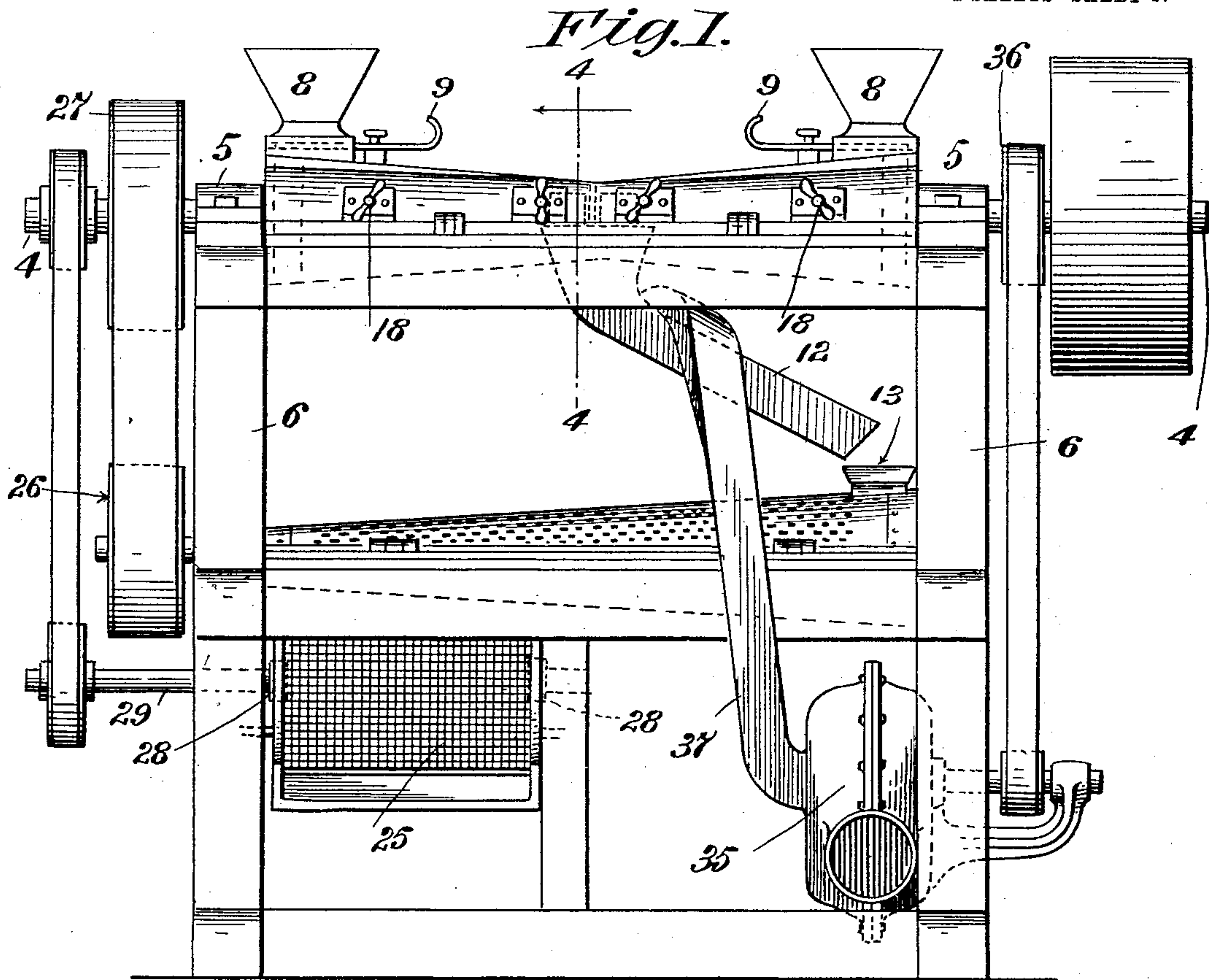
PATENTED JAN. 26, 1904.

A. B. COUCH.  
GRAIN HULLER.

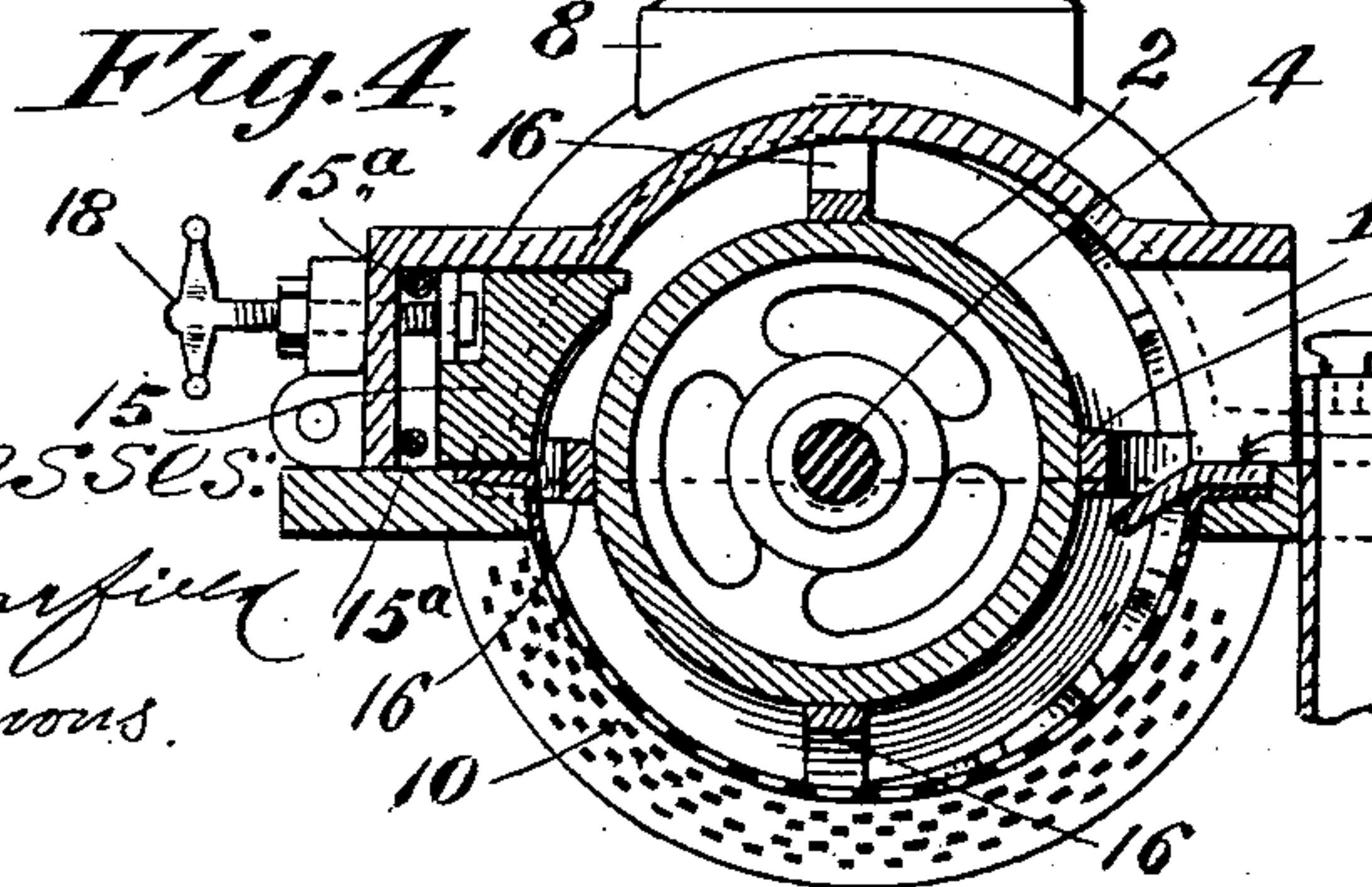
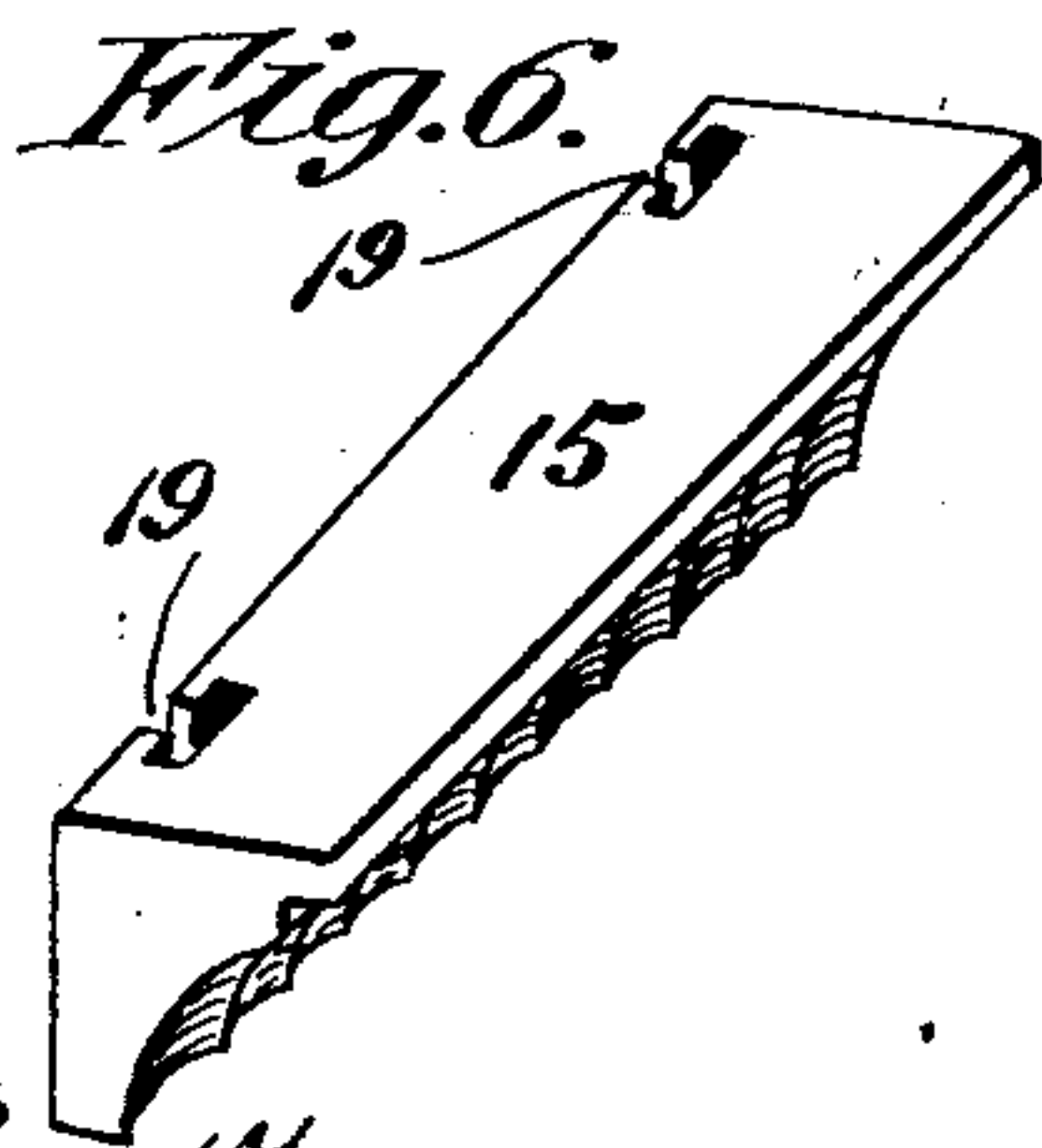
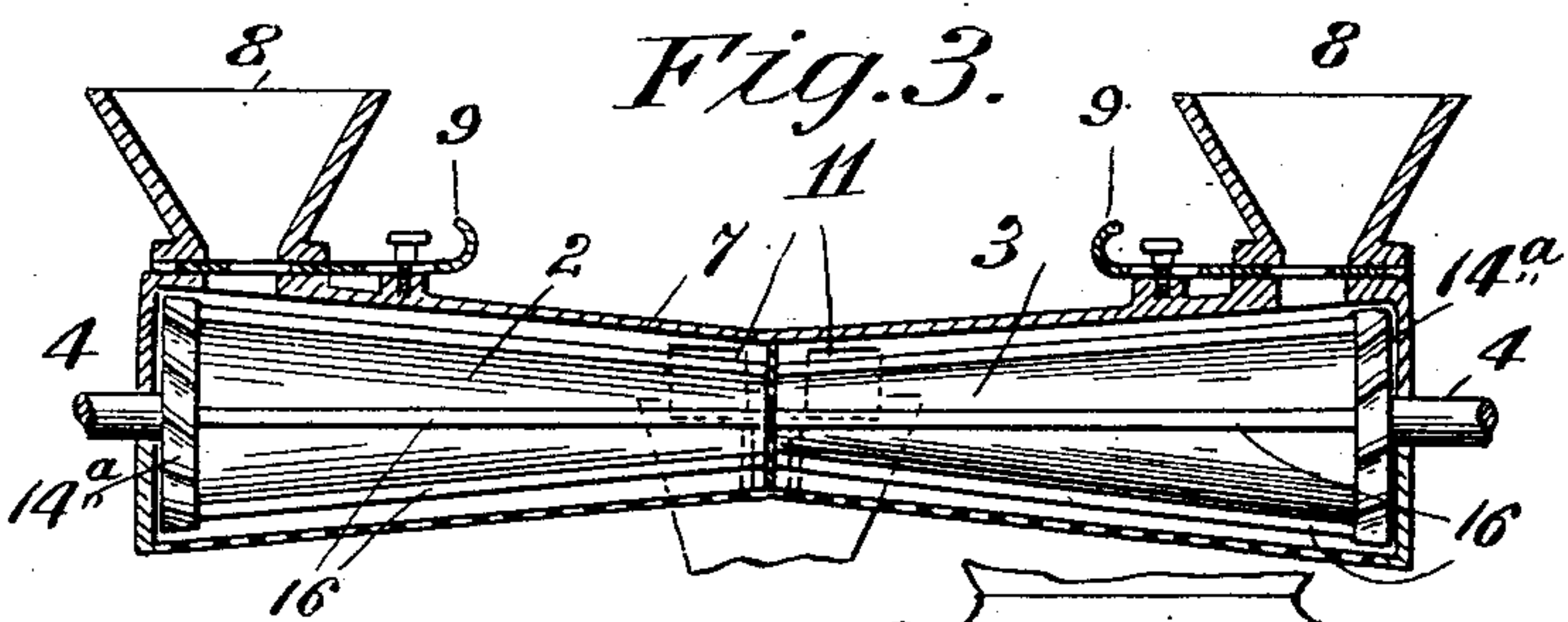
APPLICATION FILED DEC. 13, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



*Fig. 5.*



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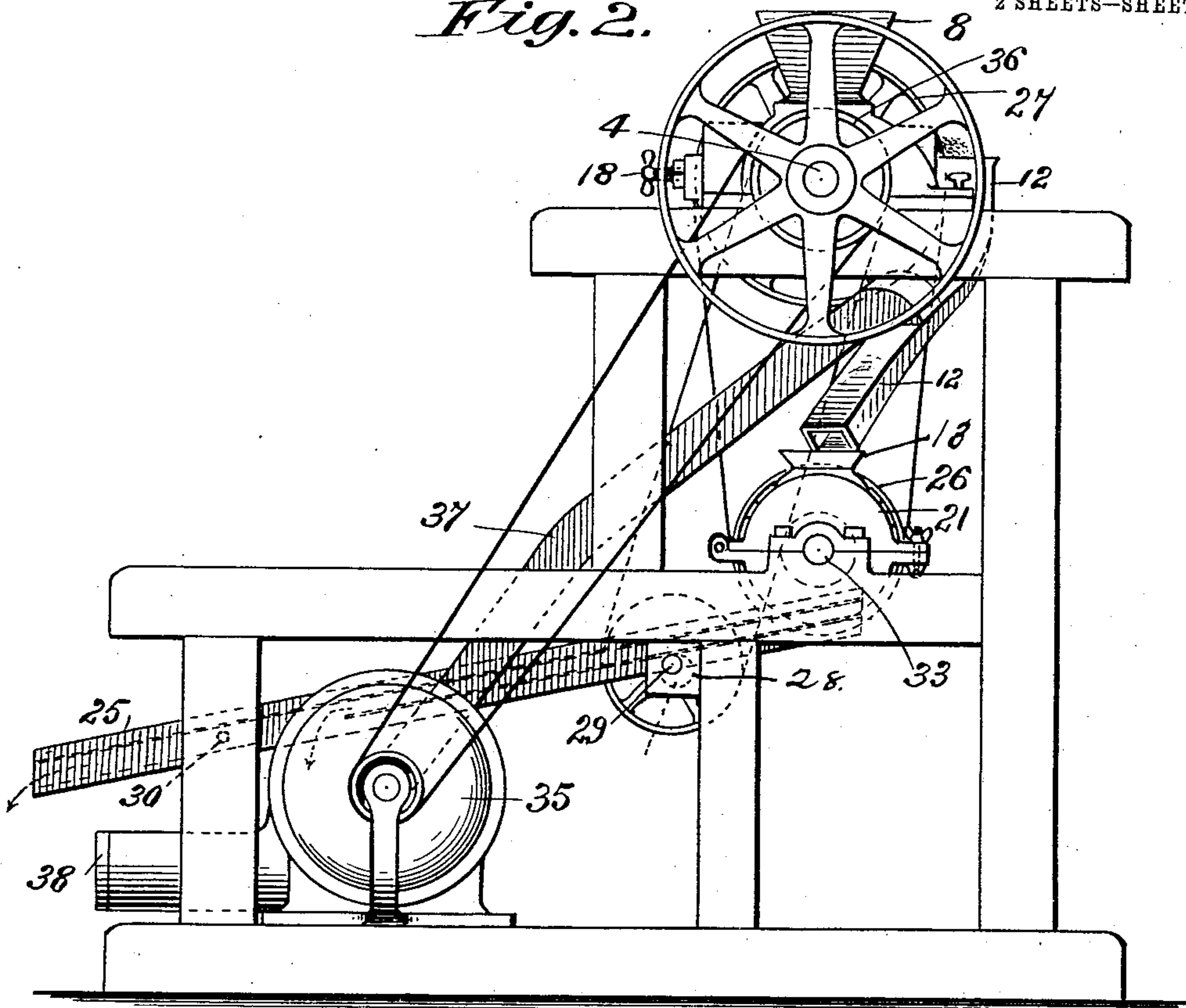
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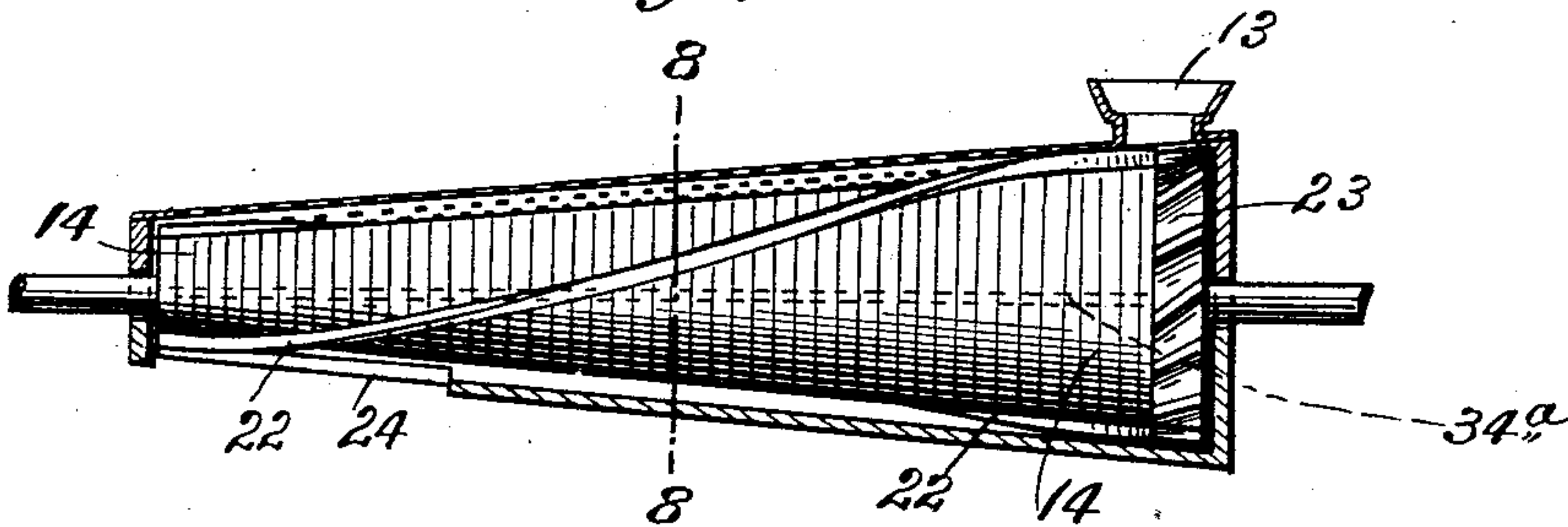
NO MODEL.

2 SHEETS—SHEET 2.

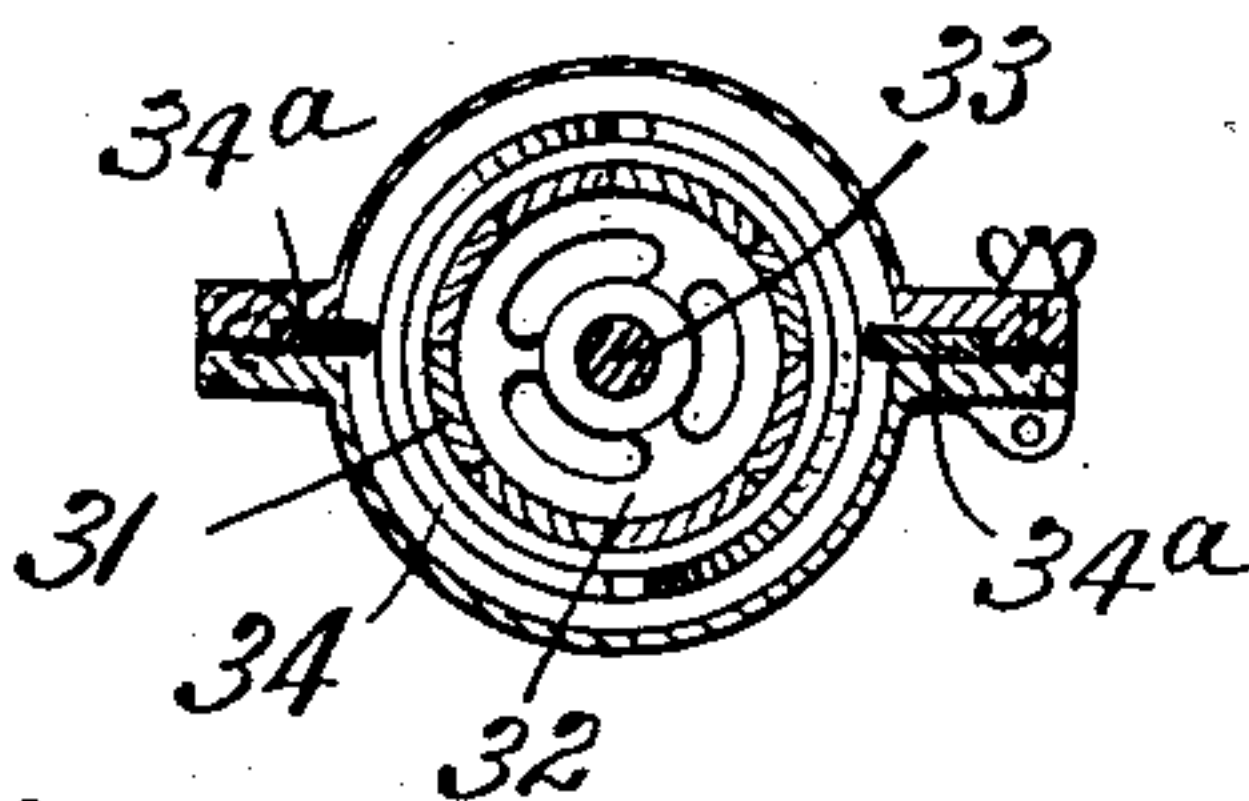
*Fig. 2.*



*Fig. 7.*



*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

ALBERT BRITAIN COUCH, OF HOUSTON, TEXAS.

## GRAIN-HULLER.

SPECIFICATION forming part of Letters Patent No. 750,610, dated January 26, 1904.

Application filed December 13, 1901. Serial No. 85,799. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT BRITAIN COUCH, a citizen of the United States of America, residing at Houston, in the county of Harris and State of Texas, have invented new and useful Improvements in Grain-Hullers, of which the following is a specification.

This invention relates to machines for hulling grain, and is in the nature of an improvement on Letters Patent of the United States granted to me on July 25, 1899, numbered 629,547, the object of the invention being to increase the capacity and reduce the cost of manufacture relative to the capacity of the machine and to make certain improvements in the detailed construction, all as hereinafter set forth.

In the drawings forming part of this application, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is an end elevation of Fig. 1 looking from the right. Fig. 3 is a longitudinal sectional elevation of the huller-cone casing and showing the huller-cone in side elevation. Fig. 4 is an enlarged transverse section on line 4 4, Fig. 1. Figs. 5 and 6 are detailed views of the huller-bars. Fig. 7 is a side elevation of the polishing-cone, its casing being in section; and Fig. 8 is a transverse sectional view of the same on line 8 8 of said figure.

In this machine two hulling-cones are provided (indicated by 2 and 3) and are suitably supported on a common shaft 4, supported in suitable bearings 5 on the frame 6. These two cones are oppositely placed on the shaft 4 and are inclosed in a suitable casing 7, divided longitudinally, as shown in Fig. 4, substantially on the axis of said cones, the upper half of said casing being of sheet metal and at each end thereof being provided with a hopper 8 whose delivery end is controlled by a sliding gate 9. The lower portion of this cone-casing is of perforated metal, (indicated by 10 and shown in Figs. 3 and 4.) The small ends of the cones 2 and 3 lie in close proximity one to the other at the center of the casing and are separated by a thin metal partition 11<sup>a</sup>, on each side of which are the openings 11, through which the grains after having traversed the length of the hulling-cylinders are forced

and at their exit fall into the end of a conduit 12, whereby they are carried to and delivered into a hopper 13, located at the large end of a polishing-cone 14.

While the grains are subjected to the action of the hulling-cones 2 and 3 the hulls and kernels are separated, and many of the finer particles of the hulls will drop through the lower perforated half 10 of the cone-casings. This hulling process is accomplished as follows: First, means are provided for forcibly carrying the grain toward the small end of the cones by means of propeller-blades 14<sup>a</sup>, fixed on the shaft 4 at each end and in close proximity to the hulling-cones 2 and 3 and of course within the cone-casing 7. When sufficient grain has been delivered into the latter to cause it to back up against the end of the casing of the cones, then these blades begin to force it forward toward the openings 11. The cones 2 and 3, together with their casings, are true cones; but the axis of the shaft 4 is located eccentrically to the axis of the casings, to the end that between one side of said cone and that side of the casing nearest thereto there shall be provided a space which narrows constantly between one point on said cone and its opposite point, and at this narrowest point there is located the metal huller-bar 15, which is shown in detail in Figs. 5 and 6. That side of the huller-bar next to the surface of the cone is provided with a series of inclined corrugations, and the direction of inclination of these corrugations is contrary to the course of the grain passing through the casing, to the end that the passage of the grains may be restrained to a certain degree. Furthermore, the face of these huller-bars is concaved longitudinally on a shorter radius than that of the cone, to the end that the passage between the cone and the upper edge of these huller-bars shall be still further restricted, as shown in Fig. 4. The result of this construction is that from a point opposite the huller-bar the channel or space between the cone and its casing which the grain must follow is substantially helical when looked at in cross-section.

On the surface of the cones there are secured four ribs or bars 16, parallel with the axis of the cones and of such height above the



surface thereof that they will pass by the upper edge of the huller-bar without touching it. These bars are of steel and equally spaced around the cone and extend from one end thereof to the other. At that point on the casing opposite the huller-bar 15—that is to say, at that point where the space between the cone and its casing is divided—there is secured a sheet-steel beater-board 17, which is bent downward at an angle of about thirty-five degrees and rigidly held in the cone-casing by any suitable means. This member projects inward far enough to bring its edges into close proximity to the outer surface of the bars 16 during the revolution of the cone, and it is made of spring-steel, whereby it may yield to permit the passage of grains between its edge and the bar 15 without cracking the hulls. The huller-bar is cushioned at the rear by a couple of rubber packing-strips 15<sup>a</sup>. (Shown only in Fig. 4.)

From the above description of the hulling-cones it will be seen that the grain delivered through the hoppers 8 will be constantly forced, by means of the propelling device 14<sup>a</sup>, toward the small end of the cone, where, encountering the partition which separates these cones, it will be expelled through the opening 11 by pressure on the mass behind, also that during its transit through the cone-casing it will be subjected on the beater-board 17 and between the hulling-bar 15 and the cone to a rolling and rubbing action, which will crack and remove the hulls from the grain; that a large part of the finer particles of the hulls will sift through the perforated plate which constitutes the lower half of the cone-casing.

The complete separation of the hulls from the grain is effected by subsequent operations, which will be described farther on.

The huller-bars 15 are adjustable toward and from the surface of the cones by means of hand-screws 18, having a head thereon for engagement with the T-slots 19, located in the back side of the huller-bars, all of which is shown in Figs. 4 and 5. The position of the hand-screws for adjusting these bars is also clearly shown in Fig. 1.

From the hulling-cones the grain passes through the conduit 12 into the hopper 13, which is located on the casing 21 of the polishing-cone 14. This cone lies beneath the hulling-cones 2 and 3 and has a long easy taper, being provided with two helical ribs 22 and also with a propelling device 23 at the large end of the cone near the hopper, which, together with said ribs 22, will force the grain to the small end of the cone, where it will fall through an opening 24 onto the screen 25, which is shown in Figs. 1 and 2. There is no novelty in the screen construction, which is practically the same as that described in my said prior United States Letters Patent.

The polishing-cone 14 is rotated by means of a pulley 26, belted to a pulley 27 on the shaft 4. The screen 25 has a shaking motion imparted thereto by means of the eccentrics 28, (shown in Figs. 1 and 2,) secured to a shaft 29, running under the screen.

The two sides of the screen-frame rest on the eccentrics, said frame being pivotally supported at 30, as shown in Fig. 2. This shaft 29 is also driven by suitable belt and pulley connections with the shaft 4.

In constructing the polishing-cone 14 a wooden cone (indicated by 31, Fig. 8) is first built up on spiders 32, secured to the cone-shaft 33, and this cone is then wound with a strip of walrus hide, preferably, or some such material, (indicated by 34,) over which the ribs 22 are applied. Between the upper and lower half of the casing for this cone there are secured strips of leather running lengthwise thereof and whose edges project inward toward the surface of the cone and are indicated by 34<sup>a</sup>. As the grains now deprived of their hulls pass through the polishing-cone they are rolled over and over between the yielding surface of the cone and the cone-casing and between said yielding strips 34<sup>a</sup> and the cone-surface, whereby the grains are polished. From this cone the grains pass to the screens 25, where they are graded in the usual manner.

The separation of the hulls from the grain is effected by a suction-fan 35, (shown in Figs. 1 and 2,) which is driven by means of a pulley 36 on the shaft 4 and a suitable belt connection therefrom with the fan. The suction-pipe 37 extends from the fan-casing up to the upper side of the conduit 12 and separates the hulls from the grain, blowing the former out of the delivery end 38, which may be carried as far as necessary away from the machine.

The point at which the connection of the conduit 12 is made with the suction-pipe 37 of the fan is at that point where the grain and the hulls would be subjected to considerable agitation by reason of their fall from the cone-casings of the hulling-cones into the open end of said trough. The upper half of the casing of the polishing-cone is made of perforated metal to permit the escape of any dust which may arise from the passage of the grains through said casing.

By means of the hereinbefore-described construction of hulling-cone the huller-bar 15 may be set up to restrict the passage between its upper edge and the side of the cone to such a degree that the grain may be backed up in the cone-casing to produce more or less friction between the grains, whereby the hulls may be after having been cracked rubbed off from the grains, as described. This is an important feature of the machine, for the reason that when the hulls are separated from the grain by the rubbing of the kernels one against the other the hulling process may be completed with a less percentage of broken grains than



where the hulling process is more largely performed by the operation of the moving parts of the machine directly upon the grain.

5 Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a machine for hulling grain, two oppositely-located rotatable cones having a common axis, a suitable casing for said cones, means  
10 on each cone for moving grain toward the contiguous ends of the cones, an inlet-opening in the casing for each cone, an outlet-opening in the casing at the delivery end of said cones, a bar on each cone axially located thereon and  
15 projecting beyond the surface thereof, and huller-bars parallel with the surface of the cone, adjustably supported in the casing opposite each cone, and means for adjusting said huller-bars toward and from said cones, com-

bined with a polishing-cone and means for 20 conveying grains from the hulling-cones to the polishing-cone.

2. In a machine for hulling grain, a rotatable cone having an axially-disposed rib thereon, propeller-blades secured to the large end of 25 the cone, a casing for the cone, a huller-bar in the casing, the operative surface of which bar is concave, and the axis of said surface eccentric to that of the cone, the surface of said bar having spirally-disposed ribs thereon oppo- 30 sitely inclined to the direction of movement of the grain from one end of the cone to the other.

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