

No. 646,893.

Patented Apr. 3, 1900.

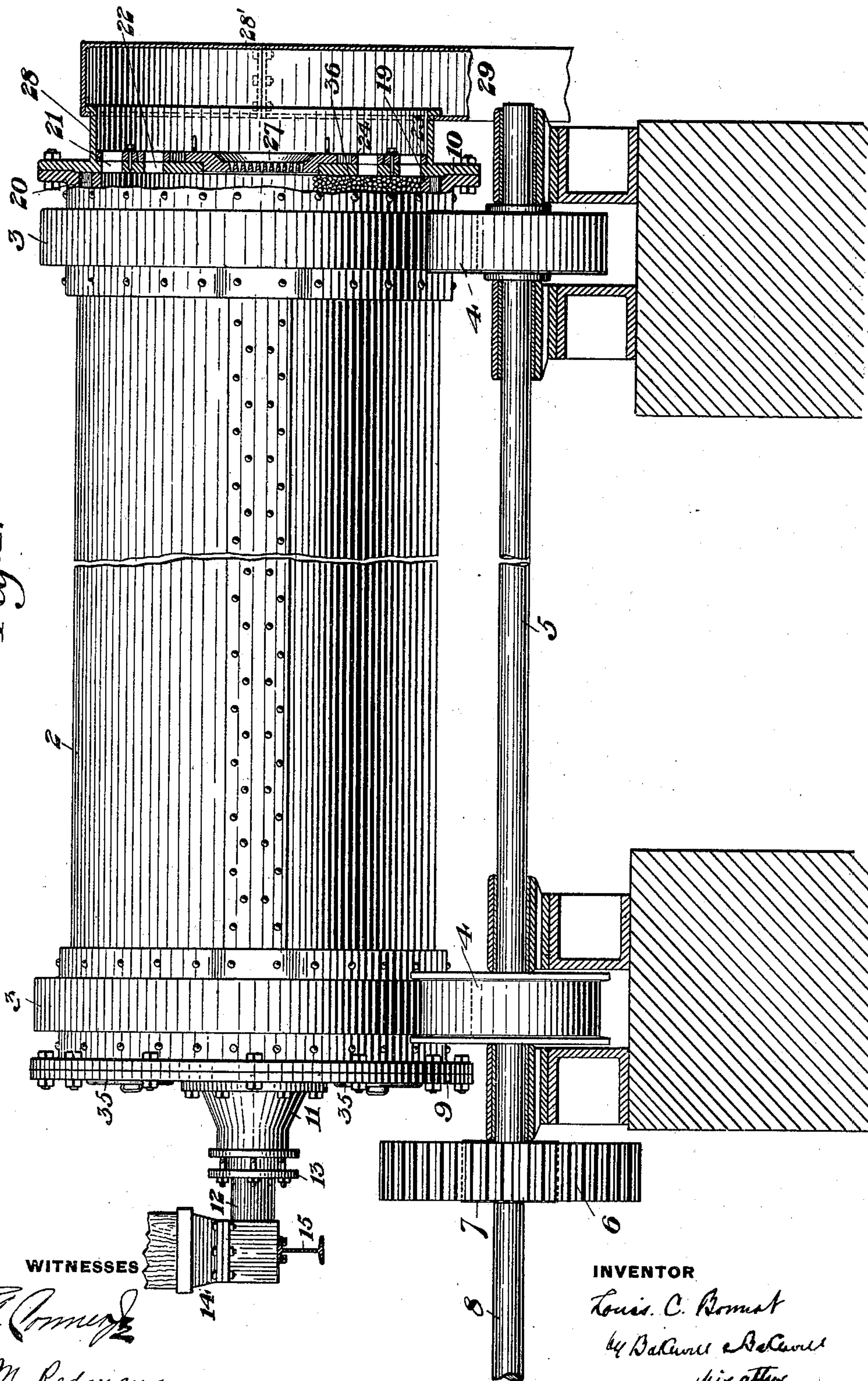
L. C. BONNOT.
GRINDING CYLINDER.

(No Model.)

(Application filed Dec. 22, 1898.)

4 Sheets—Sheet 1.

Fig. 1.



WITNESSES

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4 Sheets—Sheet 2.

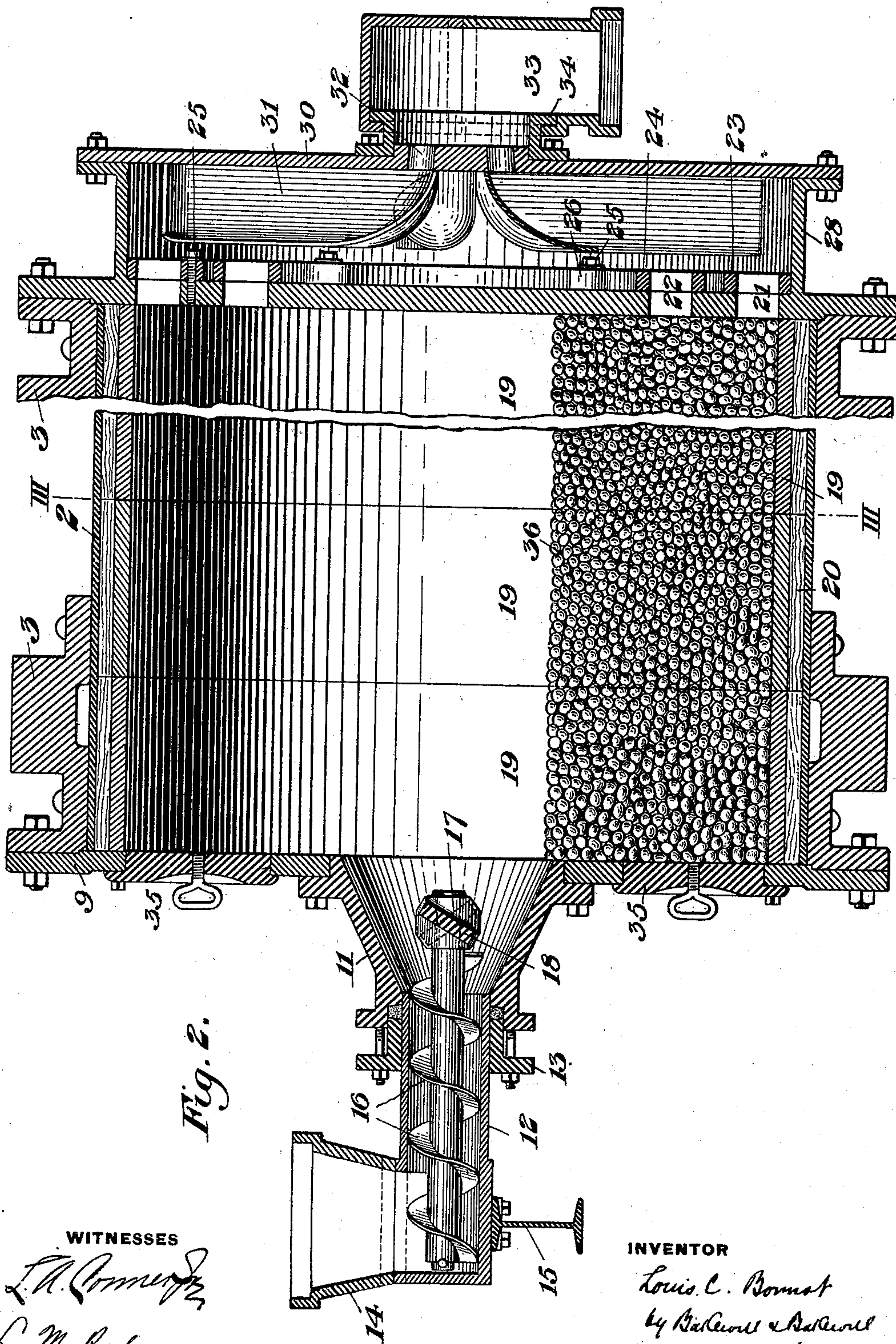


Fig. 2.

WITNESSES

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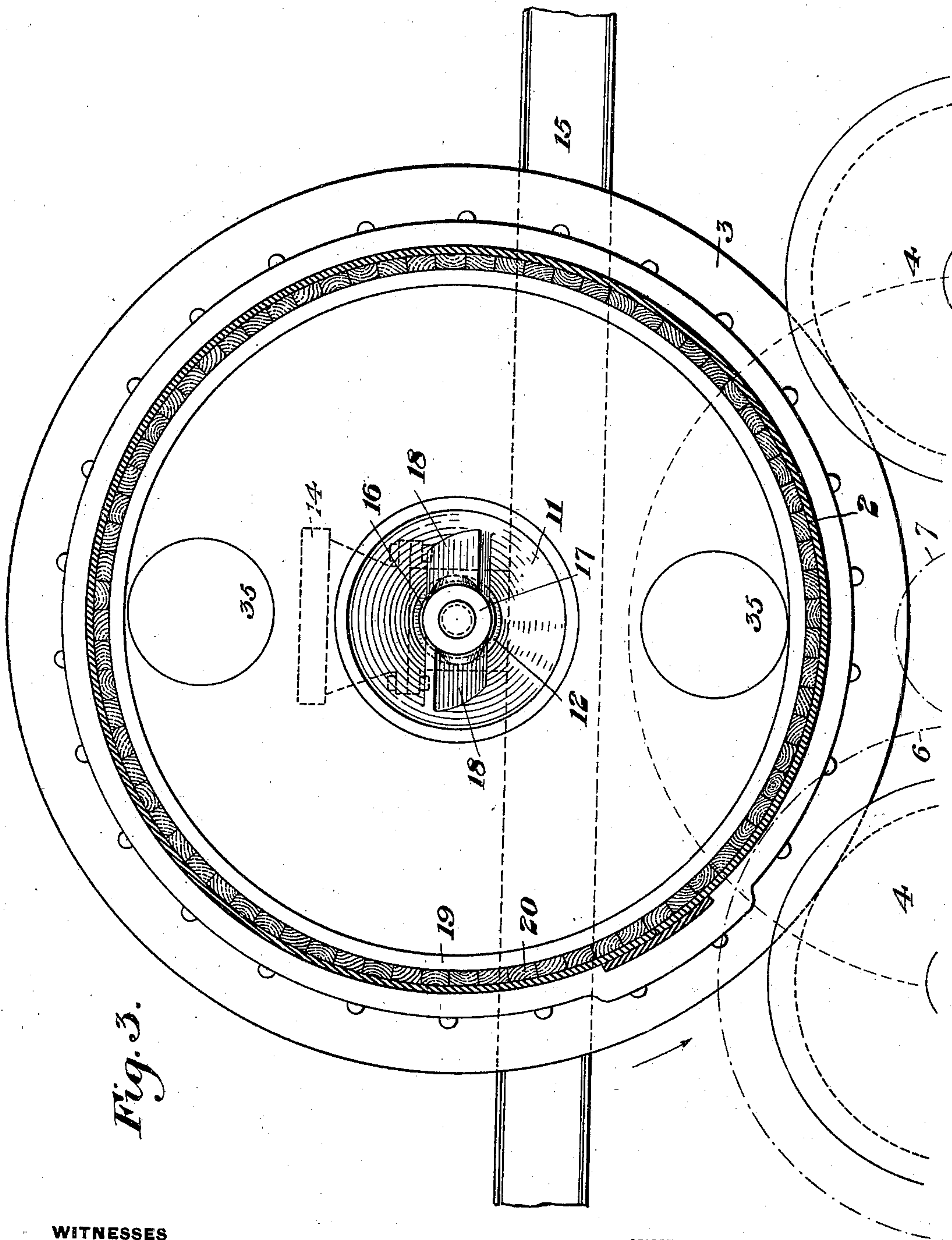


Fig. 3.

WITNESSES

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Fig. 6.

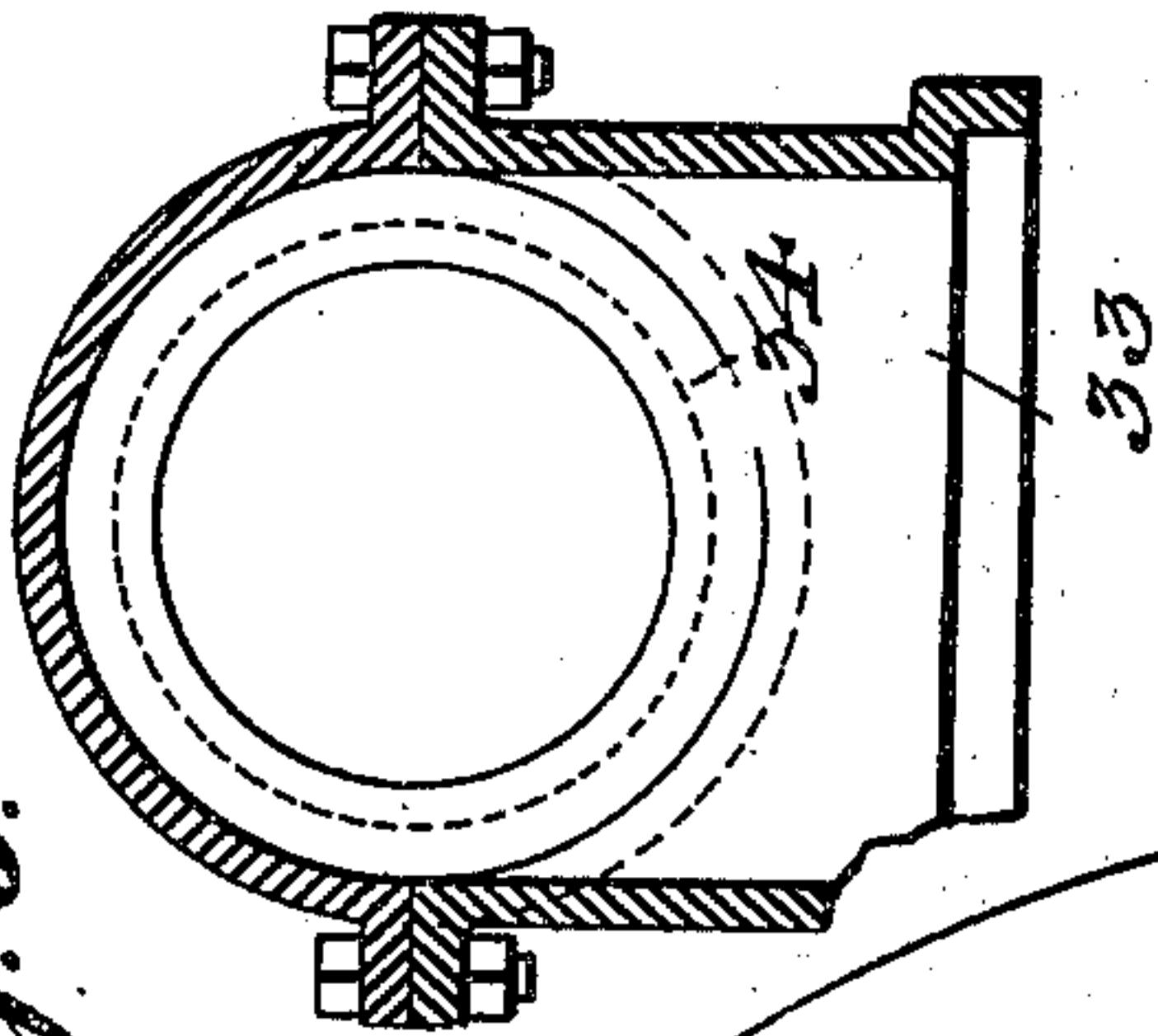


Fig. 4.

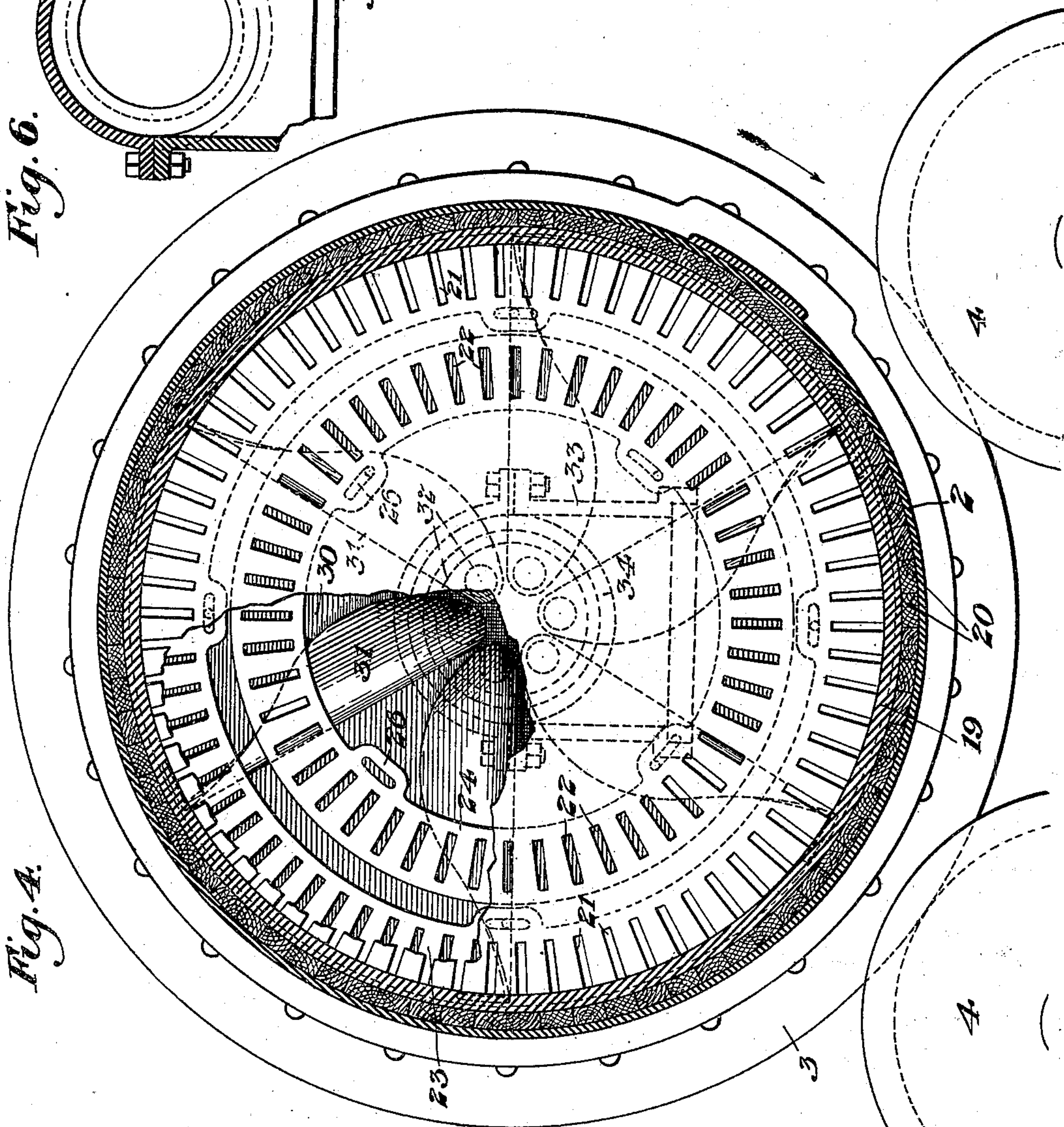
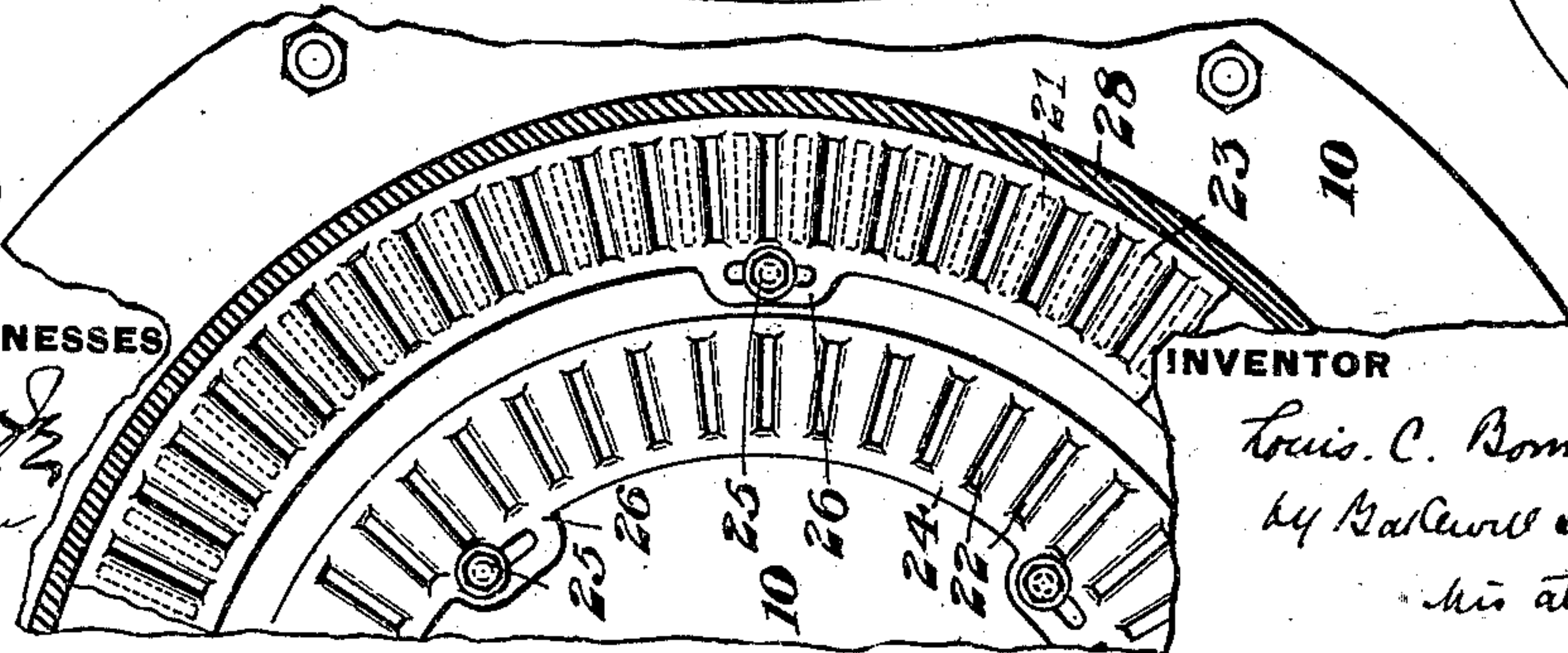


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

LOUIS C. BONNOT, OF CANTON, OHIO.

GRINDING-CYLINDER.

SPECIFICATION forming part of Letters Patent No. 646,893, dated April 3, 1900.

Application filed December 22, 1898. Serial No. 700,010. (No model.)

To all whom it may concern:

Be it known that I, LOUIS C. BONNOT, of Canton, in the county of Stark and State of Ohio, have invented a new and useful Improvement in Grinding-Cylinders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly broken away, of one form of my improved grinding or pulverizing apparatus. Fig. 2 is a vertical longitudinal section of a modified form with the central portion of the cylinder broken away. Fig. 3 is a vertical cross-section on the line III III of Fig. 2 looking toward the inlet end of the cylinder. Fig. 4 is a vertical cross-section of the form of Fig. 2 looking toward the discharge end, with the end plate partly broken away. Fig. 5 is a detail broken end elevation of the cylinder, and Fig. 6 is a vertical cross-section of the delivery box or hood of Fig. 2.

My invention relates to the class of grinding or pulverizing cylinders for reducing materials to a powdered condition, and is designed to provide improved mechanism for feeding the material into the cylinder and to improve the construction of the cylinder itself and the outlets therefrom, as well as to provide means for collecting the material issuing from said outlets.

In the drawings, 2 represents a horizontal cylinder having secured at or near its ends bearing-rings 3 3, which rest within the recessed peripheries of supporting-wheels 4 4, which are arranged in pairs, as indicated in Fig. 3. The set of wheels upon each side of the cylinder is secured to a common shaft 5, and one of these shafts is provided with a toothed wheel 6, intermeshing with a pinion 7, secured to a driven shaft 8, by means of which the cylinder is given a rotary motion.

The ends of the cylinder are closed by heads or end plates 9 and 10, the head 9 having a central inlet 11, preferably made in the form of the frustum of a cone. Within the outer end of this inlet is neatly fitted a feed-tube 12, a suitable stuffing-box 13 being secured to the inlet and surrounding this tube to prevent the escape of dust or powdered material

at this point. The feed-tube 12 leads from the lower end of the hopper 14, and these parts are rigidly secured upon a suitable support 15. Within the feed-tube 12 is placed a feed-screw 16, the inner end of which is formed as a hub 17, which is secured to the inlet portion 11 by inclined connecting-webs 18, these webs preferably being inclined in opposite directions upon the opposite sides, as indicated in Fig. 2, for the purpose of feeding the material forward into the cylinder and to prevent clogging of the same. By this simple connection between the feeding-screw and the rotating cylinder I drive this feed-screw directly without the use of outer intermediate connections, as heretofore employed.

The inner grinding-surface of the cylinder is formed by a series of cast-iron rings 19, the meeting edges of which are machined so as to fit neatly together. These cast-iron rings are of smaller diameter than the cylinder, and to secure them in place I drive between their outer peripheries and the inside of the cylinder wooden strips 20, which are preferably of the same length as the width of the rings. I have shown these wooden strips or blocks as abutting together and forming a continuous layer; but they may be separated and driven in at different points around the rings and may be of different lengths, though I have found the form shown a convenient one for assembling, as by starting at one end I may secure one ring by its wooden backing-strips and then insert the next and secure it in the same manner, and so on throughout the length of the cylinder.

The head or closing plate 10 at the exit end of the cylinder is preferably provided with two annular series of outlet-openings 21 and 22, and the passage of the material there-through is regulated by slotted rings 23 and 24, secured to the outer face of the head by bolts 25, passing through slots in lateral lugs 26 and through the head. By the use of the two sets of discharge-openings and the independently-adjustable rings I am enabled to adjust the relative area of the discharge-opening to accommodate the class of material being ground and to regulate the degree of fineness to which it is ground. In the form of Fig. 1 I have shown the head as provided with a

central plate 27, having a series of exit-openings through which the material may pass out; but this may be used or not, as desired. The head 10 is provided with a projecting annular flange 28, which in the form of Fig. 1 fits and rotates within the collecting box or receptacle 28', from which leads the offtake-pipe 29.

In the form of Figs. 2 and 4 I show the outer head of the cylinder as closed at its central portion, and in this form I secure to the flange 28 a closing-plate 30, having secured thereto a series of radial buckets 31, which are open at one side. The curved inner ends of these buckets direct the material falling into them downwardly and outwardly through the holes 32 in the plate 30 into a stationary hood 33, which fits about the neck 34, secured to and rotating with the plate 30. The form of these buckets or scoops is shown in Fig. 4, they preferably having bent outer ends, which are closely adjacent to the inner surface of the flange or ring 28. In this form the material passing out through the annular series of holes in the head of the cylinder is picked up by the scoops, and as they reach the upper portion of their travel the material is fed out through the openings 32 to the collecting-head.

The head 9 is preferably provided with hand-holes which are closed by suitable plates 35.

In using the apparatus the cylinder is filled up to the desired height with the grinding-balls 36 or similar material, as common in this class of machines, and the material to be ground, being fed to the hopper, is moved by the screw-feed into the cylinder. As it passes along through this cylinder it is acted upon and ground by the balls and passing out through the other end is collected and taken away to the point desired.

The use of the metal rings for the grinding-surface greatly reduces the expense of operating the machine, while the wooden strips give a simple and effective means for holding the rings. The construction of the outlets and the feed therefrom is simple and easily adjusted, while the parts are not liable to get out of order.

Many changes may be made in the form and

arrangement of the parts without departing from my invention, since

I claim—

1. A rotatory grinding-cylinder having secured within the same a series of metal rings abutting end to end and fastened by strips or blocks driven in between the rings and the cylinder; substantially as described.

2. A horizontal driving-cylinder having an annular series of discharge-openings, and a slotted annulus adjustably secured to the cylinder and arranged to regulate the size of said discharge-openings; substantially as described.

3. A horizontal rotatory grinding-cylinder having an annular series of discharge-openings, and an adjustable slotted ring rotating with the cylinder for adjusting the size of said discharge-openings.

4. The combination with a rotatory grinding-cylinder, having a series of outlets in its head, of a chamber into which the openings lead, said chamber containing a series of buckets adapted to receive the ground material directly from said outlet-openings, and mechanism for moving these buckets in a rotary path, to receive and discharge the ground material; substantially as described.

5. The combination with a rotatory grinding-cylinder having a series of outlet-openings in its head, of a chamber into which the openings lead, said chamber containing a series of buckets adapted to receive the ground material directly from said outlet-openings, mechanism for moving said buckets in a rotary path to receive and discharge the ground material, and a stationary receptacle situate at the inner ends of said buckets to receive the material therefrom.

6. A horizontal rotatory grinding-cylinder having annular series of discharge-openings, and two or more adjustable slotted rings for regulating the size of said discharge-openings.

In testimony whereof I have hereunto set my hand.

LOUIS C. BONNOT.

Witnesses:

LULU RACKLE,
CHAS. KRICHBAUM.