

No. 673,671.

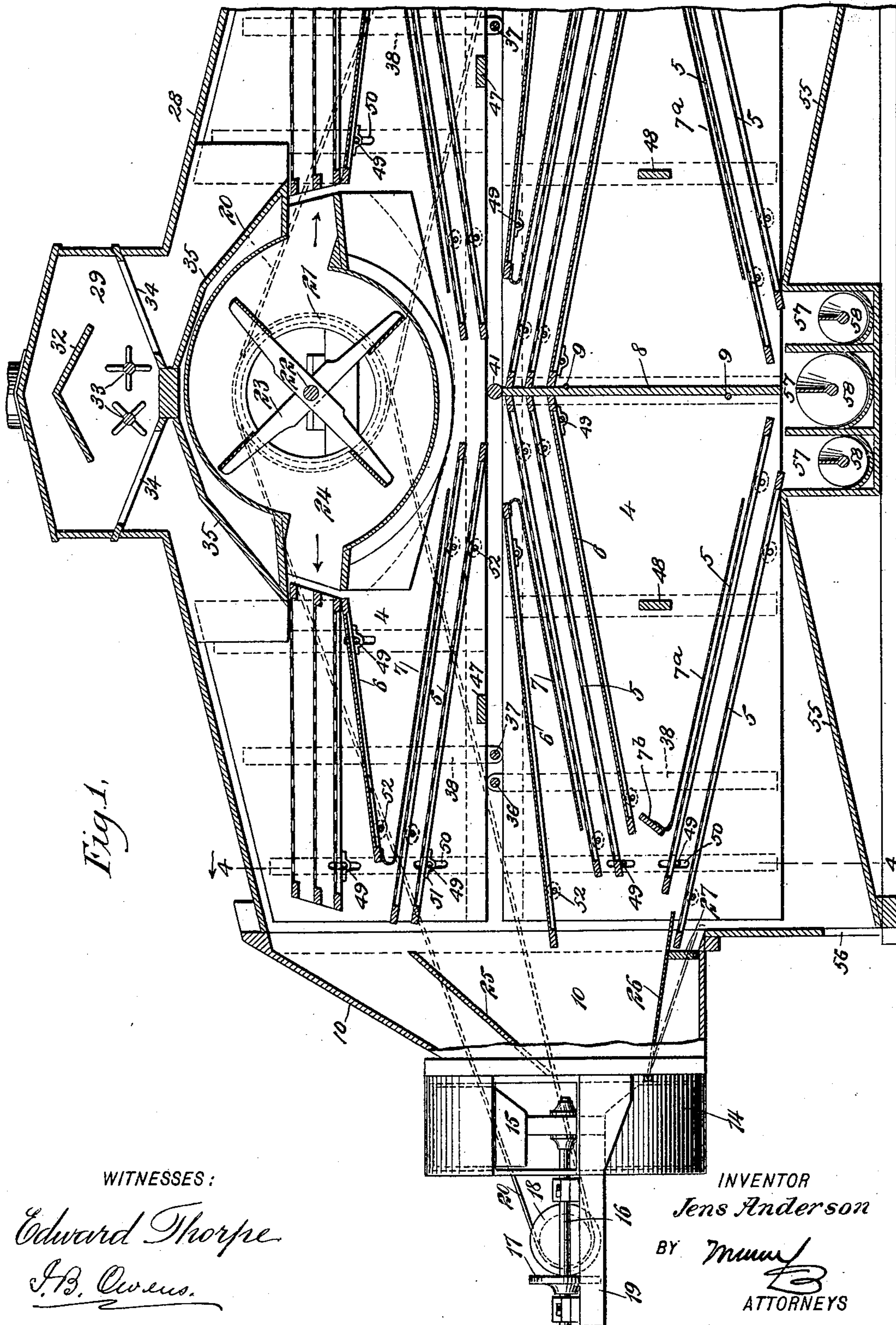
Patented May 7, 1901.

**J. ANDERSON.
SEPARATOR.**

(Application filed May 16, 1900.)

(No Model.)

5 Sheets—Sheet 1.



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Fig. 2

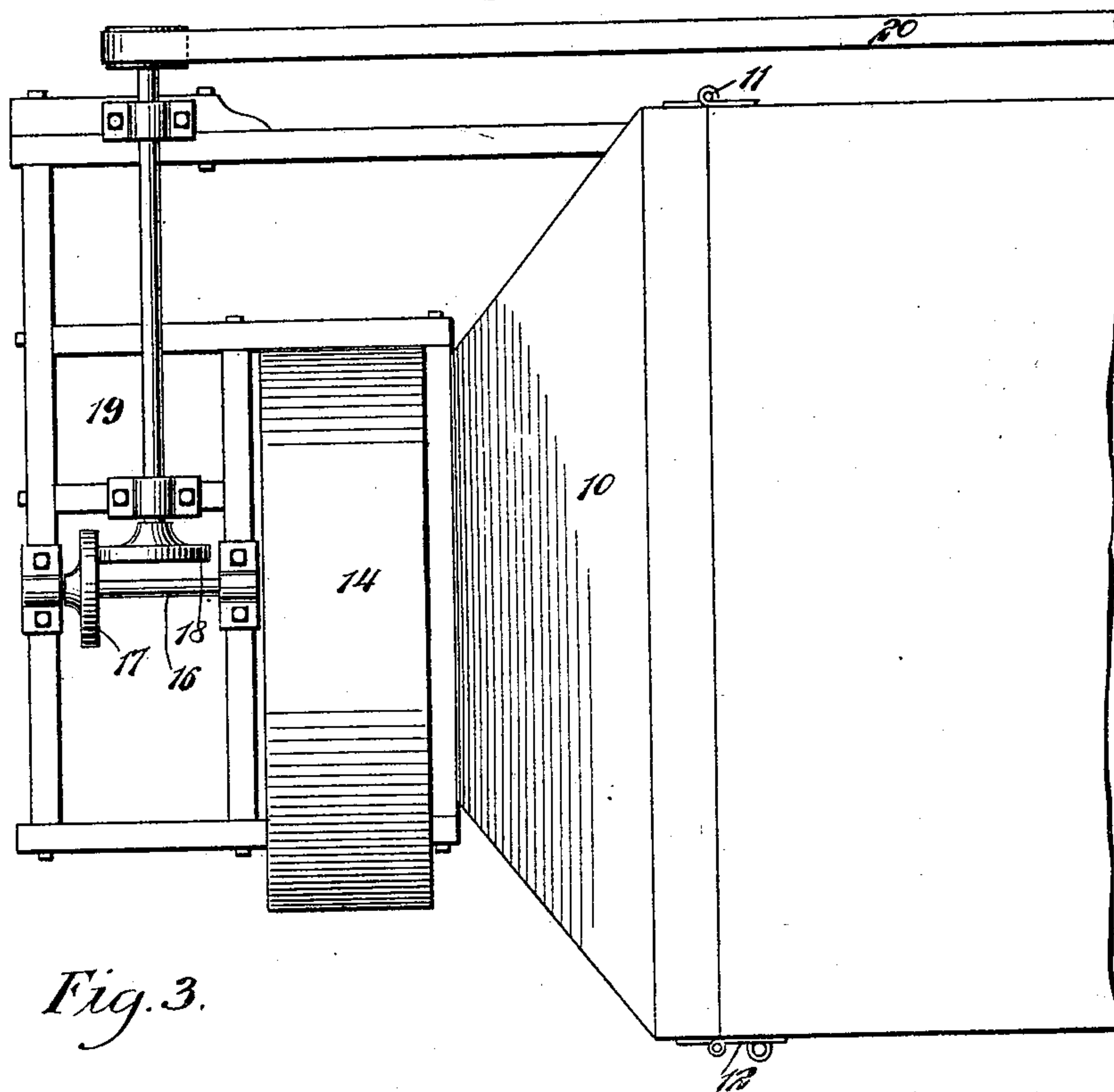
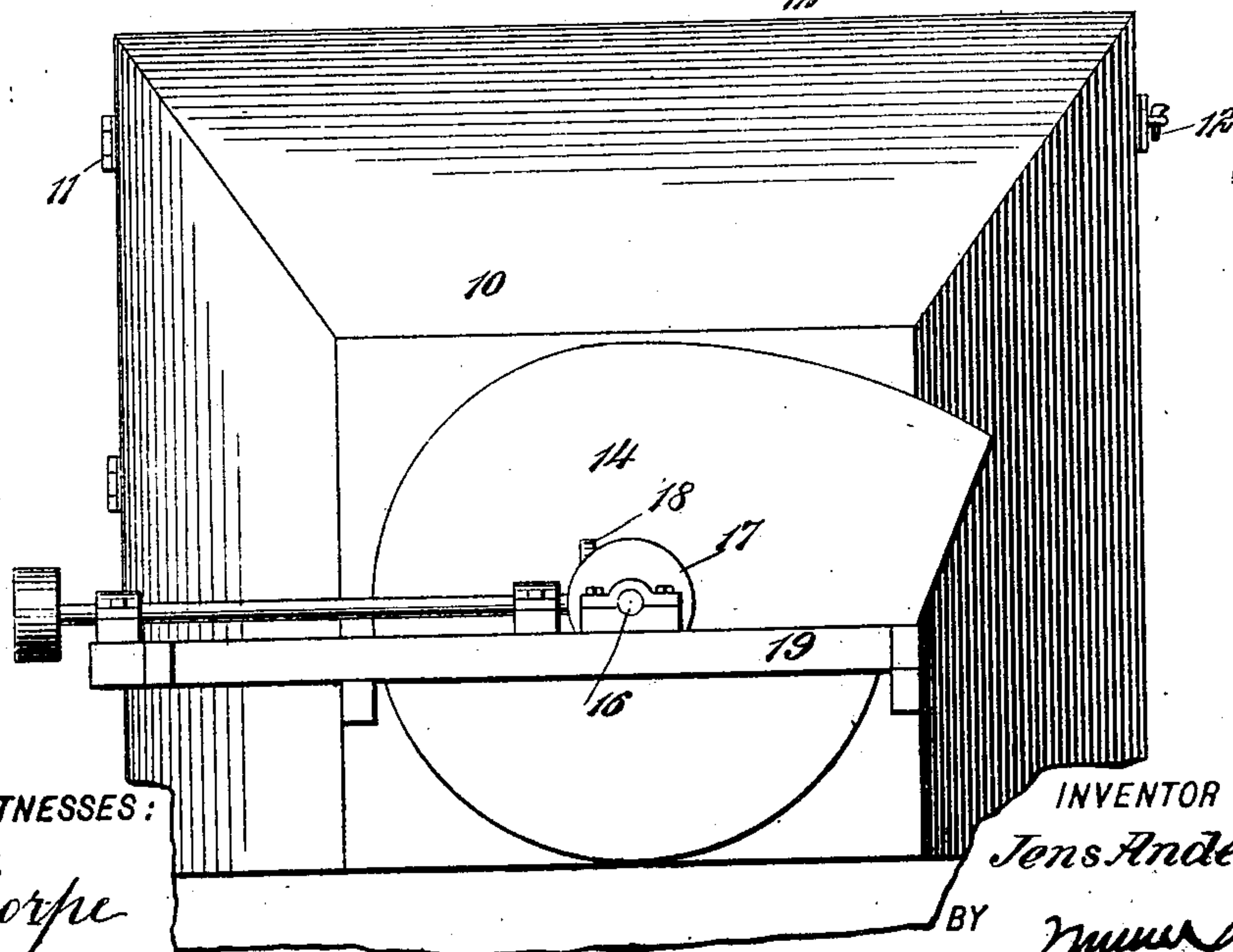


Fig. 3.



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Fig. 4.

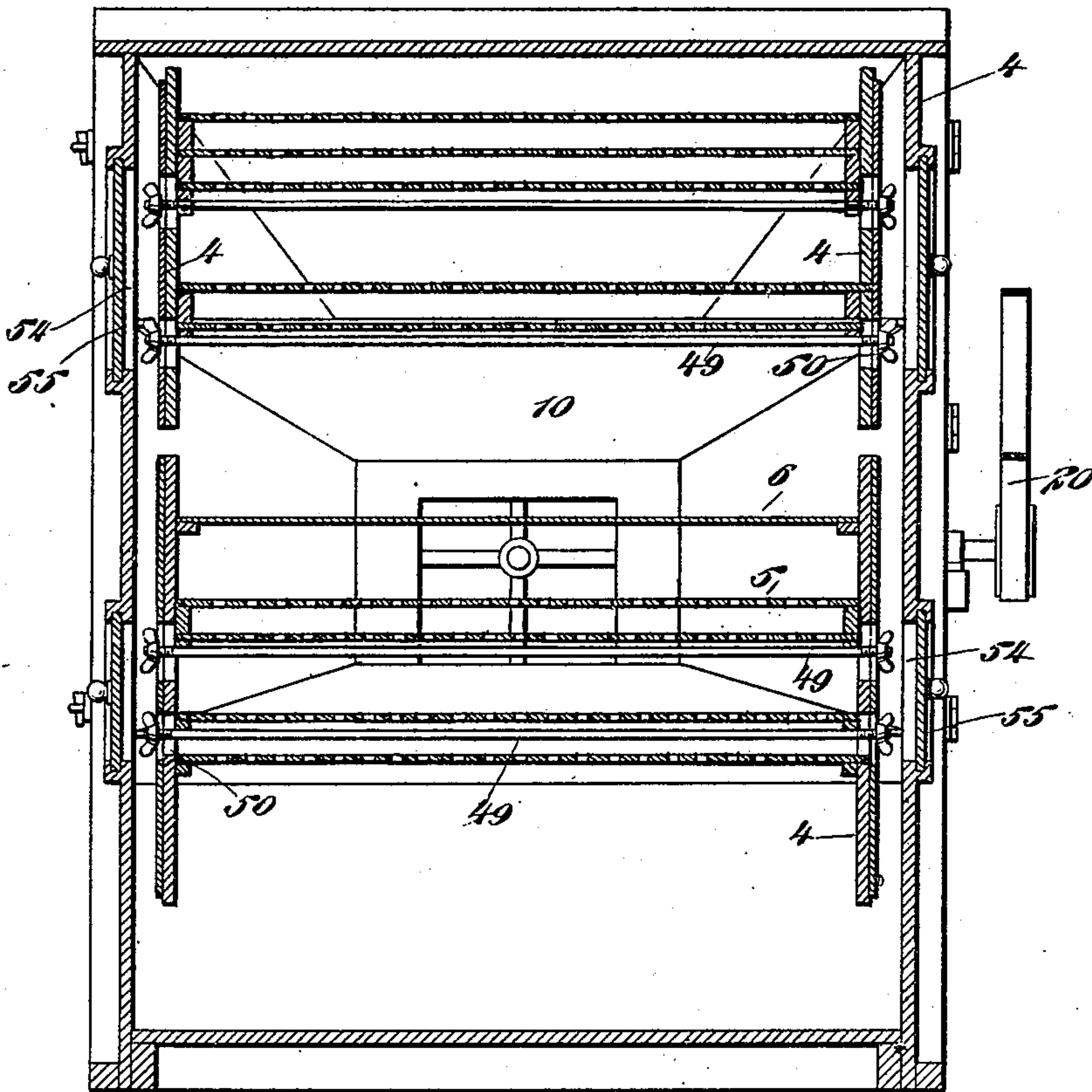


Fig. 5.

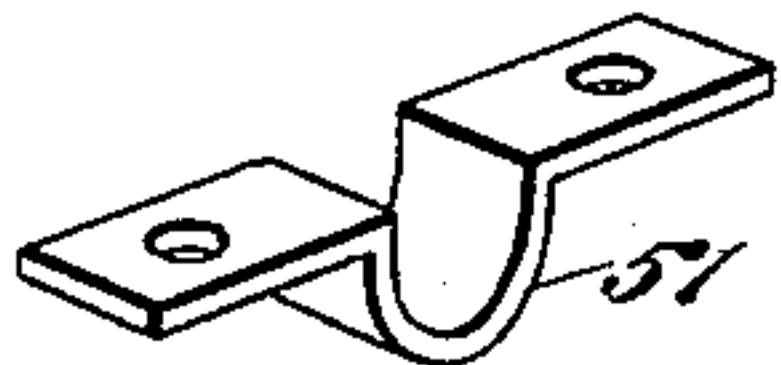


Fig. 6.

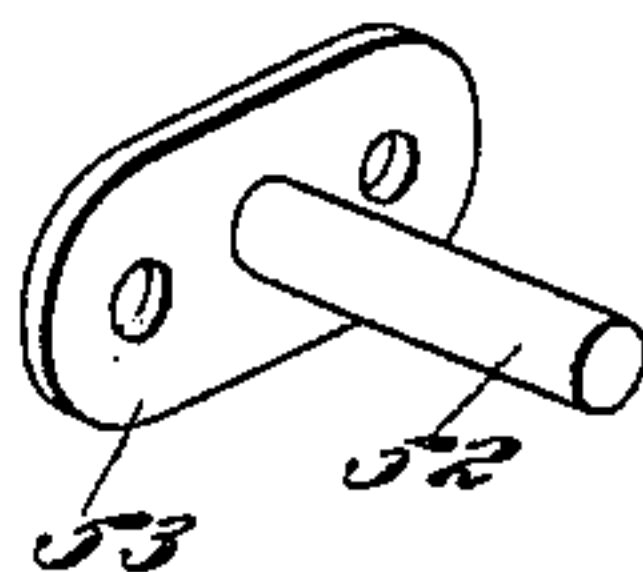
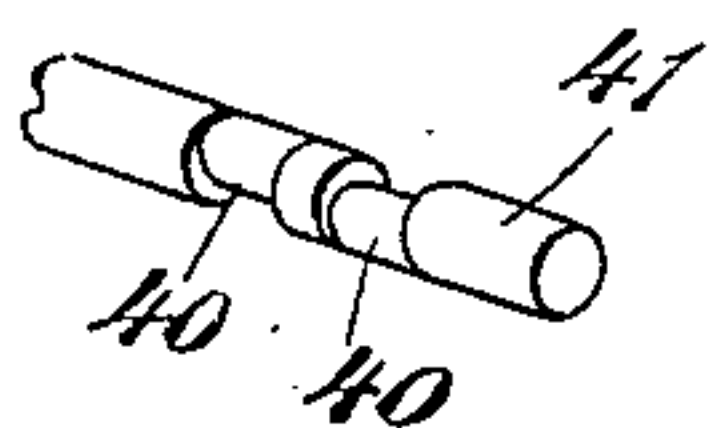


Fig. 7.



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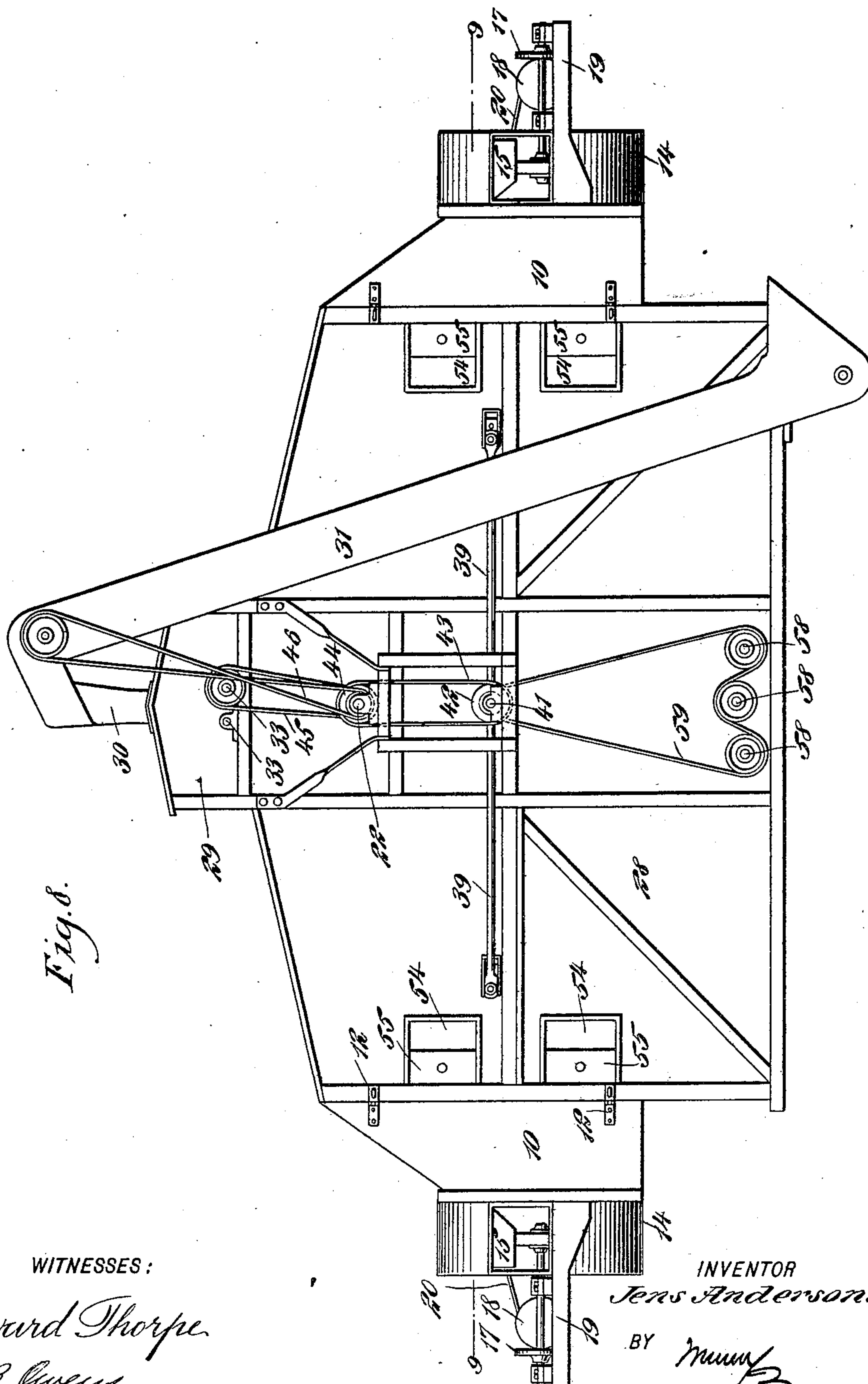
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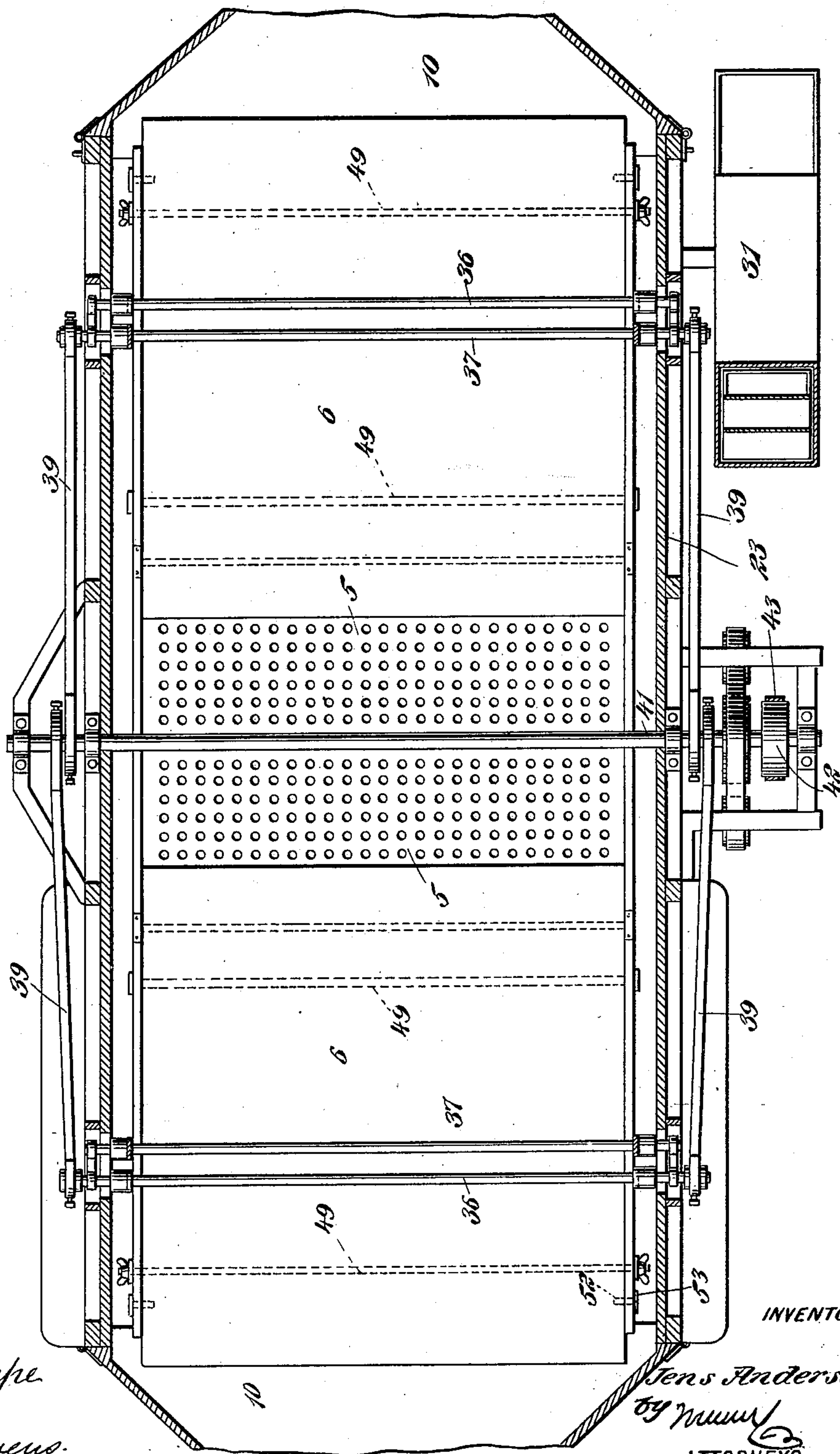
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Fig. 9.



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UNITED STATES PATENT OFFICE.

JENS ANDERSON, OF WALLA WALLA, WASHINGTON.

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SPECIFICATION forming part of Letters Patent No. 673,671, dated May 7, 1901.

Application filed May 16, 1900. Serial No. 16,874. (No model.)

To all whom it may concern:

Be it known that I, JENS ANDERSON, a citizen of the United States, and a resident of Walla Walla, in the county of Walla Walla and State of Washington, have invented a new and Improved Separator, of which the following is a full, clear, and exact description.

This invention relates to an improvement in grain-separators of that class in which the separation is effected by the joint action of a shaking-screen and a blast of air; and the invention resides in certain improvements in the structure and arrangement of the parts, as will be hereinafter fully explained.

This specification is a specific description of one form of the invention, while the claims are definition of the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a vertical longitudinal section of the invention with one of the end portions removed. Fig. 2 is a plan view of one of the ends of the machine. Fig. 3 is an elevation of the same. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is a detail perspective view of one of the straps which are employed for holding the screen and grain-board in place. Fig. 6 is a detail perspective view of one of the pins employed for the same purpose. Fig. 7 is a fragmentary view of the main drive-shaft, showing the eccentrics thereon. Fig. 8 is a side elevation of the complete machine, and Fig. 9 is a horizontal section on approximately the line 9 9 of Fig. 8.

The machine has an outer casing 28, provided at its top with a dome 29, into which the grain is delivered by any means desired. I have here shown an elevator 31, arranged with its discharge-spout 30 entering the dome for the purpose of delivering the grain thereto; but this forms no part of my invention. The boot of the elevator is arranged at the bottom of the casing, so that the grain may be fed thereto and elevated into the dome 29. Here it falls upon a deflector 32 and is fed by agitators 33 through a grating 34 into the casing 28. A fan-box 24 is mounted within the casing just under the dome 29, and the grain is directed over the same and discharged

from each side thereof by chute-boards 35. The fan 23 is mounted within the box 24 on a shaft 22, and the fan-box is formed with two outlets, as shown in the drawings, such outlets being disposed, respectively, toward the end portions of the machine. Within the casing are arranged two pairs of shoes 4, which extend throughout the length of the casing, the said pairs being arranged one above the other. The shoes 4 carry sieves 5 and grain-boards 6. Each grain-board is provided at its discharge end with a sheet of fabric 7, having one end attached to the discharge end of the grain-board and the fabric lying under the grain-board on top of the next adjacent sieve. As the grain rolls off of the grain-board it falls onto such sieve and passes under the sheet of fabric, which thereby serves to hold the grains on their sides and prevent them from standing edgewise on the screen. The fabric also serves to cause the grain to be rolled over and over and to be kept firmly in contact with the sieve.

The two pairs of shoes 4, with their attached sieves and grain-boards, are mounted in the casing 28 to vibrate, and this is effected by transverse shafts 36 and 37, which are connected to the shoes by means of battens or cleats 38, fastened to the outer sides thereof. These shafts 36 and 37 have their end portions mounted to slide in guideways formed in the casing 28, (see Fig. 9,) and the said shafts are given a vibratory movement through the medium of rods 39, connected to the shafts and driven from eccentrics 40, (see Fig. 7,) formed on the drive-shaft 41 of the machine. The drive-shaft 41 is adapted to have movement imparted thereto in any suitable manner and carries a pulley 42, over which passes a belt 43, extending around a pulley 44 on the shaft 22 of the fan 23. A belt 45 is driven from the shaft 22, and this belt passes to and is arranged to drive in any suitable manner the agitators 33, before referred to. A belt 46 may also be driven from the shaft 22 and this belt extended to the elevator 31 to drive the same.

It is immaterial in what manner the screens 5 and grain-boards 6 are held within the shoes, so long as they be fitted therein so as to be secure during their operation and capable of removal for repairs and adjustment, as will

be understood by persons skilled in the art. One means of mounting the shoes is shown in the drawings, and according to this arrangement the members of the upper pair of shoes 4 are connected rigidly together by means of cross-braces 47, and the members of the lowest pair of shoes are engaged in the same manner by cross-braces 48 and by a vertically-disposed board 8, located centrally and forming a partition, as shown in Fig. 1, the shoes being drawn against this board by rods 9. Tie-rods 49 are extended between the members of the pairs of shoes, as shown, and adjustably fastened by nuts attached to the ends of the tie-rods. If desired, these tie-rods may be adjustable vertically in slots 50, formed in the shoes, as shown with respect to some of the tie-rods in the drawings. These tie-rods support various of the grain-boards and sieves, being connected thereto by the boxes 51, (illustrated in Fig. 5,) such boxes being fastened to the grain-boards and sieves and passed around the tie-rods. Other of the grain-boards and sieves are held by pins 52, (see Fig. 6,) which are extended through openings in the shoes and projected beyond the inner faces thereof, so as to engage the sieves and grain-boards. The outer ends of the pins 52 are provided with heads 53, secured to the shoes by screws passed through openings in the heads, as shown in the figure referred to above. By these devices the screens and grain-boards may be held in the proper manner and adjusted from time to time, as desired. For the purpose of reaching the interior of the casing it may be provided with manholes 54, having suitable closures 55, as shown in Figs. 4 and 8. Beneath the lowermost grain-board 6 is arranged a sheet of fabric 7^a, which works with the adjacent sieve 5 in the same manner as the fabric 7, referred to before, and which differs from the other fabric sheets only in that the sheets 7^a are attached to cross-pieces 7^b, extending between the members of the lower pair of shoes and located directly adjacent to the lower structures of the corresponding grain-board 6.

Each end of the machine is provided with a tapering cap 10, which caps are mounted on the main casing by hinges 11 at one side edge, the opposite side edge being provided with releasable fastening devices 12, as shown in Figs. 2 and 3, and by which arrangement the caps may be swung sidewise and the end portions of the machine completely opened, thus exposing the machine and permitting the manipulation of the machine in the various manners specified. Each cap 10 carries a fan-box 14, in which is arranged a fan 15, and these fans 15 have their shafts 16 provided with a friction or other gear 17, meshing with gears 18, carried in frames 19, supported from the caps 10. The gears 18 are driven by belts 20, which pass from a double pulley 21 on the shaft 22 of the fan 23. It will be observed that the belts 20 form a driving-gear which will not hinder swinging the

caps 10 on their hinges, as described above. The fan 23 draws the air into the fan-box 24 and discharges it in the directions of the arrows in Fig. 1, and the fans in the ends of the machine take up the draft thus formed and carry the same out by way of the outlet-passages of the fan-boxes 14. This blast of air carries off the chaff and other impurities which are separated from the grain. The major portion of the chaff is separated from the grain at the top portion of the casing of the machine, and in order that this major portion of the chaff may pass directly into the caps 10 and out through the fan-boxes 14 I provide each cap 10 in its interior with a chute-board 25, slanting downward toward the adjacent fan-box. By this arrangement as the blast passes from the discharge-openings from the box 24 a portion thereof continues directly over the chute-board 25 and into the fan-boxes 14, carrying with it the chaff before referred to. The other portion of the chaff and other impurities taken from the grain passes into the boxes 14 from below the chute-boards 25.

Each end cap 10 is provided with a hinged board 26, the hinged edges thereof being at the outer portions of the caps and the free edges extending inward, so as to lie when in one position over the lowermost of the screens at the respective ends of the machine. These grain-boards work with hinged supports 27, which are mounted in the lower portions of the caps 10 and which may be thrown to the position indicated by full and dotted lines in the drawings, whereby to hold the boards 26 in either of the two positions also indicated by full and dotted lines. In one position the boards 26 lie over the lowermost screens 25 at the ends of the machine, and in the other position the boards extend beneath said screens. In the first case the grain falling on the boards 26 is delivered to the lowermost screen, and in the second case it is passed under the lowermost screen into the bottom of the casing, where it falls upon oppositely and downwardly inclined chute-boards 55, these boards leading to discharge-openings 56, passing from the casing. The boards 26 may be made to clear the lowermost sieve 5 by swinging the cap 10 outward to open position, and then when the parts 26 and 27 are properly adjusted the cap may be returned. The two pairs of lowermost screens 5 deliver the grain into troughs 57, running transversely of the casing, at the bottom thereof, and having screws 58 working therein to cause the movement of the grain through the troughs and to deliver the same out of the casing. As here shown, different ones of these screens may be made to deliver to different troughs, so as to grade the grain, as is usual in the art. The screws 58 may be driven by any suitable means—for example, by a belt 59, actuated from the shaft 41.

Assuming that the various parts of the machine are in operation as described, the grain

fed upon the top sieves 5 will be sifted through the same, and the chaff and other impurities will be blown off of the grain into the respective caps 10 and out through the fan-boxes 14, the grain undergoing a continual sifting process as it gravitates from one sieve or grain-board to the other and finally passing into the troughs 57 or into these troughs and onto the chute-boards 55, according to the adjustments of the parts of the apparatus. These adjustments depend upon the character of the material being worked with and the sort of separation that is desired and will be fully understood by persons acquainted with the art.

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

1. A grain-separator having a casing, an induction-fan situated intermediate the ends thereof, end caps mounted movably on the casing to permit opening and closing the ends thereof, eduction-fans respectively situate in the end caps, sieves mounted in the casing and extending from a point adjacent to the induction-fan to the bottom of the casing, the lowermost sieves discharging the grain, and a vertically-disposed board located centrally below the induction-fan and forming a partition dividing the lower part of the casing into two parts.

2. A grain-separator, having a casing, sieves arranged therein, an induction-fan at one side of the sieves, an eduction-fan at the other side, the lowermost sieves discharging the grain, and a chute-board arranged adjacent to the eduction-fan and slanting downward toward the same, the said chute-board leading from the upper sieves, for the purpose specified.

3. A grain-separator, having a casing, sieves

mounted therein, an induction-fan arranged at one side of the sieves, an end cap hingedly mounted on the casing at the other side of the sieves, an eduction-fan supported on the end cap, and an inclined chute-board mounted in the end cap and leading downward toward the eduction-fan, the said chute-board leading from the upper sieves, for the purpose specified.

4. A grain-separator, having a casing, sieves mounted in the casing, a blast apparatus for inducing a current in the neighborhood of the sieves, an end cap hingedly mounted on one end of the casing, a grain-board hingedly mounted in the cap and projecting inward toward the interior of the casing, the said grain-board coacting with one of the sieves in the manner specified, and an adjustable support carried in the end cap and serving to hold said grain-board in one position.

5. A grain-separator, having a casing, sieves mounted therein, an end cap hingedly attached to one end of the casing and capable of movement on its hinge to close or open said end of the casing, a fan-box supported on the end cap and movable therewith, a fan mounted in the box, and gearing for driving the fan.

6. A grain-separator, having a casing, a sieve mounted therein, an end cap mounted movably on one end of the casing to permit opening and closing the same, a fan-box supported on the end caps, a fan mounted in the fan-box, and gearing for driving the fan.

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

JENS ANDERSON.

Witnesses:

MAX BAUMEISTER,
H. E. JOHNSON.