

J. BUFFELEN.  
 GLUING MACHINE.  
 APPLICATION FILED SEPT. 22, 1909.

Patented June 28, 1910.

5 SHEETS—SHEET 1.

962,619.

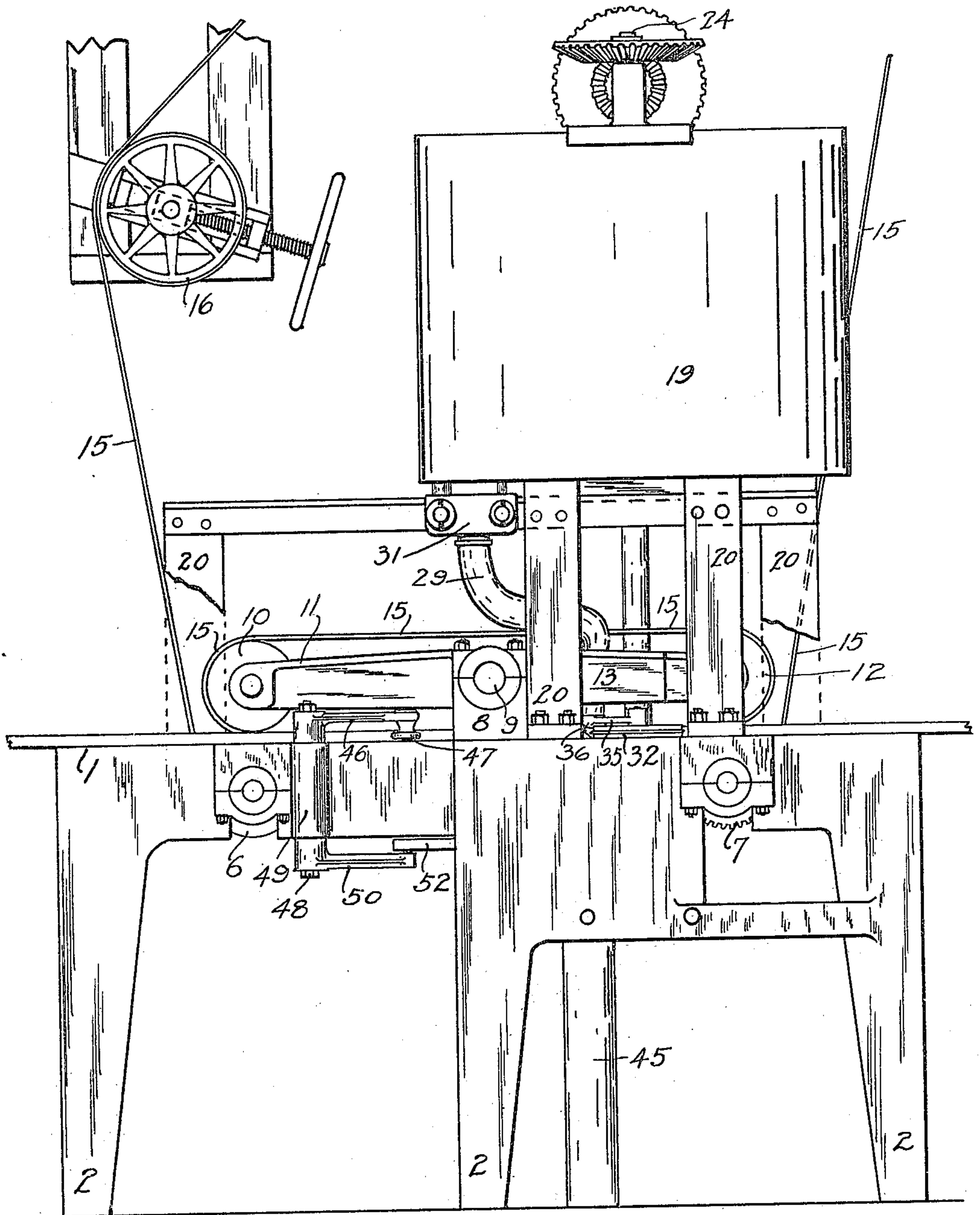


Fig. 1.

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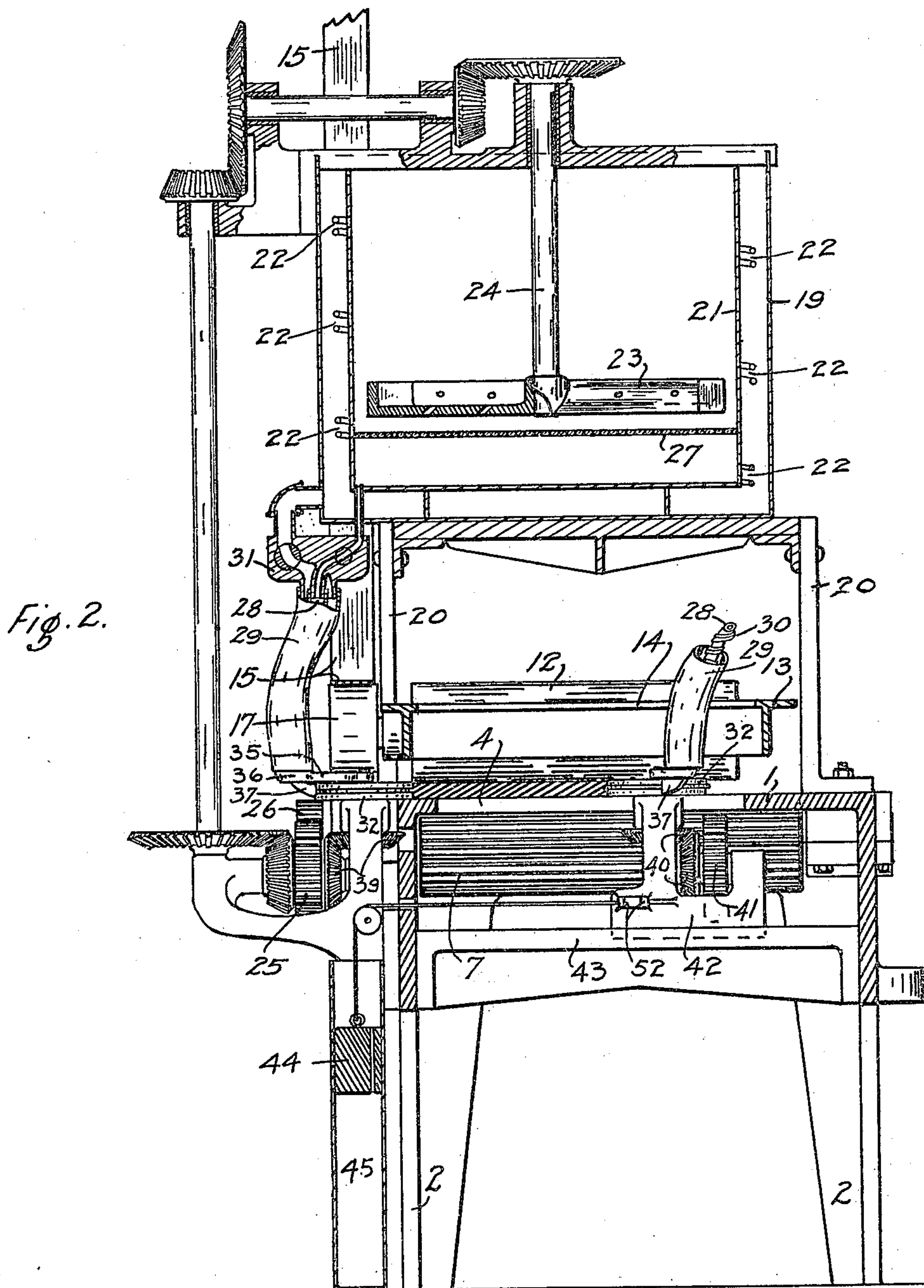
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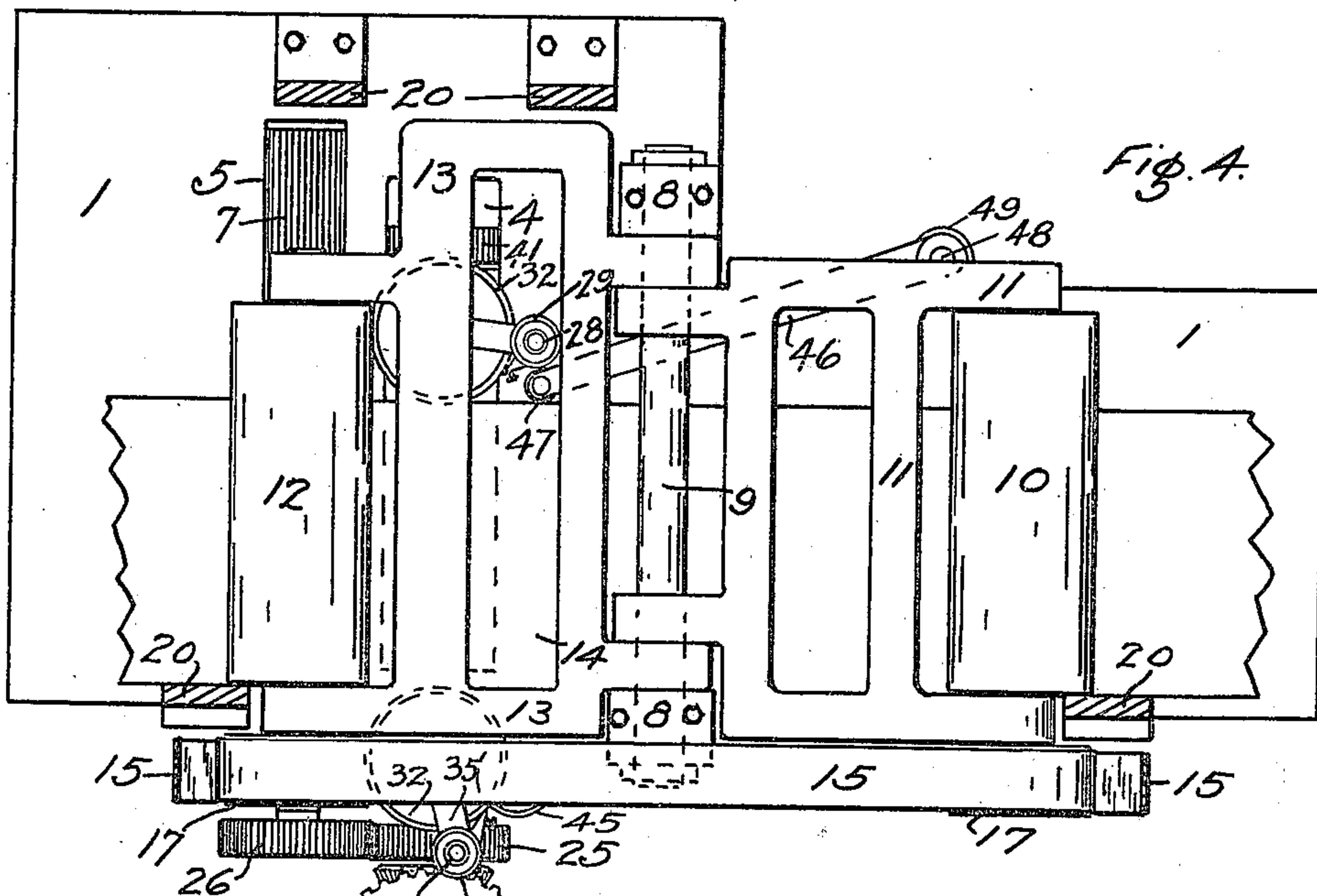
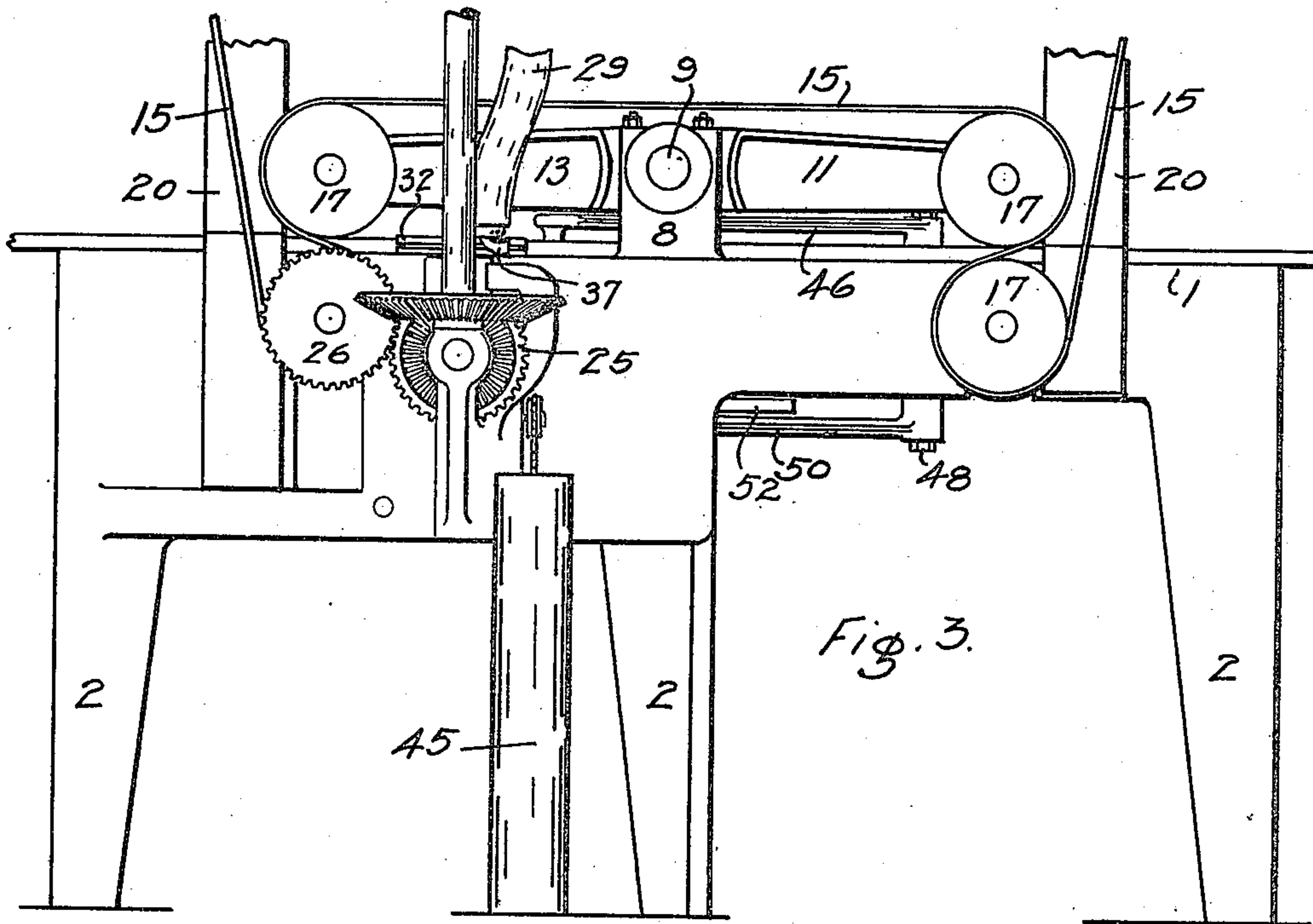
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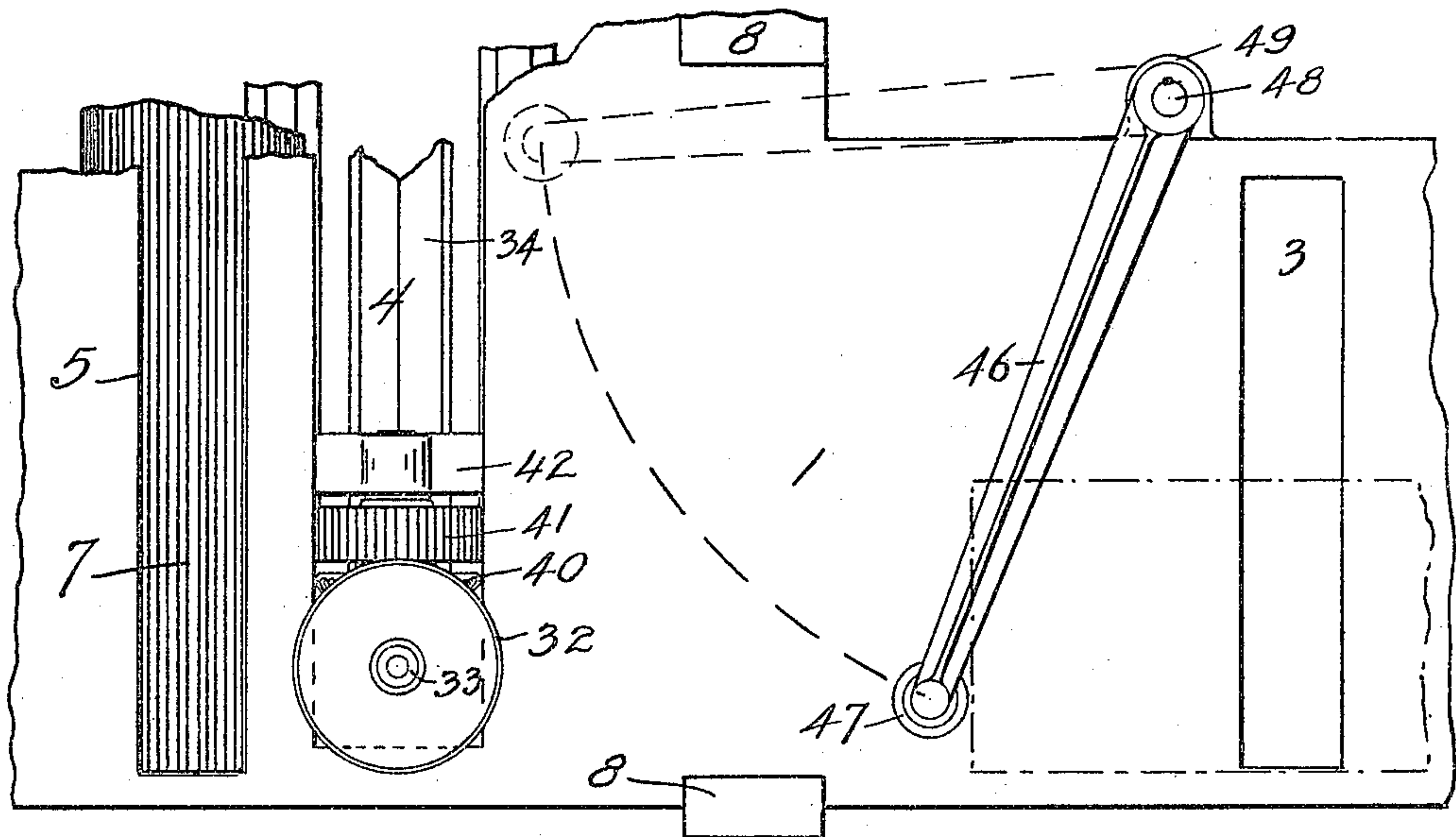


Fig. 5

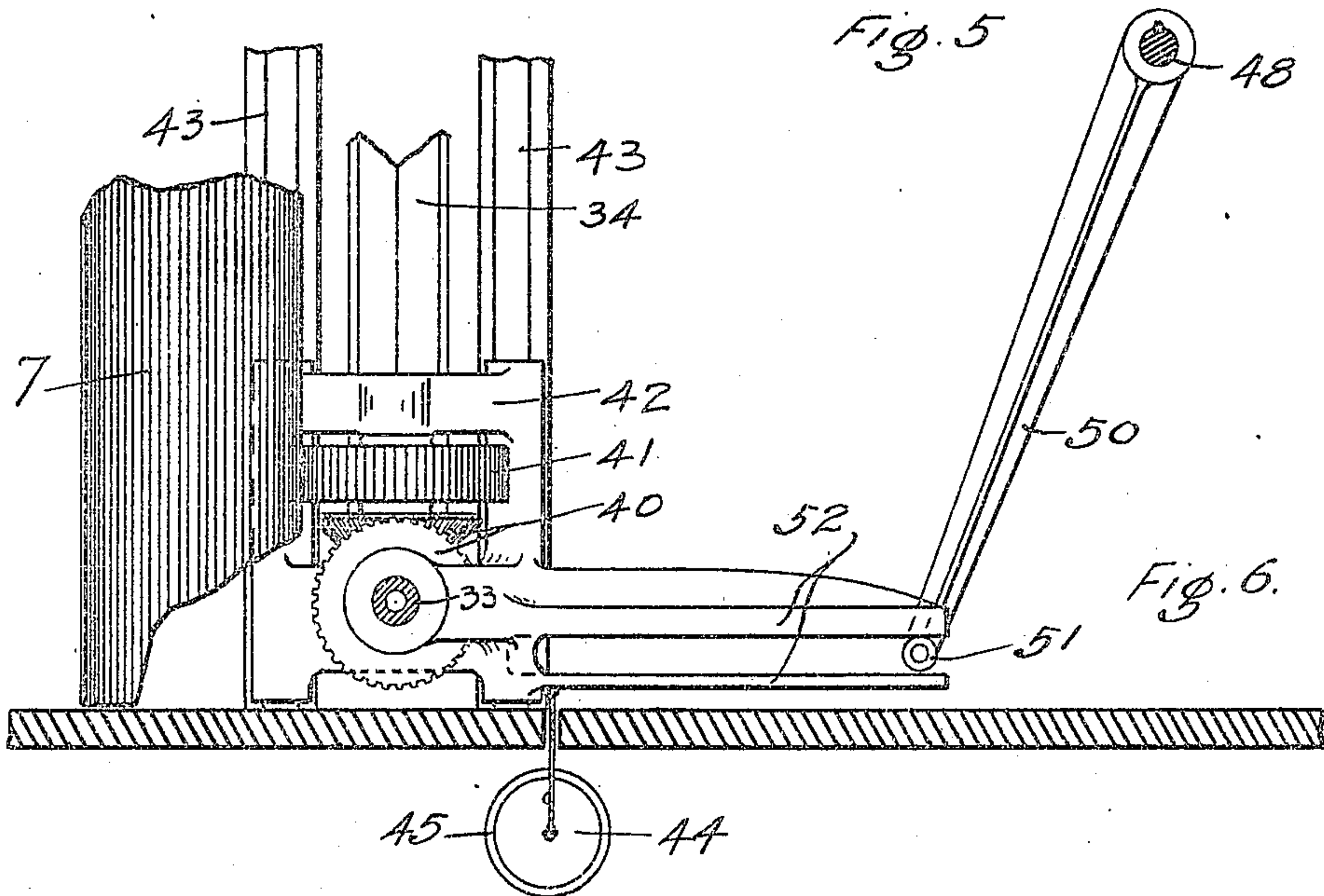


Fig. 6.

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5 SHEETS—SHEET 5.

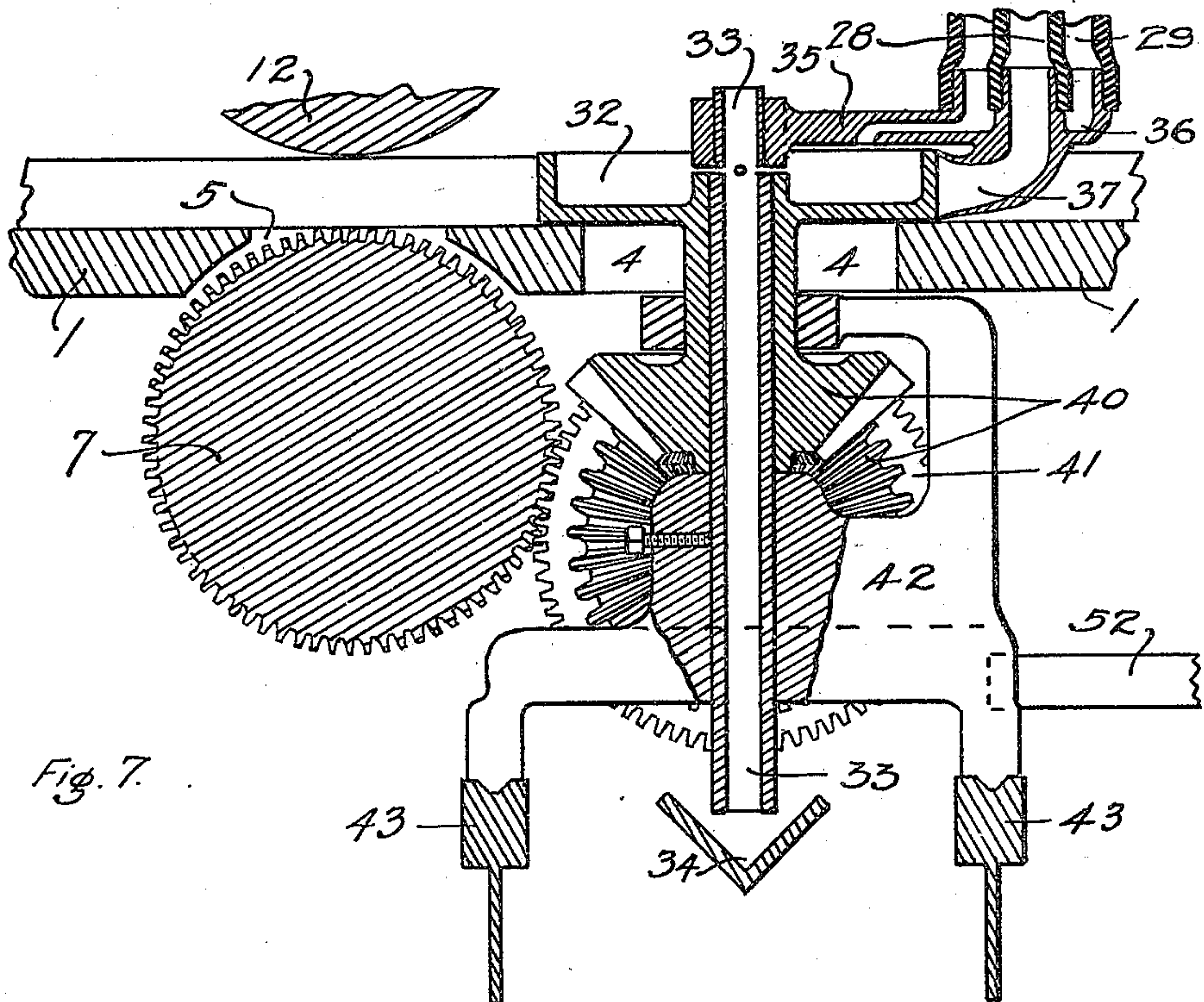


Fig. 7.

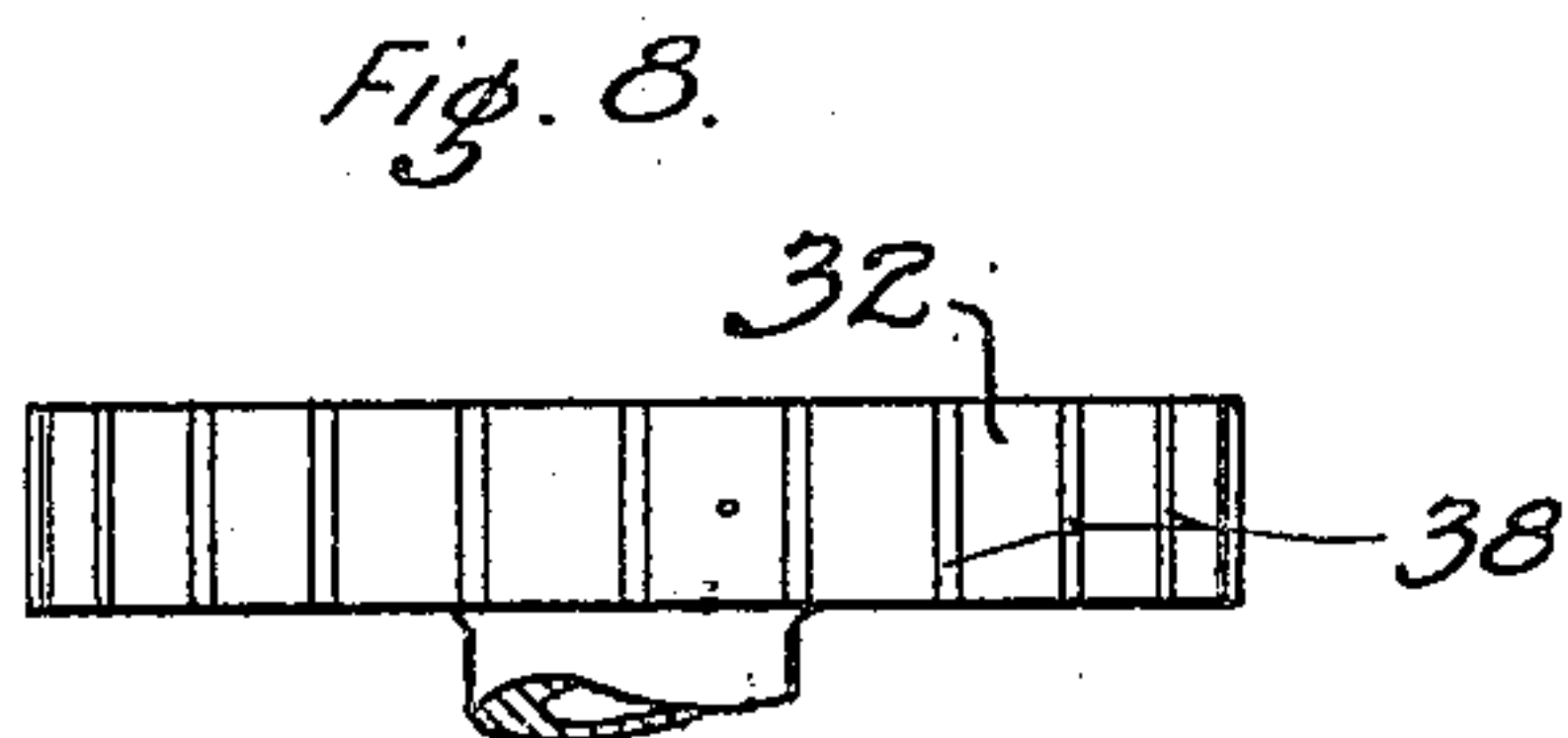


Fig. 8.

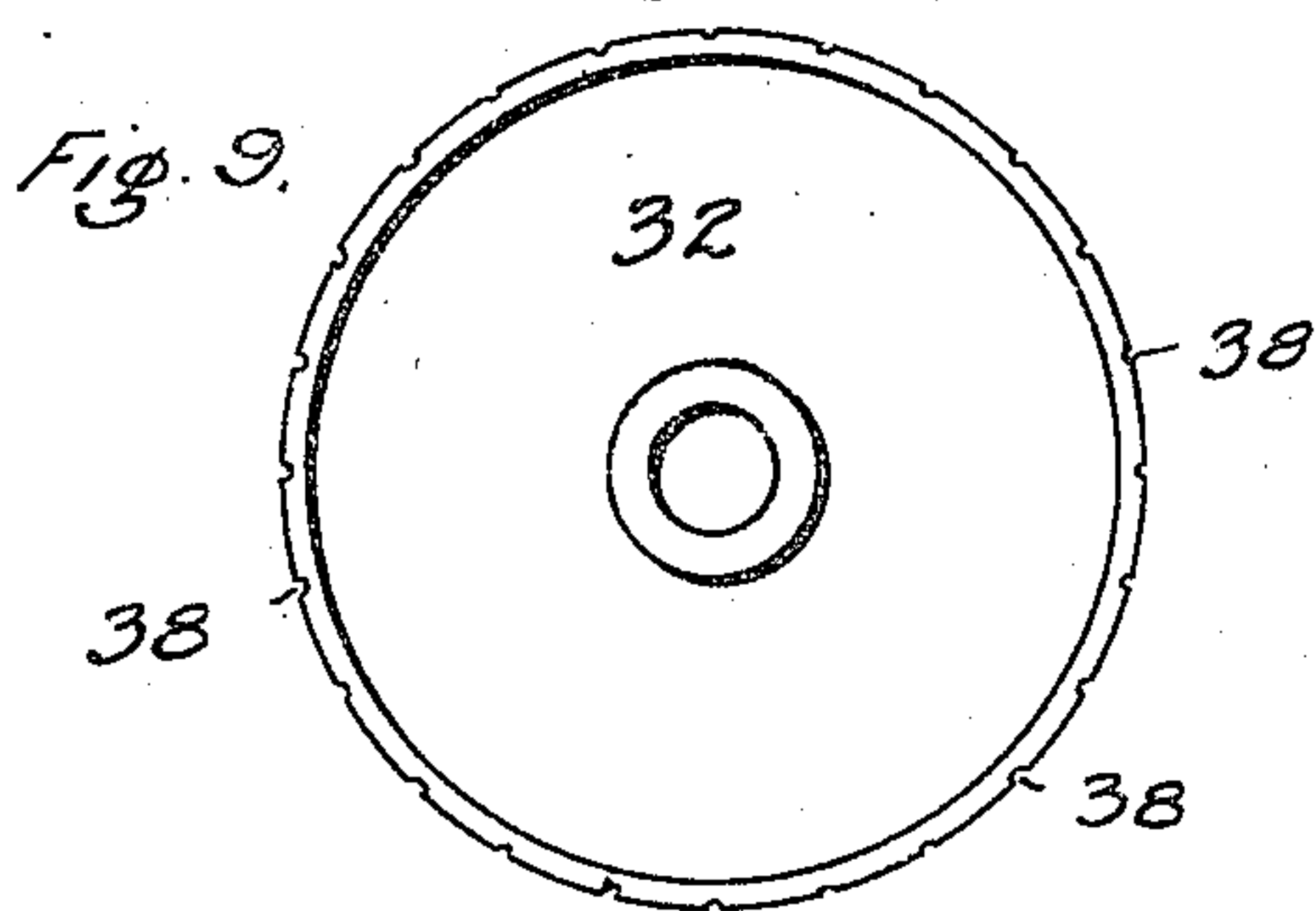


Fig. 9.

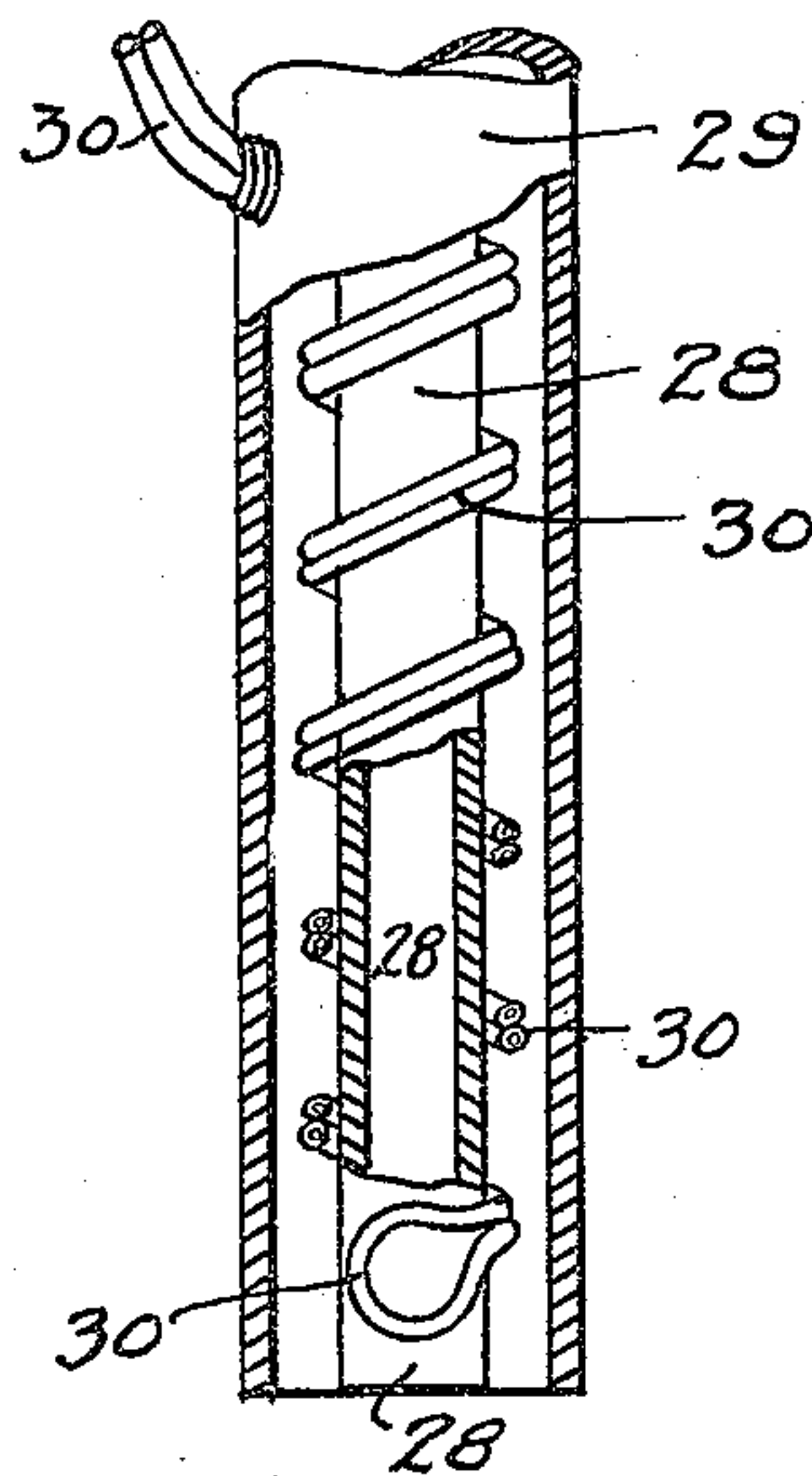


Fig. 10.

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# UNITED STATES PATENT OFFICE.

JOHN BUFFELEN, OF TACOMA, WASHINGTON.

GLUING-MACHINE.

962,619.

Specification of Letters Patent. Patented June 28, 1910.

Application filed September 22, 1909. Serial No. 518,960.

*To all whom it may concern:*

Be it known that I, JOHN BUFFELEN, a citizen of the United States of America, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Gluing-Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to machines for applying an adhesive to a surface and especially to machines for gluing the edges of boards, panels or other pieces of wood for use in making doors, tables, or other built-up articles.

The objects of my invention are—to provide means for delivering the glue, in a hot state, to the surface to which it is to be applied; to distribute the glue on the surface in a uniform manner; to allow for variations in the width and thickness of the object being glued; to automatically shift the gluing apparatus to a position to be engaged by an object to be glued; and to provide a machine which shall be simple and cheap to build, easy and effective to operate, and strong and durable. I attain these and other objects by the devices, mechanisms, and arrangements illustrated in the accompanying drawings, in which

Figure 1 is an elevation of the right-side of my machine; Fig. 2 is a vertical cross-section thereof; Fig. 3 is an elevation of the lower portion of the left-side of my machine; Fig. 4 is a plan of that portion of my machine below the glue tank; Figs. 5 and 6 are plans, respectively above and below the operating table, of the mechanism for automatically shifting the gluing apparatus; Fig. 7 is a vertical cross-section through the shifting gluing apparatus; Figs. 8 and 9 are respectively plan and elevation of the gluing wheel; and Fig. 10 is an elevation, partly broken away, of the glue-conveying pipe.

Similar characters of reference refer to similar parts throughout the several views.

The machine can be conveniently divided, for descriptive purposes, into several sets of mechanisms, as follows:—(a) mechanism for propelling the wood to be glued through the machine at a rate uniform with the peripheral speed of the gluing wheel; (b) the glue mixing, heating, conveying, and apply-

ing apparatus; and (c) the means for shifting the glue applying apparatus to suit the width of the wood to be glued.

Referring now to the drawings, the table 1 is mounted on suitable legs 2 and has three openings 3, 4 and 5 across its surface. The opening 3 is to allow the lower feed roll 6 to project above the surface of the table; the opening 4 is to allow the carriage of the shifting gluing apparatus to project upward therethrough; and the opening 5 is to allow the lower delivery roll 7 to project above the surface of the table. The two fixed bearings 8 extend above the table 1 about the middle thereof and are adapted to receive and hold the horizontal pivot bar 9. The upper feed roll 10 is mounted in bearings in the end of the horizontal arm 11, through the other end of which the pivot bar 9 passes, thus allowing the roll 10 to have free vertical motion about the axis of the bar 9. The upper delivery roll 12 is similarly mounted in bearings in the horizontal arm 13 which is similarly pivoted to the machine by the same pivot bar 9. The arm 13 is provided with an open space 14 through which the glue conveyer pipe of the shifting gluing apparatus passes. The lower rolls 6 and 7 are journaled in fixed bearings in the table and are directly below the upper pivoted rolls 10 and 12 respectively. All the rolls 6, 7, 10 and 12 are provided with suitable pulleys 17 mounted in the same plane and all said pulleys are of the same size. The driving belt 15 passes from the source of power, under and around the pulley of the lower delivery roll 7, then around and over the upper delivery roll 12, then horizontally over and around the upper feed roll 10, then around and under the lower feed roll 6, then around the idler 16 to the source of power. The idler 16 is adjustably mounted in suitable framing and is adapted to slacken or tighten the belt 15 to adjust it for variations in the thickness of the wood to be glued. It is evident that all the pulleys 17 and therefore all the rolls will turn at the same rate and that therefore the action of the rolls on the board will drive it at the same speed through the machine. It is also evident that, if a thicker board follows a thin board, the pairs of rolls will be separated farther and that therefore the belt 15 will be correspondingly tightened and the gripping ac-



tion of the rolls will therefore be increased, thus the speed of the wood through the machine will be independent of its weight. Therefore by driving the gluing wheels at the same peripheral speed as the rolls they will have the same speed as the wood which they glue.

Coming next to the second group of mechanisms: The glue tank is supported on suitable legs 20 above the table 1, and consists of a double walled vessel, in the inner part 21 of which the glue is melted and in the surrounding part 19 of which is kept a supply of hot water. This water is kept at practically boiling temperature by means of the steam circulating pipes 22 through which a constant stream of steam is kept passing. The glue is continually stirred up by a suitable stirring paddle 23 which revolves in the glue, being mounted on the end of the bar 24 which is suitably driven, by means of various bevel gears, from a gear 25 which is itself driven by a gear 26 mounted outside of the pulley 17 of the lower delivery roll 7. A suitable filter 27 is provided in the glue tank 21 a short distance above the bottom thereof.

The glue is conveyed from the tank 21 to two gluing wheels, each engaging one edge of the wood to be glued, by means of glue pipes. These pipes consist of an interior glue pipe 28, an exterior hot water pipe 29, and a double wound steam pipe 30, wound around the pipe 28 within the pipe 29. These pipes 28, 29 and 30 are all made of flexible material. The upper ends of the two glue conveying pipes are connected to the controlling blocks 31, one for each of the glue conveyers, in which the glue passage is separated from the water passage and in which each passage has a separate turn valve by means of which it is controlled, the said passages in the controlling blocks being connected by suitable pipes to the glue tank 21, below the filter 27 therein, and to the hot water compartment 19 respectively. Each gluing pipe leads to a gluing wheel and is revolvably attached to the axis thereof so as to be free to occupy any position about said wheels.

The two gluing wheels 32 are similar, and are driven as hereinafter described from below the level of the table 1, and are mounted on hollow vertical stationary pins 33. The pins 33 are secured in the frame or bracket for the gearing of the wheel and pass directly through the said bracket. The gluing wheel 32 is made with a deep groove or channel cut around its upper surface so as to separate the rim from the hub by a space adapted to be filled with hot water whereby the rim of the wheel is kept hot. The hub is slightly lower than the rim and a series of holes are made in the pin 33 just above the level of the hub so that water in the channel of the wheel will flow over the top of the hub

and through the said holes in the pin 33 and then down the inside passage of the pin to the drain 34 below the outlet of said pin passage. The upper end of the pin 33 is of slightly smaller diameter and acts as a pivot for the pipe arm 35. This arm 35 extends out horizontally from the center pin 33 and carries a cup-shaped receptacle 36 at its end. This receptacle 36 is adapted to connect with the water pipe 29 and has an outlet passage through the arm 35 into the water channel in the wheel 32; and the arm 35 also has a glue passage connected to the glue pipe 28 and passing through the cup 36 to the glue spreader or nozzle 37 adjacent to the outside of the glue wheel 32. Since the arm is pivoted concentrically with the wheel it is evident that the nozzle, which is formed integral with the said arm, will always make the same angle with the wheel independently of its position.

The outer surface of the glue wheel 32 is provided with vertical notches or grooves 38 at regular intervals and is preferably shaped so as to lie flat against the edge of the wood being glued. The nozzle opening is directly against the face of the wheel and the glue only flows, to any appreciable extent, whenever one of said notches 38 passes the opening in the nozzle. As each such notch passes the opening it becomes filled with the glue, and as the wheel rotates, the glue in the notch is brought into contact with the edge of the wood and is applied thereto in a series of vertical strips which quickly spread into a thin even film all over the edge. In this way the quantity of glue used is reduced to the least amount necessary to cover the surface to which it is applied and practically no glue escapes beyond the edges of the said surface. The two gluing wheels 32 are each driven from the lower delivery roll 7, the fixed wheel by means of the bevel gears 39 driven by the gear 26, on the pulley 17 of the roll 7, through the gear 25 (Figs. 2 and 3) while the adjustable wheel 32 is driven by similar bevel gears 40 mounted in the transversely shifting carriage and driven from the lower delivery roll 7, which is appropriately toothed, through the gear 41 mounted on the carriage and adapted to engage and be driven by said roll 7 in all transverse positions which said carriage may occupy.

Coming now to the third group of mechanisms by means of which the movable gluing wheel is shifted across the machine to bring it to a suitable position to engage the edge of an approaching board. Referring to Figs. 1, 2, 5, 6 and 7. The carriage 42 is supported on two parallel rails 43 secured underneath the table 1, transversely to the direction of travel of the board. The carriage is free to move on said rails and is pressed toward the other gluing wheel by means of a weight 44 secured to the end of



a flexible cord fastened to the carriage and passing over a suitable pulley so as to exert its force horizontally on the carriage. In order to prevent the carriage from moving too fast when a board has passed it, the weight 44 is hung in a vessel 45 from which the air can only escape past the weight at a comparatively slow rate. It is necessary to move the carriage away from the fixed gluing wheel, against the action of the weight, in order that the board may pass between the two gluing wheels. The arm 46 is supported in a horizontal position above the table 1 a sufficient distance therefrom to allow the boards to pass under the arm without touching it. The arm is provided with a downwardly projecting pin, at its free end, on which is mounted the small wheel 47 in the path of the boards. The wheel 47 is preferably provided with a rubber band or tire. The other end of the arm 46 is keyed to the vertical pivot pin 48 which is journaled in a suitable bracket 49 on the right side of the table 1. The pivot pin 48 extends through and below the bracket and carries an arm 50 keyed to its lower end. This arm 50 is arranged so as to be vertically below the arm 46 and parallel therewith, and the free end thereof carries an upwardly extending pin which carries a small roller 51. The roller 51 is directly below the wheel 47. The carriage 42 has a pair of parallel arms 52 extending out horizontally from it in the plane of travel of said roller 51, said arms 52 being adapted to be engaged by the roller which passes freely between them. The action of these parts is as follows:—When no board is in the machine the weight 44 pulls the carriage until the two gluing wheels 32 practically touch. Now as soon as a board is fed into the machine its forward end engages the wheel 47 and pushes it forward. As the wheel 47 moves forward the arm 46 on which it is mounted swings with the pivot 48 thus drawing the wheel 47 toward the right edge of the board, and this motion will depend on the width of the board. As soon as the wheel 47 has turned the right-forward corner of the board the arm 46 ceases to turn. Simultaneously the arm 50 is turned by the pivot 48 through an equal angle and the roller 51 presses on the arm 52 of the carriage 42 and forces the carriage to move on the rails 43 against the action of the weight 44. The angular motion of the arms 46 and 50 will thus depend on the width of the board, and the transverse motion of the carriage will depend on the angular motion of the arms.

In practice I prefer to arrange the parts so that the gluing wheel 32 will not move the full width of the board so that the board will push the gluing wheel and the carriage a slight distance in passing therebetween, thus allowing the weight 44 to press the glu-

ing wheel on the edge of the board without the interference of the pivoted arms, and thus removing the wheel 47 a slight distance from the edge of the board.

Having described my invention, what I claim is:

1. In a gluing machine, the combination with a glue tank and a surrounding hot-water tank; of a glue pipe; a surrounding hot-water pipe; a steam pipe within the hot-water pipe and wound around the glue pipe; and valves whereby the flow in said pipes is regulated.

2. In a gluing machine, the combination of a glue pipe; a surrounding hot-water pipe; a rotating wheel; a hot-water channel formed therein; a nozzle connected to said glue pipe and having its opening against the rim of the wheel; and a passage connected to said hot-water pipe and opening over said channel to conduct the water from the pipe to the channel.

3. In a gluing machine, the combination of a glue pipe; a surrounding hot-water pipe; a rotating wheel; a hot-water channel formed therein; an arm pivotally mounted on the axis of the wheel and free to turn about its pivot; a nozzle formed on the arm and connected to the glue pipe and having its opening adjacent to the rim of said wheel; and a passage formed in said arm and connected to said hot-water pipe and opening over said channel to conduct hot-water from the pipe to the channel.

4. In a gluing machine, the combination of a glue delivering nozzle having a vertically disposed narrow orifice; and a horizontally rotating wheel adjacent said nozzle and in rolling contact with the object to be glued and adapted to dole out the glue from the nozzle and to apply it to said object.

5. In a gluing machine, the combination of a glue delivering nozzle having a vertically disposed narrow orifice; a horizontally rotating wheel adjacent said nozzle and in rolling contact with the object to be glued; and vertical grooves formed in said wheel and adapted to successively pass said nozzle and to dole out the glue therefrom and to apply it to said object.

6. In a gluing machine, the combination of a glue delivering nozzle having a vertically disposed narrow orifice; a horizontally rotating wheel adjacent said nozzle and in rolling contact with the object to be glued; an open channel formed in the upper face of said wheel and adapted to receive a supply of hot-water whereby the wheel is warmed and the glue thereon, received from the nozzle, is kept in fluid condition.

7. In a gluing machine, the combination with a fixed glue tank and a surrounding hot-water tank; of a flexible glue pipe; a surrounding flexible hot-water pipe; a transversely movable rotating glue wheel; a



hot-water channel therein; a nozzle connected to said glue pipe and having its opening adjacent to the rim of the glue wheel; a passage connected to said hot-water pipe and opening over the channel in the glue wheel; and means for moving said glue wheel transversely of the machine.

8. In a gluing machine, the combination with a frame; an arm pivoted thereto and adapted to be engaged and turned on its pivot-axis by the wood being fed in the machine; a transversely movable carriage mounted on said frame and having a later-

ally projecting arm; and an arm actuated by said pivoted arm and moving parallel therewith and engaging said laterally projecting carriage arm whereby the carriage is moved transversely of the machine a distance corresponding with the width of wood being fed in the machine.

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

JOHN BUFFELEN.

Witnesses:

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M. F. McNEIL.