

No. 644,155.

Patented Feb. 27, 1900.

A. D. THOMAS.

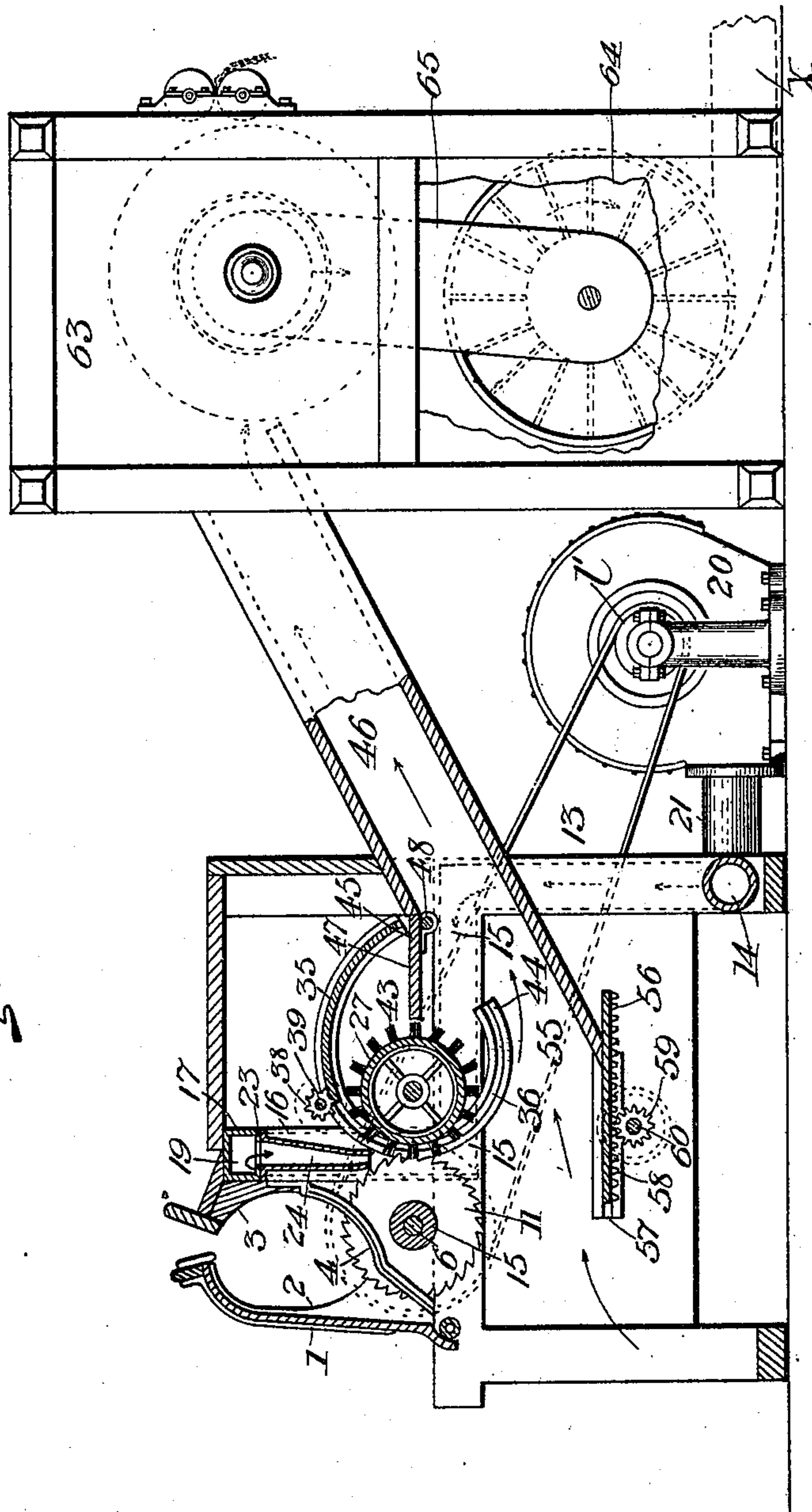
COTTON GIN.

(Application filed Aug. 14, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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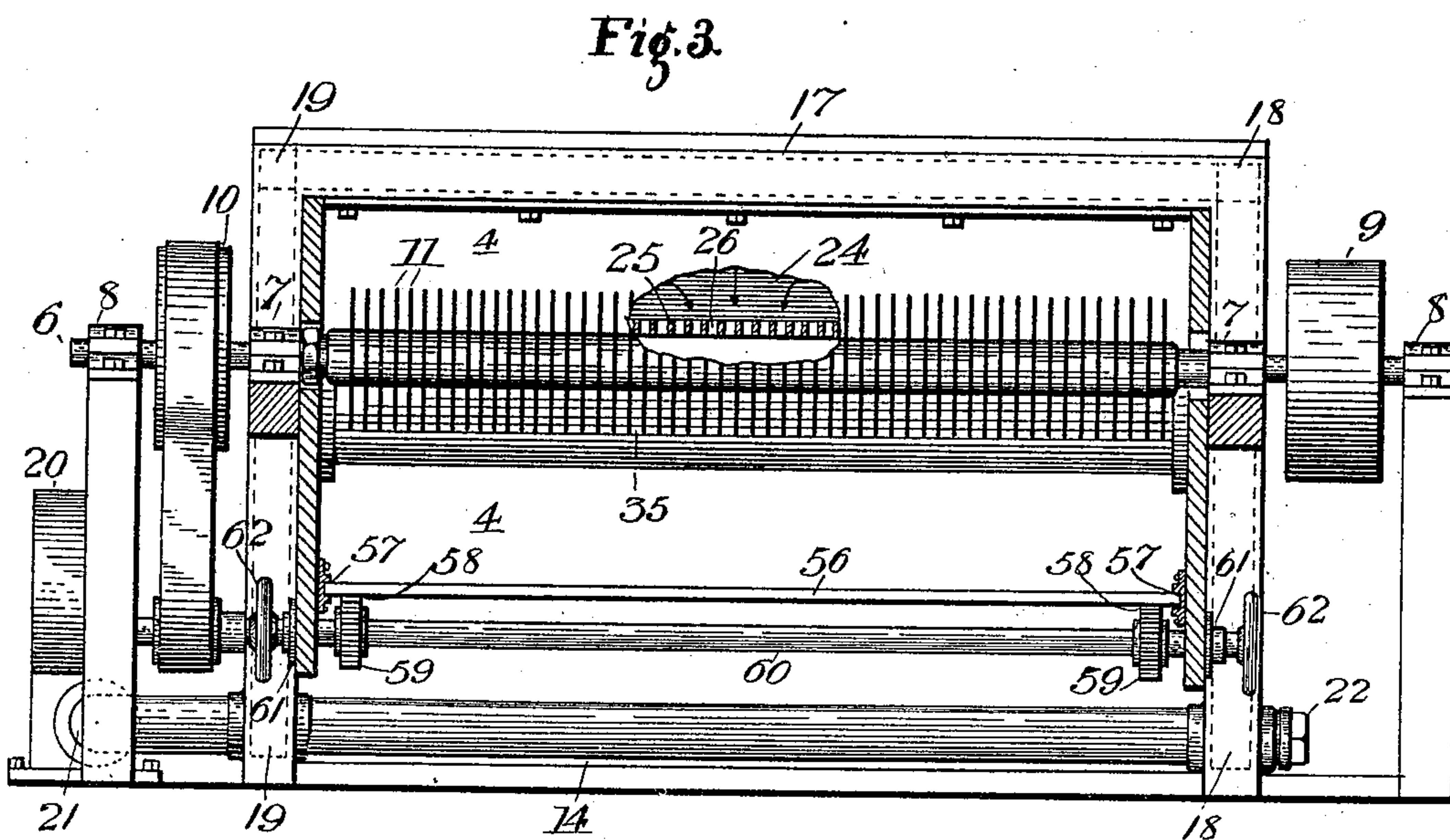
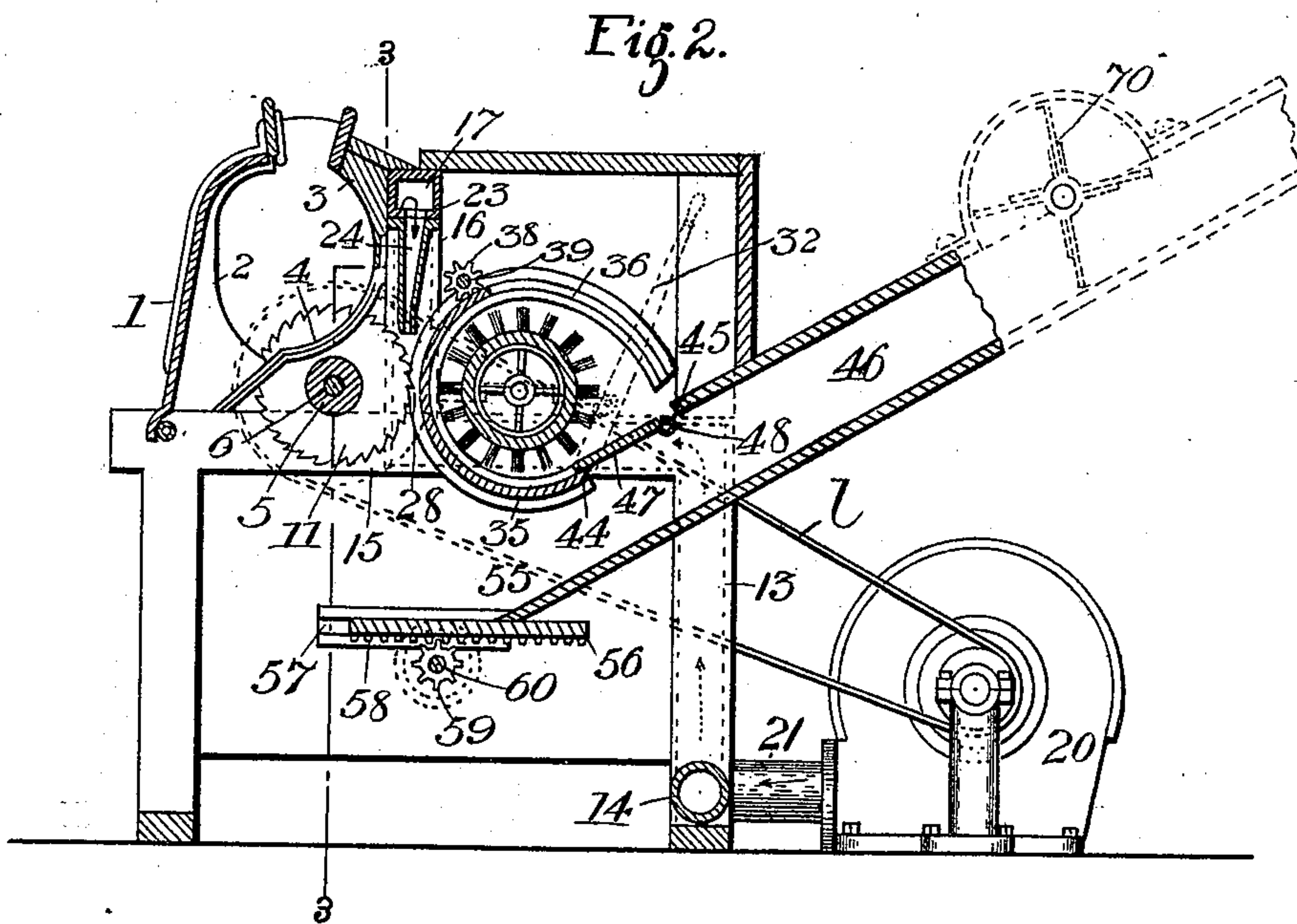
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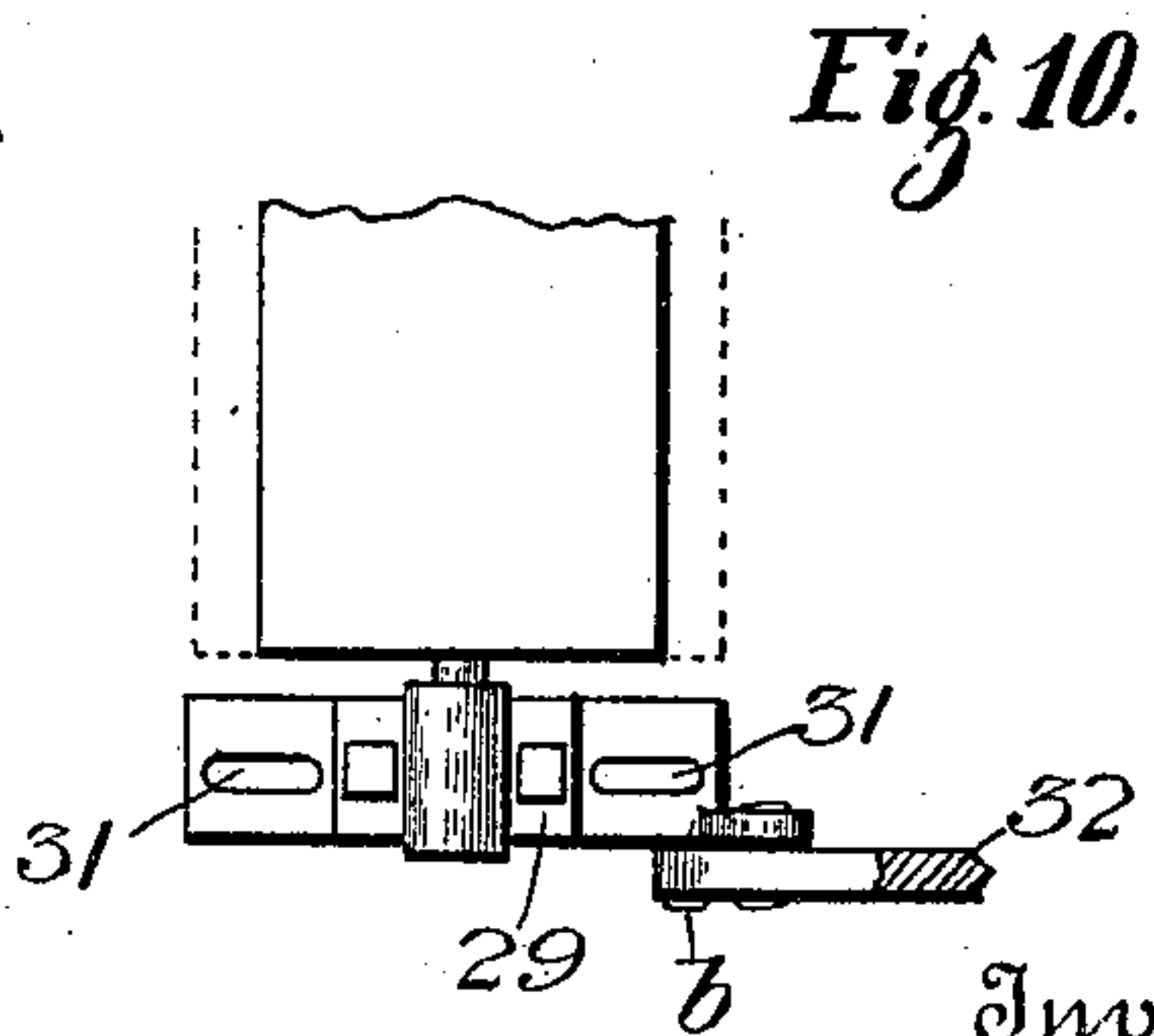
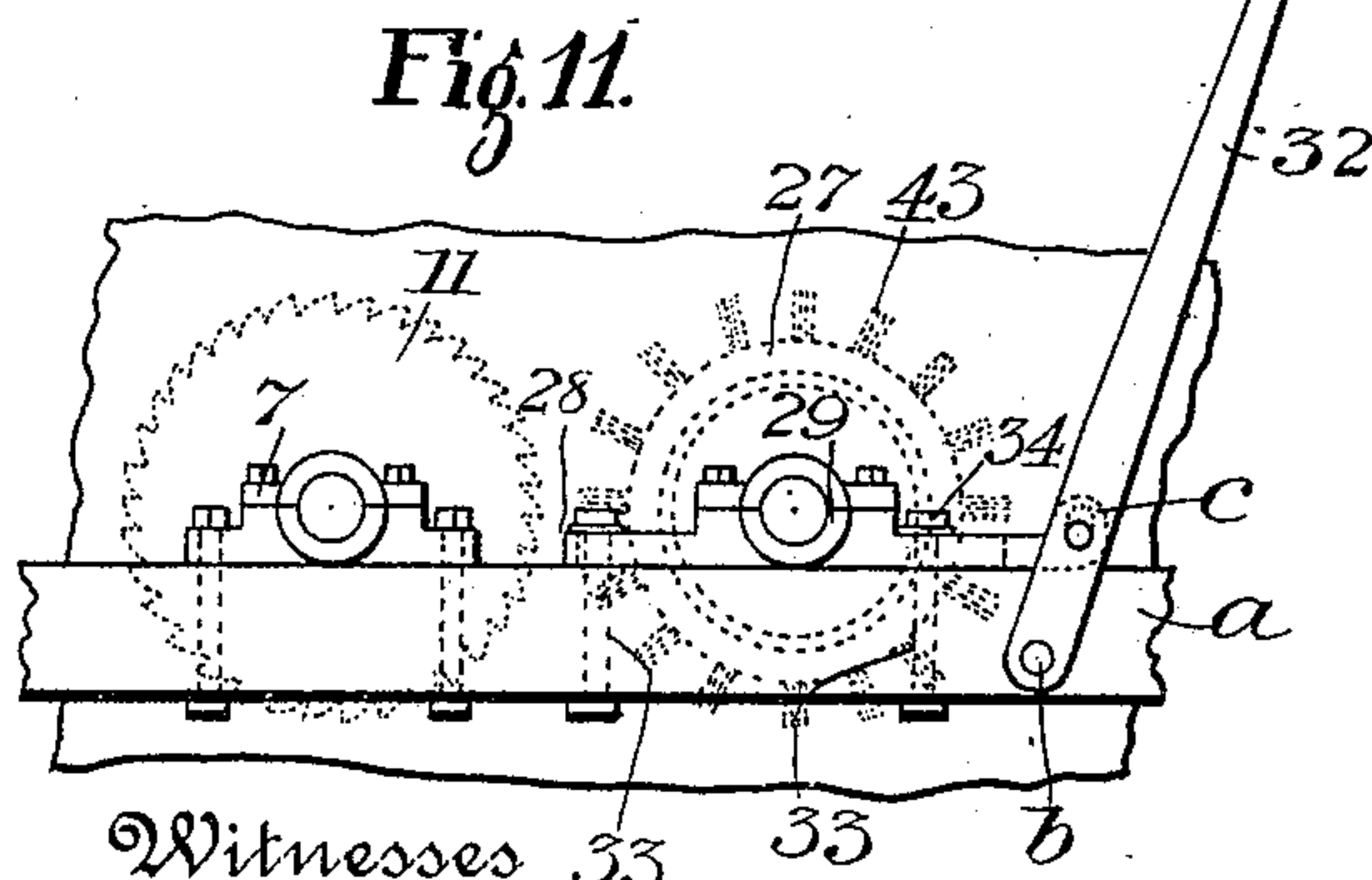
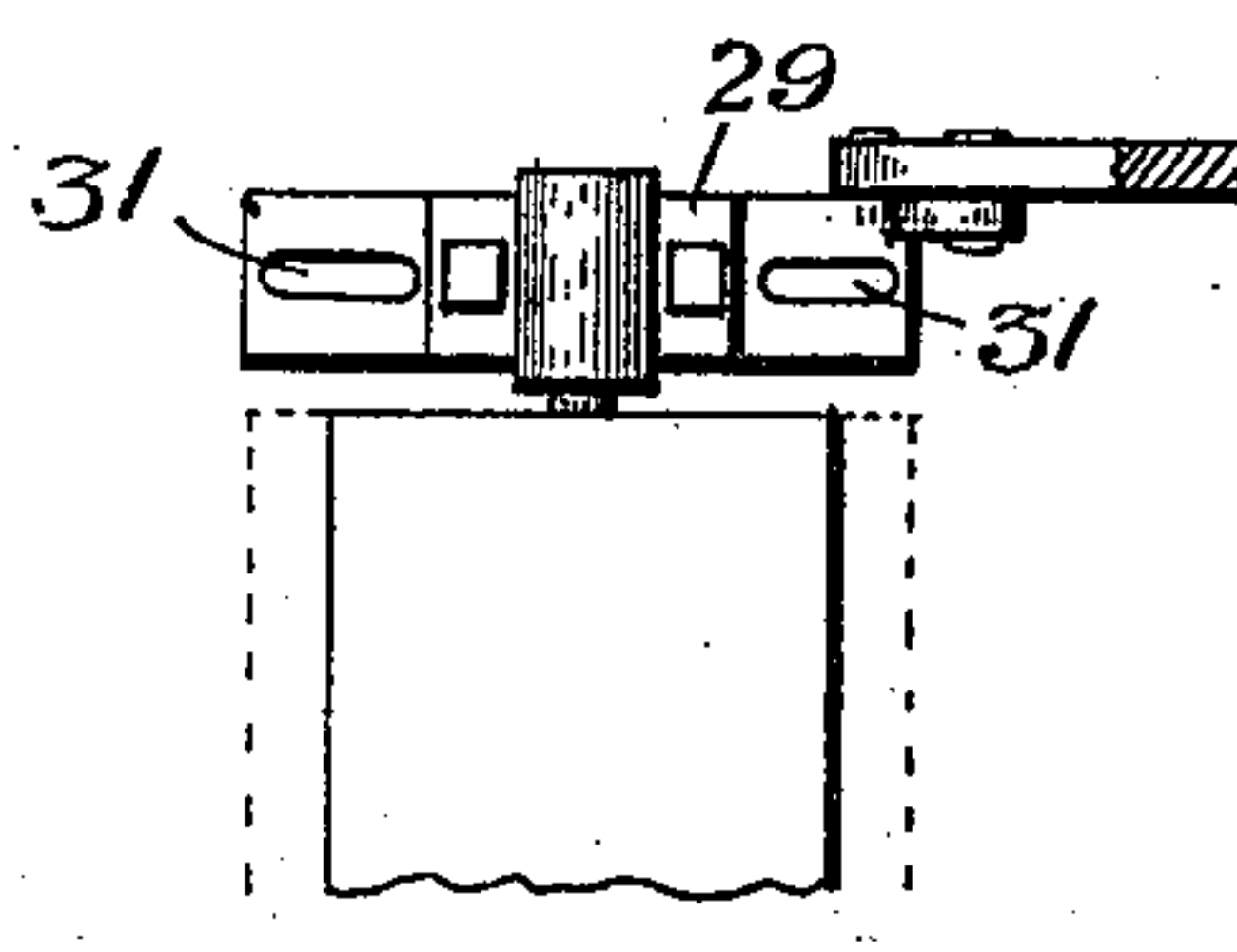
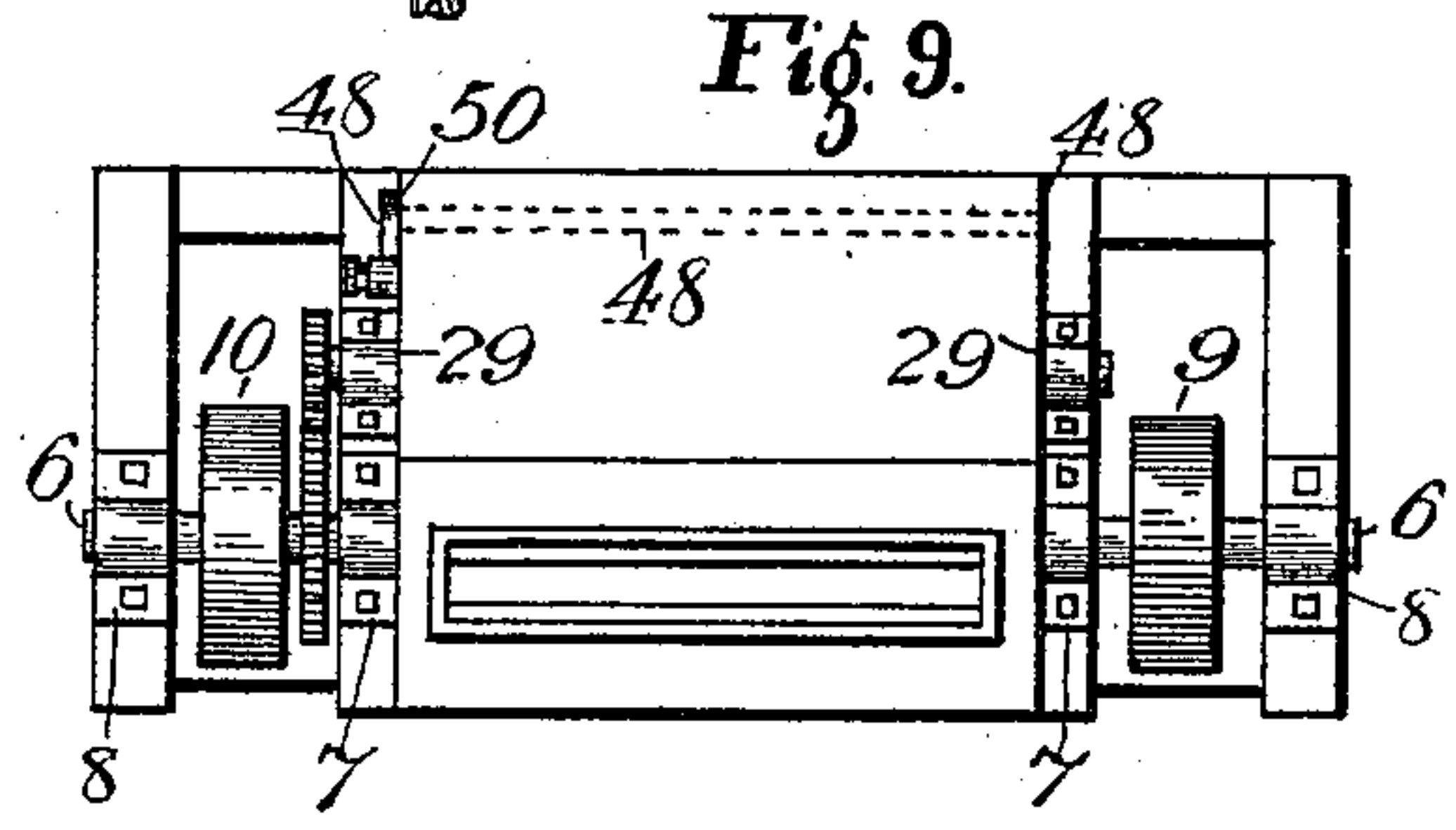
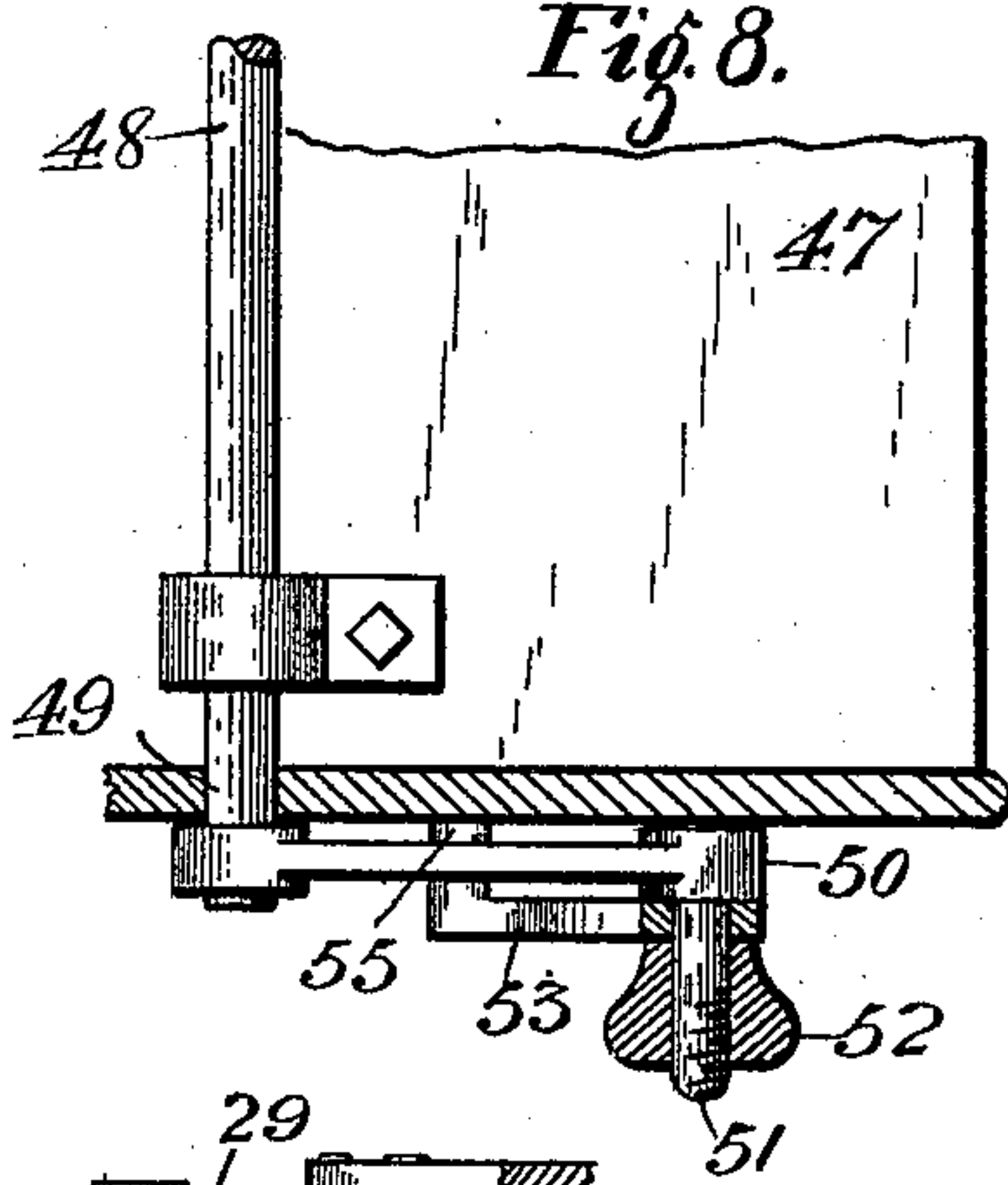
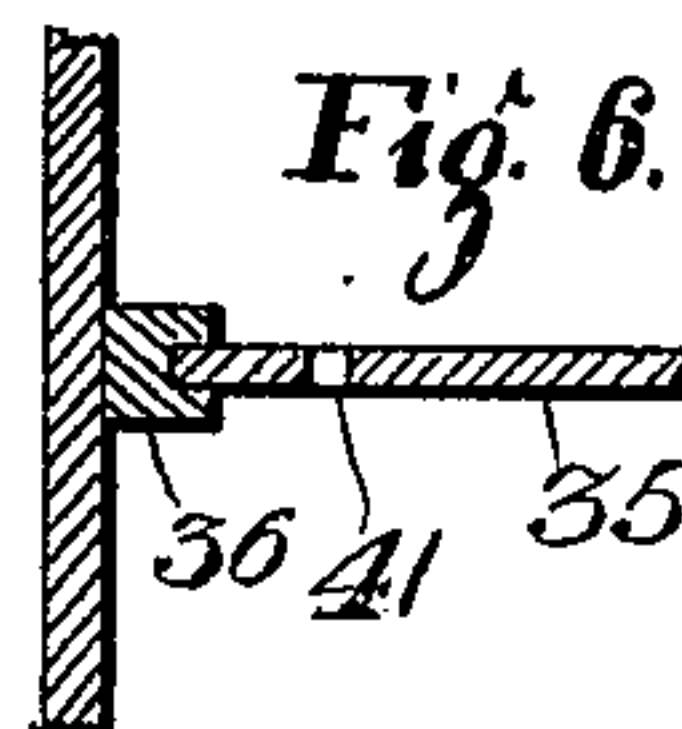
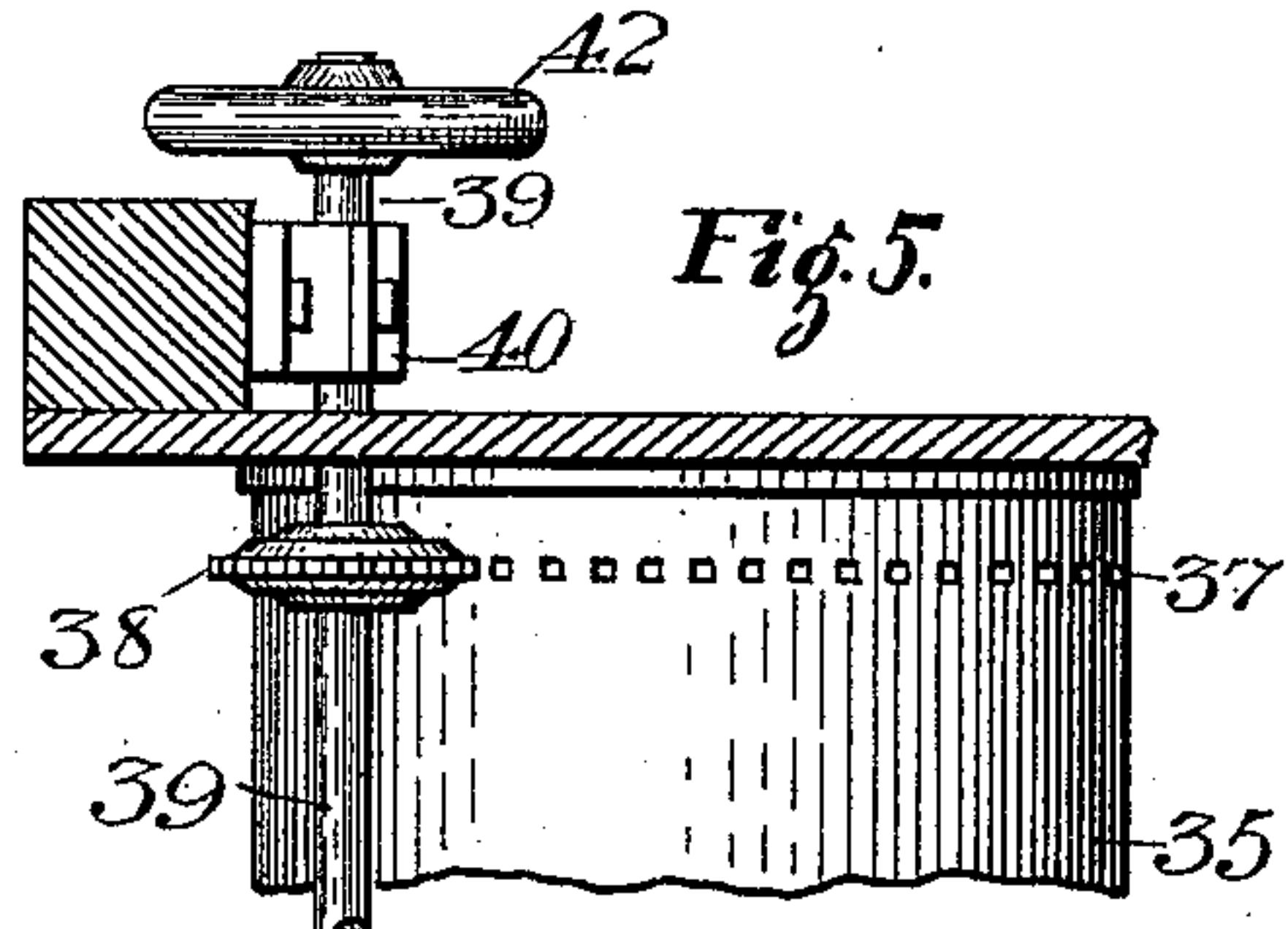
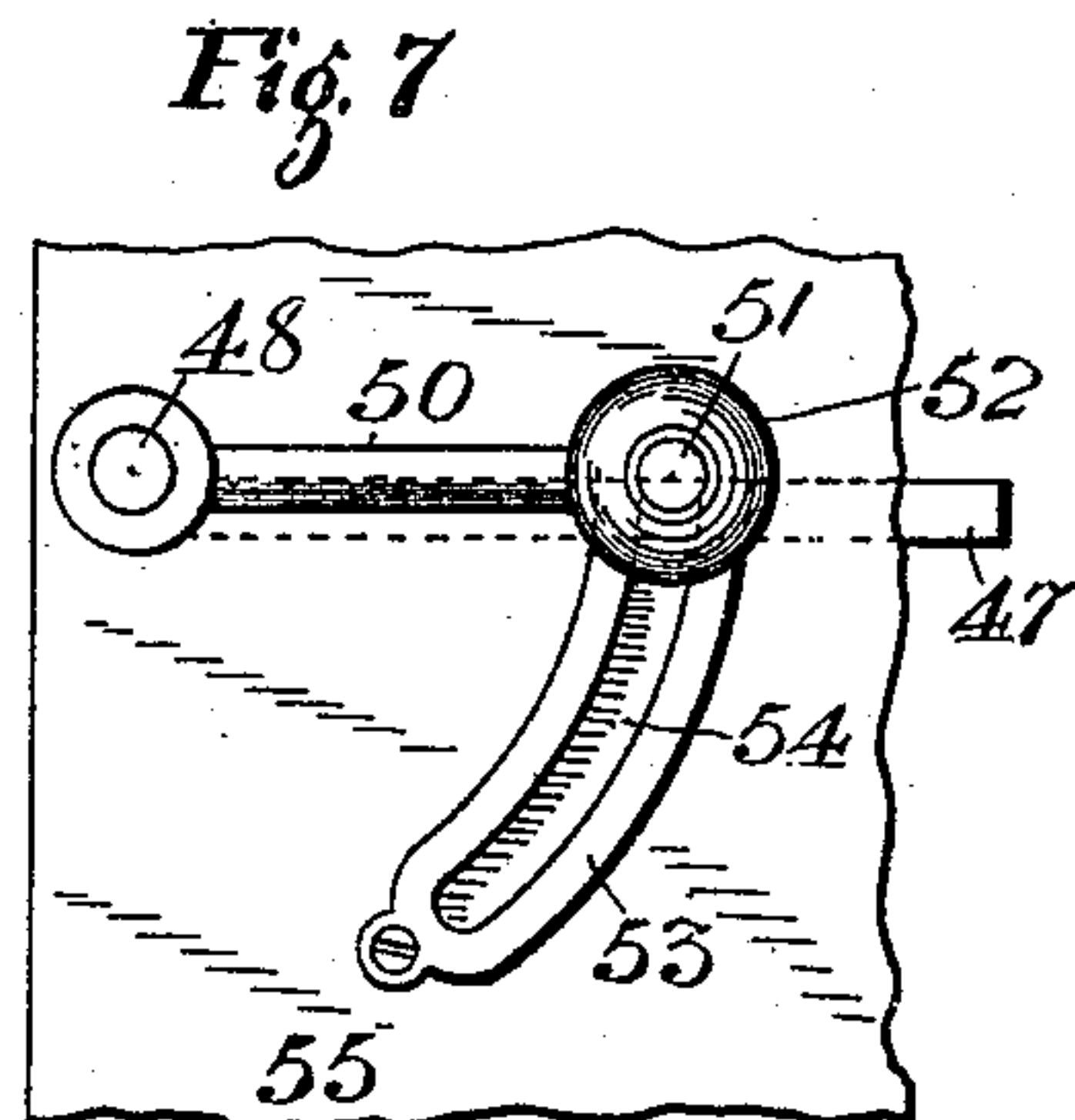
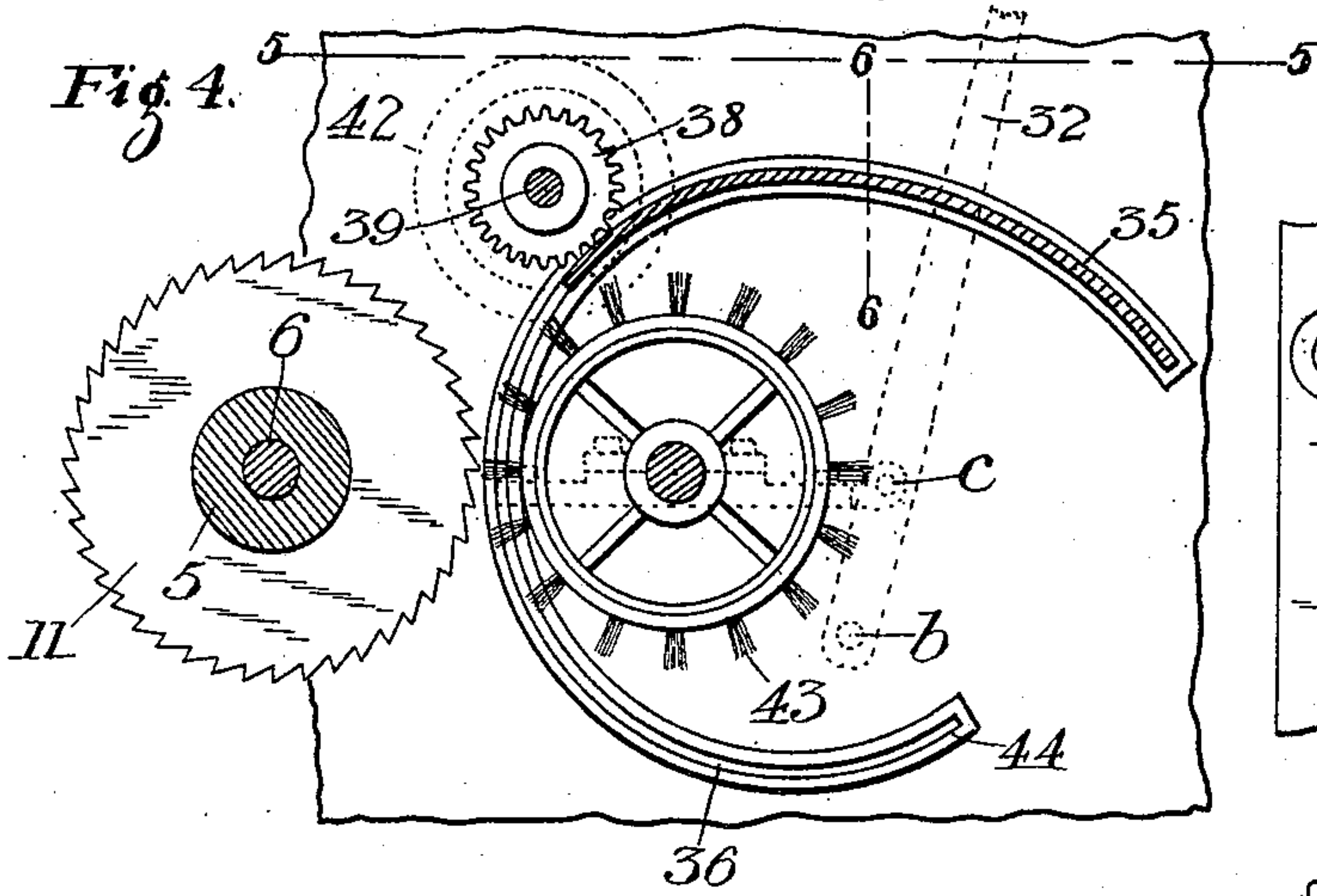
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COTTON GIN.

(Application filed Aug. 14, 1899.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

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COTTON-GIN.

SPECIFICATION forming part of Letters Patent No. 644,155, dated February 27, 1900.

Application filed August 14, 1899. Serial No. 727,185. (No model.)

To all whom it may concern:

Be it known that I, ABNER D. THOMAS, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented certain new and useful Improvements in Cotton-Gins, of which the following is a specification.

In an ordinary brush-gin the brush-cylinder performs two functions. One is the removal of lint from the saws, and the other is the creation of a current of air by which the lint is carried on its course toward the condenser. The performance of these functions makes it necessary to rotate the brush-cylinder about four times as fast as the saws, and as there is great danger of heating the journal-boxes of the brush-cylinder, and thereby setting fire to the cotton being ginned, if the speed of the brush-cylinder is raised to about sixteen hundred revolutions per minute the speed of the saws is practically limited to about four hundred revolutions, though it is desirable, as far as their function is concerned, to increase the speed of the saws to about eight hundred revolutions, as the amount of lint removed from the seed in a given time is greatly increased by increasing the speed of the saws. Where no brush-cylinder is used and air-currents created by fans or blowers are relied upon to remove the lint from the saws and carry it to the condenser, the speed of the saws can be increased without difficulty; but when damp cotton is ginned air-currents alone cannot always be relied upon to clean the saws. I have found, however, that these difficulties in ginning damp cotton can be fully overcome and the speed of the gin maintained by combining with the air-blast in removing the lint from the saws a brush-cylinder revolving at the usual speed or less. I have also found that the speed of the brush may be further greatly reduced also by the use of means to produce air-currents in the flue leading to the condenser.

With the object of overcoming the objections above pointed out and maintaining high speed in the saws while ginning either dry or damp cotton my invention consists of the parts and combinations, as will be hereinafter particularly described, and definitely pointed out in the claims.

In the drawings, Figure 1 is a section of a

cotton-gin embodying my improvements, parts being shown in elevation. Fig. 2 is a similar view showing some of the parts in different position. Fig. 3 is a section on line 3 3 of Fig. 2. Fig. 4 is an enlarged sectional detail showing the relation of the saws, the brush, and hood. Fig. 5 is a section on line 5 5 of Fig. 4. Fig. 6 is a section on line 6 6 of Fig. 4. Figs. 7 and 8 are detail views, in side elevation and section, of the means for operating the gate 47. Fig. 9 is a plan view to show the relation of the general parts of the gin structure. Fig. 10 is a detail showing the means for permitting adjustment of the brush-cylinder toward and from the saws to throw the former out of operative position. Fig. 11 shows in side elevation the means for placing the brush-cylinder in and out of operative position.

The gin-breast 1, seed-board 2, upper circle 3, ribs 4, saw-cylinder 5, its shaft 6, the shaft-bearings 7 and 8, the pulleys 9 and 10 and operative means, and saws 11 are and may be all of any usual or preferred construction.

The gin-frame is of ordinary form except that the rear legs 13 are connected by the cross-pipe 14 and are themselves hollow up to the side pieces 15, whose rear ends they support and which are also hollow as far forward as the blower-uprights 16, which support the blower cross-beam 17. In this manner two air-passages 18 and 19 are preferably formed leading from the tube or pipe 14 to the blower cross-beam 17. The position of these hollow leg-framings is clearly indicated in dotted lines in Figs. 1, 2, and 3, the arrows showing the course of the air-currents presently to be referred to. Though I prefer to use both passages, a single passage to cross-beam 17 may be used.

One end of tube 14 is preferably connected with a blower 20, preferably by pipe 21, and where only one gin is used the opposite end of said tube is closed by a removable plug 22; but where several gins are used these tubes 14 may be joined, so as to form a continuous passage for air, as will be obvious.

There is preferably a longitudinal air-passageway 23 through the bottom of cross-beam 17, which connects the air-chamber within said beam with a nozzle 24, attached to said beam and extending downward in proximity to the

saws. The nozzle 24 is preferably as long as the width of the space occupied by the gin-saws, and its tip is preferably divided by a series of partitions 25 into a series of openings 26, one for each saw, and said nozzle is preferably arranged so as to direct a substantially-vertical blast upon the teeth of each of the saws.

To the rear of the saws I arrange a brush 27, designed to operate in connection with the air-blast from the nozzle 24 in removing lint from the saws when the cotton is so damp as to make it difficult or impossible for the air-blasts alone to do the work perfectly. In ginning dry cotton, however, I prefer to rely upon the air-currents for removing the lint from the saws, and in order to enable a gin-ner to use an air-blast either with or without the coöperation of the brush I provide means for throwing the brush readily into operative or inoperative position and form a clear space between the brush-bristles and the saw-teeth for the free passage of the air-currents issuing from the nozzles 24 and the lint detached from the saws. It is not sufficient alone that the brush be thrown out of operation, but a clear unobstructed passage must be provided for the lint, which would otherwise catch upon the brush-bristles and clog the machine, and to secure such space I have provided means to move the brush away from the position it occupies during its operation of cleaning the saws into a position of inoperation away from the saw-teeth.

Having reference to Figs. 2, 10, and 11, the bearings 29 for the brush-cylinder 27 are provided with elongated slots 31, through which are passed the securing and guiding bolts 33. Pivoted to the gin side *a* on the bolt *b* is the lever 32, having a pin-and-slot connection *c* with the journal-bearings of the brush-cylinder. Normally the bolts 33 serve to hold the brush-cylinder in position to act upon the saws; but when loosened they free the sliding journal-boxes to the action of lever 32, to be thereby moved into position indicated by Fig. 11 to throw the brushes out of operation and provide a clear space 28 for the action of the air-currents and free passage of lint. To more effectually provide for the necessary free passage of the air-currents and lint, I provide a shield 35, sliding in grooves or guides 36 and having a rack 37 near each edge, into which gears 38, secured to shaft 39, turning in bearings 40, mesh. I prefer to make shield 35 of sheet metal and form rack 37 therein by punching a series of holes 41. By means of hand-wheel 42, Fig. 5, shaft 39 and gears 38 are rotated and shield 35 caused to assume either of the positions to be described. Figs. 1 and 4 show it in its upper position, where it does not interfere with the action of brush-cylinder 27, and Fig. 2 shows it as lowered between the brush and the saws to prevent interference of the brush with the free passage of the lint. When caused to slide down into the latter position, it comes

in contact with bristles 43 of the brush and bends them down and back out of the way, said shield preferably extending back to a point 44. The space between the bar 45 and the top of the condenser-flue 46 is preferably closed when the shield 35 is in its lower position or when the brush is in inoperative position by means of a cut-off board 47, whose rear edge is preferably attached to shaft 48, by means of which its outer edge can be either raised or lowered. Said shaft passes through openings 49 in the side of the gin and has attached a crank 50, Figs. 7 and 8. To the outer end of crank 50 is attached an outwardly-projecting screw-threaded wrist-pin 51, which is preferably attached to and carries a screw-threaded handle 52, adapted to be screwed in and out upon said pin.

The end of crank 50 preferably extends beneath a raised plate 53, having a curved slot 54, which preferably rests upon legs 55, secured to the side of the gin. Through slots in said plate the wrist-pin of the crank projects, and by screwing the handle 52 inward, so as to cause it to press against the outside of the plate 54, the crank 50 is locked in desired position.

When shield 35 is down, it not only forces the brush-bristles back and forms space 28 for the passage of air, but also presents a smooth face to the lint and air-currents, which would not be the case if bristles were left uncovered. Moreover, the shield can be moved with ease and readily, and its use makes it unnecessary in some cases to disturb the bearings of the brush-cylinder.

Mouth 55 of flue 46 extends across the gin to the rear of the space occupied by the saws and below the level of said saws. Mote-board 56 occupies the same position occupied by mote-boards in gins in which lint is removed from the saws by a brush. It preferably slides horizontally in guides 57 and has rack 58, meshing with gear 59, attached to shaft 60 in bearings 61. When shield 35 and cut-off board 47 are down, they form what may be termed the "continuous top" of the flue 46, the shield forming the upper lip and the mote-board the lower lip of the flue-mouth.

Below the saws and in front of the mote-board the gin is open for admission of air to mouth of the flue 46 and also to permit motes, dirt, and other impurities to drop down in front of and below the mote-board.

Flue 46 leads to the condenser 63, in connection with which I use a suction-fan 64, as in Fig. 1, having a discharge-opening. By thus drawing air into the mouth of the flue 46 a current is formed which enters the front of the gin above the mote-board and crosses the path followed by the lint and heavy impurities under the impulse of the air-current issuing from the nozzles 24. Thus the light fluffy mass of lint is drawn into the flue 46, while the heavier impurities, being uninfluenced by the cross-current, continue on their course out of the machine.

In order to assist in the production of the cross-current above alluded to, I may place in the flue 46 a fan 70, driven from any suitable source of power, suitable provisions being
5 made in the flue for the proper accommodation and working of said fan which draws the air into the mouth 55 of the flue. Likewise the fans 20 and 64 may be driven from any suitable moving part of the gin. The former I
10 have shown as driven from the saw-shaft by belt 7 and pulleys 10 and 7'.

From the construction above described it will be obvious that I may when ginning dry cotton employ the air-currents alone for removing the lint from the saws and carrying
15 it to the condenser, or when treating cotton too damp for effective removal by air-currents alone I may move the brush into operation in conjunction with the air-currents and while
20 maintaining the high speed of the saws run the brush at reduced speed sufficient to keep the saws clean and depend upon the air-currents for rapid and effective transmission of the lint from the saws to the condenser, or
25 when desired from any cause I may dispense with the air-currents entirely by moving the brush into operative position, depending upon the brush alone. Thus my improved gin is readily convertible to perform the operation
30 usually requiring a series of different kinds of machines.

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

35 1. In a gin, the combination of the saws, a brush to raise and loosen the lint on the saws, means for directing a current of air on said saws substantially tangential thereto to remove the lint from the saws.

40 2. In a gin, the combination of the saws the gin-brush for removing lint therefrom, and means for rendering said brush inoperative and to provide a free passage between the brush and saws for the unobstructed escape
45 of lint.

3. In a gin, the combination of the saws, the gin-brush for removing lint therefrom, means for directing a current of air on said saws, and means for rendering the brush inoperative
50 ative and to provide a free passage for the escape of lint and air-currents between the saws and brush.

4. In a gin, the combination of the saws, a brush for removing lint from the saws, means
55 for directing an air-current on said saws, and means for rendering said brush operative or inoperative as desired.

5. In a gin, the combination of the saws, a

brush, means for directing a current of air on said saws, means for rendering said brush 60 operative or inoperative as desired, and a cut-off board back of said brush.

6. In a gin, the combination of the saws, a brush, means for rendering said brush operative or inoperative as desired, means for 65 directing a current of air on said saws, a flue leading from said brush, a cut-off board and means to move it to close the passage from the brush to the flue.

7. In a gin, the combination of the saws, a 70 revolvable brush, and a movable shield adapted to be placed between the saws and brush for separating them.

8. In a gin, the combination of the saws, a revolvable brush, a movable shield adapted to 75 be interposed between the saws and brush, and an adjustable cut-off to the rear of the brush.

9. In a gin, the combination of the saws, a revolvable brush, means for directing a current 80 of air on said saws, and a movable shield adapted to be interposed between the saws and brush.

10. In a gin, the combination of the saws, a revolvable brush, a sliding shield for separating the saws and brush and provided with a rack, a gear-wheel meshing with the rack and means to rotate the gear-wheel and thereby move the shield.

11. In a gin, the combination of the saws, a 90 revolvable brush, a shield adapted to be interposed between the saws and brush, and guides for said shield.

12. In a gin, the combination of supporting-legs, an air-tube connecting to said legs, an 95 air-passage extending up from said tube through one of the legs connected thereto.

13. In a gin the combination of supporting-legs, side pieces connected thereto, a hollow cross-beam, upright connecting the side 100 pieces and hollow cross-beam, a tube connecting a pair of the supporting-legs, and an air-passage leading from said tube through each of the legs, the side pieces, and uprights to the hollow beam. 105

14. The combination in a saw-gin of a frame, supporting-legs therefor, side pieces and uprights, a hollow beam connected to said uprights, a tube connecting said legs, air-passages extending up through said legs, side 110 pieces and uprights, and a nozzle extending down from said cross-beam.

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Witnesses:

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