

No. 700,196.

Patented May 20, 1902.

E. B. HEINOLD.
STARCHING MACHINE.

(Application filed Aug. 17, 1901.)

(No Model.)

3 Sheets—Sheet 1.

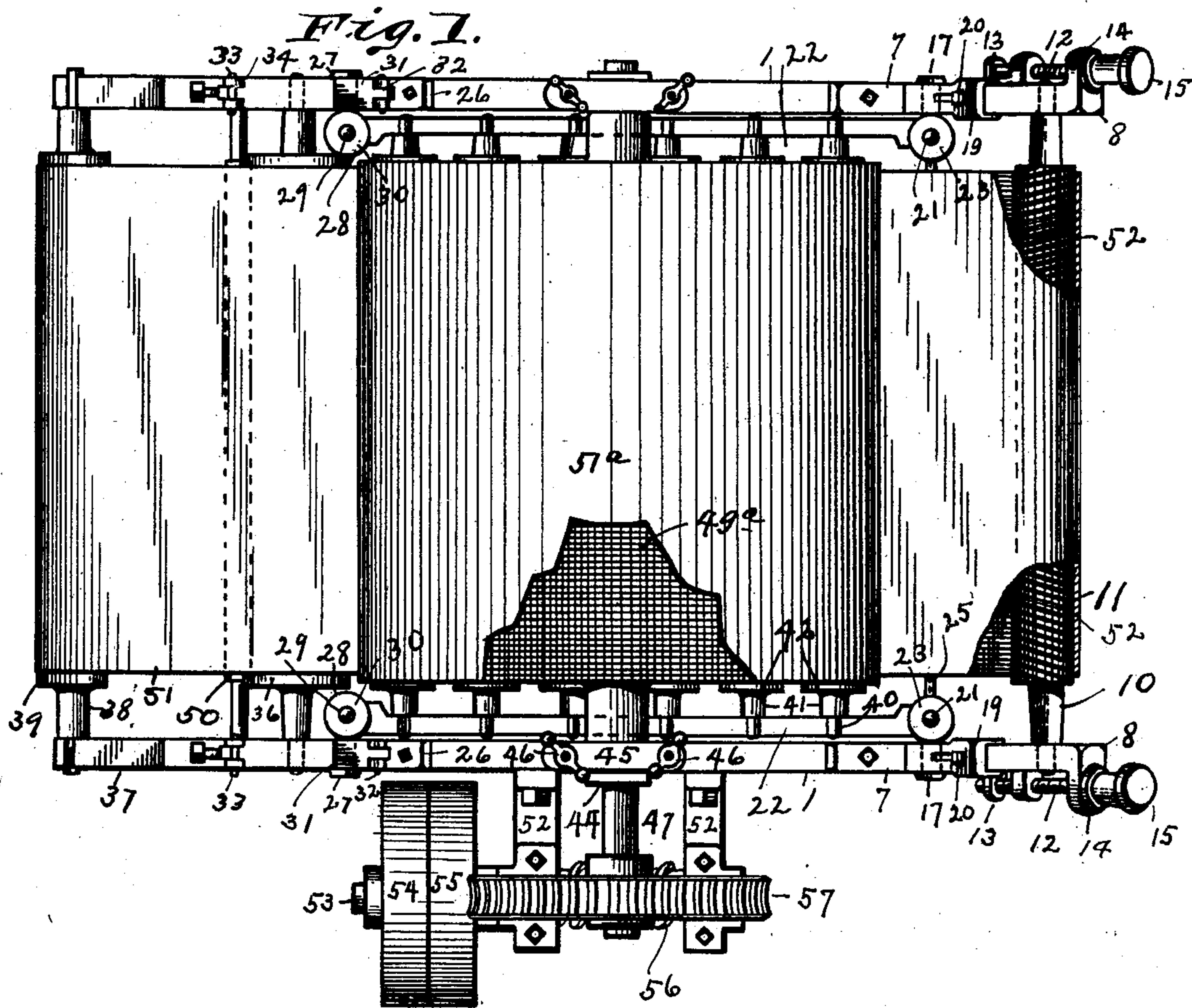


Fig. 8.

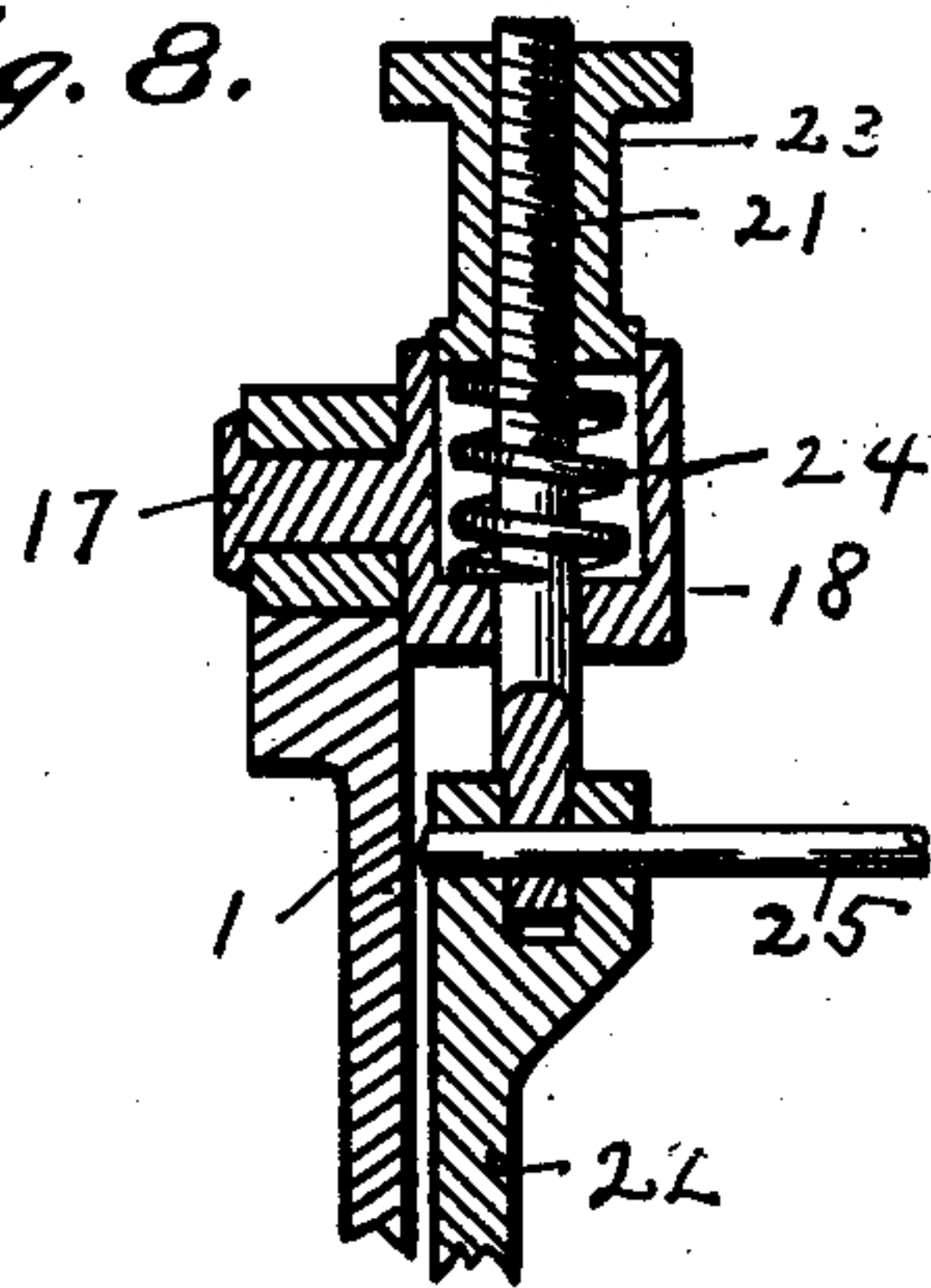
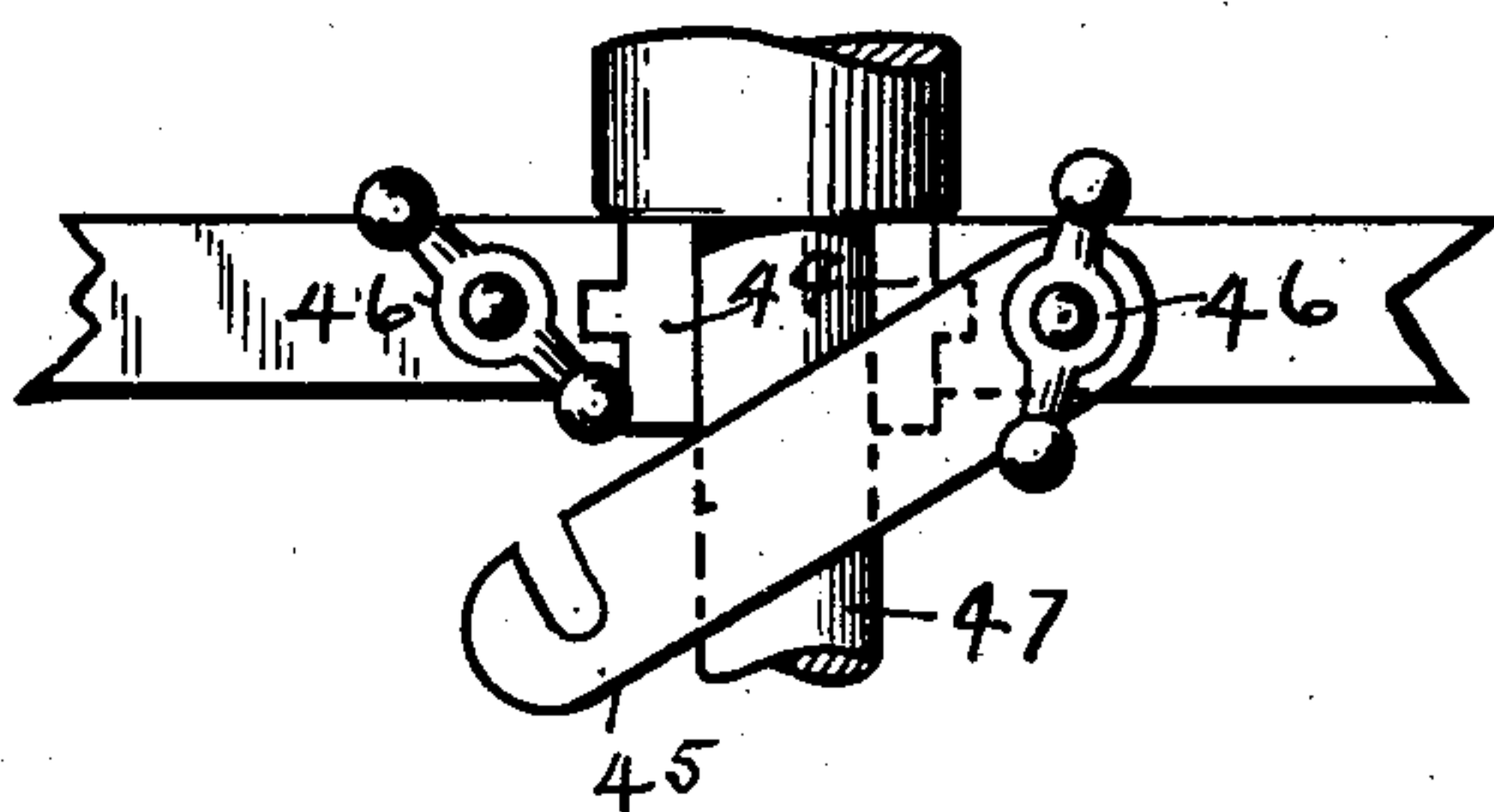


Fig. 9.



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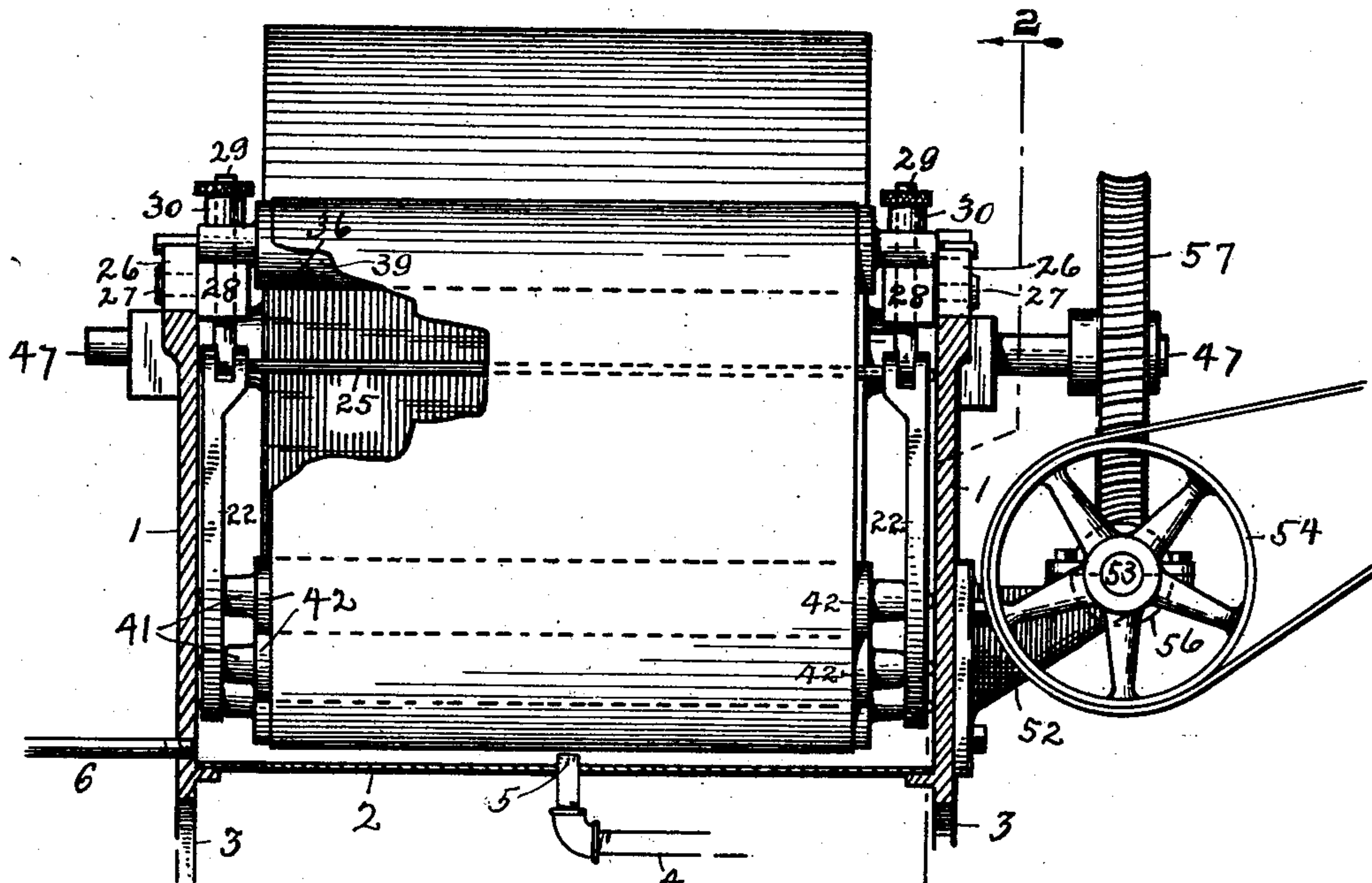
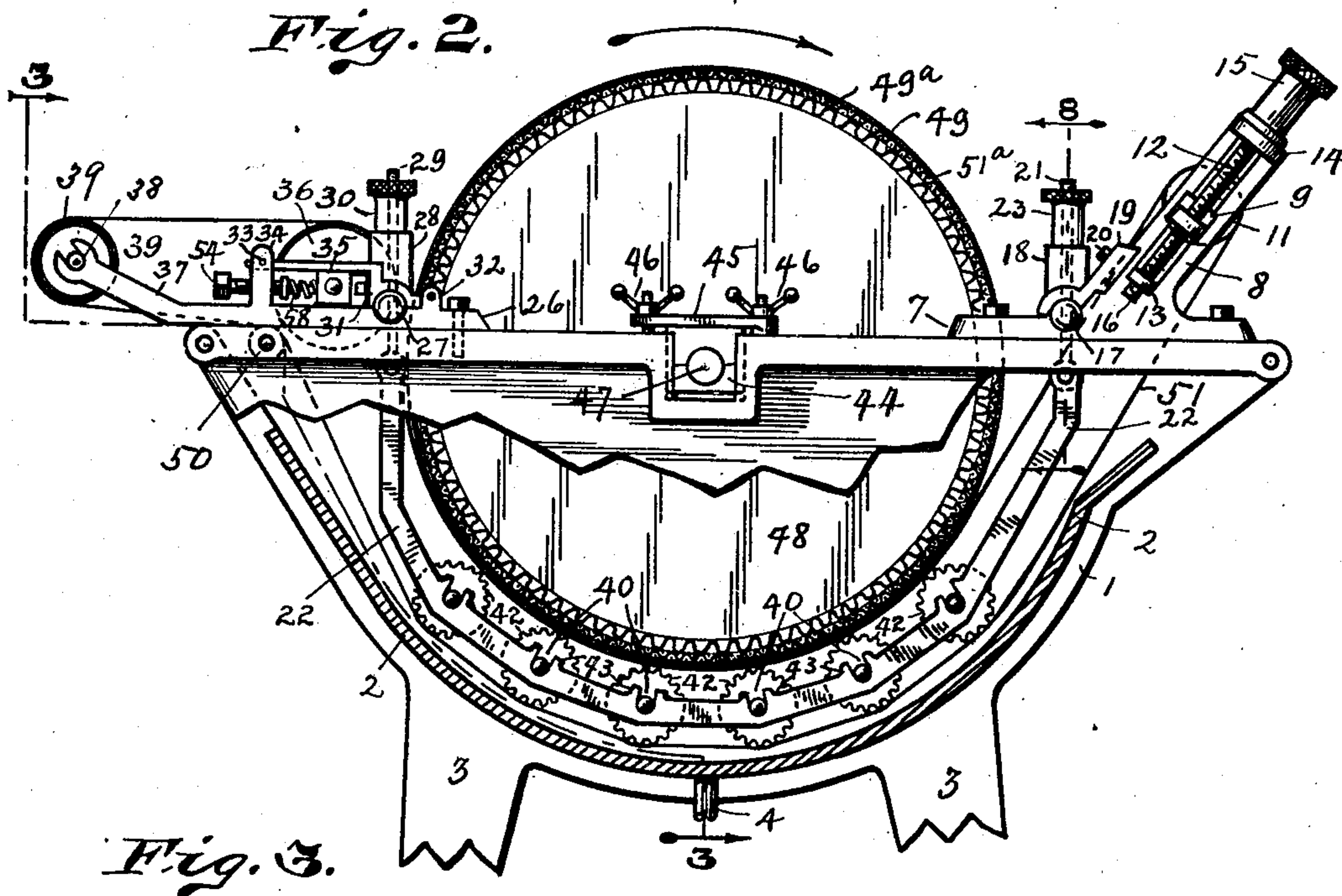
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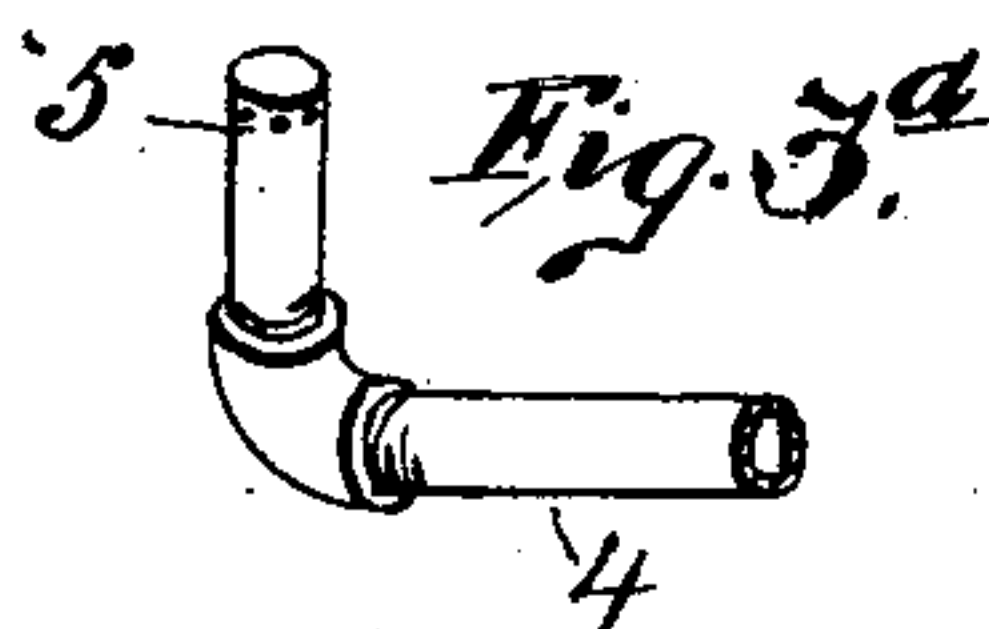
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3 Sheets—Sheet 2.



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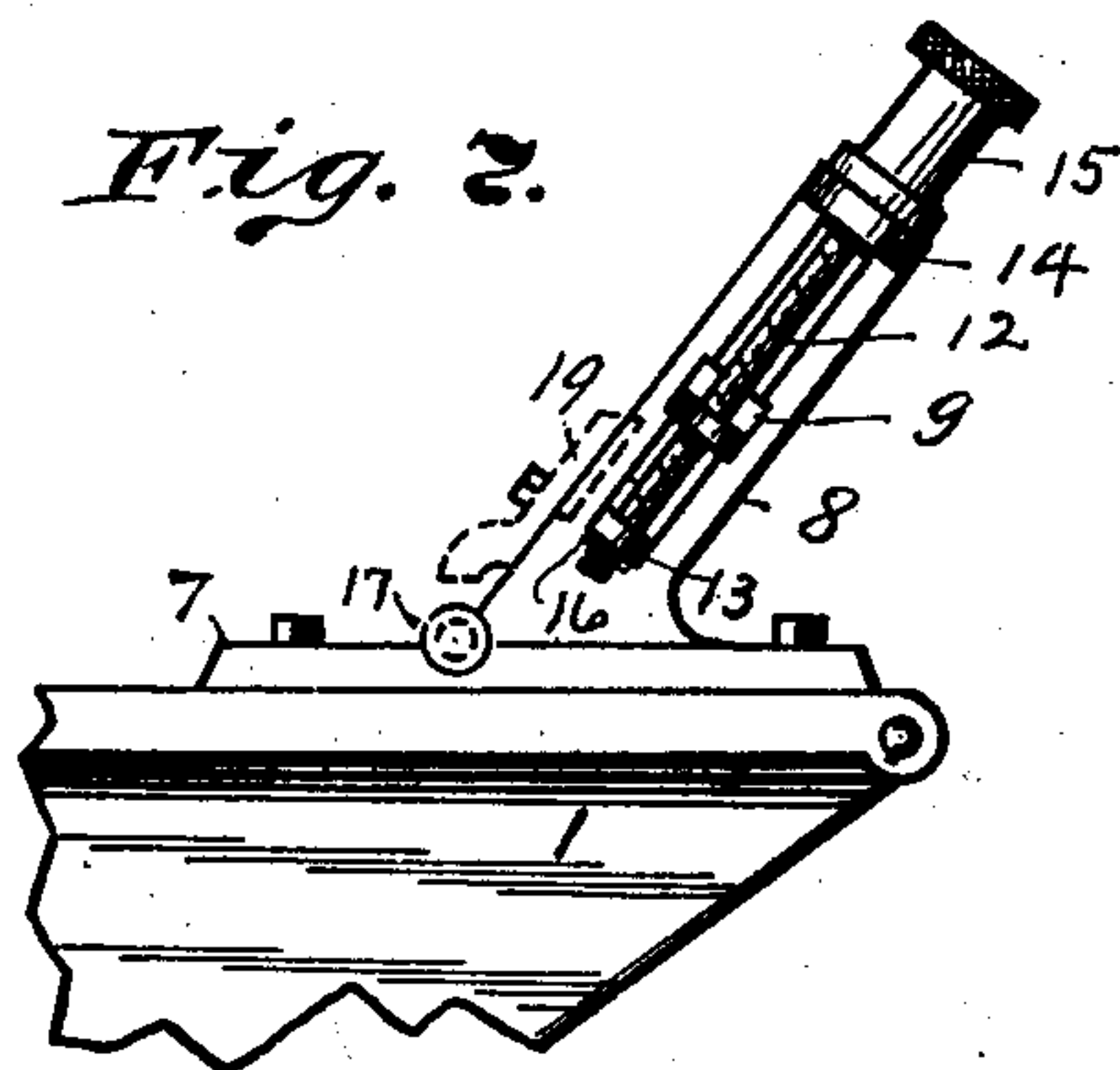
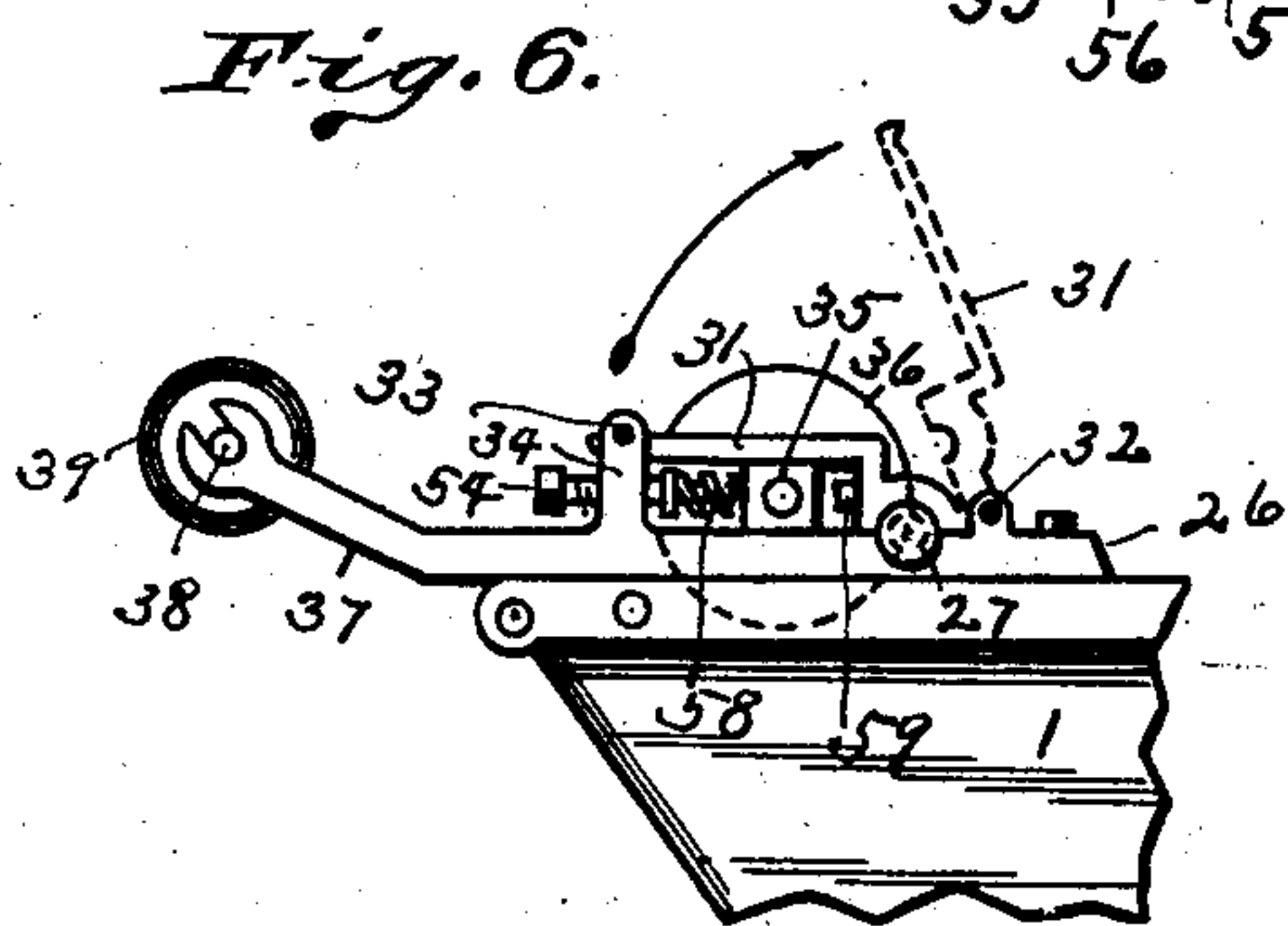
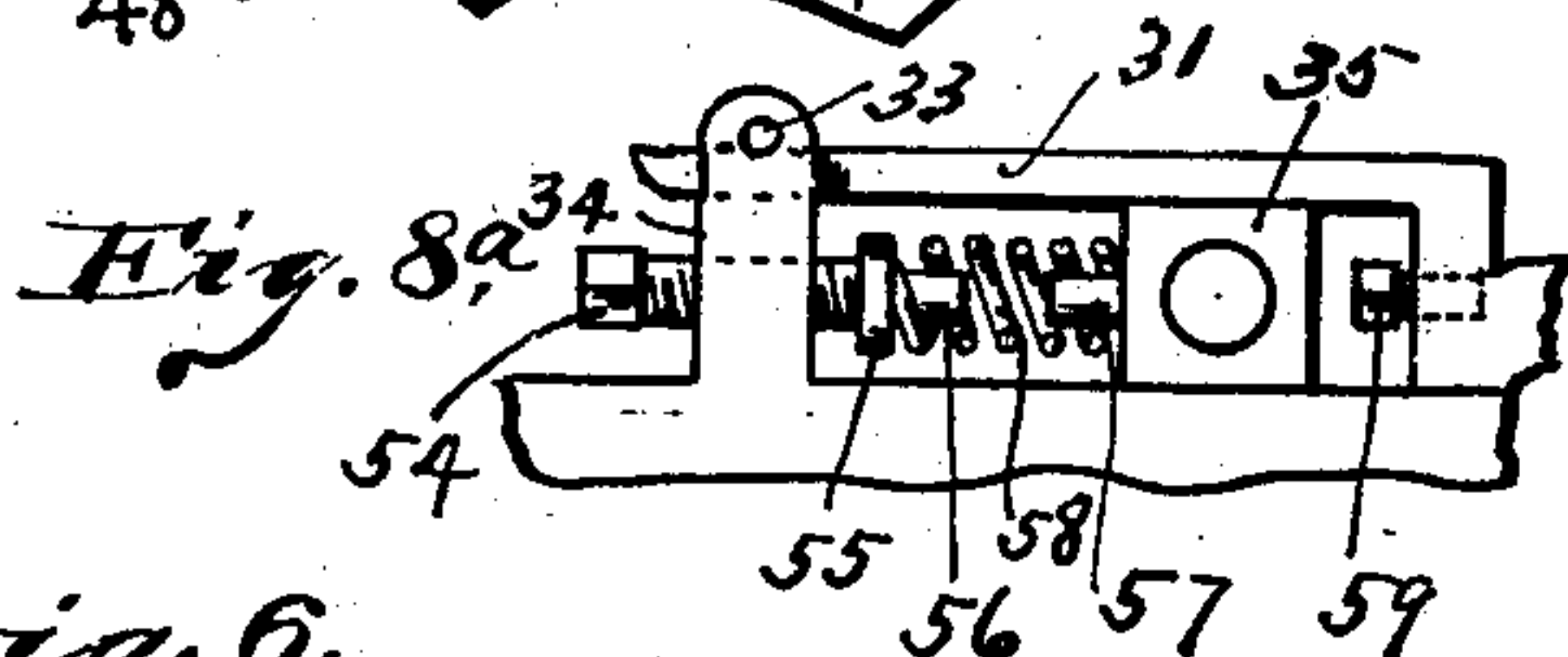
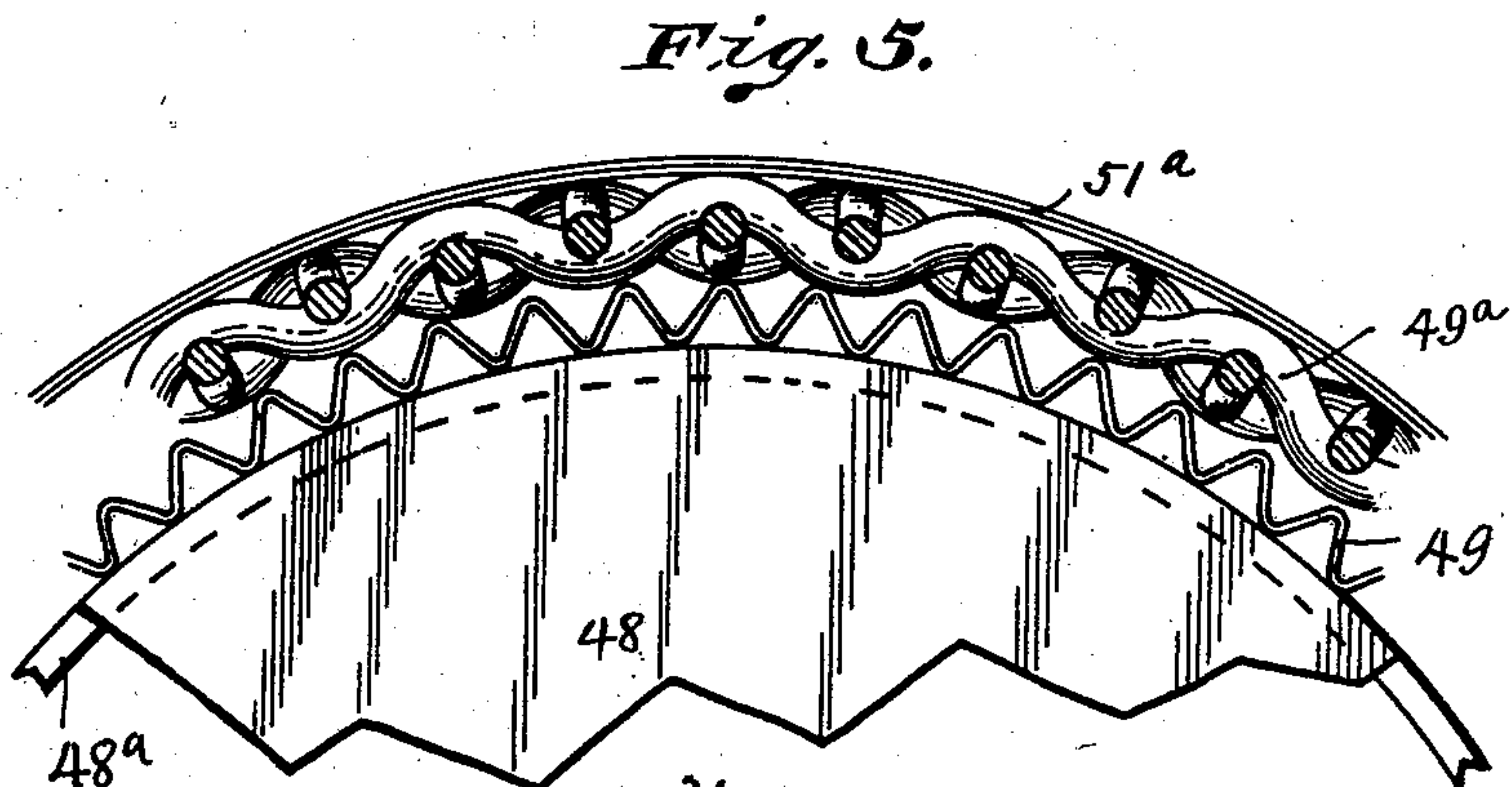
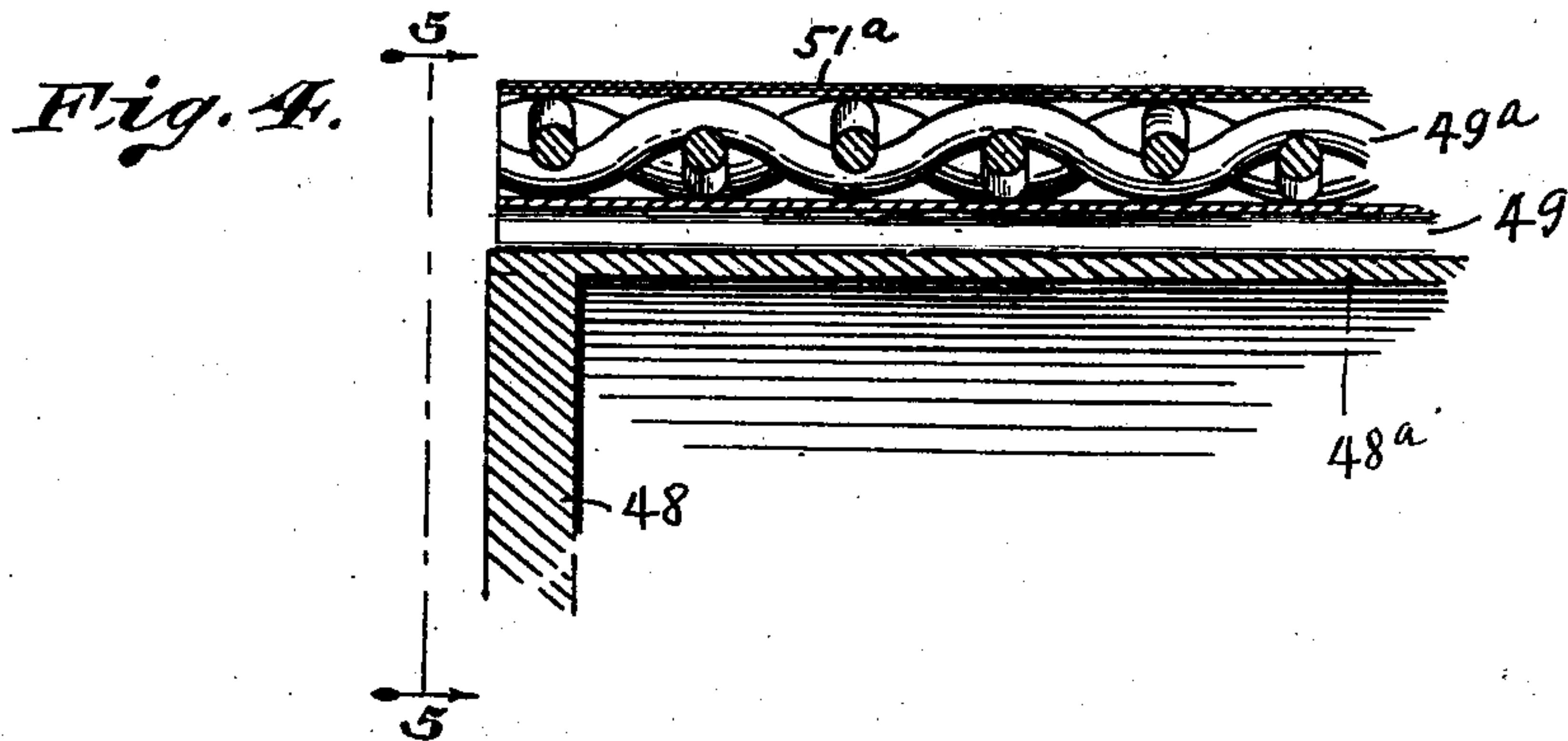
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(Application filed Aug. 17, 1901.)

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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

EDWARD B. HEINOLD, OF ANDERSON, INDIANA.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 700,196, dated May 20, 1902.

Application filed August 17, 1901. Serial No. 72,400. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. HEINOLD, a citizen of the United States, residing at Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Starching-Machines, of which the following is a specification.

This invention relates to improvements in machines for starching collars, cuffs, or similar wearing-apparel; and the object of the invention is, first, to provide a one-drum machine and means for supporting a plurality of rolls in adjustable relation thereto, said rolls having an endless belt by means of which the articles to be starched are presented with predetermined pressure to the drum, whereby a regulated quantity of starch is given to them; second, to provide a primarily solid or closed drum to prevent the entrance of starch into its interior, but with a periphery having ample conduits to allow the air and starch to readily pass out into the starch-pot after the surplus starch has been pressed through the articles to be starched; third, to provide a machine which can be taken apart readily to clean the parts; fourth, to provide a machine that will be simple to construct and operate, durable, and inexpensive both as to first cost and as to maintenance.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top or plan view of my invention; Fig. 2, a vertical longitudinal section on the line 2 2 of Fig. 3; Fig. 3, a section on the line 3 3 of Fig. 2. Fig. 3^a is a detail view of the end of pipe 4; Fig. 4, a detail on a larger scale of the drum and its periphery, the detail being in longitudinal section; Fig. 5, a detail in side-elevation of the drum on the line 5 5 of Fig. 4; Fig. 6, a detail showing the construction and operation of the hinged bar for retaining the box for the top delivery-roll and its adjacent frame-hanger; Fig. 7, a detail showing in dotted lines the raised position of the adjustable fastening of the hanger at the opposite end of the frame; Fig. 8, a detail in vertical section on the line 8 of Fig. 2; Fig. 8^a, a detail of the adjustment for roll 36; Fig. 9, a detail in plan view of the plate which locks the journal-box of the

drum in place, said locking-plate being partially open.

1 1 are the sides of the starch-pot, and all of the operative mechanism of the machine has support from the reinforced upper edges of said sides.

2 is the curved bottom of the starch-pot, connecting the sides 1 1, and the upwardly-turned ends of the bottom form the ends of the starch-pot.

The machine is supported on legs 3. A steam-pipe 4 projects a short distance through the bottom 2 into the starch-pot. The end of this pipe is closed; but through the sides, near the closed end, is a plurality of holes for the purpose of allowing the live steam supplied through the pipe to discharge into the pot and cook the starch and keep it hot. A discharge for the starch is shown at 6, Fig. 3.

Bolted to the rim of the starch-pot, on either side thereof, are the blocks 7 7, having the upwardly-projected standards 8 8, with longitudinal slots that form ways for the journal-boxes 9 9, in which the reduced ends of the shaft 10 of feeding-in roll 11 are mounted. The reductions in diameter of shaft 10 form shoulders which prevent longitudinal movement of the shaft on account of the contact of the shoulders with the boxes. The adjustment of the boxes in their ways is obtained at either end of the roll by screws 12, which pass through threaded holes in their respective boxes, and the screws being held by lugs 13 and 14, head 15, and pin 16 from movement longitudinally will when rotated cause the boxes to travel up or down in their respective ways. The blocks 7 7 also have transverse half-round grooves to form seats for the wrist-pins 17 17, (see Fig. 8,) which project laterally from the spring-cups 18 18. The wrist-pins are held in place by bars 19 19, having longitudinal slots for bolts 20 20, by which the bars are secured to standards 8 8 in an adjustable manner. By loosening the bolts the plates which have half-round grooves in their lower ends can be moved up on the standard to uncover and release the wrist-pins. Passing through a suitable opening in the bottom of each cup 18 is the threaded eyebolt 21, and suspended from bolt 21 is frame 22, there being two frames, one on either side of the ma-

chine. Screwed on the outer threaded end of each bolt 21 is hand-nut 23, and between the nut 23 and the bottom of the cup is spring 24, (see Fig. 8,) which presses the nut up, there-
 5 by drawing up the bolt and raising the frame 22. The pin 25, which connects the frames to the eyebolts, will preferably extend across the machine.

At the opposite or delivery end of the ma-
 10 chine are blocks 26 26, also bolted to the rim of the starch-pot. These blocks have transverse half-round grooves which form seats for wrist-pins 27 of cups 28, in which is seated a spring (not shown) and through which pass
 15 eyebolts 29, the upper ends of which are screw-threaded to receive the hand-nuts 30 and the lower ends of which are pivotally secured to the ends of the frames 22 opposite the previously-described ends, held by the eye-
 20 bolts 21. The construction of cup, spring, eyebolt, nut, &c., being the same as like parts at front end of frames 22, it is not thought necessary to more fully illustrate or describe their construction.

The cap 31, which holds the wrist-pin in its seat, is hinged at 32 to the block 26. The other end of the cap is secured under a pin 33 at the top of the post 34. The arm of the cap between the wrist-pin cover and the post is
 30 parallel with the top of the block 26 and forms therewith a way for the journal-boxes 35 of large roller 36. Each box 35 is pressed toward the drum by spring 58, which is held in place against the boxes by boss 57. The tension of
 35 the spring will be regulated by set-screw 54, having reduced end 56 to slip into the opening in the coil of the spring and collar 55 to form a bearing. The set-screw 59 forms an adjustable stop which can be set to prevent
 40 roll 36 approaching too close to drum.

The blocks 26 have the outside extensions 37, with bifurcations to form seats for shaft ends 38 of roller 39. The rollers 36 and 39 are preferably covered with silence-cloth or
 45 other goods having a long pile.

Formed in the inner edges of the frames 22 are the notches 40, which form seats for the ends of shafts 41 of the corrugated rollers 42. On either side of the notches 40 are
 50 the lugs 43 to form extensions to guard against the displacement of the ends 41. The surfaces of the rollers 42 are corrugated longitudinally of the rollers in order to provide grooves to carry starch.

Formed in the rims of the two sides of the starch-pot are large rectangular notches having vertically-grooved sides. The notches form seats for the journal-boxes 44, which have ribbed edges to take into the grooves of
 60 the notches to retain the boxes in the latter, as shown in Fig. 9, in which figure the top half of the box has been removed. 45 is a plate secured at its ends to the frame on either side of the notch by means of the
 65 threaded pins on which are screwed the nuts 46. By tightening the nuts on the pins the plates can be lowered, thereby limiting the

upward movement of the boxes in their notches. The plates 45 will have the opening for the pin at one end notched through
 70 to the edge to allow the plate to be moved laterally, as shown in Fig. 9, to release the journal-box, and thereby permit the removal of the shaft 47, mounted therein, without screwing the nut entirely off.

Mounted on shaft 47 are metal disks 48, and connecting the disks, as shown in Figs. 4 and 5, is a metal cylinder or sleeve 48^a, forming therewith a perfectly-tight drum into which
 80 no starch or moisture can penetrate. Removably secured to the periphery of the drum is a metal sleeve 49, having transverse corrugations, as shown in Figs. 2, 4, and 5, and wrapped around this corrugated sleeve is a layer of cloth 49^a, made out of heavy
 85 metal wires (preferably brass) woven together, as shown in the drawings. Then around this wire-cloth are several layers of canton-flannel, silence-cloth, or other material 51^a, having a loose pile to form a yielding
 90 background for the collars and cuffs. The drum in operative position is in close relation to the corrugated rollers 42. Passing around the roller 11, thence between the drum and the rollers 42, thence between the drum and
 95 roller 36, over said roller 36, thence around roller 39, thence over a roller 50, supported by the sides of the starch-box near the top of said box, and thence under the rollers 42, back to roller 11 is an endless belt 51, the
 100 purpose of which is to carry goods through the starch under the drum. The tension of the belt is regulated by moving the roller 11 in or out along the slotted ways which guide it, and as the boxes at the ends are inde-
 105 pendently adjustable one side of the belt can be tightened or loosened without changing the other. In order to spread the belt both ways from the middle of it, I provide right and left grooves 52 in the face of the roller
 110 11, or the grooves may be in roller 39.

Secured to the side of the starch-pot are brackets 52 52, having boxes in which is mounted shaft 53, having thereon the tight belt-pulley 54 and loose pulley 55 and having
 115 the worm 56 mounted thereon between the two boxes. Mounted on an extension of the shaft 47 is the toothed wheel 57, the teeth of which engage the spirals of the worm. The drum mounted on shaft 47 is revolved by
 120 power from any suitable motor transmitted through pulley 54, shaft 53, worm 56, wheel 57, and shaft 47, and by the use of the worm and wheel the latter, with its shaft and drum, can be readily detached from the associated
 125 driving mechanism to permit of the removal of the drum for ready cleaning of it and other parts of the machine.

The drum, as shown and described, is made up for handling a stiff heavy starch, such as
 130 is preferred for starching new goods to be handled and offered for sale in a commercial way, and the nature of the starch used requires ample conduits for the flow back to the

main body in the tank of the excess starch which has been pressed through the goods into and through the drum-cover. Such conduits are afforded by the interstices of the woven-wire cloth added to by the spaces between the corrugations of the sleeve 49.

In starching collars and cuffs for every-day wear a thin free-flowing starch is most commonly used, and because of the free-flowing nature of the starch it is not only possible, but desirable, that a solider background or drum-periphery be employed, and this I provide by lifting the drum out of the machine and removing the corrugated sleeve 49 from the body of the drum and then replacing the woven-wire layer 49^a and wrappings of silence-cloth outside of the layer 49^a. The latter by being split on one side will close in enough to fit the drum after the removal of corrugated sleeve therefrom. The frames 22 22 being pressed constantly upward by the springs in the cups 18 and 28 impart a yielding pressure through rollers 42 and belt 51 on the goods against the drum. This pressure can be regulated by adjusting the nuts 23 and 30 on the eyebolts. A swinging adjustment of the frames on wrist-pins 17 and 27 longitudinally of the starch-pot also obtains, whereby the degree of pressure of the front rollers 42 against the drum can be made to vary from that of said rollers 42 at the rear of the machine, and vice versa. This is obvious, for if the front nuts 23 are loosened and rear nuts 30 are tightened the frames will tend to swing on the last roller 42 as a fulcrum, causing the frames 22 and their rollers on the other or front side of the drum to depart from the drum. So if too much starch is being left in the goods the rollers 42 toward the rear or delivery end of the machine can be readily brought closer to the drum, thereby pressing out more of the starch, or by a reverse operation a looser fit of the rollers will obtain and a greater quantity of starch left in the goods.

An important feature of my invention is the ease with which the machine can be taken apart, all of the rollers being so attached that they may be lifted out of their supports without much trouble.

Having thus fully described my invention, what I claim as new, and wish to secure by Letters Patent of the United States, is—

1. In a starching-machine the combination of the starch-pot, a drum mounted therein, having a closed body and longitudinal channels in its periphery extending from end to end, a woven-wire-fabric covering for said drum, a fabric on the outside of said wire fabric, a plurality of rollers parallel with the drum and mounted between said drum and the bottom of the pot, and an endless belt mounted on rollers supported on each side of said drum, said belt passing between the under side of said drum and the series of rollers in the bottom of the pot, substantially as set forth.

2. In a starching-machine the combination of a drum having a closed body to exclude starch from its interior, a woven-wire sleeve surrounding the periphery of the drum and supported out of continuous contact with said periphery by longitudinal ribs or corrugations, and windings of loose pile fabric around said woven-wire sleeve, substantially as set forth.

3. A starch-pot, a drum suspended therein, a plurality of rollers between the drum and the bottom of the pot, independent frames on either side of the pot to support the rollers, said frames consisting of a bent bar for each having shaft-bearings for the shafts of the rollers and eyes at the ends of the bars, eyebolts connected to the ends of the frames, cups through which the eyebolts pass, said cups having springs to support the eyebolts and means for regulating the tension of the springs, said cups being supported by wrist-pins from the sides of the pot and an endless belt passing around the rollers.

4. In a starching-machine, a starch-pot, a drum, a plurality of rollers, an endless belt passing around the rollers and a pair of frames to support the rollers, said frames being elastically supported at their ends whereby they will be drawn with a yielding pressure toward the drum and said frames being hinged to the supports to permit swinging adjustment of the frames in vertical planes and means for adjusting the ends of the frames independently of each other.

5. A starch-pot, a drum, a plurality of rollers, an endless belt passing around the rollers, a pair of frames to support the rollers consisting of bent bars having indents on their inside edges to form bearings for the roller-shafts, eyebolts pivotally secured to the ends of the frames said bolts being screw-threaded, cups supported by horizontal pivots the eyebolts passing through the cups, nuts on the projecting threaded ends of the eyebolts and springs between the nuts and the bottoms of the cups around said eyebolts.

6. In a starching-machine, a drum having a closed body to exclude starch from its interior, a corrugated sleeve removably secured to the periphery of the drum, a woven-wire sleeve surrounding and removably secured to the corrugated sleeve and windings of a loose-pile fabric around the woven-wire sleeve.

7. In a starching-machine, a starch-pot, a drum adjustable vertically, rollers parallel with the drum between the drum and the bottom of the pot and adjustable to and from the drum said rollers being below the axis of the drum, a roller above the axis of the drum at the front of the machine and adjustable in a plane oblique to the horizontal, a second roller above the axis of the drum on the opposite side of the latter from the obliquely-adjustable roller and adjustable horizontally, and a belt passing around all of the rollers.

8. In a starching-machine, a starch-pot, a drum, rollers below the axis of the drum and

parallel therewith and adjustable to and from
the drum, a roller above the axis of the drum
and adjustable in an oblique plane, a roller
on the opposite side of the drum from the ob-
liquely-adjustable roller said last roller ad-
justable in a horizontal plane and being above
the axis of the drum, a third roller outside of
and parallel with the second and horizontally-
adjustable roller and a belt passing around all

of the rollers and between the rollers and the ro
drum.

In witness whereof I have hereunto set my
hand and seal, at Anderson, Indiana, this
16th day of July, A. D. 1901.

EDWARD B. HEINOLD. [L. s.]

Witnesses:

HARRY J. QUIGLEY,
LOUIS K. ASCHER.