No. 751,560. PATENTED FEB. 9, 1904.

F. W. ROBINSON.

STOCKING TOP CUTTING MACHINE.

APPLICATION FILED JUNE 16, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.

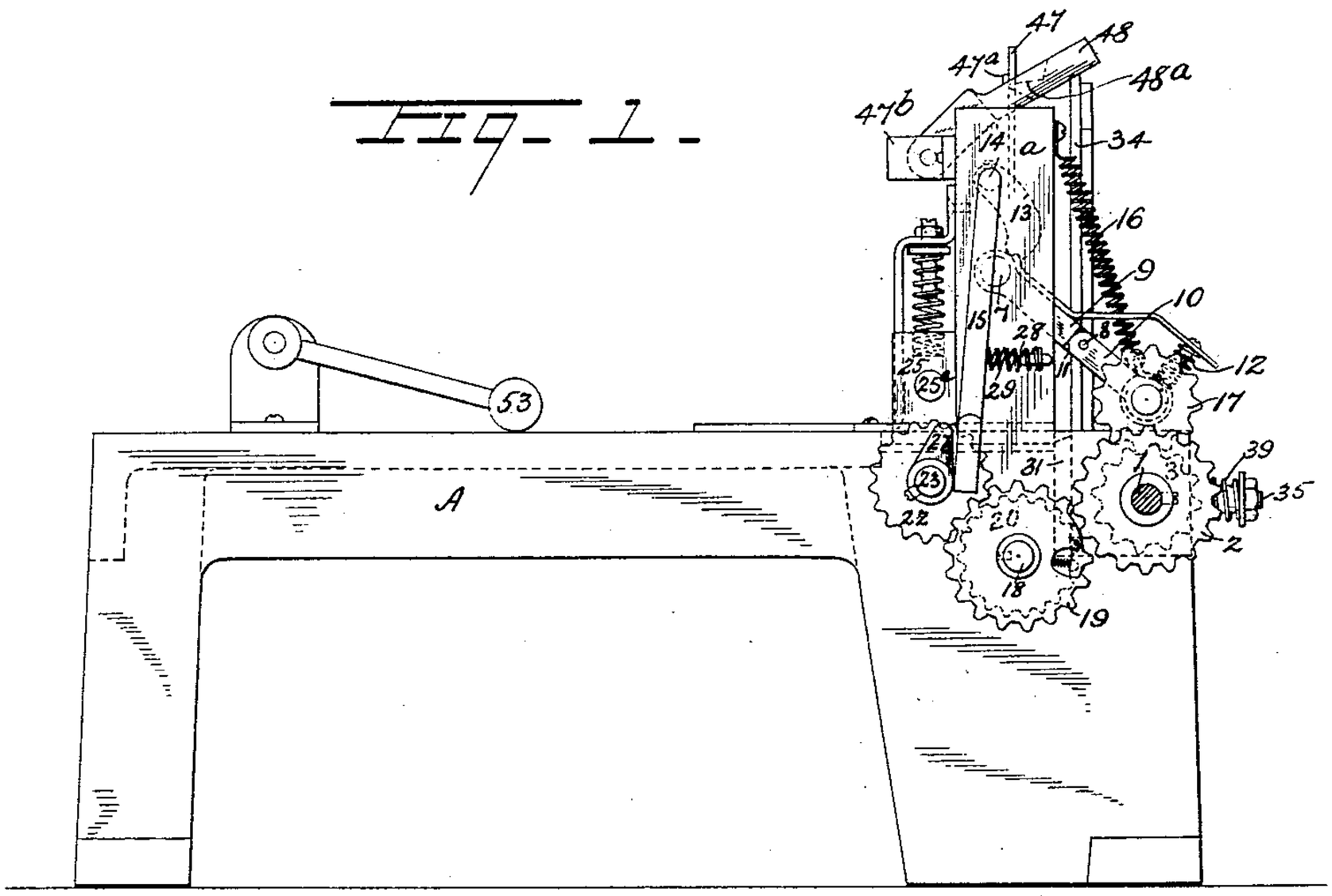


Fig. 2.

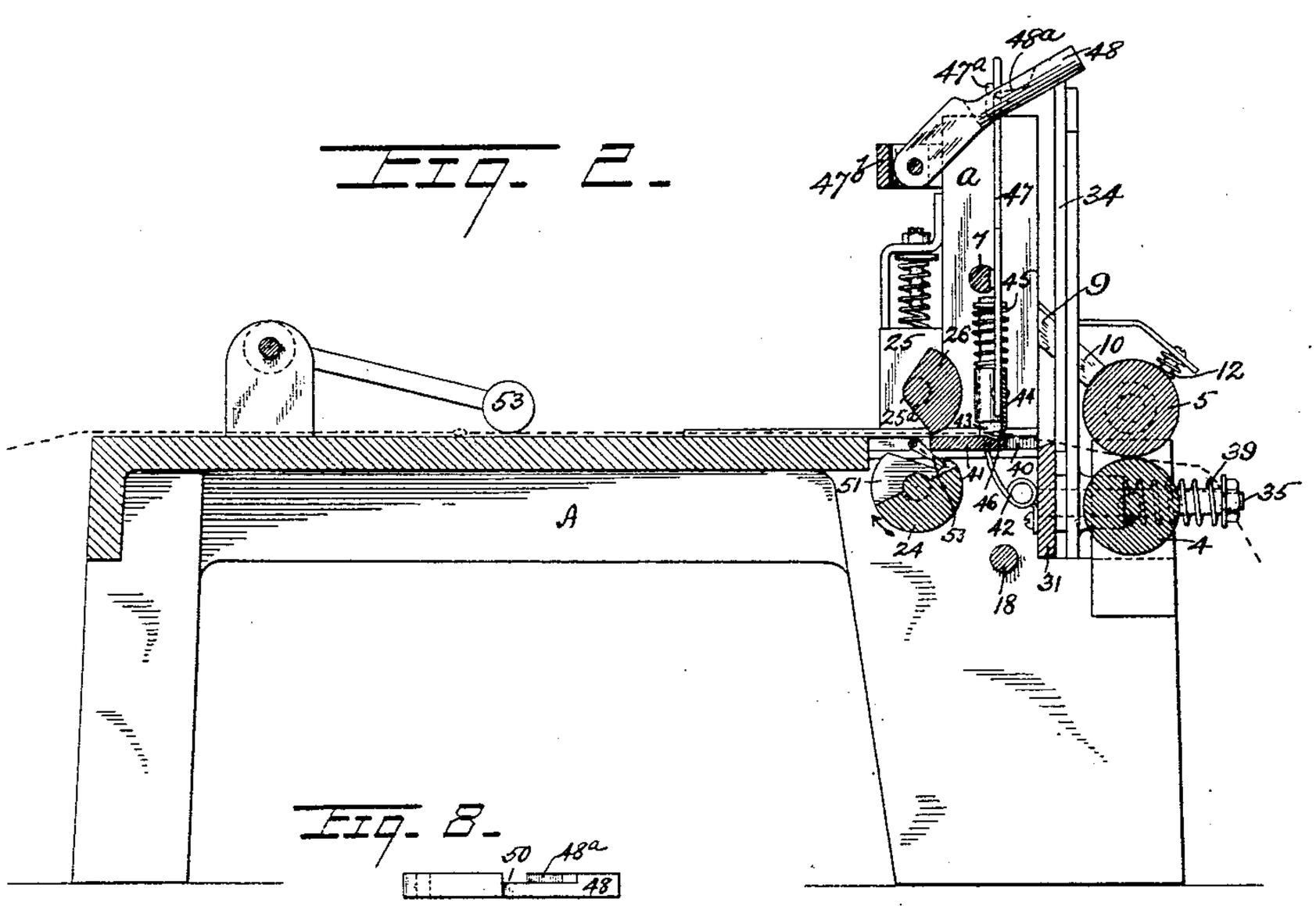
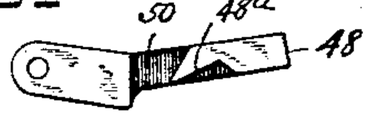


Fig. 8.

Fig. 9.



Witnesses
David Lucas
D. M. Stewart

Frank W. Robinson Inventor

by D. M. Stewart Attorney.

No. 751,560. PATENTED FEB. 9, 1904.

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APPLICATION FILED JUNE 16, 1903.

NO MODEL. 4 SHEETS—SHEET 2.

Fig. 4.

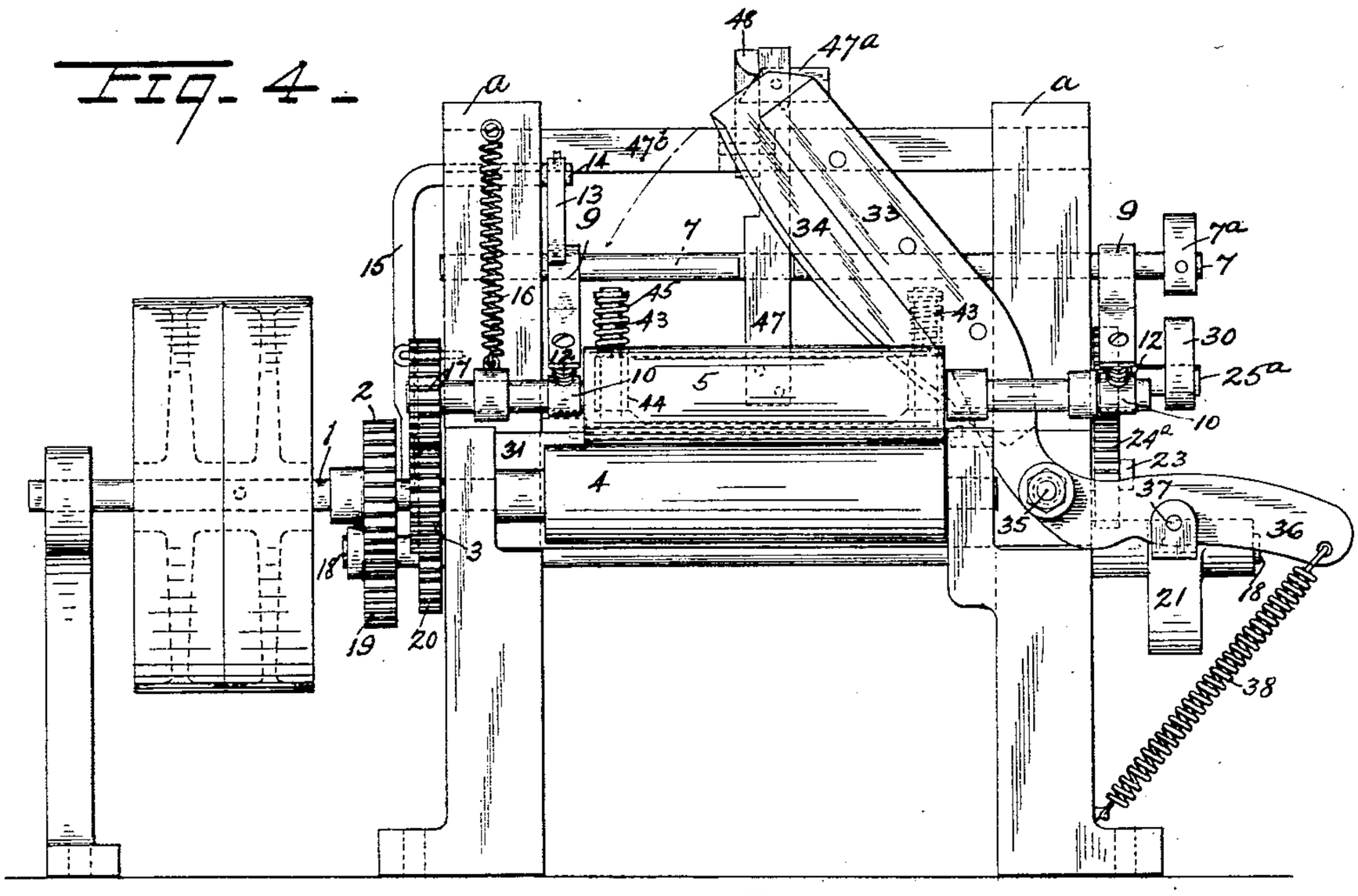
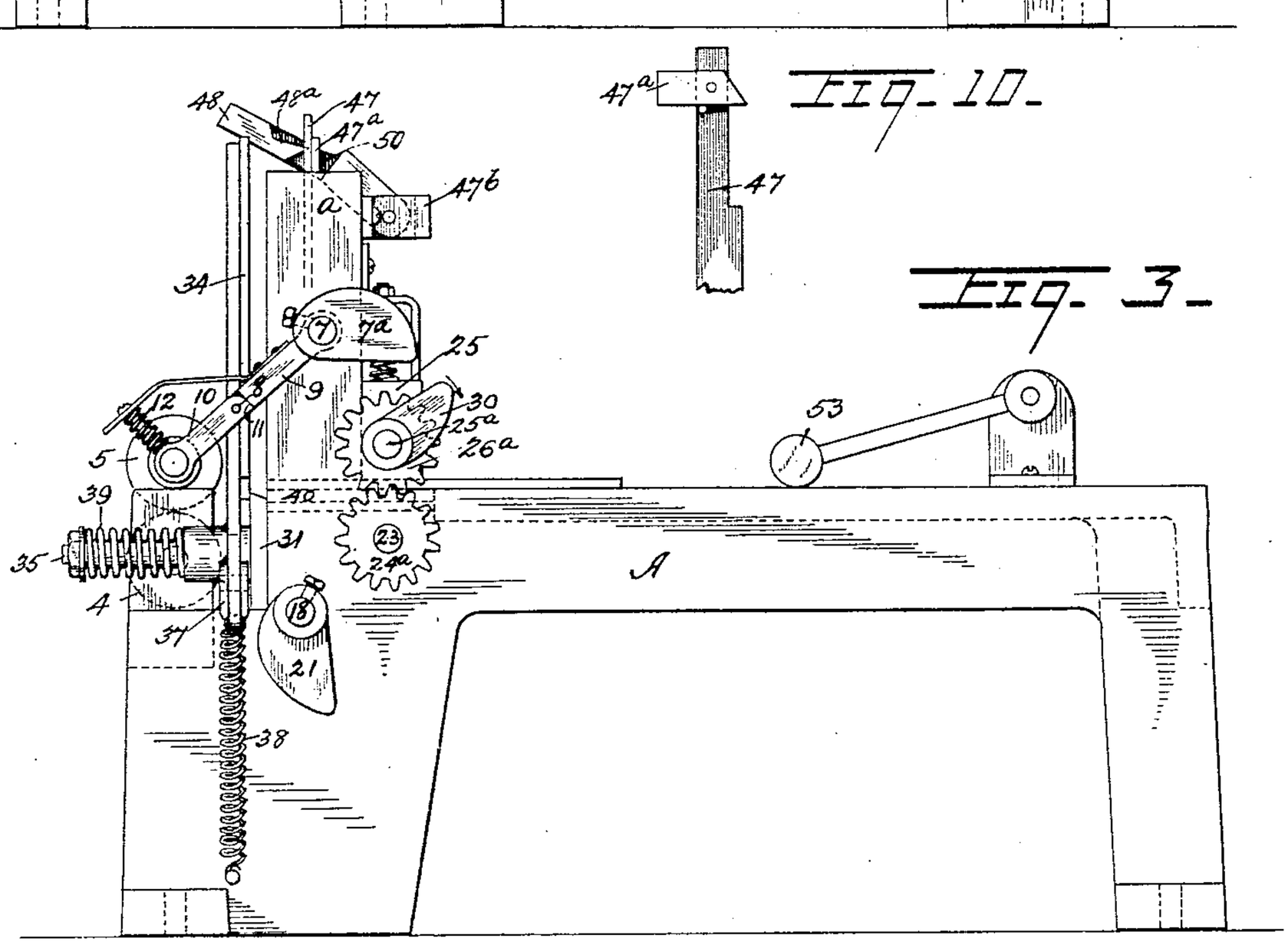


Fig. 10.

Fig. 3.



Witnesses
David Levan
D. M. Stewart

Frank W. Robinson Inventor

by J. M. Stewart Attorney.

No. 751,560. PATENTED FEB. 9, 1904.

F. W. ROBINSON.

STOCKING TOP CUTTING MACHINE.

APPLICATION FILED JUNE 16, 1903.

NO MODEL. 4 SHEETS—SHEET 3.

Fig. 5.

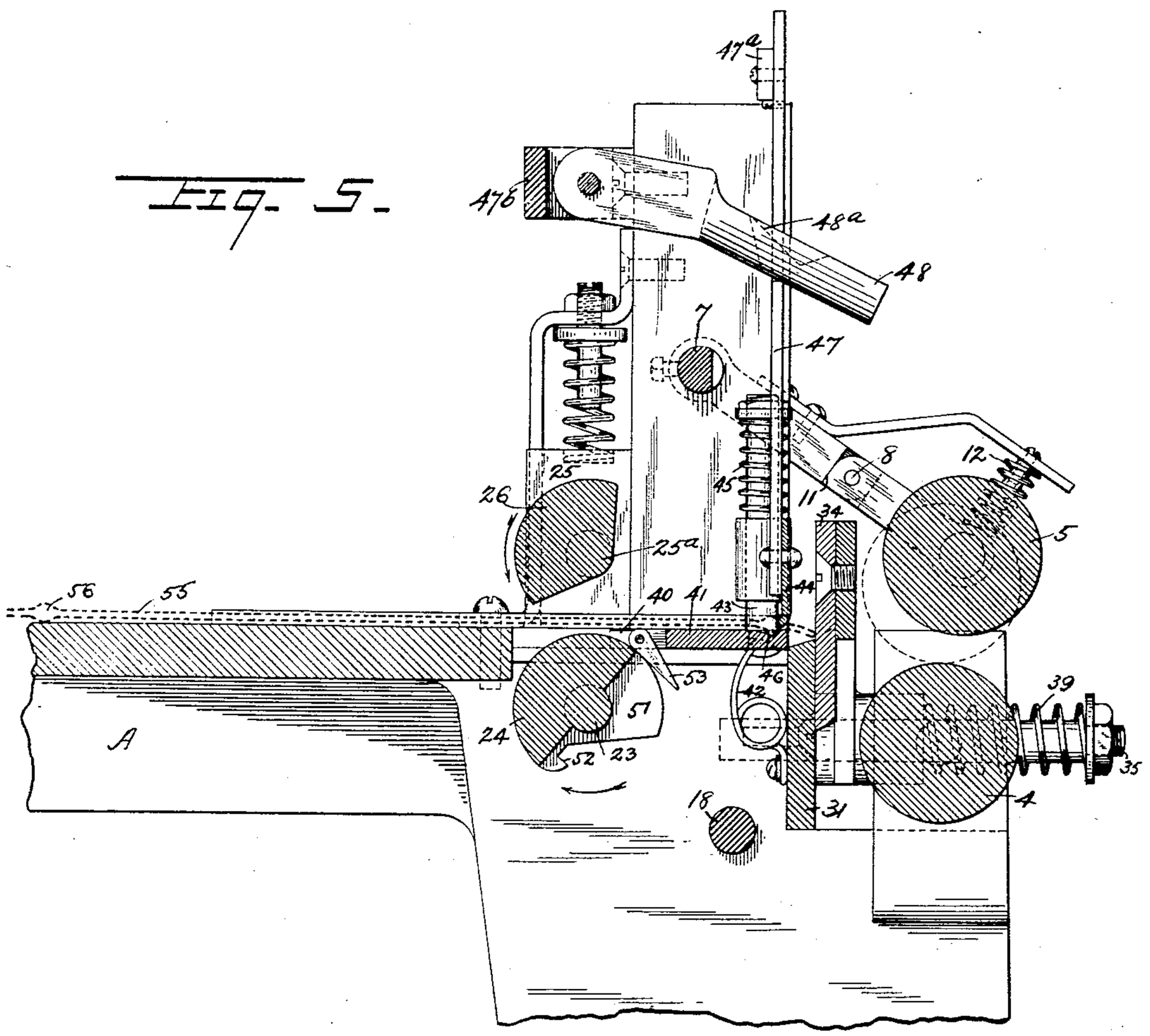


Fig. 11.

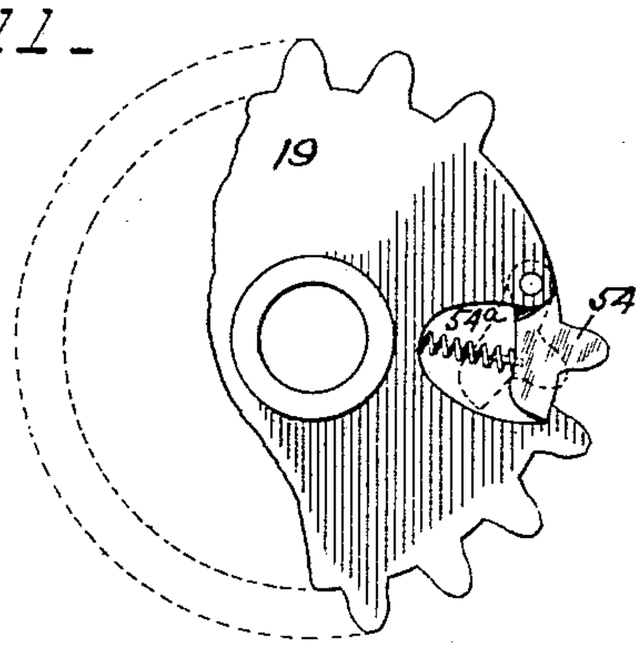
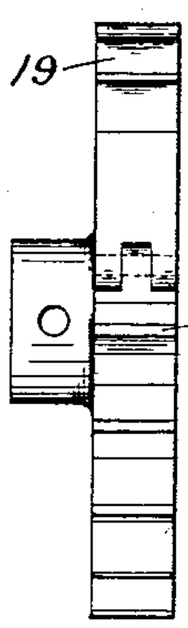


Fig. 12.



Witnesses
David Levan
D. N. Stewart

Frank W. Robinson
Inventor
by D. N. Stewart
Attorney.

No. 751,560. PATENTED FEB. 9, 1904.

F. W. ROBINSON.

STOCKING TOP CUTTING MACHINE.

APPLICATION FILED JUNE 16, 1903.

NO MODEL. 4 SHEETS—SHEET 4.

Fig. 6.

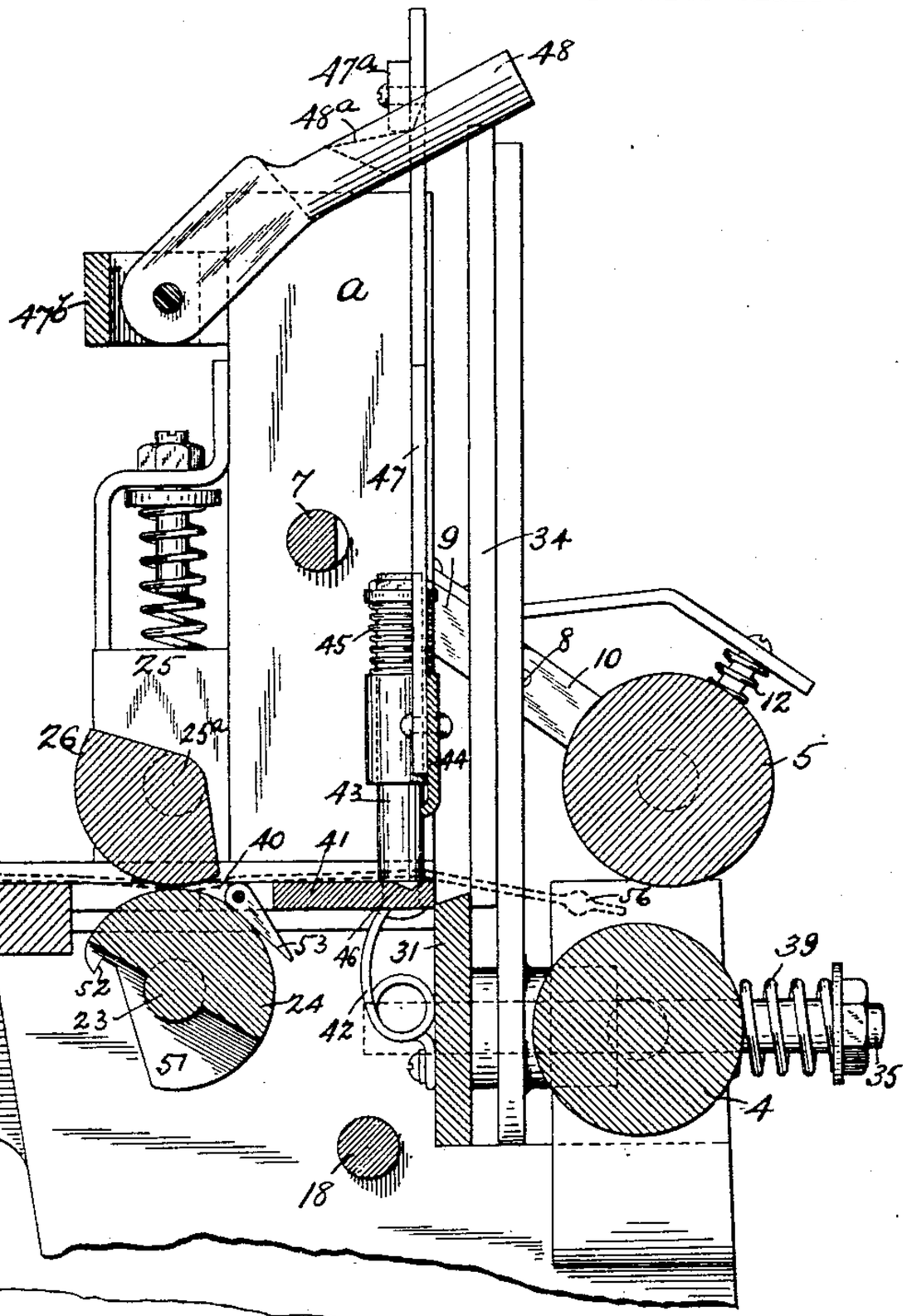
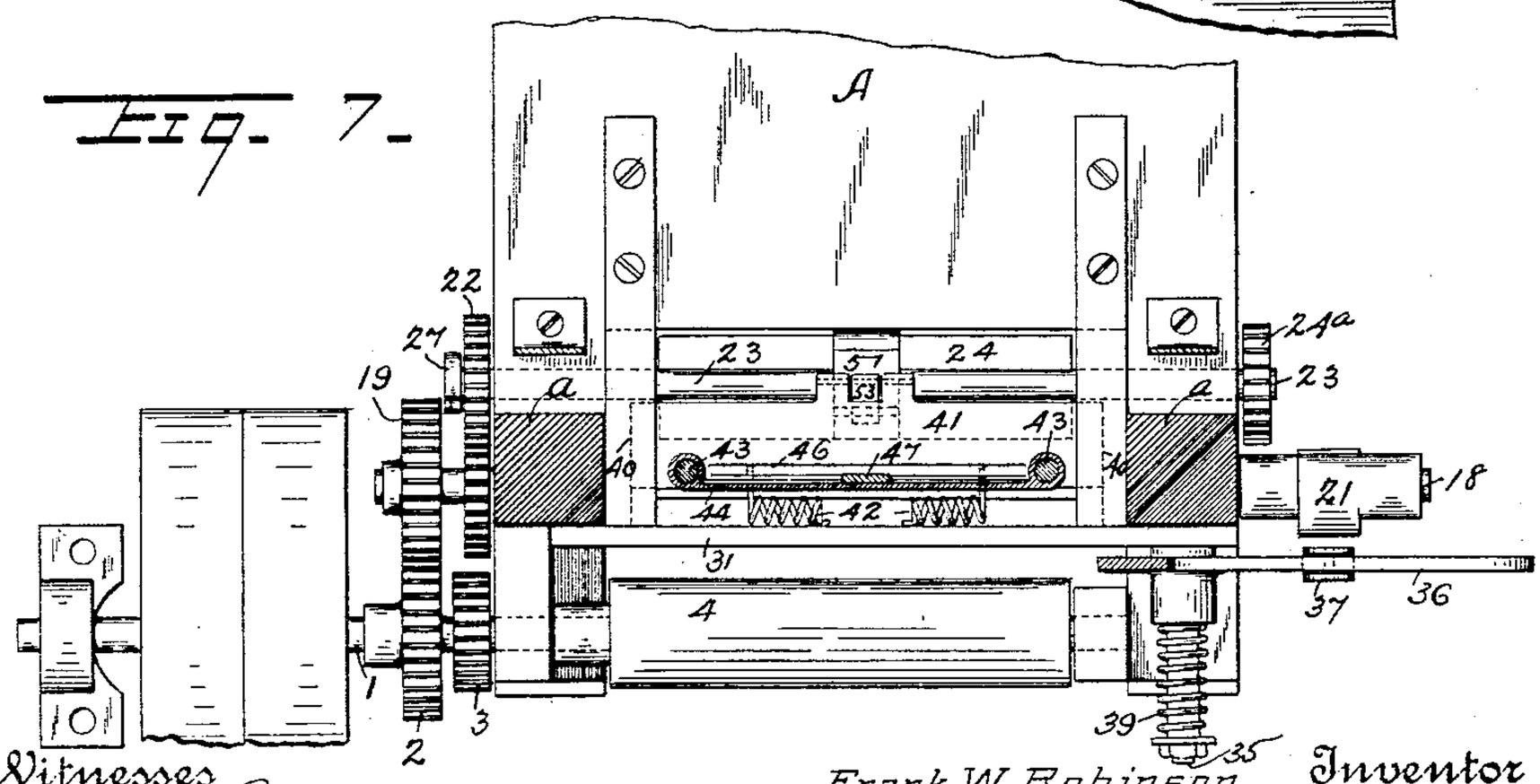


Fig. 7.



Witnesses
David Lenan
D. M. Stewart

Frank W. Robinson Inventor

by D. M. Stewart

Attorney.

No. 751,560. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

FRANK W. ROBINSON, OF READING, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO OSCAR B. WETHERHOLD, OF READING, PENNSYLVANIA.

STOCKING-TOP-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 751,560, dated February 9, 1904.

Application filed June 16, 1903. Serial No. 161,740. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. ROBINSON, a citizen of the United States of America, and a resident of Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Stocking-Top-Cutting Machines, of which the following is a specification.

My invention relates to an improved cutting-machine adapted especially for operating upon stocking tops or legs to separate each top successively from the connected series in which they are commonly delivered from the knitting-machine, the foot portion being thereafter attached to each top or leg portion to complete the stocking. This class of stocking-top is commonly formed with one or more ribs or welts near the upper end, and my machine is particularly arranged to operate upon such tops, a rib-engaging device being provided in connection with additional feeding mechanism to insure the continuous automatic operation of cutting the tops at the proper place.

The main object of the invention is to insure an accurate cut, while at the same time permitting the feeding of varied lengths and widths of stocking-tops without adjustment of the machine.

The invention is fully described in connection with the accompanying drawings, and the novel features are particularly pointed out in the claims.

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a central longitudinal elevation, the parts being indicated in normal feeding position. Fig. 3 is a reverse side elevation. Fig. 4 is a front elevation. Fig. 5 is an enlarged view similar to Fig. 2, showing the changed positions of the parts while the knife is in the act of cutting off a top. Fig. 6 is an enlarged view similar to Fig. 5, but showing the auxiliary feed-rolls acting upon the connected tops to push the same into the main feed-rolls immediately after a shearing action. Fig. 7 is a sectional plan view of the forward end of the machine, the parts above the plane of the table being cut away and the parts below said plane shown in the position indicated in Fig. 2. Figs. 8 and 9, Sheet 1, 10, Sheet 2, and 11 and 12, Sheet 3, are detail views.

In the drawings, A represents a table suitably supported on legs. 1 is the main driving-shaft, mounted in bearings on the table, and may be driven either by hand or by power through fixed and loose pulley-wheels thereon. Upon this shaft 1 are mounted two gear-wheels 2 and 3 and a feed-roll 4, suitably roughened or corrugated, if desired. Hung above said roll 4 is a coöperating feed-roll 5, held in swinging arms 9 10. Said arms are fixedly attached to a shaft 7, mounted in posts *a a*, rising from table A, and the outer sections 10 thereof are hinged at 8 to the main sections 9 to permit the roll 5 to adjust itself to the thickness of the stocking-tops. A stop 11 positively limits the hinge movement in one direction, and springs 12, bearing against the sections 10, permit the latter to yield, so that the upper feed-roll 5 may adjust itself to varying thicknesses of material passing between the rolls, while at all times insuring proper feeding-pressure thereon. A catch 13, Figs. 1 and 4, pivoted at 14 and operated by a lever 15, as hereinafter described, bears against the main section of the swinging arms and holds the rolls in contact against the tension of a spring 16, adapted to normally raise said roll. The gear-wheel 3 on main shaft 1 meshes with a gear-wheel 17 on the shaft of roll 5, so as to rotate said roll in the opposite direction from the coöperating roll 4 to normally draw the interposed stocking-tops forward.

A second shaft 18, mounted beneath the table A, carries a mutilated gear-wheel 19, arranged to be engaged at the proper time with gear-wheel 2 on shaft 1, as hereinafter described. Upon this same shaft are also mounted an idler-gear 20 and a cam 21, shown on the opposite side of the machine. (See Fig. 3.) This idler 90 meshes with a gear-wheel 22 on a shaft 23, suitably mounted in the table A and carrying an auxiliary semicylindrical feed-roll 24, Figs. 2 and 5. Above this auxiliary roll 24, resting in spring-tension bearings 25, is a similar coöperating feed-roll 26. These auxiliary feed-rolls 24 and 26 are

caused to rotate together by gears 24ª and 26ª, Fig. 3.

Upon the auxiliary feed-roll shaft 23 is a cam 27, set to operate lever 15 and catch 13, before described, to release the swinging arms 9 10 and permit the raising of the main feed-roll 5 by spring 16. A stop 28 and a spring 29 are arranged to limit the movement of the lever 15 and return same and catch 13 to their normal positions, respectively, where said catch 13 is adapted to reëngage the swinging arms 9 10 when the roll 5 is again lowered.

The shaft 25ª carries a cam 30, Fig. 3, arranged to engage a cam 7ª, fixed to the roll carrying shaft 7 to turn the latter and effect this relowering of the roll 5 at the proper time to its normal position relative to roll 4 and in engagement with the main shaft 1.

A fixed shearing-blade 31 is fastened to the table A by any suitable means and a movable blade 34 pivoted at 35 to the table and having a projecting end 36. Upon this projecting end is pivoted a bearing-face 37, which gives a self-adjusting contact-surface for the cam 21, mentioned before, to operate the shear-blade against the tension of a returning-spring 38. A spring 39 keeps the shearing edges in proper contact.

In the table A is arranged a guideway 40, adapted to receive a sliding plate 41, which is normally pressed away from the knives by springs 42. Upon this slide-plate are rigidly mounted two posts 43, (see Fig. 5,) which carry a vertically-movable welt or rib engaging device 44, and springs 45, arranged to normally press said device downward against said said slide-plate, the upper face of which latter is provided with a transverse depression or groove 46 near its forward end, into which the lower edge of the rib-engaging device is adapted to press the stocking material which passes over said slide-plate to the feed-rolls 4 5, as hereinafter more fully described. An upward extension 47 of the rib-engaging device 44 carries a latch 47ª, adapted to be engaged by a lifting-lever 48, provided to raise the device against the tension of springs 45. Said lever 48 is pivoted to a bracket 47ᵇ, fixed to the posts *a a*, and is arranged to be lifted by the shearing-blade and fall with the downward movement of the latter. A bearing-ledge 48ª is cut in the lever 48 to engage said latch 47ª, and a groove 50 is adapted to provide an escape for the latch from the ledge 48ª and the consequent return of the device 44 when the slide 41 is moved back to normal position.

The semicylindrical feed-roll 24 is provided at an intermediate point of its length with a grooved cam-section 51, formed with a shoulder 52, adapted to engage a latch 53, pivotally hung from the slide-plate 41. This latch 53 is so set that the forward movement of the slide 41 turns the roll 24, (see Fig. 2,) which movement through gears 22 and 20 turns the mutilated gear 19 far enough for the gear-wheel 2 to engage therewith, and thus complete the rotation of the auxiliary rolls 24 and 26.

I have found that the gear-wheel 2 fails to properly mesh with the mutilated gear 19 at all times when thrown into engagement with the latter, the teeth of the wheels being liable to lock and stall the machine. In order to insure their prompt and accurate engagement at any time, I have hinged the first tooth 54 of the mutilated gear and adapted it to sink into the wheel, if necessary, a spring 54ª pressing it outward into mesh as soon as the gears are in proper meshing position.

To give proper tension to the strips of connected tops fed to the knife, I have found it advantageous to employ a pivoted tension-weight 53, arranged to bear upon the passing strip, as shown in the drawings.

The operation of my improved machine above described is as follows: The strip of connected stocking-tops (indicated by the dotted lines 55) is passed under the pivoted weight 53, through the auxiliary rolls 24 and 26, and under the rib-engaging device 44 to the feed-rolls 4 5, which grip the strip and draw it along. This entering of the strip may be best accomplished by turning the auxiliary feed-rolls 24 26 to the position indicated in Fig. 5 and then raising the rib-engaging device 44 to permit the easy passage of the first top to the feed-rolls 4 5. The auxiliary rolls are then returned to the position indicated in Fig. 2 and the machine started. The strip of connected tops is then drawn through the machine, and each top, regardless of its length, is automatically cut off adjacent to a welt or rib as follows: When a rib or welt 56 reaches the engaging device 44, its passage thereunder is prevented, and the continued pull of the rolls 4 5 causes the device 44, and the slide 41, upon which it is mounted, to move forward toward the shearing-blades 31 and 33 34. This forward movement of the slide-plate causes the roll 24 to be rotated in the direction of the arrow by the pawl 53 sufficiently to cause the gear-wheel 2 to engage the mutilated gear 19, the pivoted cog 54 of which insures proper engagement, as already explained. The shaft 23 being now rotated, immediately the cam 27 (see Fig. 1) thereon, through the lever 15 and catch 13, releases the roll 5, which is raised by the spring 16, thereby stopping the pulling of the stocking-tops forward. The cam 21 on shaft 18, Figs. 3 and 4, now operates on the movable shearing-blade 33 34 to cut off the top in front thereof, Fig. 5. Upon the downward movement of the shearing-blade by means of cam 21 the lifting-lever 48 for the rib-engaging device, which has been resting on the raised blade, falls, and when the blade is reraised by the spring 38 after the passage of said cam 21 it again raises this lever 48 and with it the rib-engaging device 44, the latch 47ª on the rod 47 of the moved-forward de-

vice 44 engaging the ledge 48ª of the lever 48, thus giving the adjacent rib 56 a free passage past said device. The latter being thus held in raised position, Fig. 6, the auxiliary feed-rolls, which have been rotating, now engage and push forward the remaining strip of stocking-tops past the knife and onto the feed-roll 4. The cam 30 on the shaft 25ª (see Fig. 3) next lowers the roll 5 into engagement with roll 4 by turning the shaft 7 through the cam-wheel 7ª, and the lever 15, with its catch 13, is moved by the spring 29 to lock the roll 5 in this normal lowered position, where it coöperates with the roll 4 to again draw the strip forward. The slide 41 and rib-engaging device 44 carried thereby are now the only parts out of normal position. This slide is held in forward position by the rolls 24 26, Fig. 6, which are still rotating; but as these rolls approach the position indicated in Fig. 2 the slide 41 is returned to its normal position by the springs 42, and the pawl 53 again assumes the position shown in Fig. 2. This return of the slide 41 carries with it the rib-engaging device 44 and its connected rod 47 and latch 47ª. The latch 47ª rides along the ledge 48ª until it reaches the return-groove 50, when it is freed, and the rod 47 and connected device 44 fall by the action of springs 45 and the parts are all again in normal position. By this time the mutilated gear 19 has made a revolution and again reached the position in which its mutilated portion is thrown out of engagement with the gear 2, and the main feed-rolls 4 5 are alone rotated to feed onward the strip of stocking-tops until another rib contacts with the engaging device 44, and the operation is repeated.

The rib-engaging device 44 not only controls the cutting-off operation, as described, but it at the same time acts as a straightener for the welt or rib should the latter not be running true, so that an accurate and even cut at the proper place is assured. It will be easily seen that no adjustment of the machine is necessary to permit of the introduction of any width of stocking up to the capacity of the machine or to adapt it to any particular length of top, each cut being made accurately at a fixed distance from each welt or rib regardless of the spacing of the latter. It will also be readily seen that many modifications of the particular construction described may be made without departing from the spirit of my invention, and I do not desire to limit myself to this specific construction.

What I claim is—

1. A machine for cutting ribbed fabrics comprising a shearing mechanism, a feed mechanism in advance of said shearing mechanism, an auxiliary feed mechanism to the rear of the same, and rib-operated means for throwing said advance feed mechanism out of action.

2. A machine for cutting ribbed fabrics comprising a shearing mechanism, a feed mechanism in advance of said shearing mechanism, an auxiliary feed mechanism to the rear of the same and rib-operated means for automatically throwing said feed mechanisms into action alternately.

3. A machine for cutting ribbed fabrics comprising a shearing mechanism, a feed mechanism in advance of said shearing mechanism, an auxiliary feed mechanism to the rear of the same, and a rib-engaging device arranged to throw said auxiliary feed mechanism intermittently into action.

4. A machine for cutting ribbed fabrics comprising a shearing mechanism, a feed mechanism in advance of said shearing mechanism, an auxiliary feed mechanism to the rear of the same, a rib-engaging device arranged to throw said auxiliary feed mechanism intermittently into action, and means for throwing said advance feed mechanism out of action at such times.

5. A machine for cutting ribbed fabrics comprising a shearing mechanism, intermittent feed mechanism, and a spring-depressed rib-engaging device having a limited movement with the fabric and serving to clamp the same during each shearing action.

6. A machine for cutting ribbed fabrics comprising a shearing mechanism, intermittent feed mechanism, and a spring-depressed rib-engaging device having a limited movement with the fabric and serving to clamp the same during each shearing action, said device being engaged and raised from the fabric by the return movement of the shearing-blade.

7. The combination with the shearing mechanism of main feed-rolls having one roll movable out of engagement with the other, and auxiliary segmental rolls.

8. A machine for cutting ribbed fabrics comprising a feed mechanism, a shearing mechanism, and a rib-engaging device located adjacent to said shearing mechanism and arranged to control the cutting action of the latter upon a portion of the fabric adjoining the engaging rib.

9. A machine for cutting ribbed fabrics comprising a shearing mechanism, a feed mechanism comprising coöperating segmental rolls, an operating-shaft intermittently in gear therewith, and a horizontally-movable rib-engaging device carrying a pawl arranged to engage one of said segmental rolls and throw the same into gear with the operating-shaft.

10. The combination with the shearing mechanism of a pair of feed-rolls one of which is carried by a swinging flexible arm, a spring for normally retracting said movable roll, and means for moving and holding the same in operative engagement with the other roll.

11. The combination with the shearing mechanism of a pair of feed-rolls one of which is movable relative to the other, means for moving and holding the same in operative engagement with the other roll, and means for auto-

matically withdrawing the same preparatory to the shearing operation.

12. The combination with the shearing mechanism and feed mechanism of a vertically-movable rib-engaging device carried by a horizontally-movable slide-plate, a spring for normally pressing said device downward upon said slide-plate, and means operated by the shearing mechanism for raising said device.

13. The combination with the shearing mechanism and feed mechanism of a vertically-movable rib-engaging device carried by a horizontally-movable slide-plate, a spring for normally pressing said device downward upon said slide-plate, means operated by the shearing mechanism for raising said device, and means for moving said slide-plate rearwardly with the device in raised position and thereafter releasing the same.

14. In a machine for cutting ribbed fabrics the combination with segmental feed-rolls of a rib-engaging device carried by a horizontally-movable slide-plate arranged to control the operation of said rolls.

Signed at Reading, Pennsylvania, this 13th day of June, 1903.

FRANK W. ROBINSON.

Witnesses:

D. M. STEWART,

W. G. STEWART.