

No. 705,842.

Patented July 29, 1902.

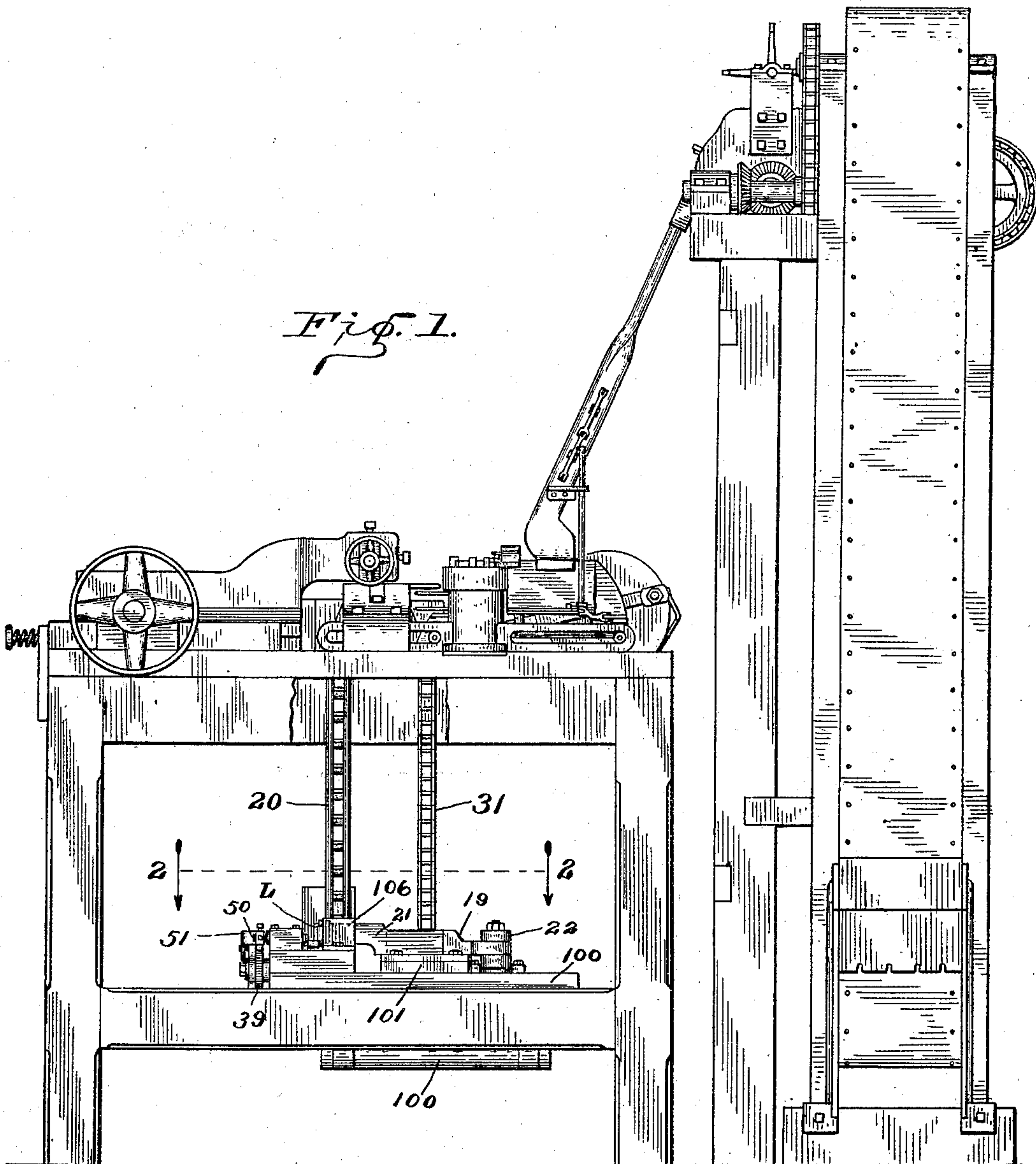
J. C. HOWE.

MACHINE FOR ASSEMBLING LINKS IN MAKING CHAIN BELTS.

(Application filed Oct. 25, 1901.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

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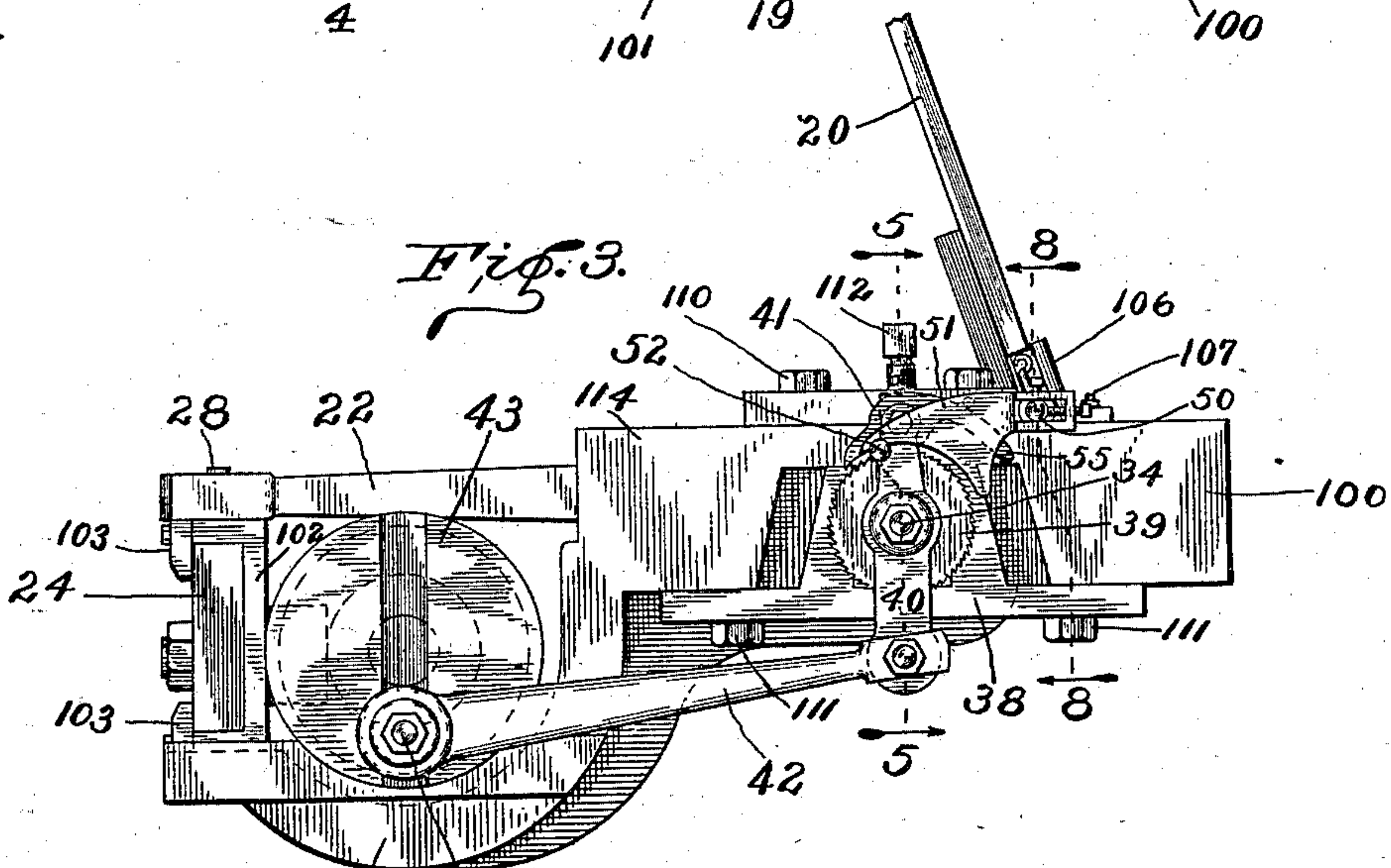
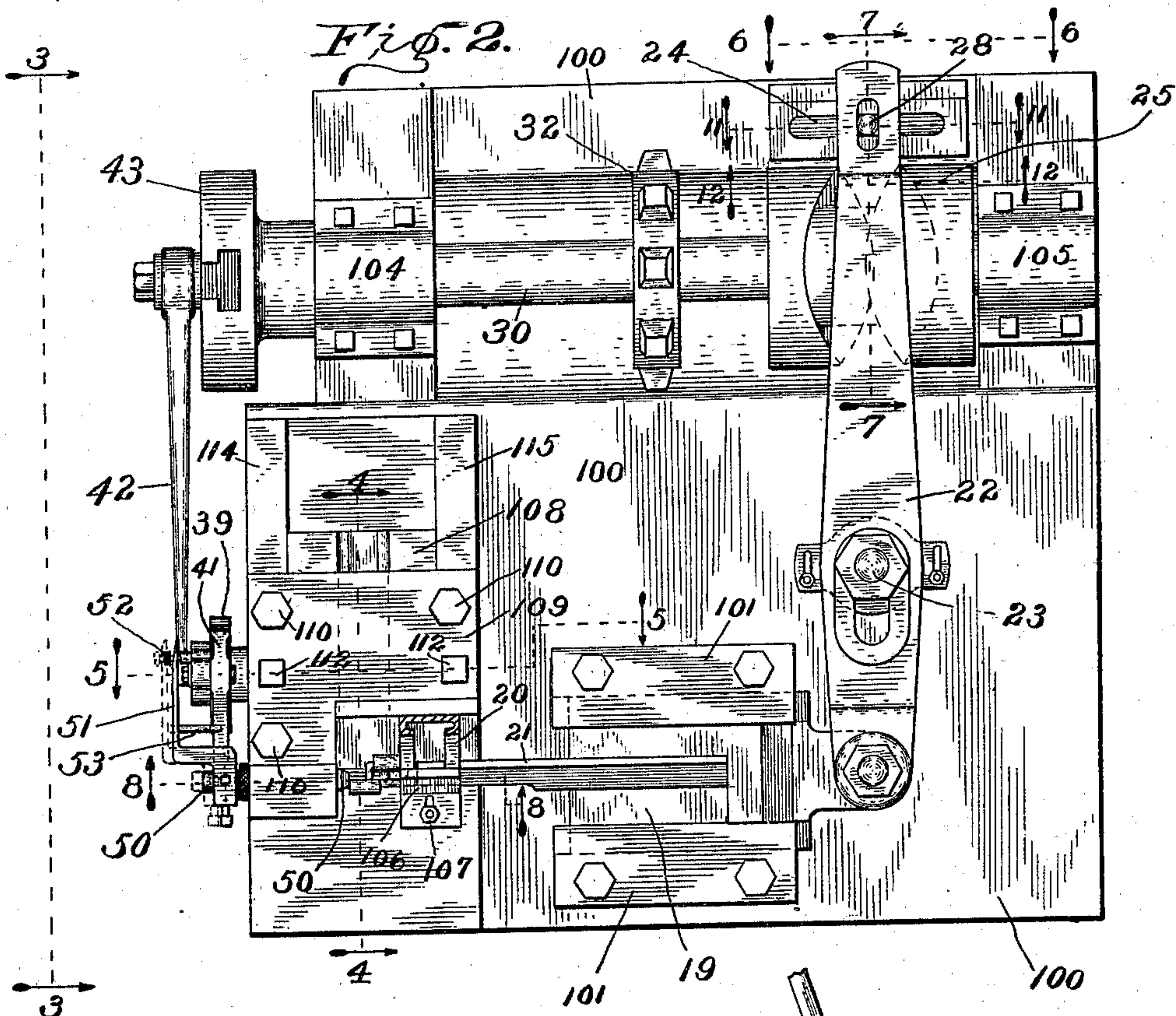
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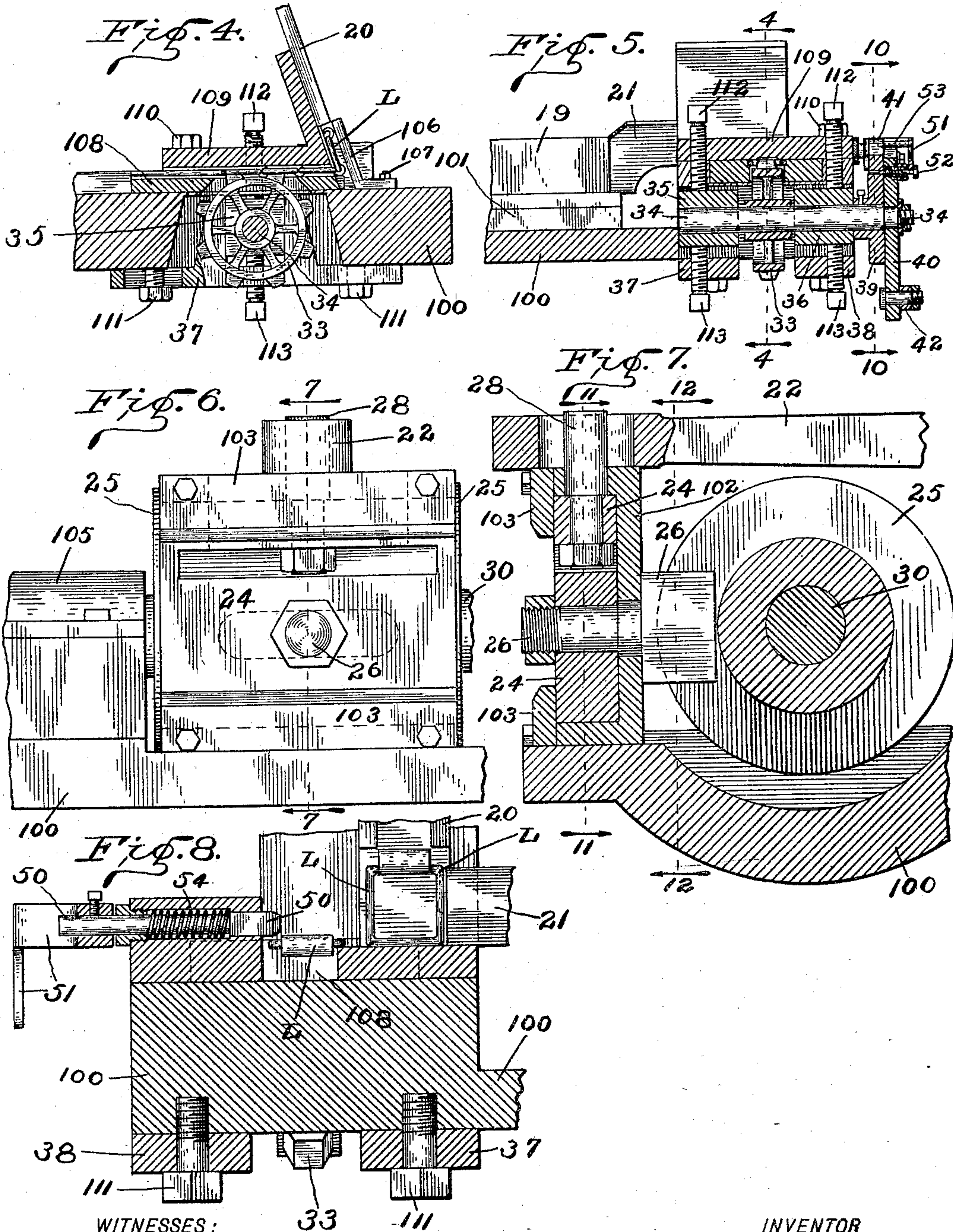
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Fig. 9.

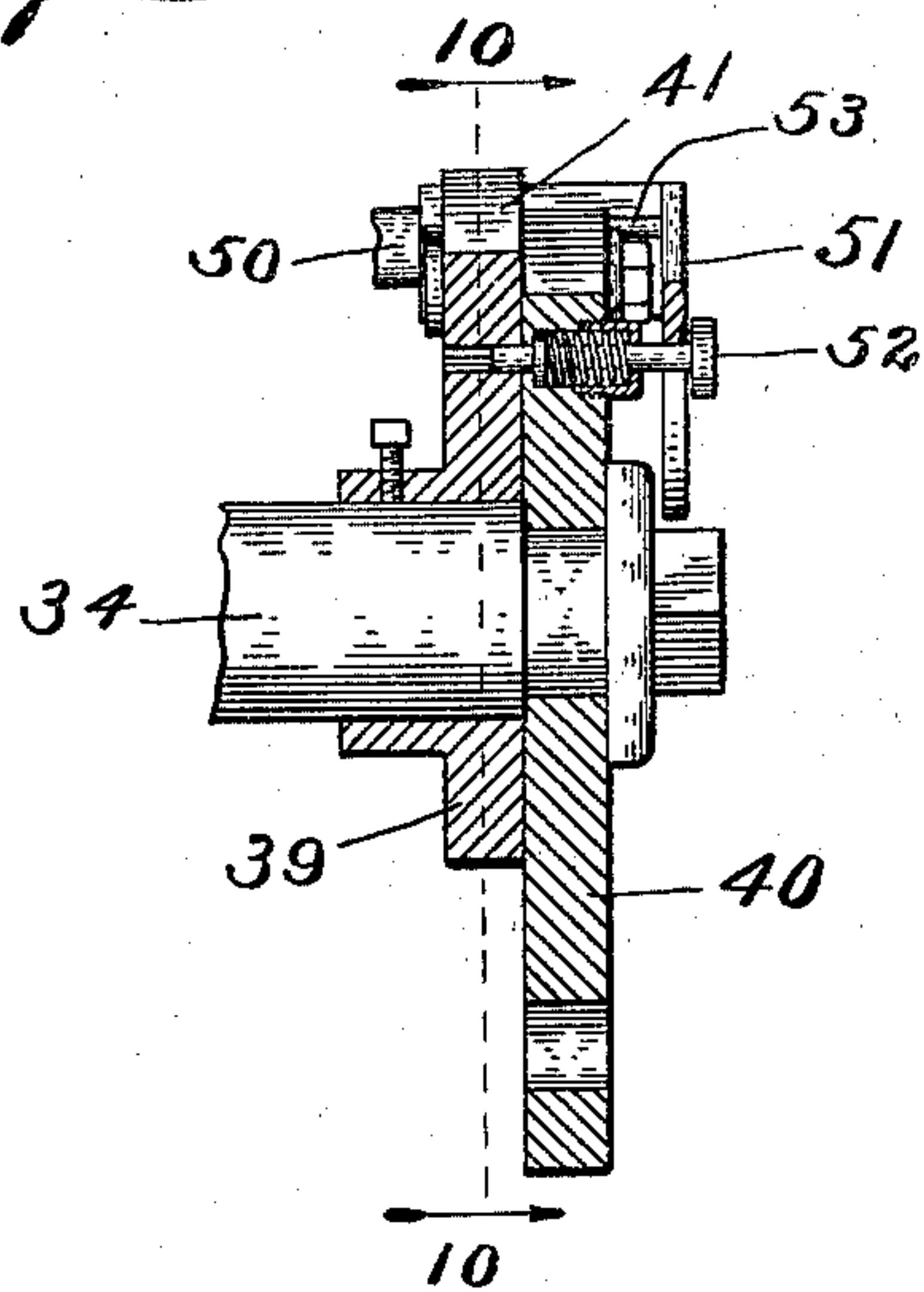


Fig. 10.

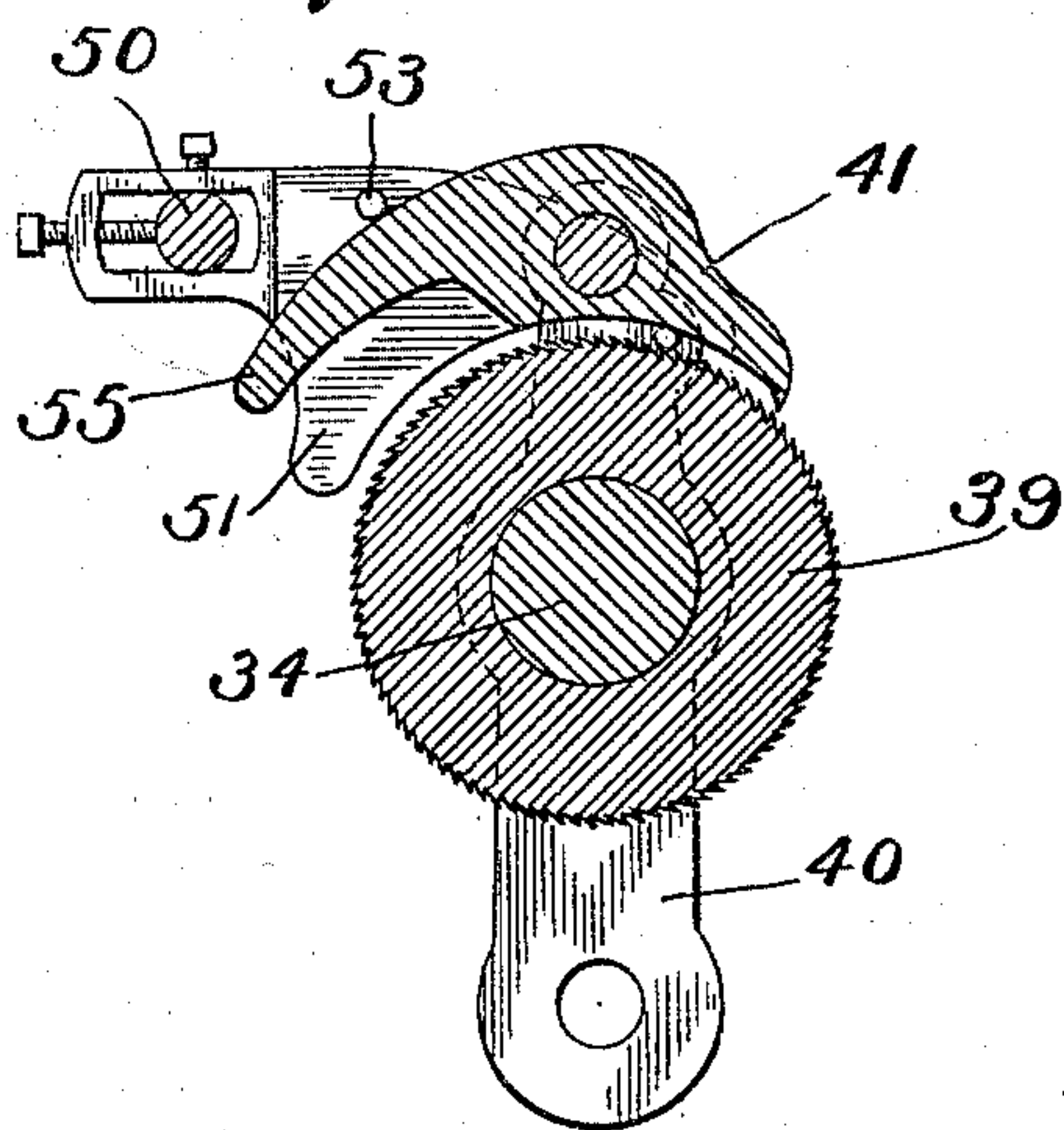
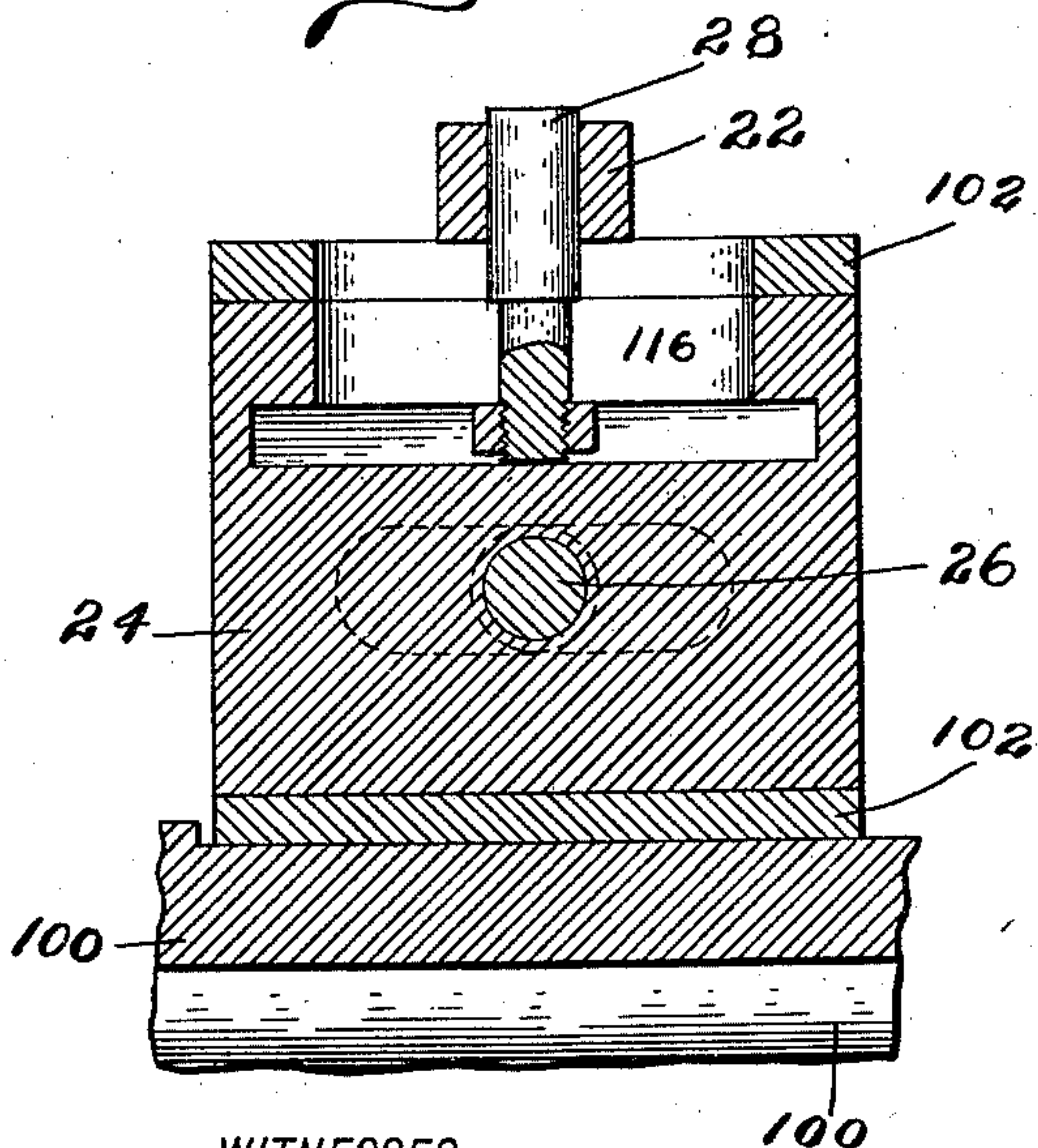


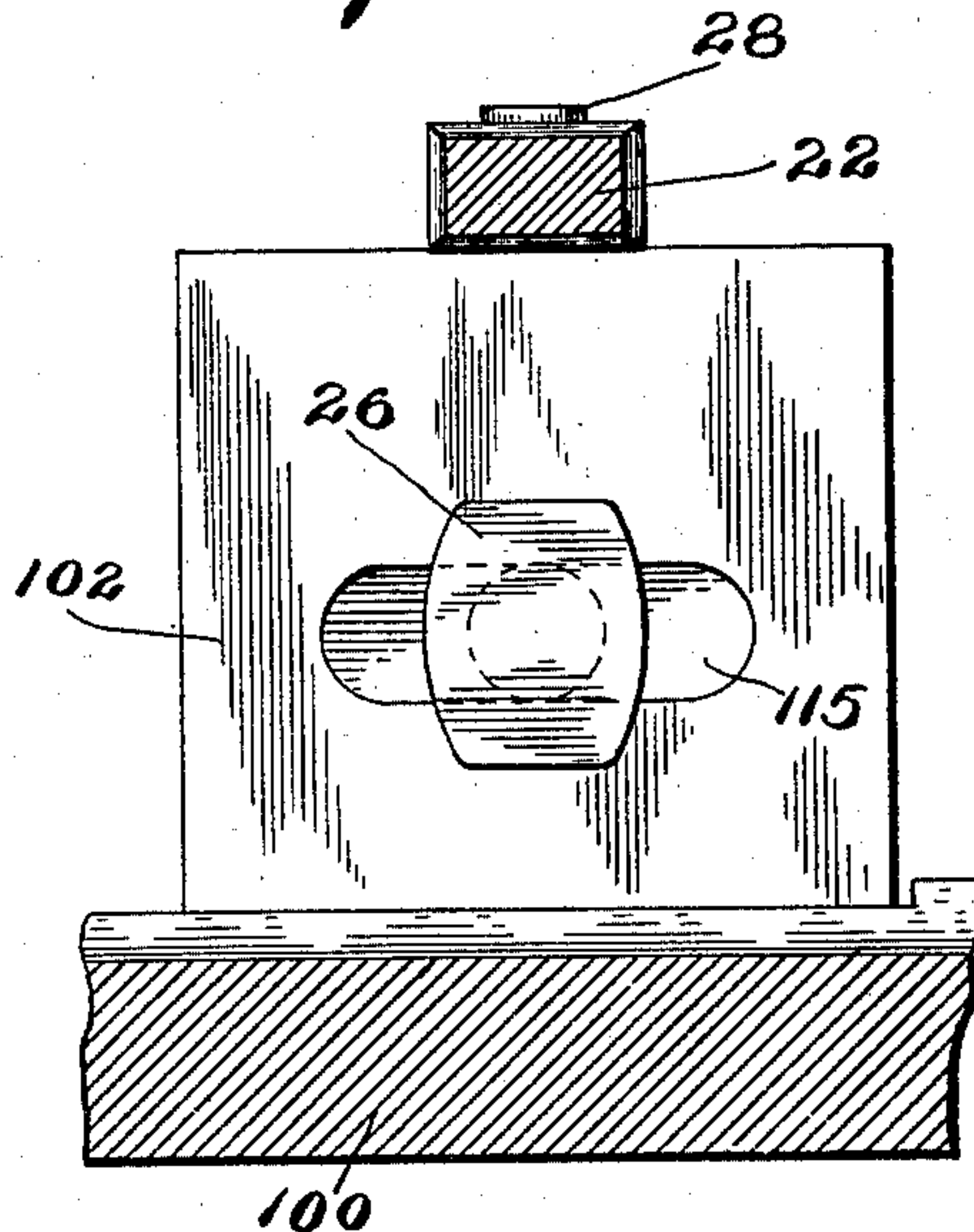
Fig. 11.



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Fig. 12.



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UNITED STATES PATENT OFFICE.

JOHN CLARK HOWE, OF INDIANAPOLIS, INDIANA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ELEVEN-TWENTIETHS TO DANIEL M. MORONEY, JACOB WOHLFELD, JULIUS M. KAMINSKY, AND ISAAC BACH-RACH, OF INDIANAPOLIS, INDIANA.

MACHINE FOR ASSEMBLING LINKS IN MAKING CHAIN BELTS.

SPECIFICATION forming part of Letters Patent No. 705,842, dated July 29, 1902.

Application filed October 25, 1901. Serial No. 79,905. (No model.)

To all whom it may concern:

Be it known that I, JOHN CLARK HOWE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Machines for Assembling Links in Making Chain Belts, of which the following is a specification.

In the manufacture of what are commonly known as "link" or "chain" belts one of the most tedious operations where the work is performed by hand is the assembling of the links in forming the chain.

The object of my present invention is to provide a simple, accurate, and rapidly-operating machine whereby assembling is performed automatically.

A machine embodying my said invention will be first fully described, and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of my improved machine as the same appears when mounted upon the same frame and operated in connection with my "machine for straightening and trimming the links of chain belts," which forms the subject-matter of Letters Patent No. 677,744, issued upon my application July 2, 1901; Fig. 2, a top or plan view, on an enlarged scale, of a machine embodying my present invention separately as seen when looking downwardly from the dotted line 2 2 in Fig. 1; Fig. 3, a side elevation of said machine as seen from the dotted line 3 3 alongside Fig. 2; Fig. 4, a detail sectional view as seen from the dotted line 4 4 in Fig. 2; Fig. 5, a detail sectional view as seen from the dotted line 5 5 in Figs. 2 and 3; Fig. 6, a fragmentary rear elevation showing the rear end of the main lever and its connections as seen from the dotted line 6 6 alongside Fig. 2; Fig. 7, a detail sectional view as seen from the dotted line 7 7 in Figs. 2 and 6; Fig. 8, a detail sectional view as seen from the dotted line 8 8 in Figs. 2 and 3; Fig. 9, a fragmentary

sectional view similar to a portion of Fig. 5, but on a still further enlarged scale; Fig. 10, 50 a detail sectional view as seen from the dotted lines 10 10 in Figs. 5 and 9; Fig. 11, a detail sectional view as seen from the dotted lines 11 11 in Figs. 2 and 7, and Fig. 12 a detail sectional view as seen from the dotted lines 12 12 in Figs. 2 and 7. In all cases the direction of sight from the dotted lines is that indicated by the arrows placed at the ends of said lines.

The chain-links after being suitably 60 straightened and trimmed—as, for example, by the machine shown in Fig. 1—are introduced into the machine constituting my present invention by way of a chute 20. Playing back and forth below the end of this chute is a 65 plunger 21, which operates to move the links sidewise, one by one, as they descend the chute, thus moving each link into assembled relation with the preceding link, as will be presently more fully described. This plun- 70 ger 21 is carried by the cross-head 19, running in slides 101 on the main frame or base 100 and is operated by the vibrating bar or lever 22, which is mounted on a pivot-bearing 23 on the frame 100 of the machine and 75 the rear end of which engages with and is operated by a reciprocating block 24, which is mounted in a slideway 102 103 and is driven by the cam-wheel 25 into the cam-groove, wherein a suitable projection 26, carried by 80 the block 24, enters. The stem of the projection 26 passes through a slot 115 (see especially Fig. 12) in the rear portion of the slideway 102 103, as is best shown in Figs. 6, 7, and 11. The stud or pin 28, which is car- 85 ried by the block 24 and with which the end of the vibrating bar or lever 22 engages, is adjustable lengthwise of said block by means of the slot 116, formed therein, (see especially Fig. 11,) and thus the exact position to which 90 the plunger 21 shall move in its operation may be nicely and accurately determined. The bearing 23 is also adjustable, as shown in Fig. 2, and thus the stroke of the plunger may be regulated as desired to accommodate the ma- 95 chine to links of different sizes, so that chains

formed of several different-sized links may be assembled on the same machine. The cam-wheel 25 is mounted on the shaft 30, which is carried by bearings 104 and 105 on the frame 100. Said shaft is shown as driven by the chain belt 31, running from a shaft on the companion machine to the sprocket-wheel 32 on said shaft 30. The means and source of power for driving said shaft are, however, of course immaterial. When the links L are delivered by the plunger 21, they become assembled, as best shown in Fig. 4, and are drawn along in a suitable way provided for the purpose by means of the sprocket-wheel 33. Said sprocket-wheel is mounted on the shaft 34 and is carried by adjustable supports 37 and 38. On the outer end of the shaft 34 is a fixedly-secured ratchet 39, and outside of this, also carried by said shaft, is a loosely-mounted arm 40. Said arm 40 carries a pawl 41, which is adapted to drive the ratchet-wheel 39 when thrown into engagement therewith. The arm 40 is rocked back and forth on the shaft 34 by means of a pitman 42, driven from a crank-wheel 43 on the end of the shaft 30. The face of said crank-wheel 43 is slotted, and its wrist-pin 44 is adjustable therein, and the stroke of the pitman 42 may thus be adjusted as desired to accommodate the movement of the machine to the size of the link, as will be readily understood. Mounted in the framework, alongside the path of the links through the machine, is a plunger 50, carrying on its outer end an arm 51, which is adapted to engage with and operate a spring-pin 52, carried by the bar 40. Said arm is also provided with a pin 53, extending over the path of travel of a tailpiece 55, extending out from the pawl 41. Normally the spring-pin 52 extends under the pawl 41 and holds it out of engagement with the ratchet-wheel 39, so that said pawl plays loosely back and forth over said ratchet-wheel. When, however, the plunger 50 is forced outwardly by means of a link L being driven against the same by the plunger 21, its arm 51, engaging with the head of spring-pin 52, will push said spring-pin from below said pawl 41, thus permitting said pawl to drop into engagement with said ratchet-wheel 39. When this happens, the shaft 34, on which the ratchet-wheel is rigidly mounted, is propelled, also propelling the sprocket-wheel 33 and drawing the chain being assembled along in its way. The adjustment of the parts is such that each stroke of the pitman 42 when the pawl 41 is in engagement moves the chain being assembled a distance exactly equal to the length of one link. This brings the link shown in upright position in Fig. 4 down into position in line with the next preceding link and ready to receive another link the next time the plunger 21 is operated. As the link passes from its upright to its horizontal position it is thrown out of contact with the plunger 50, which is thereupon retracted by the spring 54, (see Fig. 8,) so that the arm 51 no longer holds

the spring-pin 52 out of the path of the pawl 41. Each time the pawl 41 moves backwardly its tailpiece 55 comes in contact with the pin 53, which has the effect of throwing said pawl out of engagement with the ratchet-wheel 39 and also of raising it up to such a position that the spring-pin 52 can pass under it. By the means described, therefore, the pawl 41 is thrown into and out of engagement each time a link is pushed into assembled relation with the preceding link and drawn down from upright to horizontal position. At the foot of the chute 20 is a guide-plate 106, behind which each link rests momentarily as it emerges from the chute before being moved sidewise by the plunger 21. This guide-plate is held in position by a bolt 107, which passes through a slot therein, as best shown in Fig. 2, and by means of said slot is adjustable, so as to accommodate different-sized links.

The way in which the assembled chain travels as it passes out of the machine is formed principally in the removable plate 108, which is held in position by the cap-plate 109, which in turn is connected to the frame 100 by the cap-screw 110. I provide as many of these plates 108 as there are different-sized links to be operated upon by the machine. A different sprocket-wheel 33 for each size is also required. When it is desired to change the machine from one size to another, I remove the cap-screw 110, lift off the cap-plate 109, take out the plate 108 and the shaft 34, replace the wheel 33 with a similar wheel of appropriate size, replace the shaft bearing said wheel, adjust the bearings to said shaft until the wheel is in proper position to draw the links along as required, replace the plate 108 with another of suitable size, and replace the cap-plate 109. The position of the shaft 34 is made adjustable to the required degree in both directions by the bearings and supports, as before briefly stated. The supports 37 and 38 are movable longitudinally of the frame 100 by means of slots therein through which the cap-screws 111 pass, as shown in Fig. 4. The bearings 35 and 36 are vertically adjustable by means of the adjusting-screws 112 and 113, as best shown in Fig. 5. A suitable recess is formed to receive the adjustable plate 108, the sides of which 114 and 115 may be either formed in piece with the frame 100 or formed separately and secured rigidly thereon. The chain as it emerges from the plate 108 may be carried off and disposed of in any desired manner.

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

1. The combination, in a machine for assembling links in making chain belts, of a suitable chute for introducing the links to the machine, a plunger for moving each link sidewise as it emerges from the chute into engagement with the preceding link, mechanism for drawing the chain along a distance equal to the length of a link after the last-

stated movement, means actuated by the link as it is moved sidewise for throwing said mechanism into operation, and means for automatically throwing said mechanism out of engagement as the chain moves.

2. The combination, in a machine for assembling links in making chain belts, of a suitable chute for delivering the links to the machine, suitable mechanism for drawing the chain away as the links are assembled, a plunger for moving each link sidewise into engagement with the preceding link, a vibrating bar for operating said plunger, a cam-wheel for operating said vibrating bar, a slide-block engaging with said cam-wheel and with said bar, and means for adjusting the connection between said bar and said block, whereby the point to which the plunger shall move may be accurately determined.

3. The combination, in a machine for assembling links in making chain belts, of suitable mechanism for drawing the chain along as the links are assembled, a plunger for moving said links into assembled relation from the point where they are introduced into the machine, a vibrating bar for operating said plunger, a movable pivot for said vibrating bar whereby the length of the stroke of said plunger may be adjustably determined, a wheel revolving in proximity to said bar having a cam-groove in its periphery, a slideway alongside said wheel, a block mounted in said slideway and having a projection engaging with said cam-groove, and a stud adjustably secured to said block and engaging with said vibrating bar, whereby the point to which said bar shall move may be adjustably determined.

4. The combination, in a machine for assembling links in making chain belts, with the link-assembling mechanism, of a plunger for moving the links, a vibrating bar for operating said plunger a slide-block for operating said bar having a suitable adjustable stud connecting the block and the bar whereby the relative position of the two may be adjustably determined, and means for reciprocating said slide-block.

5. The combination, in a machine for assembling links in making chain belts, of a

plunger for moving the links successively into position, a sprocket-wheel for drawing off the chain as the links are assembled, a ratchet-wheel on the same shaft with said sprocket-wheel, a vibrating arm on the end of said shaft, a pawl on said vibrating arm adapted to engage with said ratchet-wheel, a spring-pin on said arm adapted to hold said pawl out of engagement, a plunger adapted to be operated in one direction by the link when forced sidewise and having an arm which engages with said spring-pin to release the pawl and also having a pin extending over a tail-piece on said pawl whereby the same is raised out of engagement with the ratchet-wheel on its reverse movement, substantially as set forth.

6. The combination, in a machine for assembling links in making chain belts, of mechanism for drawing the belt forward as the links are assembled, a ratchet-and-pawl device for propelling the same, means for holding the pawl out of engagement except immediately after the link is assembled, means actuated by said link as it is assembled for throwing the ratchet-and-pawl devices into engagement, and means for automatically throwing said ratchet and pawl out of engagement as the chain moves forward after the link is assembled.

7. The combination, in a machine for assembling links in making chain belts, of mechanism for moving the links successively into assembled relation, mechanism embodying adjustable sprocket-wheel-supporting devices and a removable sprocket-wheel for moving the chain as the links are assembled, and means for adjusting said chain-moving mechanism to different positions whereby different-sized sprocket-wheels may be used to accommodate and handle different-sized links, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 21st day of October, A. D. 1901.

JOHN CLARK HOWE. [L. S.]

Witnesses:

CHESTER BRADFORD,
ALBERT F. ZEARING.