

No. 702,209.

Patented June 10, 1902.

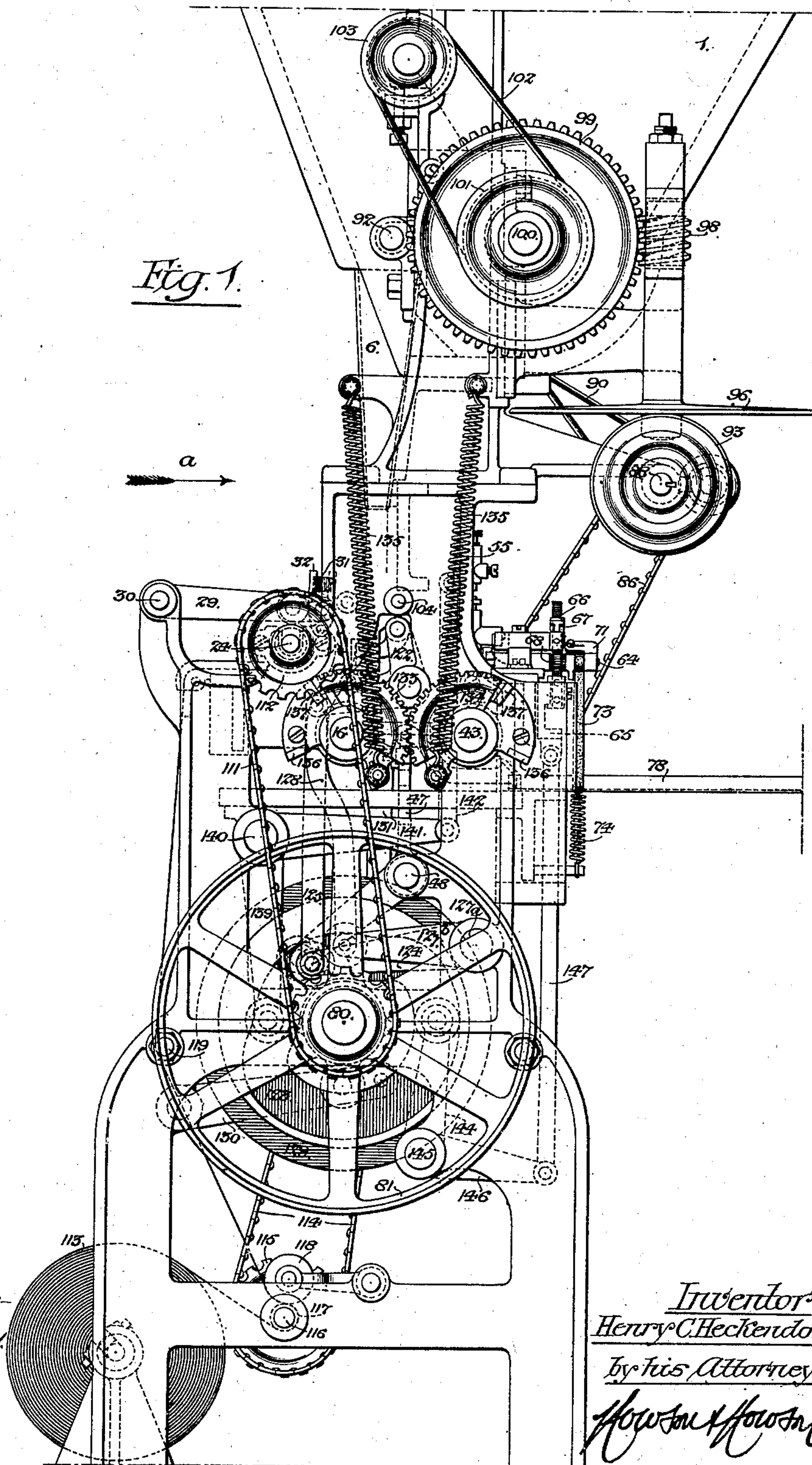
H. C. HECKENDORN.
CIGARETTE MACHINE.

(Application filed May 19, 1899.)

(No Model.)

9 Sheets—Sheet 1.

Fig. 1.



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No. 702,209.

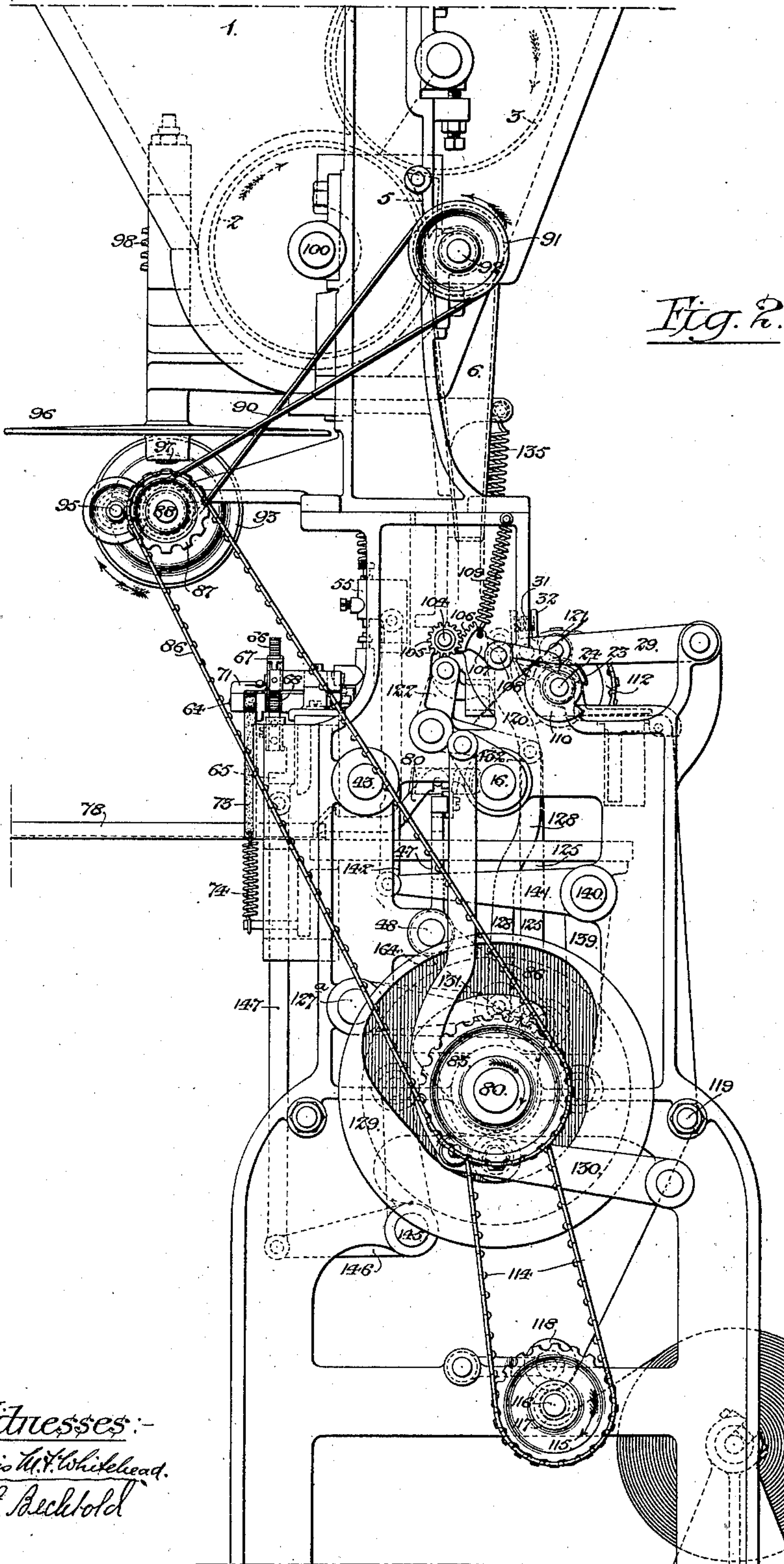
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9 Sheets—Sheet 2.



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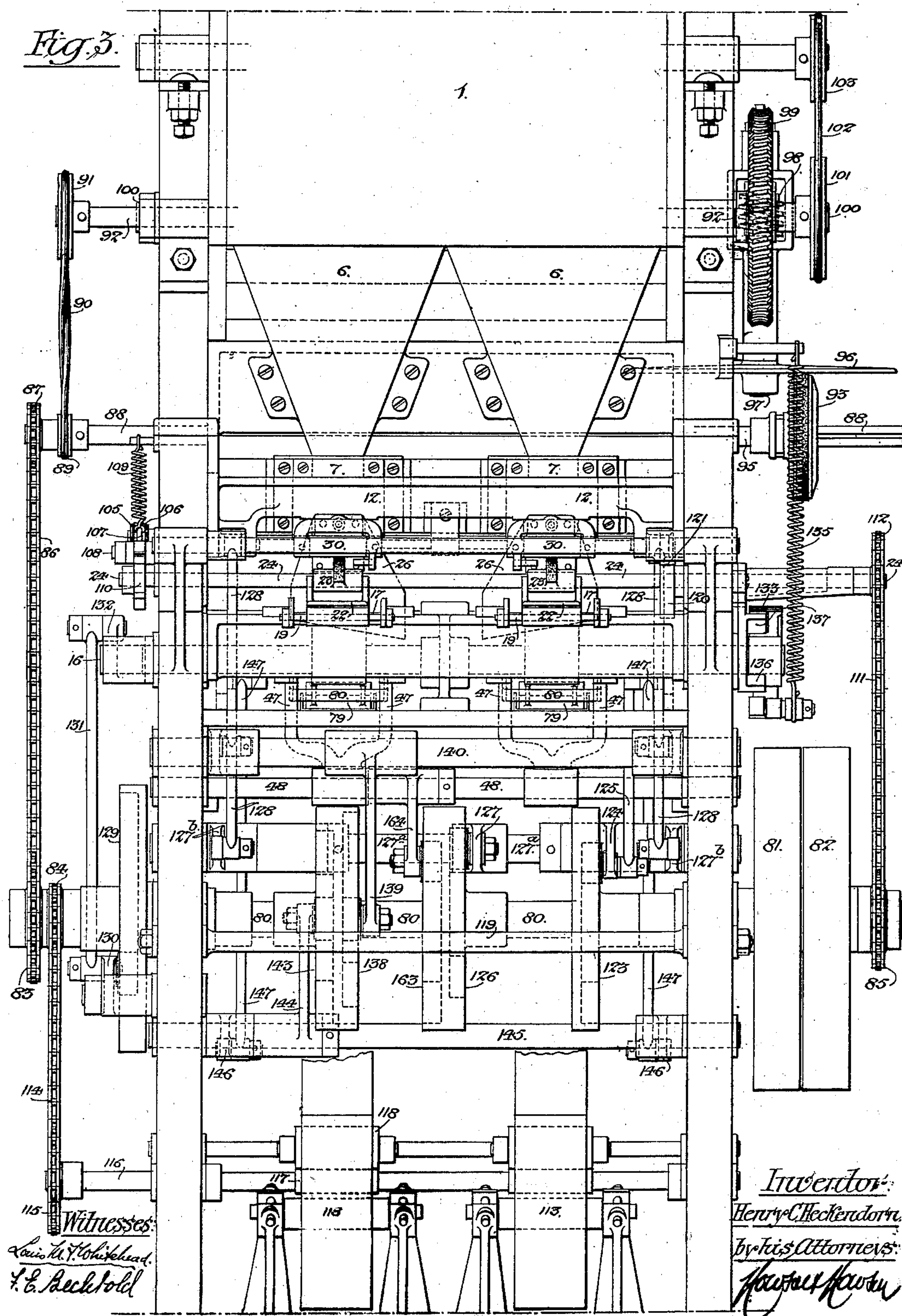
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9 Sheets—Sheet 3.



Witnesses:

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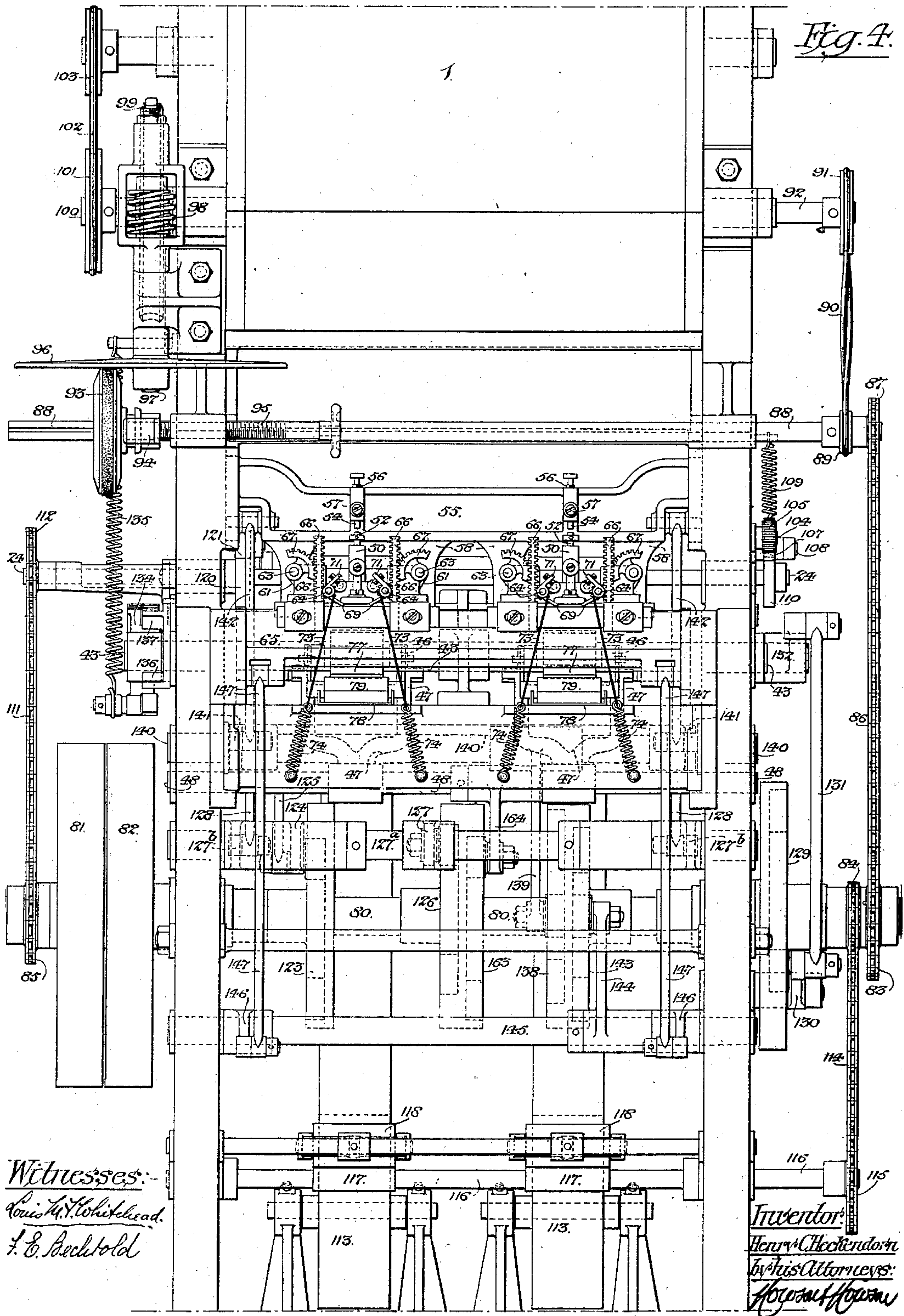
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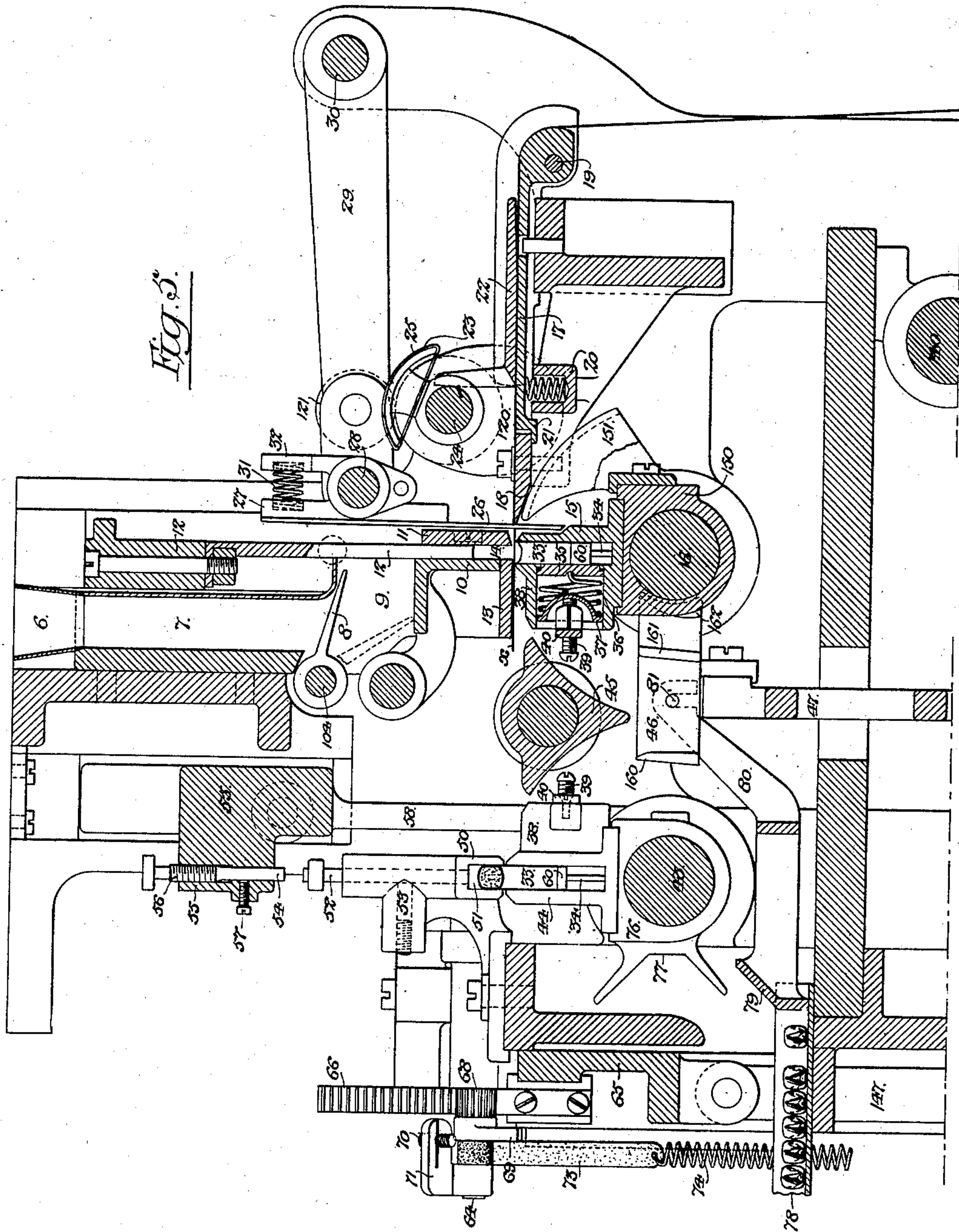
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(Application filed May 19, 1899.)

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9 Sheets—Sheet 5.

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No. 702,209.

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Fig. 6.

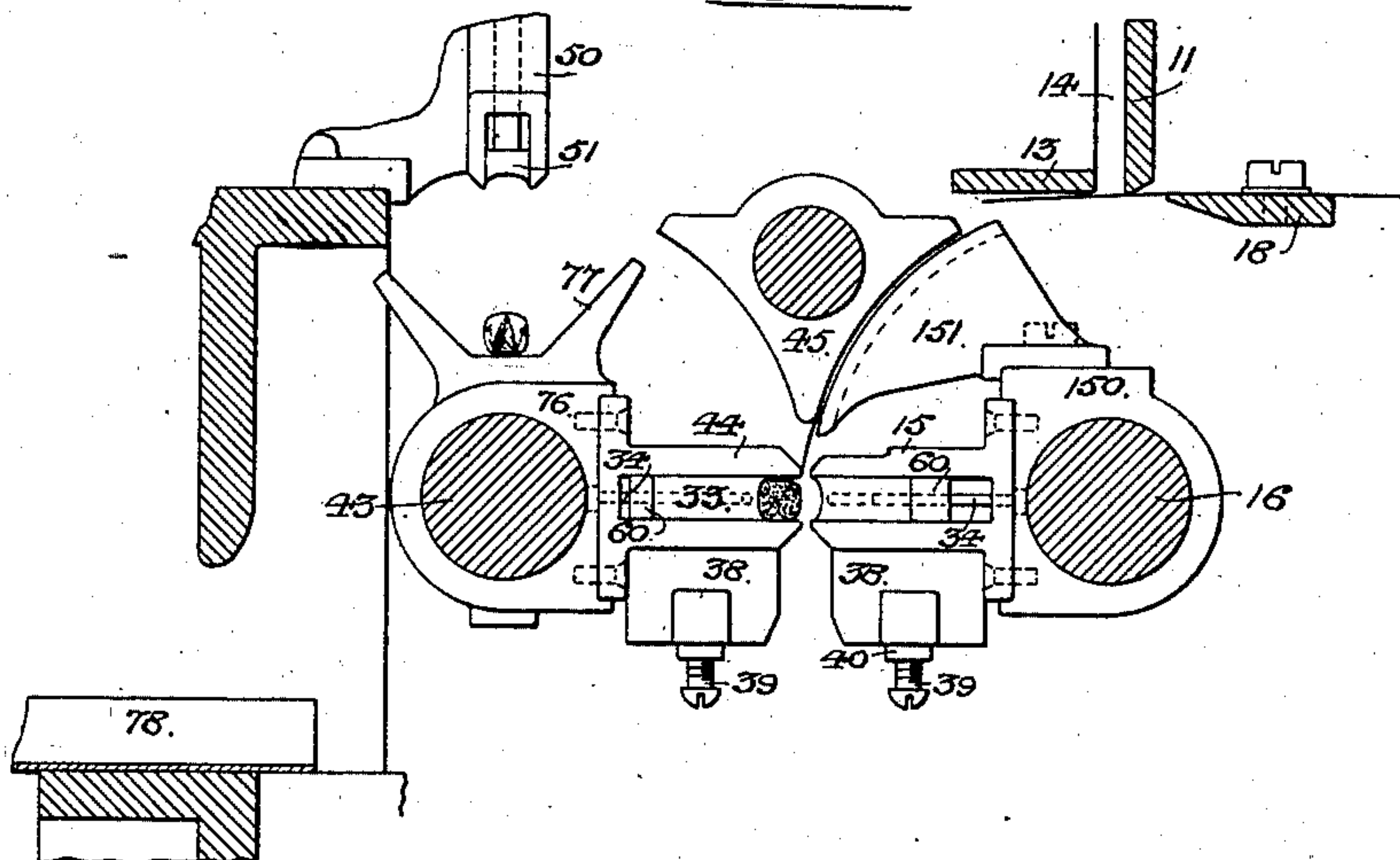


Fig. 19.

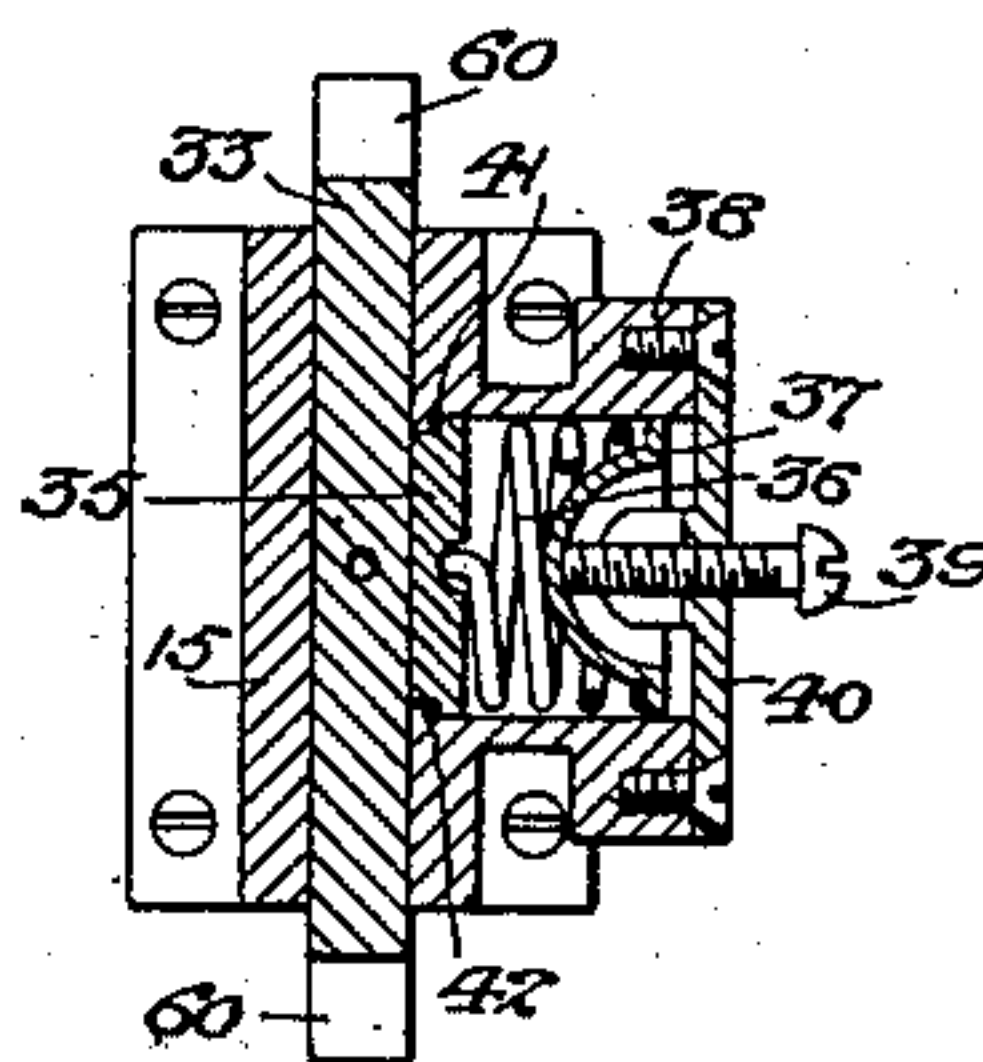
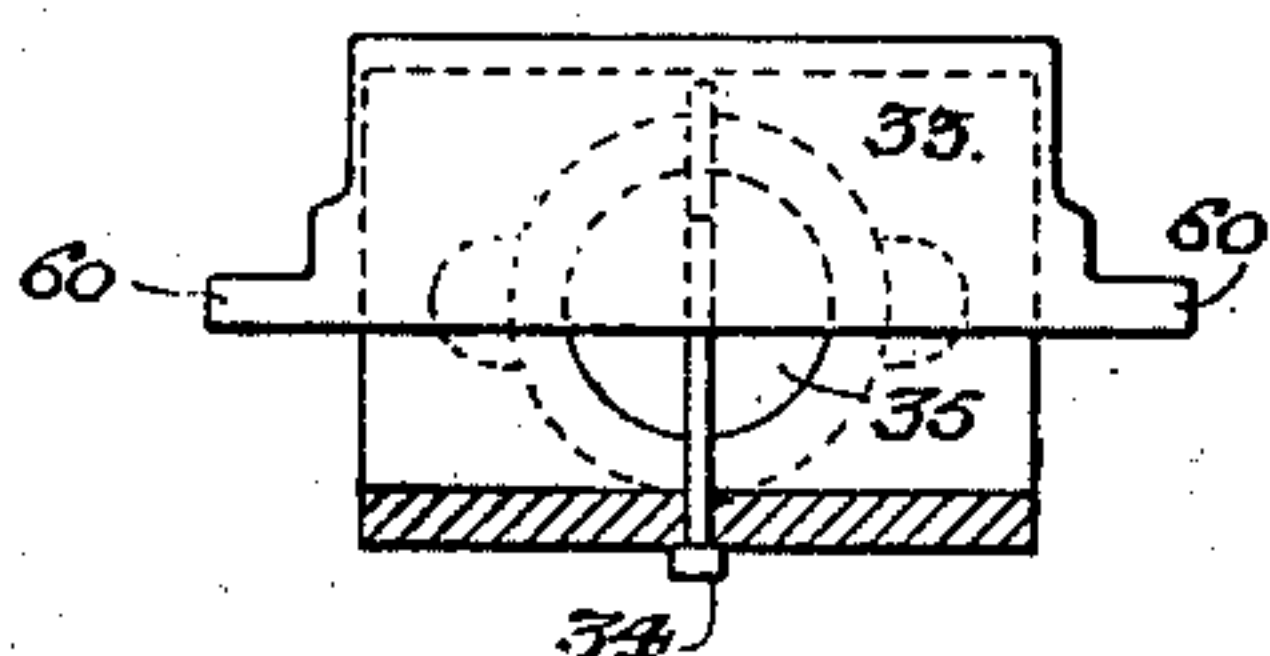


Fig. 18.



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Fig. 8.

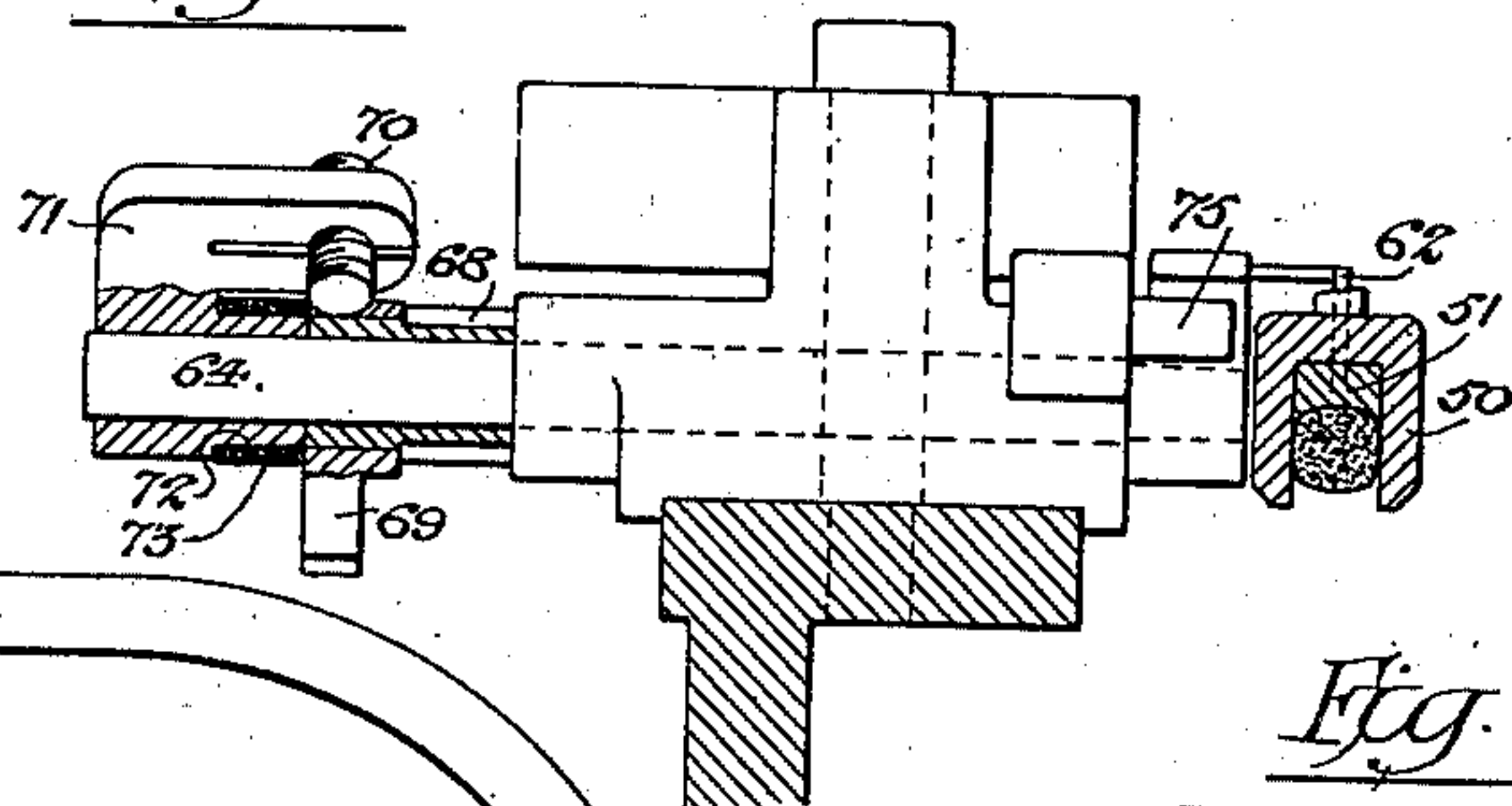


Fig. 9.

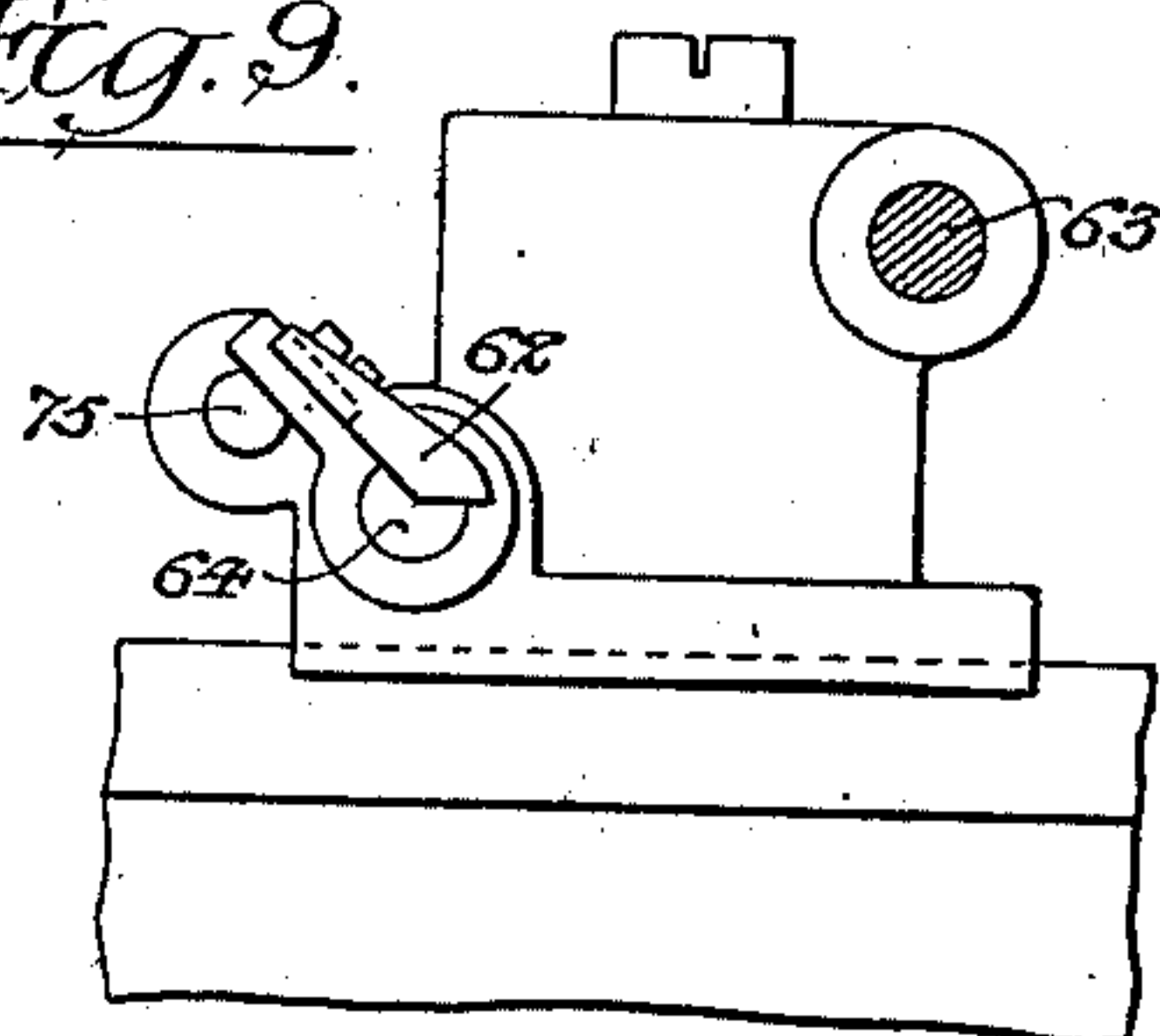
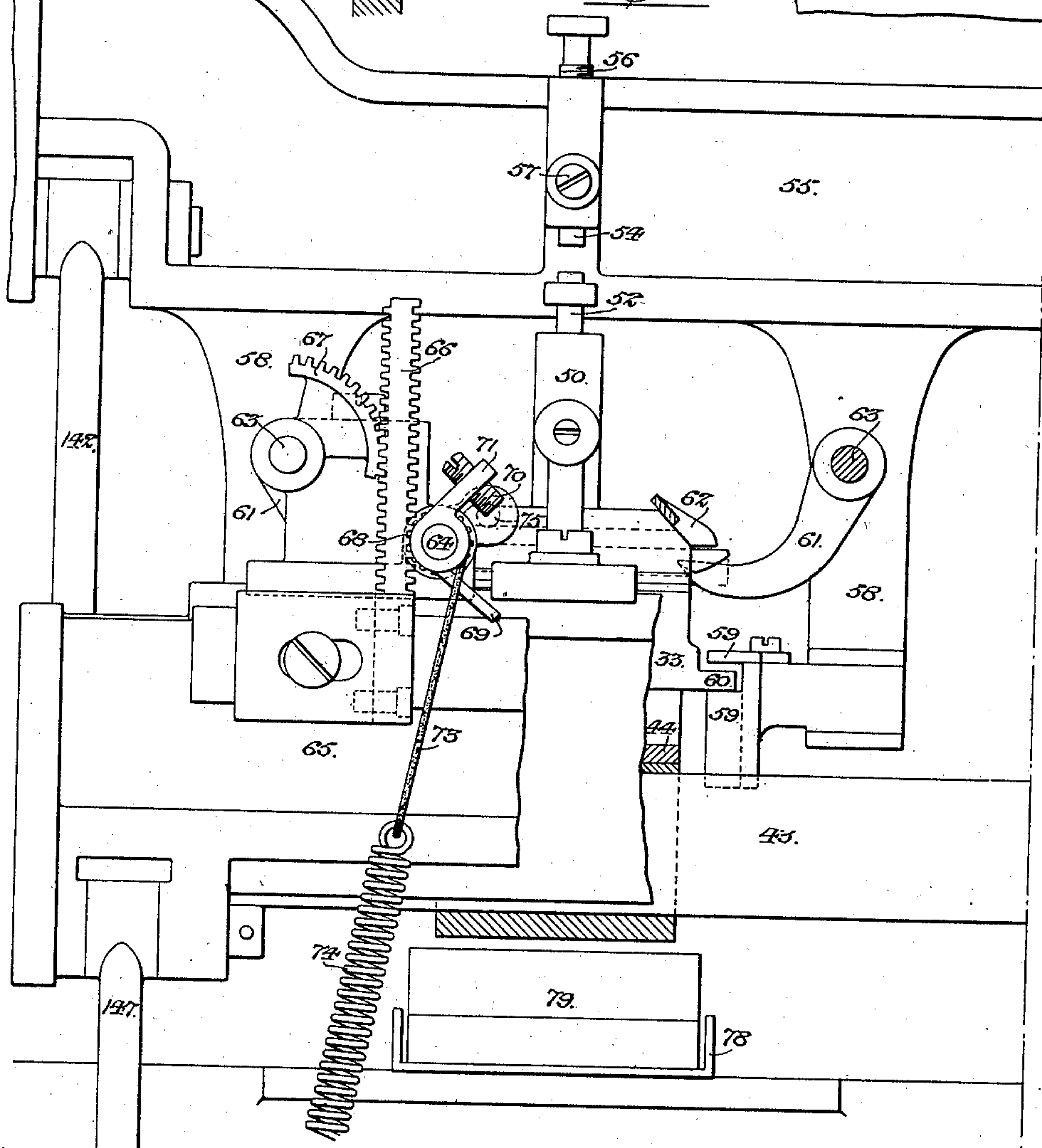


Fig. 7.



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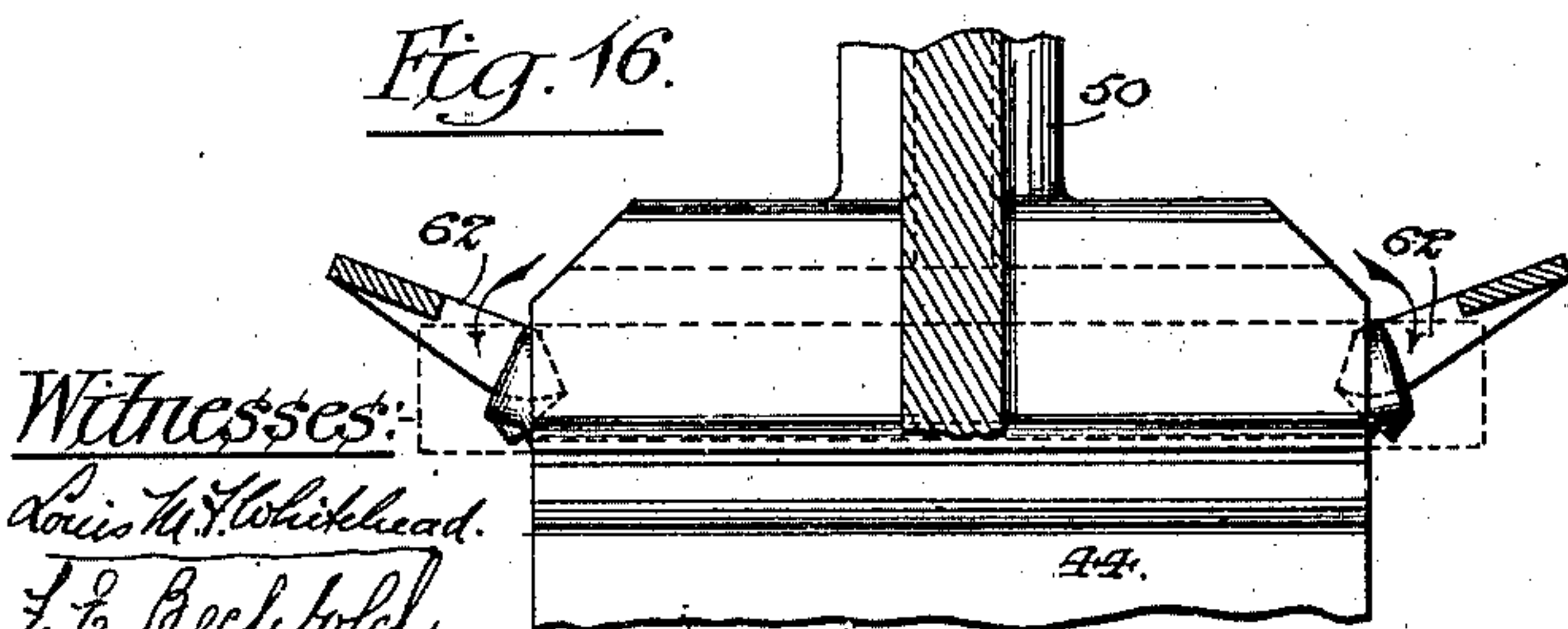
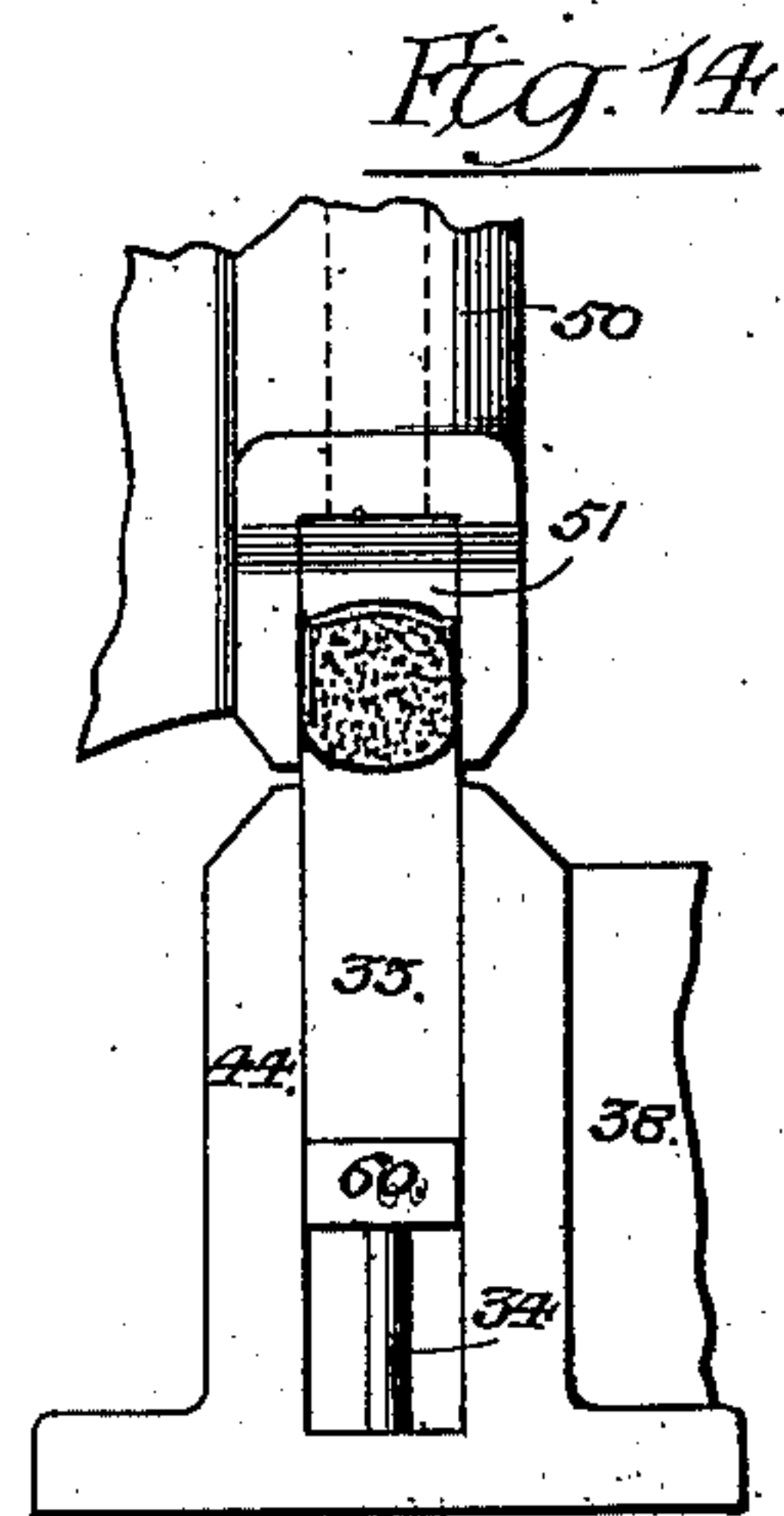
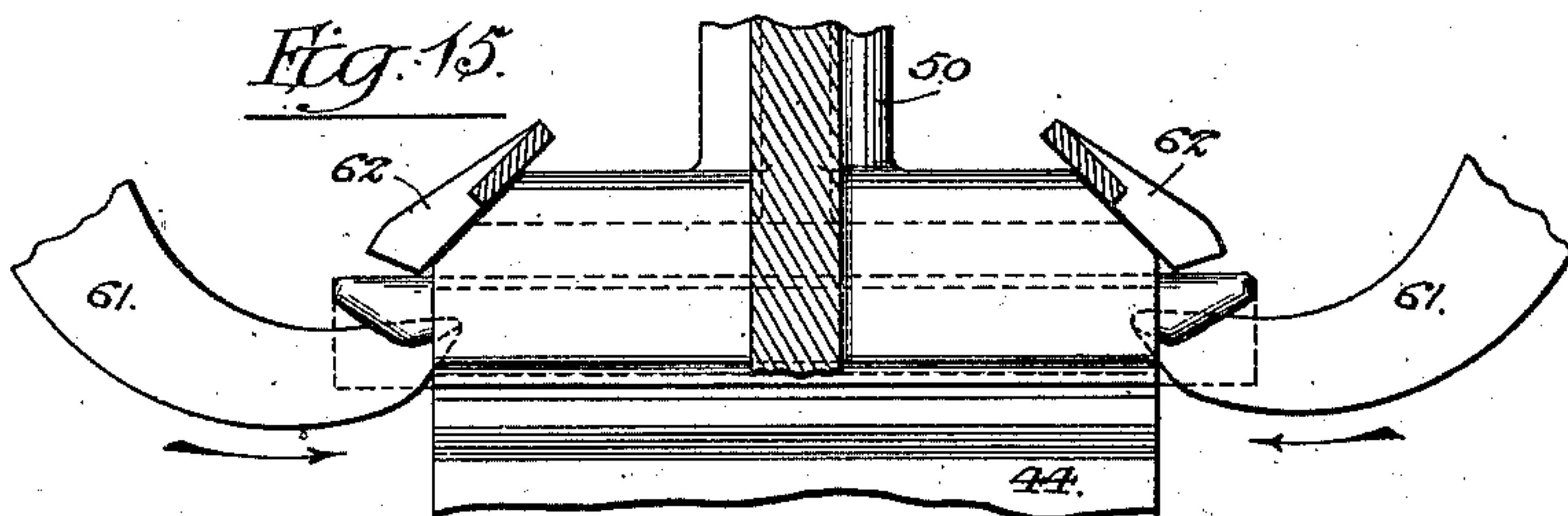
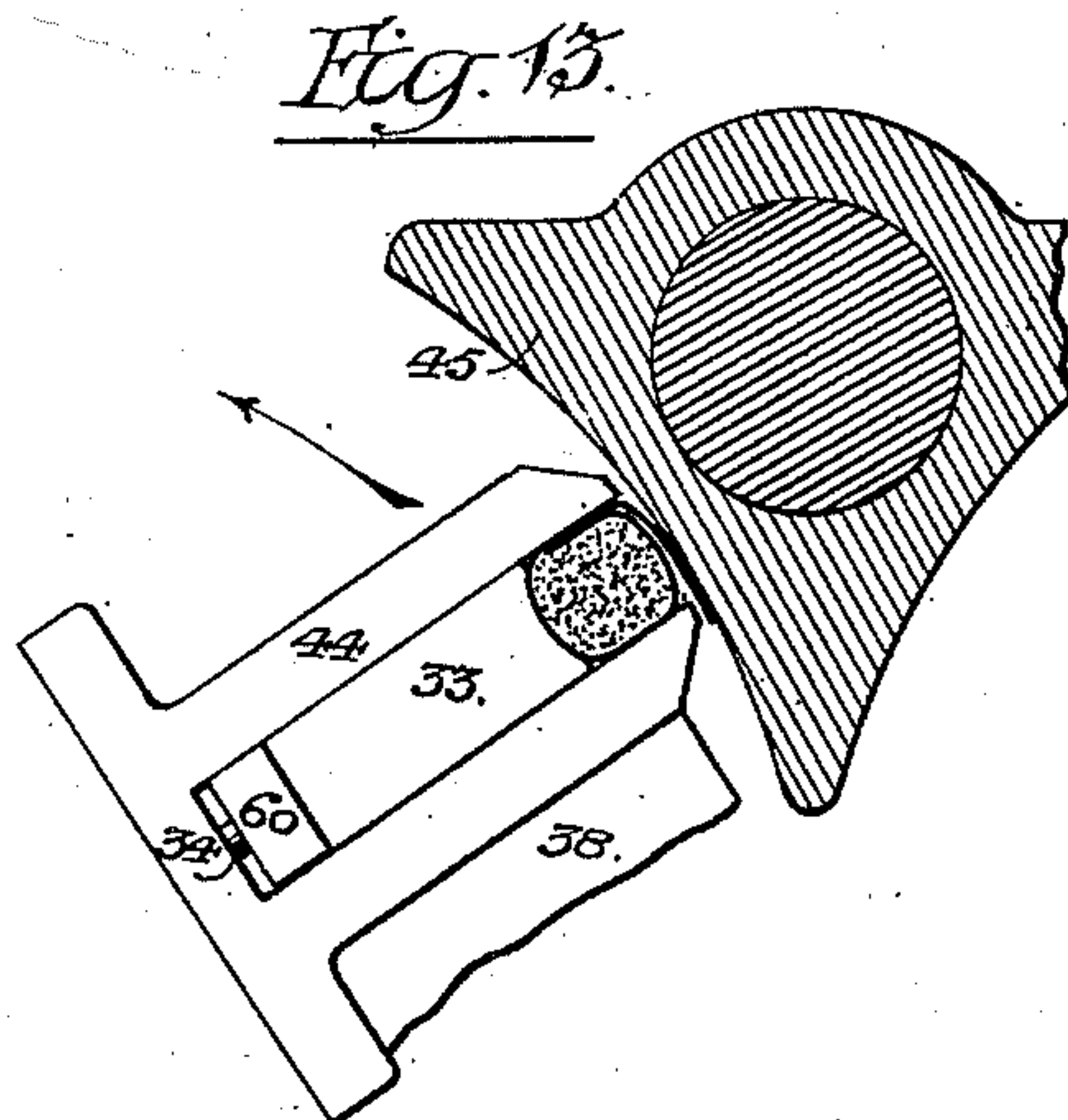
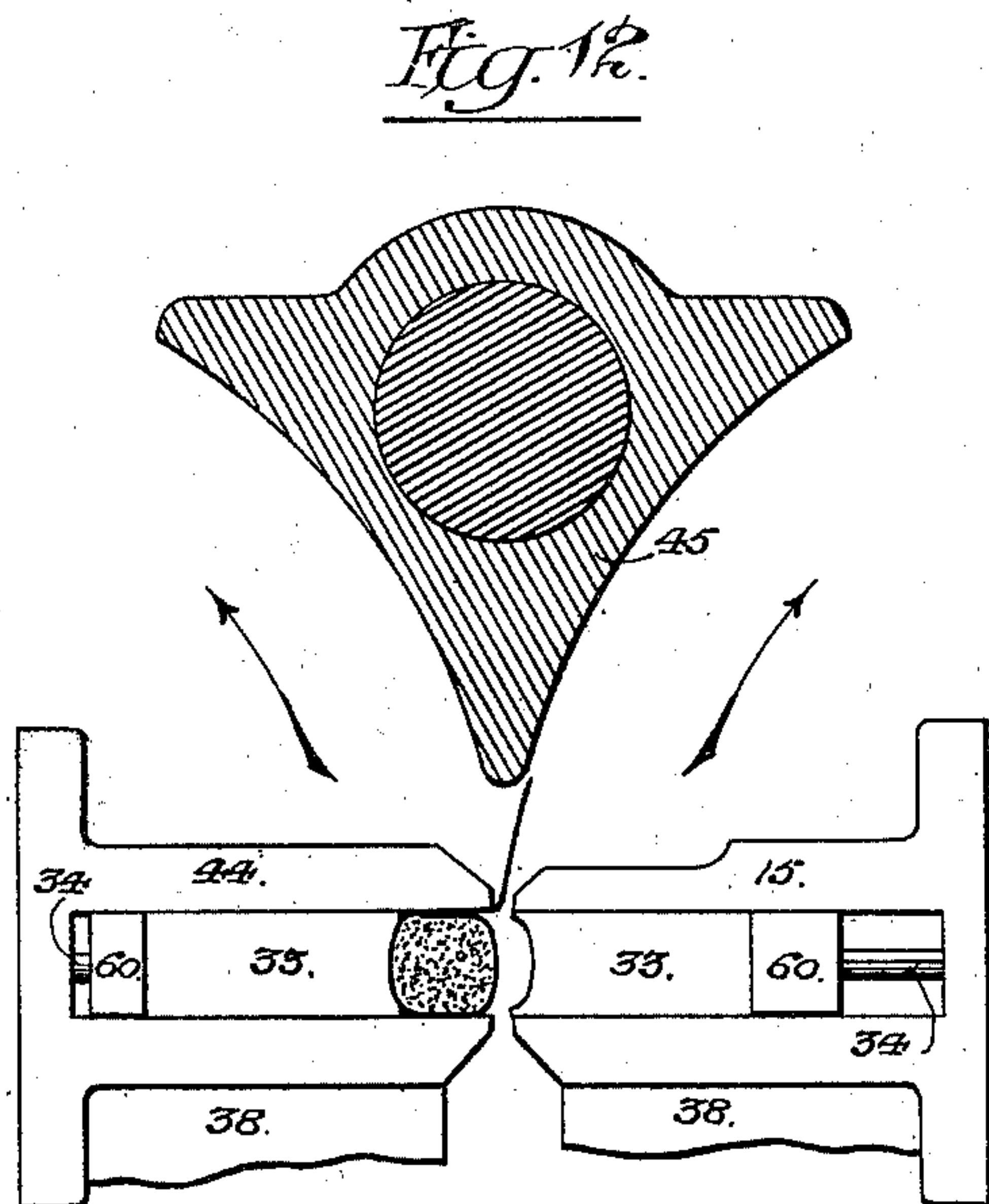
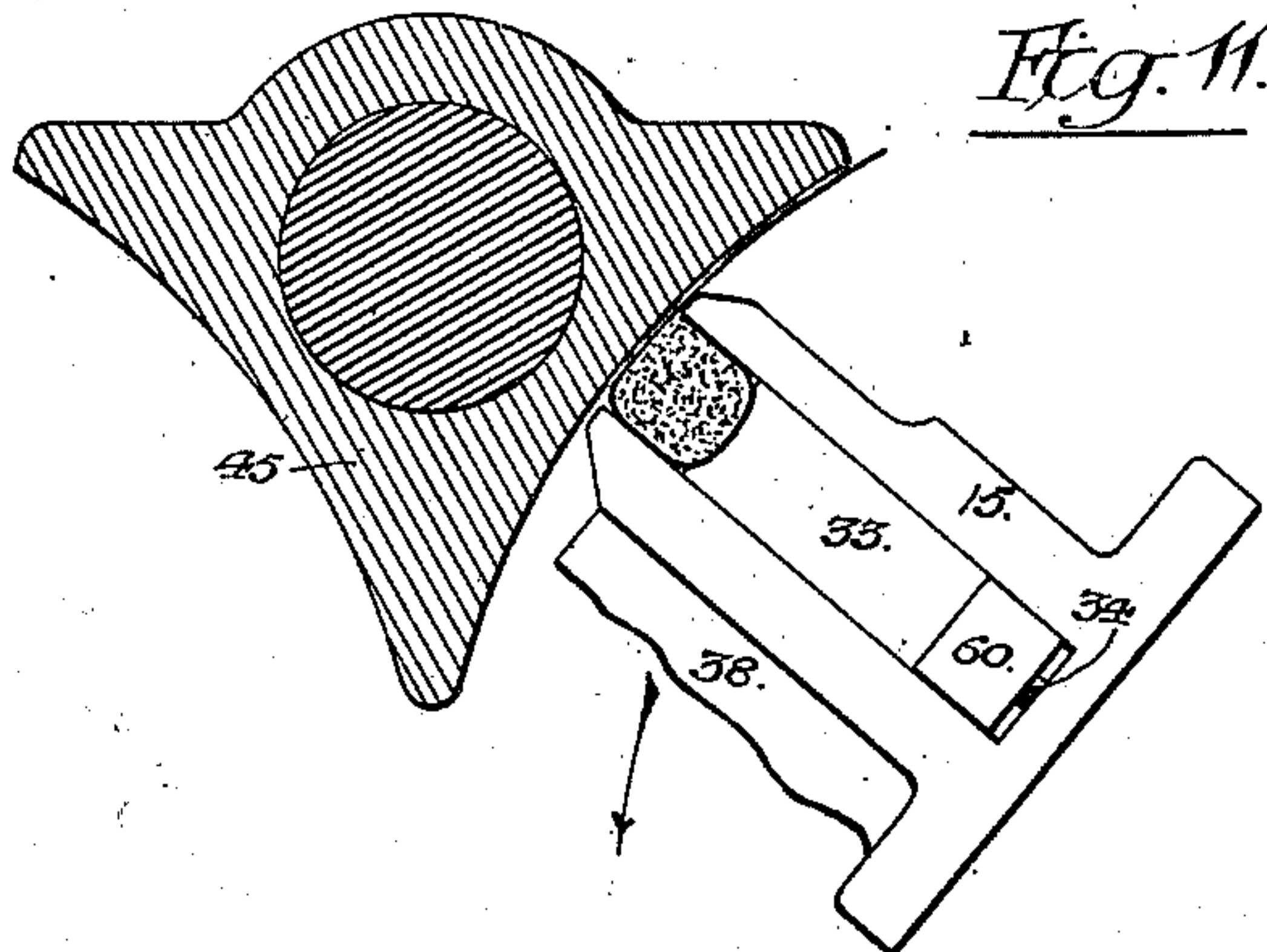
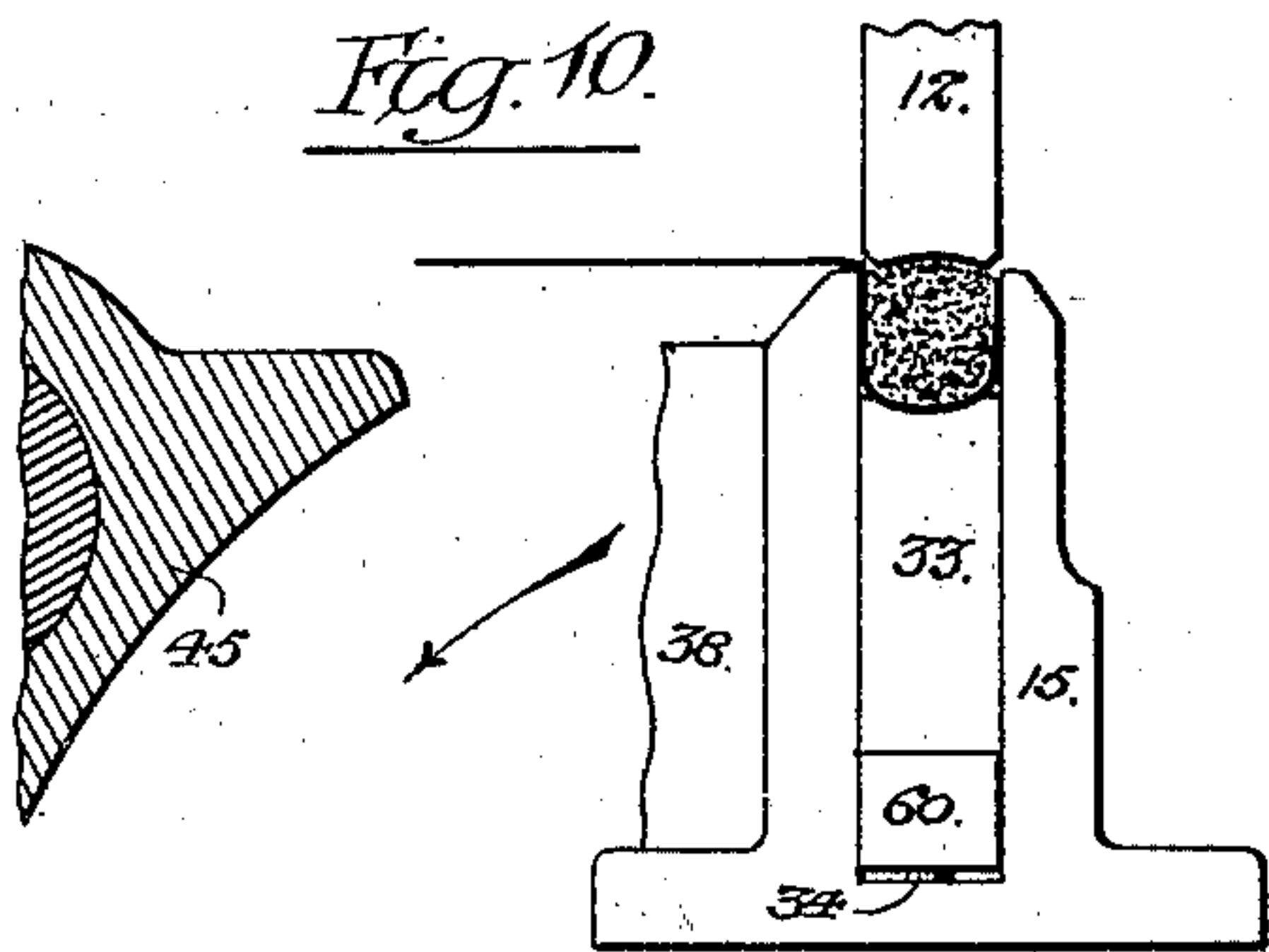
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9 Sheets—Sheet 8.



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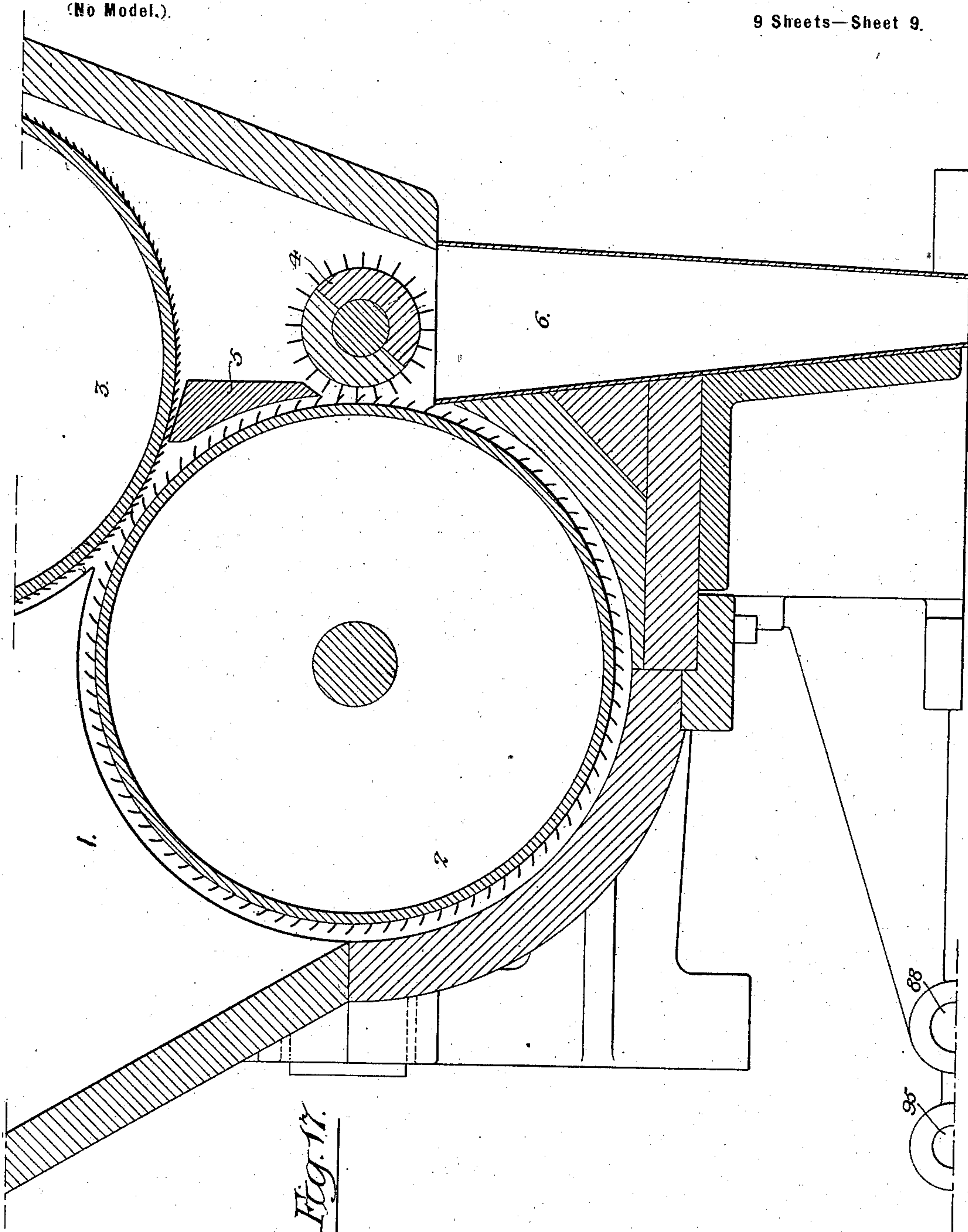
H. C. HECKENDORN.
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9 Sheets—Sheet 9.



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UNITED STATES PATENT OFFICE.

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TO JAMES A. BONSAK, OF PHILADELPHIA, PENNSYLVANIA.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 702,209, dated June 10, 1902.

Application filed May 19, 1899. Serial No. 717,444. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. HECKENDORN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Cigarette-Machines, of which the following is a specification.

My invention relates to that class of cigarette-machines in which the wrapper after being applied to the bunch of tobacco has its projecting ends tucked in order to retain the wrapper and hold the cigarette in its proper form, my invention comprising certain combinations of parts devised with the view of simplifying and improving the operation of a machine of this class and the character and purpose of the various features of my invention being fully set forth hereinafter and the features of novelty which I have devised being specifically claimed.

In the accompanying drawings, Figure 1 represents an elevation of the machine looking at one end of the same. Fig. 2 is a similar elevation looking at the opposite end of the machine. Fig. 3 is a rear view—that is to say, a view looking in the direction of the arrow *a*, Fig. 1. Fig. 4 is a front view. Fig. 5 is an enlarged transverse section of part of the machine, illustrating the mechanism employed for forming, molding, and wrapping the bunch of tobacco which constitutes a cigarette. Fig. 6 is a sectional view of part of the same in a different position. Fig. 7 is an enlarged view, partly in elevation and partly in longitudinal section, illustrating devices employed in effecting the tucking of the projecting ends of the wrapper. Figs. 8 and 9 are detached views of parts of said tucking mechanism. Figs. 10 to 16, inclusive, are diagrams illustrating the successive steps in the formation of the cigarette. Fig. 17 is an enlarged sectional view of the tobacco-feeding devices, and Figs. 18 and 19 are views of certain portions of the machine not fully illustrated in the general drawings.

It may be well in the first place to describe with reference to Figs. 5 to 19 the construction and operation of those parts of the machine which act directly upon the cigarette, the filling, or the wrapper, deferring until a later portion of the specification a descrip-

tion of the mechanism whereby the various movements of said parts are effected.

Referring first to Fig. 17, it will be observed that 1 is a hopper having a segmental lower portion in which rotates a toothed feed-drum 2, and above and at one side of the latter is a toothed filling-drum 3, the surface of which where it is adjacent to the surface of the feed-drum rotates in a direction the reverse of said feed-drum surface. The teeth of the two drums approach closely to each other, so that the teeth of the feed-drum will only carry down from the mass of tobacco above said drum as much as will fill the space between the teeth. Below the filling-drum is a picker-roll 4 with projecting teeth which remove the tobacco from the toothed surface of the feed-drum. The adjacent surfaces of the feed-drum and picker-roll move in the same direction; but the teeth of the picker-roll move at somewhat higher speed than those of the feed-drum, so as to engage with the masses of tobacco between the latter and discharge it therefrom. The tobacco is deposited in bulk in the hopper 1 and is in contact with the toothed peripheries of the rollers 2 and 3 therein. As the roller 2 rotates in the direction of the arrow, Fig. 2, it engages with the tobacco in the hopper and carries along with it a certain amount of the same, excess being removed from the teeth by the backward sweeping action of the teeth of the roller 3. The tobacco which is carried forward and downward by the teeth of the roller 2 is discharged therefrom by the teeth of the picker-roll 4. Between the filling-drum and the picker-roll is a concave guard 5, which serves to inclose that portion of the surface of the feed-drum between said filling-drum and picker-roll. Hence the toothed periphery of the feed-drum is inclosed from the time it receives its charge of tobacco until said charge is removed therefrom. The tobacco is delivered by the picker-roll into the upper end of an upright chute 6, which terminates at its lower end in a collecting-chamber 7, the bottom of which is closed by a swinging gate 8, which acts to drop at intervals the mass of tobacco which has accumulated in the collecting-chamber 7, the successive charges being delivered into a charging-cham-

ber 9, which has a reciprocating wall 10, acting as a pusher, whereby on the inward movement of said wall the charge of tobacco is pushed over toward the opposite fixed wall 11 of the chamber. Immediately adjacent to the innerside of said fixed wall 11 is a plunger 12, to which vertical reciprocating motion is imparted, and in the bottom 13 of the charging-chamber, in line with said plunger, is an opening 14, through which the charge of tobacco can be pushed by the plunger in its descent. Before this occurs, however, a strip of paper x , which is to form the wrapper of the cigarette, has been fed in beneath the bottom 13 of the charging-chamber and between the same and the top of a primary mold 15, which is mounted upon a rock-shaft 16, so that it can have swinging movement to the extent of a quarter-turn imparted to it. The paper is fed forward at suitable intervals over a table 17 and fixed shear-blade 18, said table 17 being pivoted to the fixed frame of the machine at 19 and being acted upon by a spring 20, contained in a socket on said fixed frame, so that it is pressed upward to an extent limited by contact of a lip 21 on the front edge of the table with the under side of the fixed shear-blade 18. A weighted strip or bar 22 bears upon the paper as it is fed forward over the table 17 and prevents said paper from drawing backward or curling up in the intervals between the successive feeding operations. The feeding is effected by means of a segment 23 on a rotating shaft 24, said segment having a rubber or other elastic or semi-elastic shoe 25, which may for convenience consist simply of an ordinary rubber band stretched around the segment, as shown in Fig. 5. A reciprocating shear-blade 26 operates in conjunction with the fixed shear-blade 18 to sever the successive wrappers from the sheet of paper as the latter is fed forwardly, said blade 26 being carried by a block 27, which is pivoted to a rod 28 at the inner end of an arm 29 on a rock-shaft 30, said block being acted upon by a spring 31, interposed between the upper end of the block and a lug or bracket 32, also carried by the rod 28, so that the lower end of the shear-blade 26 is continually pressed into contact with the front edge of the fixed shear-blade 18. It will be understood, of course, that the lower end of the reciprocating shear-blade 26 is beveled and that the point of the blade is never raised above the edge of the fixed shear-blade 18. Hence there is no opportunity for the reciprocating shear-blade to move inwardly over the fixed blade, said reciprocating blade being so much wider than the strip of paper to be cut that ample space will always be afforded for feeding said strip of paper under the reciprocating shear when the same is at the limit of its upward movement. As soon as the strip of paper has been fed forward, the primary mold 15 being in its vertical position, the tobacco which has previously been dumped into the charging-

chamber is pushed forward by the pusher 10 to a position under the plunger-bar 12 and directly over the opening 14 in the bottom of said charging-chamber and the open top of the vertical primary mold 15, the tobacco being prevented from falling through by resting on the interposed paper wrapper. After the tobacco is in position the shear-blade 26 descends and severs the paper, and the plunger-bar 12 is then depressed, and the charge of tobacco, together with the wrapper, is forced into the primary mold 15, pushing in advance the discharger 33, contained in said mold, which operation causes the wrapper to be folded around three sides of the charge of tobacco, as shown in Fig. 10. The mold 15 is open at the ends, so that the ends of the wrapper can project beyond the same, and in order to retain the discharger 33 longitudinally in the mold I use one or more guide-pins 34, each projecting upward from the bottom of the mold into an opening in the discharger 33, as shown, for instance, in Figs. 6 and 18.

In order to prevent accidental movement of the discharger 33 in the mold 15, I insert in one side of the mold a friction-plug 35, (see Figs. 5 and 19,) this plug being acted upon by a spiral spring 36, which is interposed between the same and a cap 37, free to slide in a hollow boss 38 on one side of the mold, a set-screw 39, adapted to a threaded opening in a cross-bar 40 on said boss, serving to adjust the tension of the spring as desired. The plug 35 has a flange 41, which by engagement with a flange 42 at the side of the mold serves to prevent the forcing of the plug into the mold if the discharger is removed.

Upon a rock-shaft 43, parallel with the rock-shaft 16, is mounted a secondary mold 44, which is in all material respects similar to the primary mold 15, differing only in the control of its discharger 33, as hereinafter described.

When the bunch of tobacco has been pushed down into the primary mold 15, so as to fold the wrapper around three sides of the same, as shown in Fig. 10, the molds 15 and 44 each have imparted to them movement of partial rotation to the extent of a quarter-turn toward each other, the effect of this movement being to bring the mouths of the primary and secondary molds into line with each other horizontally, as shown in Fig. 6, and also to cause a wedge 45, interposed between the two molds, to fold the wrapper x around the fourth side of the bunch of tobacco, as illustrated in Figs. 6 and 11. The discharger 33 is now moved outwardly in the primary mold 15, so as to thrust the partially-formed cigarette therefrom and into the secondary mold 44, thereby forming the fifth fold in the wrapper, as shown in Fig. 12. As the cigarette is being pushed into the secondary mold the discharger 33 of the latter is moved mechanically in advance of said cigarette, movement of said discharger, as well as the outward movement of the discharger 33 of the mold 15, being effected by means of

lugs upon pusher-plates 46, which are mounted, by means of a forked arm 47, upon a rock-shaft 48, carried by the fixed frame of the machine, said lugs acting upon lugs 60, Fig. 5 18, at the ends of each discharger. After the cigarette has been deposited in the secondary mold the two molds swing back again to their vertical position, as shown in Fig. 5, and during this operation the wedge 45 forms the 10 sixth fold in the wrapper of the cigarette and may complete the folding of the same, as shown in Fig. 13. When the secondary mold 44 is in the vertical position, the mouth of the same is immediately below the mouth of a 15 tucker-mold 50, which is suitably mounted on the fixed frame and has a shoe or discharger 51, having a stem 52, passing through the mold-body, a friction-shoe 53 in one side of the mold bearing upon this stem and serving 20 to retain the discharger 51 in any position to which it may be adjusted. The upper end of the stem 52 is adapted to be acted upon by a presser-stud 54, carried by a vertically-reciprocating bar 55 of the machine, said 25 stud having a threaded portion 56, whereby it can be adjusted vertically in respect to the bar, a set-screw 57 serving to secure it in position after adjustment. The bar 55 has depending arms 58, with jaws 59 for engaging 30 with the projecting lugs 60 at the ends of the plunger 33 of the secondary mold, as shown in Fig. 7, so that the upward movement of the bar 55 at the proper time will cause the said discharger 33 to eject the cigarette from the mold 44 and force it into the 35 tucker-mold 50, driving back the discharger in said mold to its full extent and clamping the cigarette between the two, as shown in Fig. 14. If desired, a seventh fold may be at 40 the same time formed in the wrapper, sufficient paper being originally provided for this purpose. In order to complete the cigarette, it is now necessary to tuck in the projecting ends of the wrapper, and this is accomplished 45 by the mechanism shown in Figs. 7, 8, and 9.

Mounted on the frame of the machine, so as to act upon each end of the cigarette-wrapper when said cigarette is in position in the 50 tucker-mold, are two tucking-blades 61 and 62, the former for producing the primary tuck and the other for forming the final tuck. The primary tucker-blade is mounted upon a rock-shaft 63 and the final tucker upon a rock-shaft 64, the primary tucker acting from below 55 to fold in the projecting end of the wrapper, as shown in Fig. 15, and the final tucker acting from above to complete the fold, as shown in Fig. 16. The primary tucker commences to swing forward as the cigarette is 60 being pushed from the secondary mold into the tucker-mold, so that by the time the cigarette is firmly seated in said tucker-mold the primary tucker begins to act upon the projecting end of the wrapper, and as soon as it 65 has completed its tuck it is withdrawn, so as to permit the final tucker to act. Both tuck-

ers are operated by a single reciprocating slide-bar 65, which carries duplex racks 66, one toothed side of each rack engaging with a toothed sector 67 on one of the rock-shafts 70 63 and the other toothed side of said rack engaging with a pinion 68, which can turn freely on the shaft 64. Secured to or forming part of this pinion is the hub of a driving-dog 69, which is adapted to come into contact with a 75 set-screw 70, carried by an arm 71, the hub of which is secured to the shaft 64 and has a drum 72, around which passes the upper end of a strap 73, the lower end of said strap being connected to a spring 74, whereby the 80 shaft 64 is normally held in position, so that the arm carrying the final tucker 62 bears against a stop 75 on the fixed frame, as shown in Fig. 9, said final tucker being then in a position of rest. During that part of the upward 85 movement of the slide-bar 65 which causes the primary tucker-blade 61 to move from its normal position to the extreme upward position (finishing the first tuck) there is no movement of the final tucker 62, (said tucker being held 90 by a spring 74 against a stop 75, as stated,) nor is there any movement of said final tucker on the downward movement of the slide-bar 65 until the dog 69 in its upward movement strikes the set-screw 70 and imparts movement to 95 the arm 71 and rock-shaft 64, so that ample time is afforded for the withdrawal of the primary tucker before the final tucker begins to act. When the tucking of the ends of the wrapper of the cigarette has been completed, 100 the slide-bar 55 is depressed, the first effect of this movement being to cause the jaws 59 to engage with the lugs 60 of the discharger 33 of the secondary mold and withdraw said discharger from the tucker-mold or to what 105 is termed a "clearance" position, where the said tucker-mold will not interfere with the rocking of the mold 44 back to the horizontal position. The same block 76 on the shaft 43 which carries the mold 44 also carries a trough 110 77, and after the slide-bar 55 has acted on discharger 33 to bring it to clearance position said slide-bar comes to rest and so remains until the mold has rocked sufficiently far toward a horizontal position to bring the trough 115 77 under the tucker-mold, whereupon the slide-bar continues its downward motion, and its stud 54 engages with the stem 52 of the discharger 51, depressing said discharger, and thereby ejecting the cigarette from the tuck- 120 ing-mold and into the trough 77. When the mold 44 again rocks back into vertical position, the cigarette is dumped from the trough 77 into a delivery-trough 78, the row of cigarettes being pushed along intermittently in 125 said trough by the action of a pusher-bar 79, which is provided with hooked arms 80, engaging with pins 81 on the pusher-plates 46, attached to the rock-arm 47, as shown in Fig. 5. 130

Having thus described the essential working parts of the machine, I will now describe

the mechanism whereby the same are operated, reference being had more particularly to Figs. 1, 2, 3, and 4.

The main driving-shaft of the machine is represented at 80, said shaft having suitable fast and loose pulleys 81 and 82 for the reception of the driving-belt and having also three sprocket-wheels 83, 84, and 85, the sprocket-wheel 83 driving, by means of a chain 86, a sprocket-wheel 87 on a transverse shaft 88 at the upper portion of the machine, said shaft having a pulley 89, which drives, by means of a crossed belt 90, a pulley 91 on the shaft 92 of the picker-roll 4 in the feed-hopper. Splined upon the other end of the shaft 88 is a friction-disk 93, which can be adjusted longitudinally on said shaft by means of a shifter 94, controlled by a set-screw 95, which is adapted to a threaded lug on the fixed frame of the machine. The periphery of the friction-disk 93 is in contact with the face of the horizontal friction-disk 96 on a vertical shaft 97, which is mounted in suitable bearings and is provided with a worm 98, the latter meshing with a worm-wheel 99 on the shaft 100 of the feed-drum 2, said shaft also having a pulley 101, which by means of a belt 102 drives a pulley 103 on the shaft of the filling-drum 3. By this means very accurate regulation of the speed of the feed-drum can be effected, and the amount of tobacco delivered by said feed-drum in the intervals of time between the successive operations of the plunger 12 can thus be readily governed, whereby a cigarette of any desired size can be produced and uniformity in the product insured.

The swinging gate 8, whereby the tobacco is delivered at intervals from the dumping-chamber 7 into the charging-chamber 9, is mounted upon a rock-shaft 104, which has a pinion 105, meshing with a toothed sector 106, forming part of a lever 107, which is hung to a stud 108 on the frame and is moved in one direction by means of a spring 109 and in the opposite direction by means of a cam 110 on the shaft 24 of the upper feeding-segment 23, said shaft 24 being driven from the shaft 80 by means of a chain 111, running from the sprocket-wheel 85 to a sprocket-wheel 112 on said shaft 24, as shown in Figs. 1 and 4.

There is a positive let-off of the paper from the roll 113 at the lower portion of the machine, this let-off being driven by a sprocket-wheel 84 on the shaft 80, said sprocket-wheel, by means of a chain 114, driving a sprocket-wheel 115 on a shaft 116, which has a feed-drum 117, around which the strip of paper passes and against which it is pressed by a weighted roll 118, as shown in Figs. 2 and 3, the strip of paper then passing around a suitable guide-bar 119 on the frame and thence to the feed-table.

The reciprocation of the shear-blade 26 is effected by a cam 120 on the shaft 24, said cam acting on an antifriction-roller 121, carried by the arm 29, to which said shear-blade is hung. (See Fig. 5.)

The slide whereby the tobacco is pushed from the charging-chamber 9 into the path of the plunger 12 is hung to a rock-lever 122, which is actuated by a cam 123 on the shaft 80, said cam acting on a rock-arm 124, which is connected to the rock-lever 122 by means of a rod or link 125.

The vertical reciprocating motion of the plunger 12, whereby the bunch of tobacco is forced down into the primary mold, is effected by a cam 126 on the shaft 80, said cam acting on a rock-arm 127 on a rock-shaft 127^a, having other arms 127^b, which are connected to the plunger 12 by means of rods or links 128.

The rocking of the primary and secondary mold-shafts 16 and 43 is effected by a cam 129 on the shaft 80, said cam acting on an antifriction-roller on an arm 130, which is connected by a rod or link 131 to an arm 132 on the shaft 16 of the primary former, the shafts 16 and 43 being geared together by means of toothed sectors 133 and 134, as shown in Fig. 1. Each sector is acted upon by a spring 135, so disposed that as the sector approaches the limit of its movement in either direction the tendency of the spring will be to complete such movement, stops 136 and 137 on the frame of the machine arresting the movements of the sectors when the molds are in proper position to register with each other, when in the horizontal position, or with the filling-chamber and tucking-mold, respectively, when in the vertical position, the springs and stops thus insuring exact registry of the molds with each other or with the other coacting parts, even should the operating-cam become loose or worn, and therefore in itself incapable of accomplishing this result.

Vertical movement is imparted to the presser-bar 55 by means of a cam 138 on the shaft 80, said cam acting upon an antifriction-roller on an arm 139, which is secured to a rock-shaft 140, having other arms 141, which are connected by rods or links 142 to said bar 55.

The bar 65, which carries the tucker-operating racks 66, is reciprocated by means of a cam 143 on the shaft 80, said cam acting on an antifriction-roller on an arm 144, which is secured to a rock-shaft 145, said rock-shaft having other arms 146, which are connected by rods or links 147 to the bar 65, as shown in Fig. 4.

The pusher-plates 46 have in addition to the lugs 160, which act upon the lugs 60 of the discharger 33 of the secondary mold 44, other lugs 161 and 162, which act upon the lugs 60 of the discharger 33 of the primary mold 15, these lugs being shown in Fig. 5, and the movement of said pusher-plates 46, so as to effect desired movement of the dischargers 33 of the two molds when the latter occupy the horizontal position, is effected by a cam 163 on the shaft 80, said cam acting on an antifriction-roller on an arm 164, which is

secured to the rock-shaft 48, having the arm 47, which carries the pusher-plates.

It will be noted on reference to Fig. 5 that the block 150 on the shaft 16, which carries the primary mold 15, also carries a segment 151, which swings up close under the forward edge of the fixed shear-blade 18 and when the primary mold 15 is swung down into the horizontal position provides a table or support for the projected end of a sheet of paper which is intended to form the wrapper for the next cigarette, thereby preventing said end from dropping down and becoming entangled with the mold. The segment also serves to loosely confine to the wedge 45 the projecting portion of the wrapper which is being applied to the cigarette, as shown in Fig. 6. This segment 151, it will be noticed, forms no part of the mechanism for feeding the strip forward, its function being simply that of a support or confiner, the feeding being effected by the rotating segment 23, in conjunction with the spring-pressed supporting-table 17, and said segment located some distance backwardly from the mold, so as to provide for the employment in advance of the feeding device of a fixed shear-blade 18, which co-operates with the reciprocating shear-blade to cut the strip of paper independently of any action of the mold, the shear-blade being removable for sharpening or other purposes without disturbing the mold, and the molds, on the other hand, being removable without interfering with the shear-blade. To provide for the ready removal of the molds from their shafts, said molds are secured in position by screws or bolts, as shown by dotted lines in Fig. 6. This removal of the molds is accomplished, therefore, without disturbing the mold-shafts, so that change in the size and character of the molds employed can be effected without any material disturbance of the machine.

By employing rock-shafts each carrying a single mold instead of employing rotary shafts carrying each a series of molds, as in some other machines of this class with which I am familiar, I am enabled to simplify the machine, and thereby cheapen its cost, as well as materially adding to the ease of its maintenance in proper working order.

In Figs. 1 to 4 I have shown a duplex machine—that is to say, a machine in which two sets of cigarette-forming mechanism are arranged side by side in the same framework and in connection with one set of general actuating devices; but it will be evident that a greater number of cigarette-forming machines made in accordance with my invention can thus be combined with a single frame and a single set of actuating devices.

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

1. The combination in a cigarette-machine, of a mold in which a cigarette is formed,

means for rocking said mold back and forth between a filling and a discharging position, and devices for feeding a strip of wrapper-paper, said feeding devices being independent of the movement of the mold, substantially as specified.

2. The combination in a cigarette-machine, of a mold in which the cigarette is formed, means for rocking said mold back and forth between a filling and a discharging position, mechanism for feeding a strip of wrapper-paper, and shearing devices for said strip independent of the mold, substantially as specified.

3. The combination in a cigarette-machine, of a mold in which the cigarette is formed, with a device independent of the mold for feeding a strip of wrapper-paper, said feeding device consisting of a rotating segment having a friction-surface for acting upon and carrying forwardly the paper strip, substantially as specified.

4. The combination of a cigarette-mold having a sliding discharger, a friction-plug in one side of the mold bearing upon said discharger, a spiral spring acting upon said plug and contained in a hollow boss on the side of the mold, a cap acting on said spring, and a set-screw bearing upon said cap, substantially as specified.

5. The combination in a cigarette-machine, of primary and secondary molds, and means for rocking the same backward and forward throughout a portion of a turn, whereby, when in one extreme position, they will register with each other, means for pressing a bunch of tobacco and a wrapper into the primary mold, means for folding the wrapper around the bunch as the mold swings from one position to the other, and means for pushing the partially-formed cigarette from the primary mold into the secondary mold and thereby further folding the wrapper around the cigarette, substantially as specified.

6. The combination in a cigarette-machine, of a pair of molds and means for rocking the same back and forth throughout a portion of a turn so that they will register with each other when in one extreme position, means for forcing a bunch of tobacco and a wrapper into the primary mold when the same is in one extreme position, a wedge for folding the wrapper around the bunch of tobacco as the primary mold moves from one extreme position to the other, and means for pushing the partially-wrapped bunch from the primary mold into the secondary mold and thereby still further folding the wrapper around the same, the wedge being so disposed as to further fold the wrapper around the cigarette as the secondary mold swings from its receiving position, substantially as specified.

7. The combination in a cigarette-machine, of primary and secondary molds, means for forcing a bunch of tobacco and a wrapper into

the primary mold, means for pushing the partially-formed cigarette from the primary mold into the secondary mold, a tucker-mold operating in conjunction with said secondary mold, and means for transferring the cigarette from said secondary mold to said tucker-mold, substantially as specified.

8. The combination in a cigarette-machine, of a primary mold, a secondary mold, means for pushing a bunch of tobacco and wrapper into said primary mold, means for pushing the partially-formed cigarette from the primary mold into the secondary mold, a tucker-mold operating in conjunction with said secondary mold, means for pushing the cigarette from the secondary mold into the tucker-mold, and means for ejecting the cigarette from said tucker-mold, substantially as specified.

9. The combination in a cigarette-machine, of primary and secondary molds, means for pushing the bunch of tobacco and a wrapper into said primary mold, means for pushing the partially-formed cigarette from the primary mold into the secondary mold, a tucker-mold acting in conjunction with said secondary mold, a discharger in said tucker-mold, a discharger in the secondary mold, and means for operating the latter discharger, whereby the cigarette is transferred from the secondary mold to the tucker-mold, and is confined between the two dischargers while its ends are being tucked, substantially as specified.

10. The combination in a cigarette-machine, of primary and secondary molds, means for pushing the bunch of tobacco and a wrapper into said primary mold, means for pushing the partially-formed cigarette from the primary mold into the secondary mold, a tucker-mold acting in conjunction with said secondary mold, a discharger in said tucker-mold, a discharger in the secondary mold, and a slide for operating said secondary and tucker mold dischargers, said slide having a two-stage return movement whereby the discharger of the tucker-mold will not eject the cigarette until the secondary mold has moved away, substantially as specified.

11. The combination in a cigarette-machine, of a primary mold, a secondary mold, means for pushing the bunch of tobacco and wrapper into said primary mold, means for pushing the partially-formed cigarette from the primary mold into the secondary mold, a tucker-mold operating in conjunction with said secondary mold, means for pushing a partially-formed cigarette from the secondary mold into the tucker-mold, a receiving-trough carried by the secondary-mold shaft, and means for ejecting the cigarette from the tucker-mold into said trough, substantially as specified.

12. The combination in a cigarette-machine, of primary and secondary molds having sliding dischargers, a trough on one of the mold-carriers, a trough for receiving the finished cigarettes from said first trough, a pusher-

bar for moving the cigarettes along in said final trough, a pusher-plate for operating the mold-dischargers, and connections between said pusher-plate and pusher-bar, substantially as specified.

13. The combination in a cigarette-machine, of a rocking mold-shaft having a mold thereon, wrapper-strip feeding and severing devices, and a segment mounted upon the mold-shaft and serving as a support for the wrapper-strip when the mold is moved away from the supporting position, said segment being independent of the feed mechanism, substantially as specified.

14. The combination in a cigarette-machine, of primary and final tucking-blades for the end of the wrapper, said final tucking-blade having movement around but a single axis and a lost-motion-operating device for effecting the movement of said final tucking-blade around its axis, substantially as specified.

15. The combination in a cigarette-machine, of primary and final tucking-blades for acting upon the projecting end of the wrapper, said final tucking-blade having movement around but a single axis, and gearing for connecting the shafts of the two blades, one of the elements of said gearing being a swinging dog which acts upon an arm on the shaft of the final tucking-blade throughout a portion only of its movement, substantially as specified.

16. The combination in a cigarette-machine, of primary and final tucking-blades for the end of the wrapper, said final tucking-blade having movement around but a single axis, gearing for connecting the shafts of said blades having as an element a swinging dog which acts upon an arm on the final tucker-shaft throughout a portion only of its swing, a spring for restoring said final tucker-shaft to its normal position, and a stop for arresting said return movement, substantially as specified.

17. The combination of the primary and final tucking-blades, rock-shafts carrying the same, a pinion on the primary tucker-shaft, a second pinion having a lost-motion connection with the final tucker-shaft, a duplex rack engaging with said pinions, and means for reciprocating said rack, substantially as specified.

18. The combination in a cigarette-machine, of a forming-mold, a rock-shaft carrying the same, mechanism for rocking said shaft, fixed stops coöperating with a shaft element for restricting the rocking movement of said shaft, and a spring tending to bring the shaft element into contact with the fixed stops at each limit of movement of the shaft, substantially as specified.

19. The combination in a cigarette-machine, of a pair of molds, each carried by a rock-shaft, whereby they can rock from and toward each other, gearing for connecting said rock-shafts, mechanism for rocking the shafts,

fixed stops cooperating with an element on each shaft to restrict the rocking movement of the same, and a spring acting upon each shaft and tending to bring its stop element
5 into contact with the fixed stops at each limit of movement of the shaft, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY C. HECKENDORN.

Witnesses:

F. E. BECHTOLD,
JOS. H. KLEIN.