

E. B. STIMPSON.
EYELET AND THE LIKE SETTING MACHINE.
APPLICATION FILED DEC. 31, 1907.

907,422.

Patented Dec. 22, 1908.

3 SHEETS—SHEET 1.

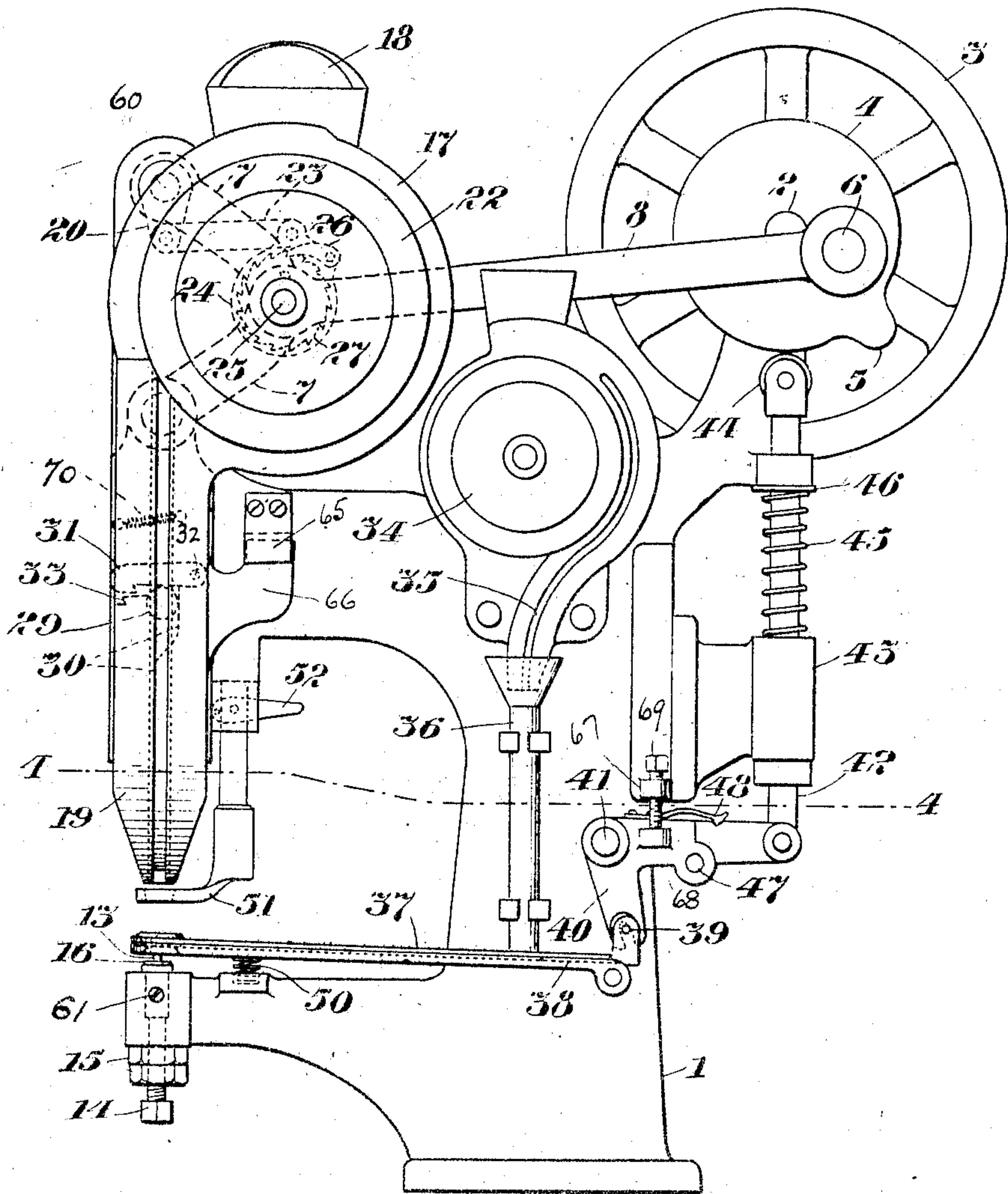


Fig. 1.

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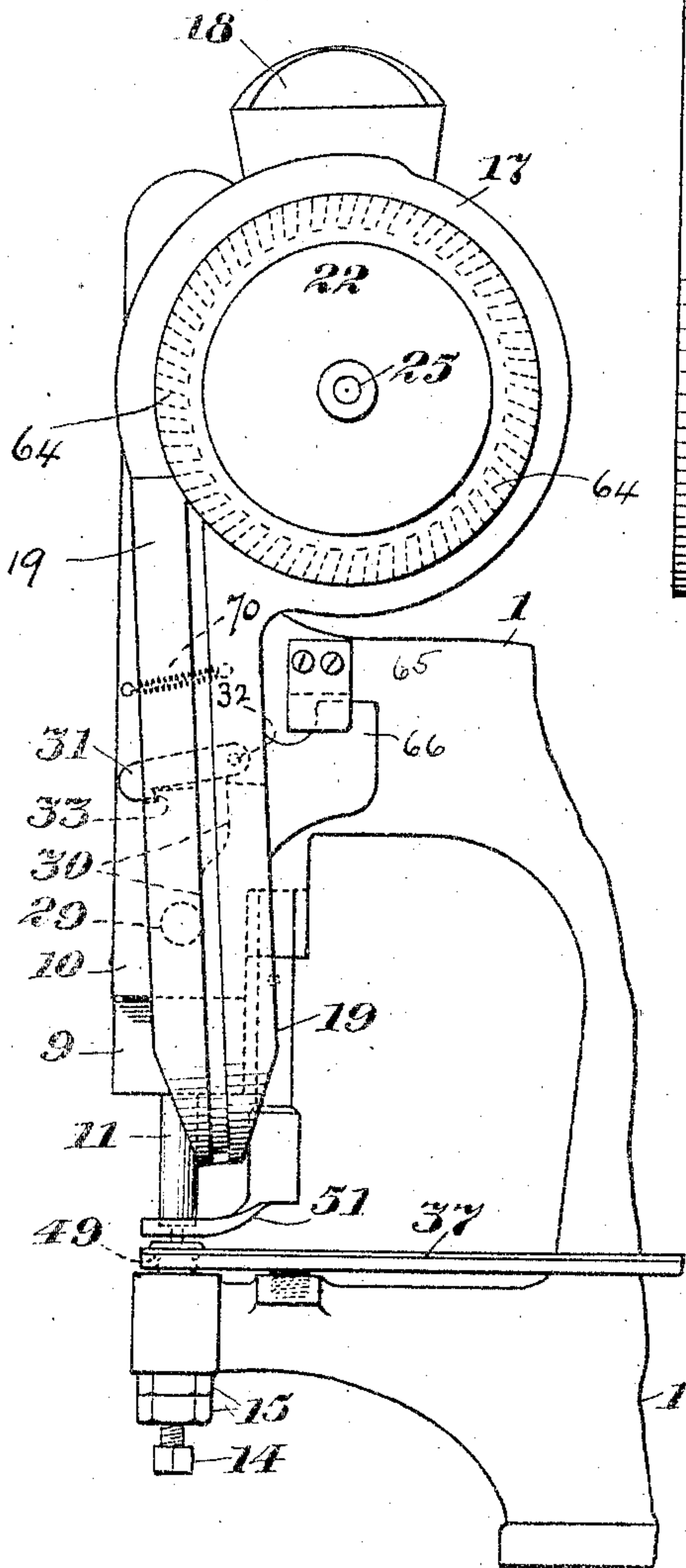


Fig. 2.

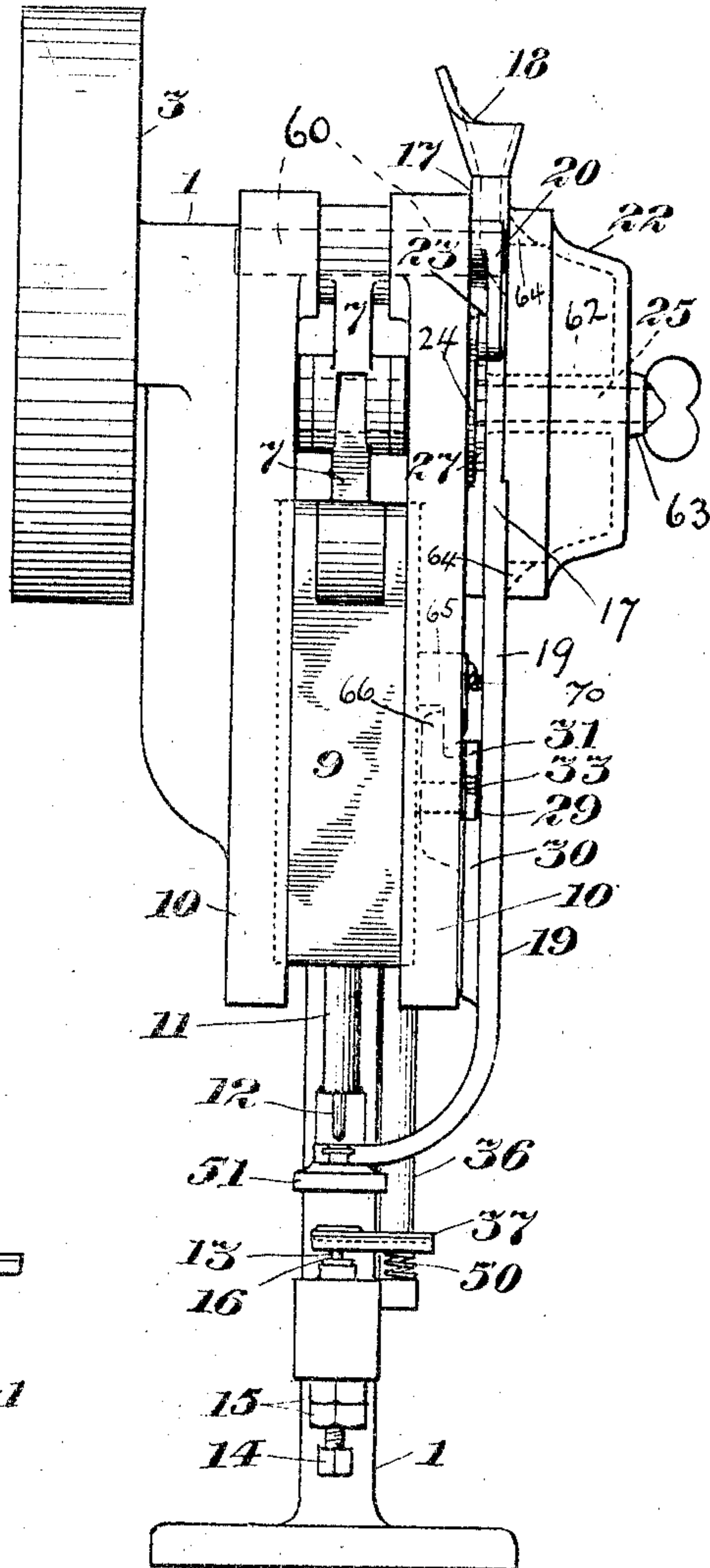


Fig. 3.

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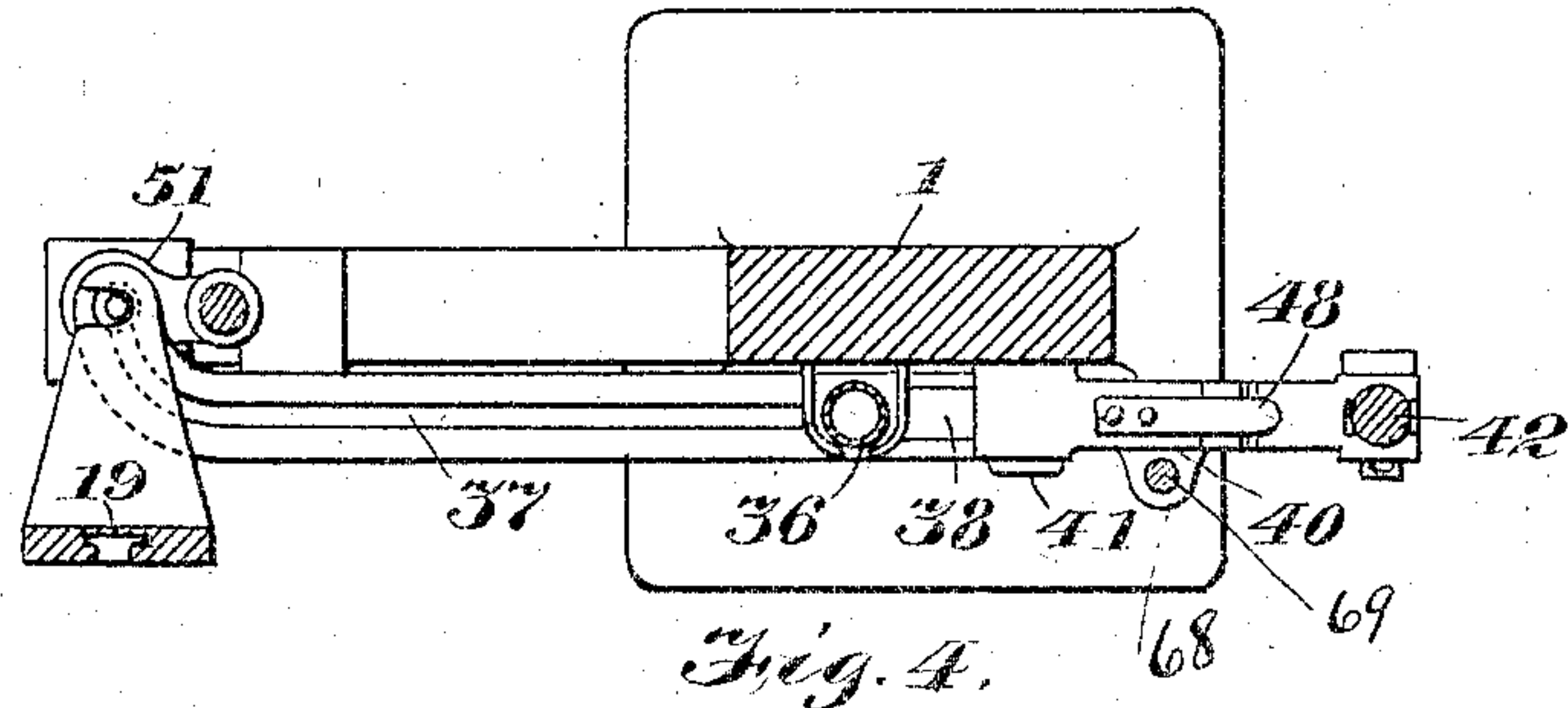


Fig. 4.

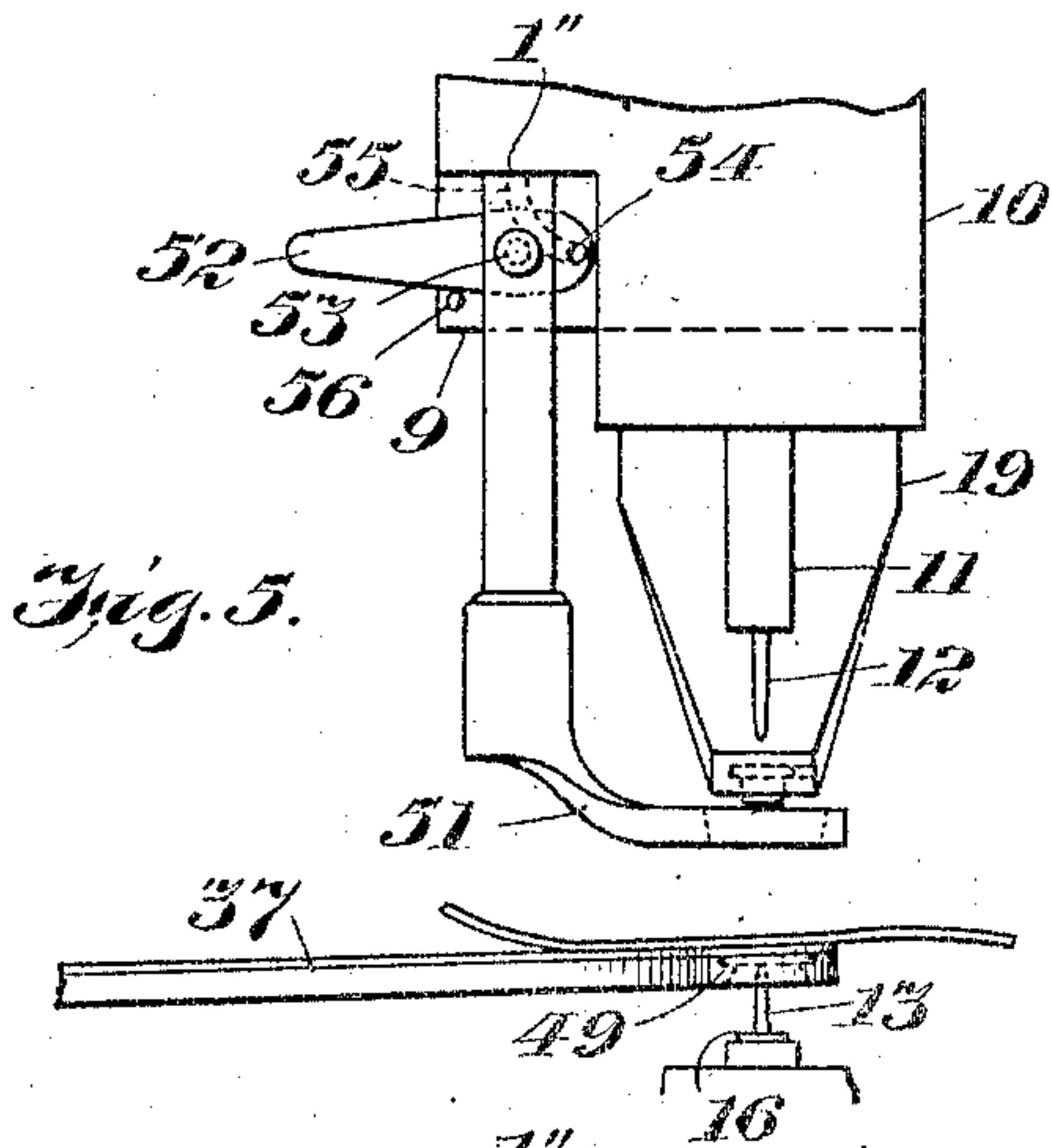


Fig. 5.

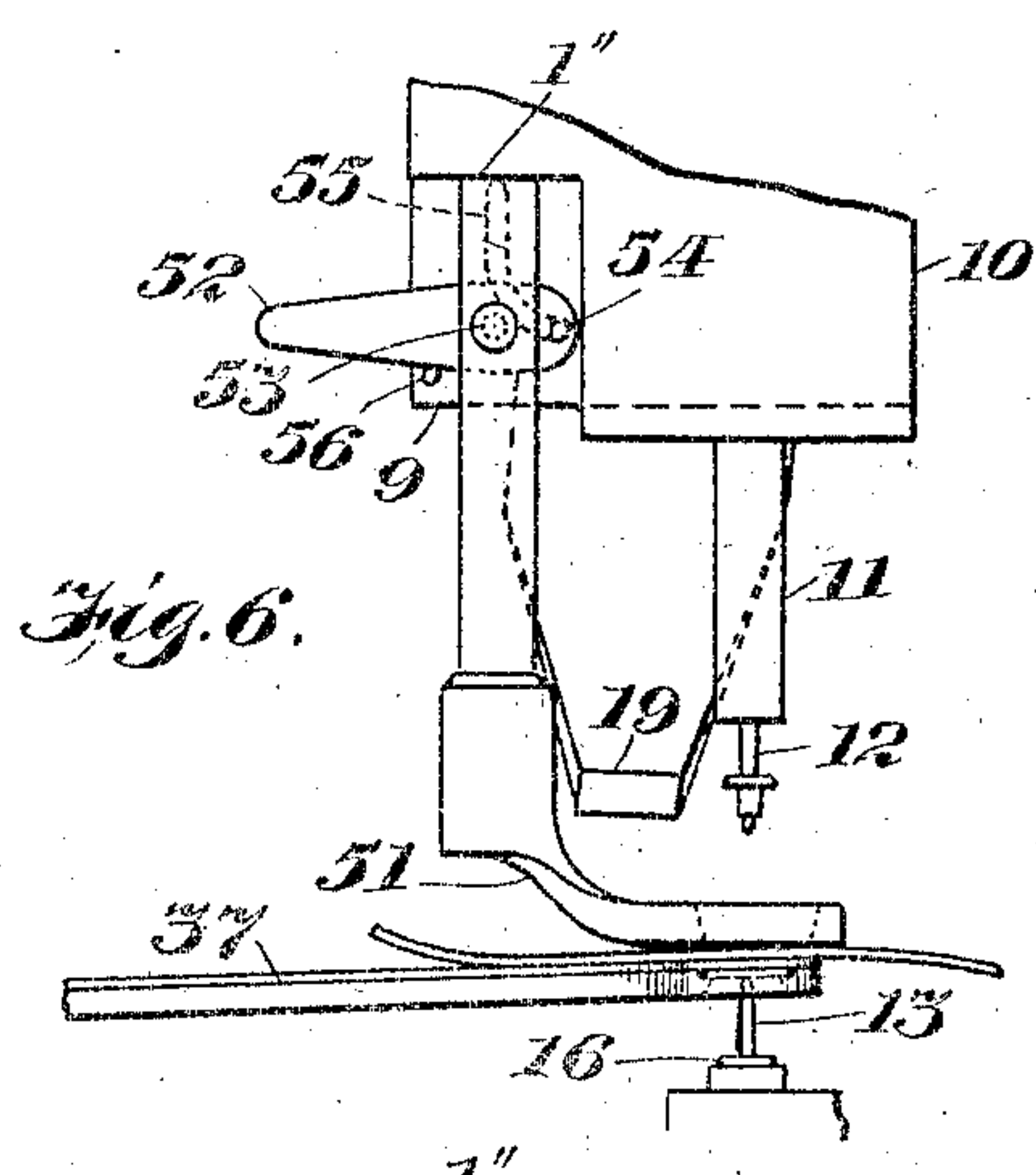


Fig. 6.

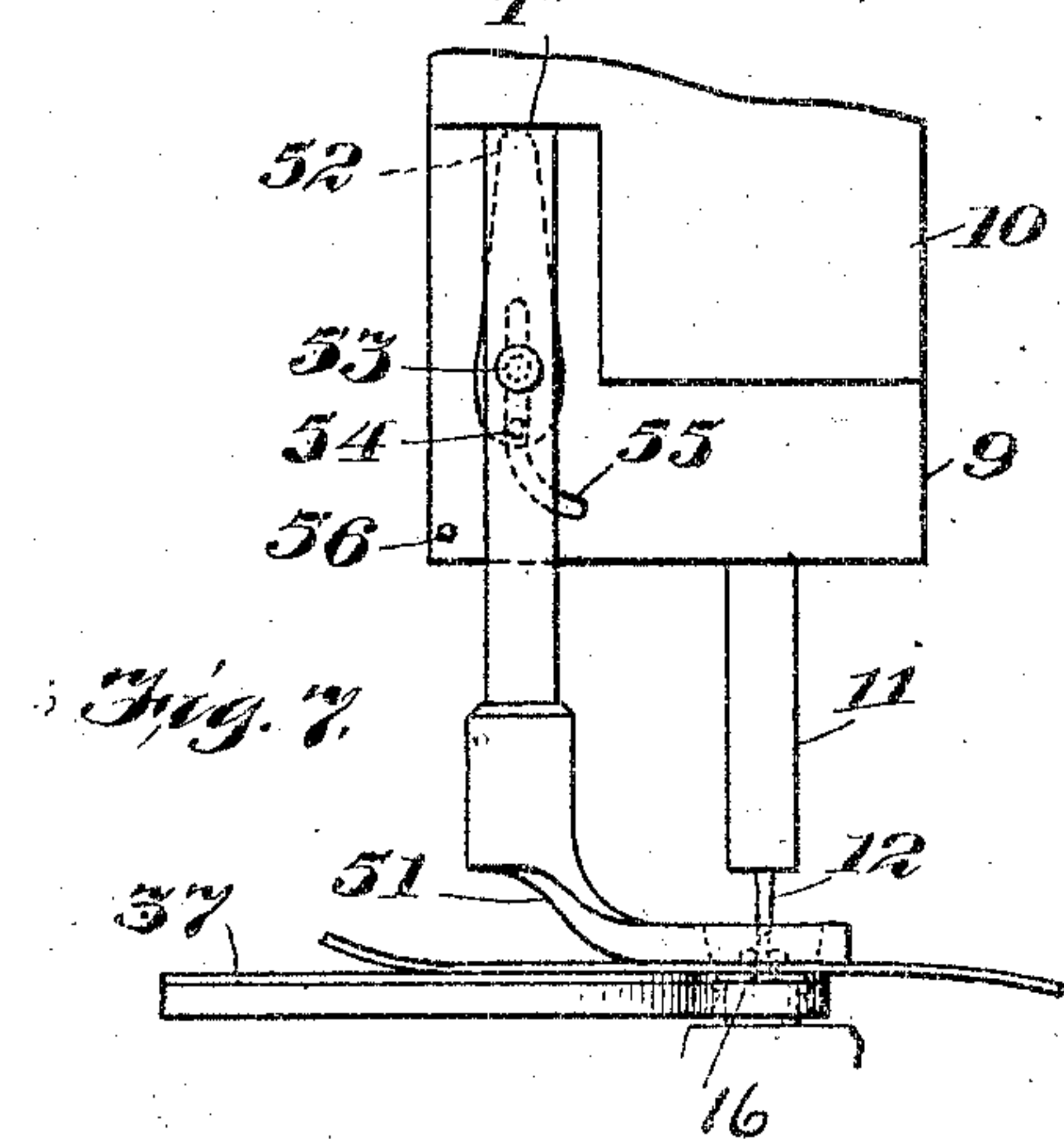


Fig. 7.

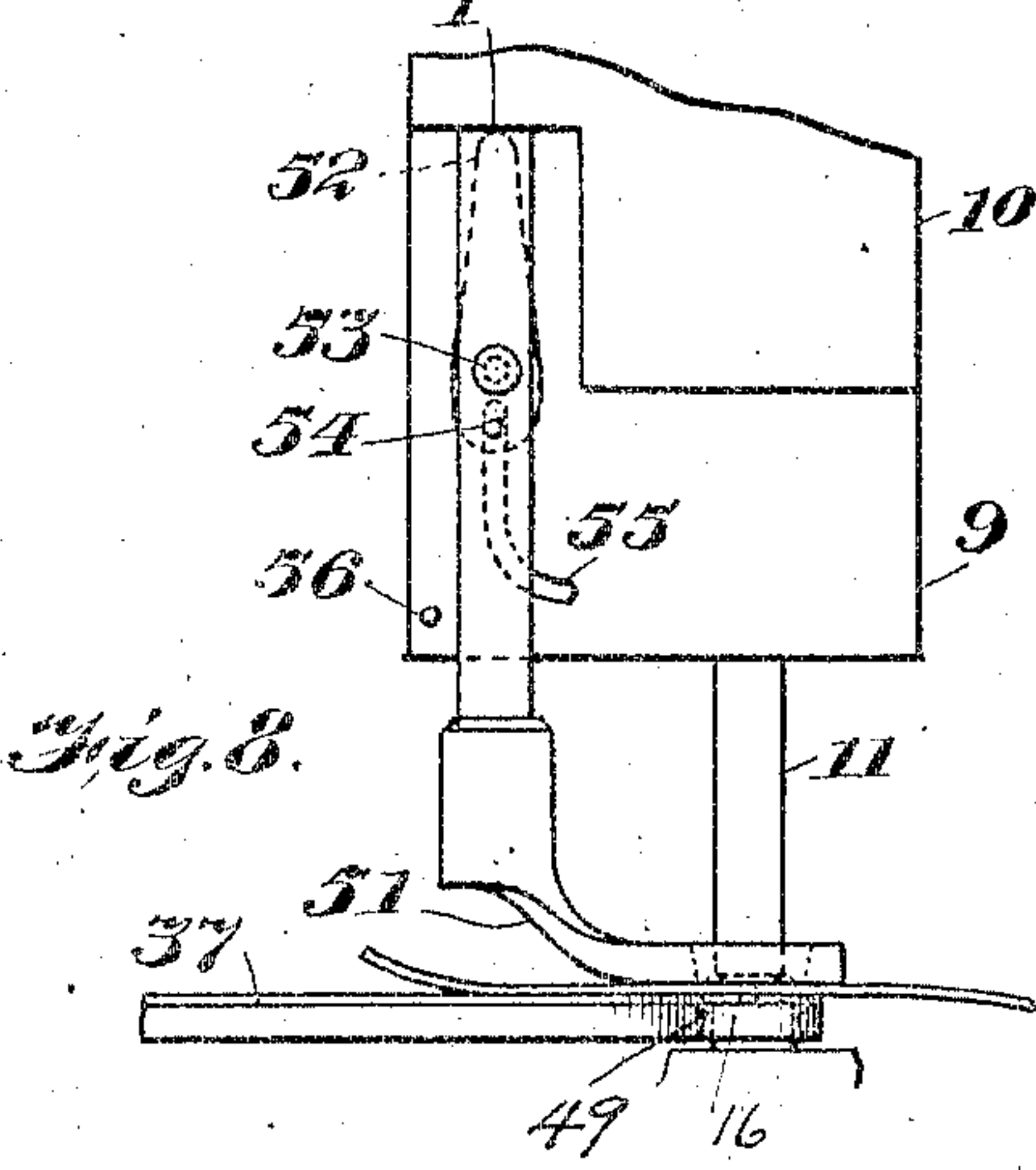


Fig. 8.

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UNITED STATES PATENT OFFICE

EDWIN BALL STIMPSON, OF NEW YORK, N. Y., ASSIGNOR TO EDWIN B. STIMPSON COMPANY,
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EYELET AND THE LIKE SETTING MACHINE.

No. 907,422.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed December 31, 1907. Serial No. 408,824.

To all whom it may concern:

Be it known that I, EDWIN BALL STIMPSON, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Eyelet and the Like Setting Machines, of which the following is a specification.

For the purpose of illustrating my present improvements, I have chosen an eyeleting machine and my invention is described in connection with such a machine, but it is to be understood that said improvements are not limited to eyeleting machines, but on the contrary are equally applicable to other machines, such as riveting machines and so forth.

Briefly stated, some of the objects of my improvements are an improved method of operatively supporting the eyelet or rivet box; improved means of operating the roadway for the washers relative to the setting devices, etc., also an improvement designed to take care of such emergencies as the accidental clogging of the washers in their roadway, or after said roadway has become filled.

Other features of improvement will appear from the annexed description and such features as are novel will be set forth in the claims.

In the drawings which show one form of my herein improvements as applied to an eyeleting machine, Figure 1 is a side elevation of such a machine with the head elevated; Fig. 2 is a fragmentary view of the same showing the head down with the eyelet-road and other parts in corresponding position; Fig. 3 is a front elevation looking at the machine from the left of Fig. 1; Fig. 4 is a view partly in section and partly in top plan along the line 4—4 in Fig. 1; Figs. 5, 6, 7, and 8 are fragmentary views of the eyelet-setting parts of the machine from the reverse side to that shown in Fig. 1. In these views, the operative parts are shown in four successive stages from an initial position with the head elevated to a final position, Fig. 8, in which the eyelet has been set in the material.

Describing now my improvements with special reference to the devices of the drawings, 1 is the frame of the machine. Mounted above in bearings on the frame is a shaft 2 carrying a pulley 3, adapted to be belted to any suitable source of power.

Mounted on the shaft 2 is a disk 4 having a

cam-projection 5. The disk has a crank-pin 6. Operatively connecting said crank-pin with the knuckle of a pair of toggle arms 7 is a connecting-rod 8. The free-end of the upper toggle arm has trunnions 60 which work in stationary bearings on the frame of the machine; and that of the lower toggle-arm is pivotally connected with a plunger 9 best shown in Fig. 3. This plunger has a vertical reciprocating motion and for this purpose is mounted between guides 10 on the machine frame. Secured to the plunger is a hollow set 11 within which is located a spring-pressed spindle 12. No attempt is made to illustrate the details of said spring construction as this is an old feature and not within my present invention. It being sufficient to state here that the construction is such that the spindle is held normally extended out of the hollow set, but when pressed from below is capable of telescoping into it.

The spear point 13 projects from an anvil 16, which latter is supported in a vertical socket in a horizontal extension of the frame of the machine. A screw 14 screws into the horizontal arm of the frame directly underneath the anvil and by adjustment of said screw the anvil and spear point can be moved into various positions of vertical adjustment. A set-screw 61 (Fig. 1) bears on the anvil and holds it rigid in its socket in its given position of adjustment. Lock nuts 15 on the screw 14 hold the latter rigid in any of its adjusted positions.

18 is a hopper adapted to receive the eyelets or other parts to be set and deliver them to the magazine which latter comprises a shell 22, the mouth of which is closed by a disk-shaped plate 17. The plate 17 having roadway 19 depending therefrom is pivotally supported on a stud 25 which projects from the frame of the machine through a central opening in the plate. The shell 22 is likewise rotatably supported on said stud 25 and for this purpose has an axial sleeve 62 (Fig. 3) to receive the stud. The stud 25 has a head 63 which holds the shell from working off the stud. The rim of the shell is formed with teeth 64, the spaces between the teeth being suitably shaped to receive, each an eyelet. The shell as will next be described has an intermittent rotary motion, and accordingly any eyelets received into the spaces between the teeth 64 will be carried along with the shell until the opening in the roadway 19

is reached, when one at a time they will drop down said roadway. (See Fig. 2.) In other words the hopper 18 delivers into a magazine made up of a plate 17 and shell 22, which latter is provided with segregating devices or teeth 64 which act as the shell intermittently rotates to segregate the eyelets and deliver them to the roadway 19. Means independent of the head 63 on stud 25 is provided for preventing the roadway from working off the stud 25, said means comprising an extension 66 (Figs. 1, 2 and 3) from the roadway, which works under the end of the lug 65 on the machine-frame; the result of the construction being that the roadway can swing freely in the direction of its customary motion to and from the setting devices, but cannot move away from the machine in the direction of the stud 25 and consequently cannot work off said stud until the roadway has been swung beyond the normal limit of its motion from the setting devices to completely remove its projection 66 from under the lug 65, whereupon it can be removed from the stud 25, as when making repairs or adjustment of the machine.

The intermittently rotary motion of the shell 22 is effected by mechanism comprising a crank 20 on the right-hand trunnion 60 (Fig. 3), of the upper toggle-arm 7. Said crank is operatively connected with the shell by means of a connecting rod 23 extending between the crank 20 on the one hand and the periphery of the disk 24 on the other, which disk is loosely mounted on stud 25 and carries a pawl 26, (Fig. 1) adapted to coact with a ratchet-wheel 27, said ratchet-wheel being secured rigidly to the sleeve 62 (compare Fig. 3) of the shell 22. It will be apparent that the described mechanism gives an intermittent rotation to the shell from the rocking of the crank 20 as it swings with the upper toggle-arm 7.

It will be noted from what has been said that the roadway 19 depending from the plate 17 swings on an axis which is in common with the axis of rotation of the shell 22 and that this is substantially through the center of gravity of the shell or magazine. A spring 70 between the frame and roadway causes the latter normally to occupy a position in which its delivery end is vertically under the spindle 12 (compare Fig. 3) whereby said spindle on its descent threads through the end eyelet carried by the roadway to deliver it down into the material to be eyeleted. After the spindle has impaled the eyelet, the roadway is automatically swung back out of the path of the set 11 by a roller 29 (Figs. 1, 2 and 3) carried by the plunger 9, which roller bears against the cam-edge of the cam-plate 30 on the roadway. The curve of said cam-plate is such that the roller does not act to displace the roadway during the descent of the plunger until after the

spindle has impaled the eyelet at which time the roller encounters the incline of the cam and forces the roadway out of the path of the descending set. (See Fig. 2.)

To keep the roadway out of the path of the set, both for the rest of its down motion and its return upward motion, automatic means is provided to latch the roadway in its "out of the way" position. Said means comprises a latch 31 pivoted to the frame at 32 and having a hook end which engages a corresponding catch 33 on the roadway, when it has been swung out of the path of the set by the roller 29. This latch remains engaged until the plunger 9 in its up-stroke brings the roller under the latch, thereby disengaging it and permitting the roadway to swing back into its normal position with its delivery end under the spindle.

Among the advantages of suspending the roadway so that it swings about an axis which is the same as the axis of rotation of the eyelet shell or magazine is that as the roadway shifts at each operation of the machine, it does not displace the magazine and consequently power is saved which would otherwise be expended in shifting the weight of the magazine and its contents. Moreover in addition to economizing power and so making the machine easier running, there is no shaking or racking of the magazine, also much less noise as compared with construction in which the roadway pivots about a different axis from the axis of rotation of the magazine or shell.

Having described the means for feeding the eyelets it will now be convenient to describe the means for feeding the other member of the fastening device, to wit: in this case the washers. The magazine for washers designated 34 is mounted on the frame. It has a roadway 35 descending therefrom which delivers the washers into a stationary funnel tube 36. The construction of these parts forms no part of my present invention and it will be sufficient to say that the washer box and its roadway are adapted to deliver the washers so that they fall flatwise down the tube to form a stack therein, the bottom washer resting on a roadway 37 (compare Fig. 4) next to be described. This roadway 37 for washers is pivoted at one end to the frame and extends forward under the lower or delivery end of the washer tube 36 to the eyelet setting devices.

Mechanism as follows is provided for feeding the washers delivered by tube 36 forward along the washer roadway 37 to the setting devices, said mechanism comprising a reciprocating slide 38 working in the slot or guide of the roadway in back of the delivery point of the washer tube 36 and adapted at each forward reciprocation, that is at each reciprocation toward the setting devices to push the bottom washer of the pile delivered

by the tube 36 forward to a sufficient distance to make room for the next above washer in the pile to drop down into the roadway.

5 In the devices shown (see particularly Fig. 1), said slide 38 has an upward extension provided with a pin 39 located in the slotted end of the elbow lever 40 fulcrumed on the frame at 41. The horizontal arm of said elbow lever 10 pivotally connects with a vertically reciprocating rod 42 working in sleeves 43 on the frame. The upper-end of this rod is provided with a roller 44 held in contact with the periphery of the cam-disk 4 already described. The means for holding said roller 15 yielding in contact with said disk comprises a spiral spring 45 around the rod and located between a collar 46 above on the rod and sleeve 43 below of the frame. The result of 20 the construction is that as the pulley is driven the cam disk depresses the rod once in each revolution, rocking the elbow lever and moving the slide forward. Immediately after, the reverse motion of the parts takes 25 place, since the projection on the cam disk having passed, the spring restores the parts to their former position. One of my present improvements relates to this portion of the machine and consists, in the specific devices 30 shown, in forming the horizontal arm of the elbow lever 40 in two parts hinged on each other at 47 to pivot downward, or in the direction of the thrust of the operating rod 42. A catch 48 connects and gives rigidity to the 35 two parts of the horizontal arm for all normal thrusts thereon. That is to say for all thrusts sufficient to push the washers along their roadway, but is not sufficient to withstand an abnormal thrust such as takes place 40 in the event that the washers in the roadway should be already full or should become jammed, in which event the catch yields to release the two parts of the horizontal arm of the elbow lever thereby preventing the rod 45 from transmitting its thrust to the washer pushing device and thereby saving these and related parts of the machine from injury in such a contingency.

The delivery end of the washer roadway is 50 provided with a vertical opening somewhat smaller in diameter than the diameter of the washer so that an annular flange 49 is provided for its support. Said vertical opening is concentric with the spear point 13 whereby 55 a washer in the delivery end of the roadway has its lower face resting on top of the anvil 16 with the spear point projecting centrally through the hole in the washer when the roadway is depressed. The roadway is held 30 normally in elevated position (see Fig. 1) by a spring 50 located between it and the frame.

A reciprocating presser foot 51 is provided which is adapted to press the material down 15 on the delivery end of the washer roadway and over the spear point to pierce the ma-

terial with the hole which is thereafter to receive the eyelet. This presser foot is connected with the plunger 9 carrying the top-set and spindle to be carried down with these parts for a portion of their down-stroke until 70 said foot has pressed the washer roadway into its lowermost position and has forced the spear point through the material gripped between the presser foot and the roadway, at 75 which time the downward motion of the presser foot is arrested, while the plunger, set and spindle continue on their down-stroke, the spindle carrying an impaled eyelet (Fig. 6) to the hole in the material by transferring 80 it to the spear point within said hole, said transfer taking place by the end of the spindle contacting with the spear point and thereby becoming telescoped into its set 11, 85 which thereupon contacting with the top of the eyelet forces said eyelet over the spear point and down into the hole in the material.

Since by the operation of the washer feeding device there will always be a washer at the delivery end of the roadway, and since 90 as already explained said washer at this stage of the setting operation, will be located around the spear point in contact above with the bottom side of the material and below 95 resting on the anvil, it will be seen that the above described operation of forcing the eyelet into the hole in the material will force its clenching edge or rim through the hole in the washer and that said rim coming in contact 100 with the top of the anvil will be clenched under the washer by the completion of the down-stroke of the set against the top of the eyelet. Upon the upward stroke due to the 105 release of the toggles of the machine, the plunger, set and spindle rise clear of the work and during the end of their up-stroke release the presser-foot and elevate it also from the work preparatory to the next operation of the machine.

The mechanism for effecting the described interaction between the plunger with its 110 carried parts and the presser-foot, being old so far as my present improvements are concerned, need not be described in detail. It will be sufficient to say that said coöperation 115 is effected by connecting the presser-foot with the plunger through a cam 52 pivoted at 53 to the presser-foot rod, which cam has a pin 54 working in a cam-slot 55 formed in the plunger. A pin 56 on the plunger supports the cam when in the position shown in 120 Fig. 5. When through the intervention of the cam, the plunger during the first part of its down-stroke carries the presser-foot, as described, into contact with the work, the cam at this point assumes the vertical position shown in Fig. 7, wherein its end has 125 come under a portion 1" of the frame of the machine. This holds the presser-foot immovable in contact with the work, while the plunger is free to continue its downward 130

movement independent of the presser-foot, because the vertical portion of the cam-slot in the plunger then receives the pin on the presser-foot cam. Upon the return or up-stroke of the plunger the presser-foot cam is rocked out of its vertical position with consequent release of the presser-foot as soon as the curved portion of the plunger cam-slot coacts with the pin on the cam. It will be noted (see Fig. 8) that the opening through the presser-foot is large enough to take through it without interference the set 11. As soon as the presser-foot is released on the up-stroke, the spring under the washer roadway acts to elevate the latter and thereby lift the now eyeleted material off the spear point, preparatory to setting the next eyelet.

Referring once more to the broken lever 40 with catch connection 48, it may be stated that it is highly desirable to provide a stop adapted to limit the upward movement of the horizontal arm of the lever 40 to the point at which the catch 48 will engage with the other part of the horizontal arm as same is carried up with the spring-pressed rod 42. For this purpose said stop may consist of a lug 67 from the machine frame having a vertical threaded opening through it to receive a screw 69, the free end of which is adapted to engage against a lug 68 from the side of the lever 40. In use the screw 69 will be adjusted so that it will abut against the lug on the lever 40 when the horizontal arm of said lever reaches the position indicated in Fig. 1. A top view of the described stop devices is seen in Fig. 4.

Having thus described my invention, what I claim is:

1. In a setting machine, the combination of setting devices, a pivotally supported roadway for delivering the parts to be set from a magazine to the setting devices, said magazine carried by the roadway and located opposite the pivotal support of said roadway, and means for swinging the roadway to and away from the setting devices at each operation of said devices.

2. In a setting-machine the combination of setting devices, a pivotally supported roadway for delivering the parts to be set to the setting devices, a magazine rotatable about the axis on which the roadway swings, said magazine having connection with the roadway to receive the parts to be set from the magazine into said roadway, and means for swinging the roadway to and away from the setting devices at each operation of said devices.

3. In a setting-machine, the combination of setting devices; a magazine for the parts to be set comprising a cup-like shell supported to be rotatable about its axis, and a base independent of the shell and adapted to close its mouth, said base being supported to rotate about the axis of the shell; means

for rotating said shell; means connected with said shell adapted to segregate the parts to be set and deliver them to a roadway; and said roadway depending from the base of the magazine.

4. In a setting-machine, the combination of setting devices; a roadway adapted to deliver parts to be set to the setting devices, said roadway being secured to a plate having a central opening to loosely receive a stud; said stud projecting from the frame of the machine; a shell having an axial sleeve to be received over said stud, with the rim of the shell located adjacent to the aforesaid plate forming a magazine to receive the parts to be set, said shell being formed with segregating devices adapted to segregate the parts to be set, and deliver them to the roadway when the shell is rotated; and means adapted to rotate the shell.

5. In a setting-machine, the combination of setting devices; a roadway adapted to deliver parts to be set to the setting devices, said roadway being secured to a plate having a central opening to loosely receive a stud; said stud projecting from the frame of the machine; a shell having an axial sleeve to be received over said stud, with the rim of the shell located adjacent to the aforesaid plate forming a magazine to receive the parts to be set, said shell being formed with segregating devices adapted to segregate the parts to be set, and deliver them to the roadway when the shell is rotated; and means adapted to give intermittent rotary motion to the shell, comprising a ratchet-wheel on its sleeve, a disk carrying a pawl coacting with the ratchet-wheel, said disk being mounted to rotate independent of the ratchet-wheel, and a reciprocating member connected with said disk.

6. In a setting-machine, the combination of setting devices; a swinging roadway adapted to deliver the parts to be set to the setting devices, said roadway having a normal position with its delivery-end at the setting devices; and means adapted to swing the roadway away from the setting devices comprising a cam-plate on the roadway and a plunger adapted to contact therewith.

7. In a setting-machine, the combination of setting devices; a swinging roadway adapted to deliver the parts to be set to the setting devices, said roadway being adapted to assume a normal position with its delivery-end at the setting devices; means adapted to swing the roadway away from the setting devices, comprising a cam-plate on the roadway in contact with a plunger; said plunger; a latch pivoted to the machine-frame adapted to interlock with the roadway when the latter has been swung away from the setting devices, and to be released by contact with the plunger when said plunger is on its stroke away from the work.

8. In a setting-machine, the combination of setting devices; a roadway adapted to deliver parts to be set to the setting devices; an intermittently rotating member adapted to segregate the parts to be set to prepare them for delivery to the roadway; and means adapted to effect said intermittent rotation comprising a ratchet-wheel on the segregating member, a pawl engaging said ratchet-wheel and adapted to be reciprocated from a crank on one of a pair of toggle arms; and said toggles arranged to operate the setting devices of the machine.

9. In a machine adapted to set a two part fastener, a spear point; an anvil at the base of said spear point; a reciprocating plunger; a yielding spindle carried by said plunger and alining with the spear point; a movable roadway for the upper-parts of the fastener having its delivery end in line with the spindle; a roadway for the underneath member of the fastener pivoted to the frame and yieldingly supported with its delivery-end over the spear point; a reciprocating presser foot adapted in its descent to press the material from above against the top of the roadway for the underneath member of the fastener and force said material over the spear point.

10. In a machine adapted to set a two-part fastener, a spear point; a roadway for the underneath members of the fastener, said roadway being pivoted to the frame and having its delivery end yieldingly supported over the spear point; means adapted to press the material from above against the top of the roadway and over the spear point; and means adapted to deliver the upper member of the fastener over the spear point and into the hole the spear point has made in the material and into the lower member of the fastener.

11. In a machine adapted to set a two-part fastener; a spear point; an anvil at the base of the spear point; a roadway for the underneath members of the fastener having its delivery end yieldingly supported over the spear point, said delivery end having an opening therethrough upon the ledge of which the underneath member of the fastener is adapted to be supported, which opening can receive through it the top of the anvil; means adapted to press the material from above against the top of the roadway and over the spear point; and means adapted to deliver the upper member of the fastener over the

spear point and force same into the hole surrounding the spear point and into the lower member of the fastener.

12. In a setting-machine, the combination of setting devices; a roadway adapted to deliver washers to the setting devices; a reciprocating member adapted to progress said washers along the roadway; an elbow-lever operatively connecting the reciprocating member with a reciprocating part of the machine, said elbow lever having one of its arms made up of two parts hinged together and catch-connected to open when subjected to greater thrust than that required to progress the washers.

13. In a setting-machine, the combination of setting devices; a roadway adapted to deliver parts to be set; a reciprocating slide adapted to progress the parts along said roadway; a plunger yieldingly in contact with a rotating member having a cam projection; said member; and a lever delivering the thrust of said plunger to the reciprocating slide, said lever being broken with its parts catch-connected to open when the thrust on the lever from the plunger is greater than that required to progress the parts along the roadway.

14. In a setting-machine, the combination of setting devices; a roadway adapted to deliver parts to be set; a reciprocating member adapted to progress the parts along the roadway; a lever through which the reciprocating member is adapted to be operated, said lever being broken with the parts held united by a catch adapted to yield when the thrust on the lever is greater than that required to progress the parts along the roadway; and said catch.

15. In a setting machine the combination of a roadway pivotally supported thereon and adapted to deliver the parts to be set from the magazine to the setting devices; said setting devices; and said magazine having the same pivotal support as the roadway and adapted to contain and deliver the parts to be set to the roadway.

In witness whereof, I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

EDWIN BALL STIMPSON.

Witnesses:

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T. W. SPRINGMEYER.