

No. 766,814.

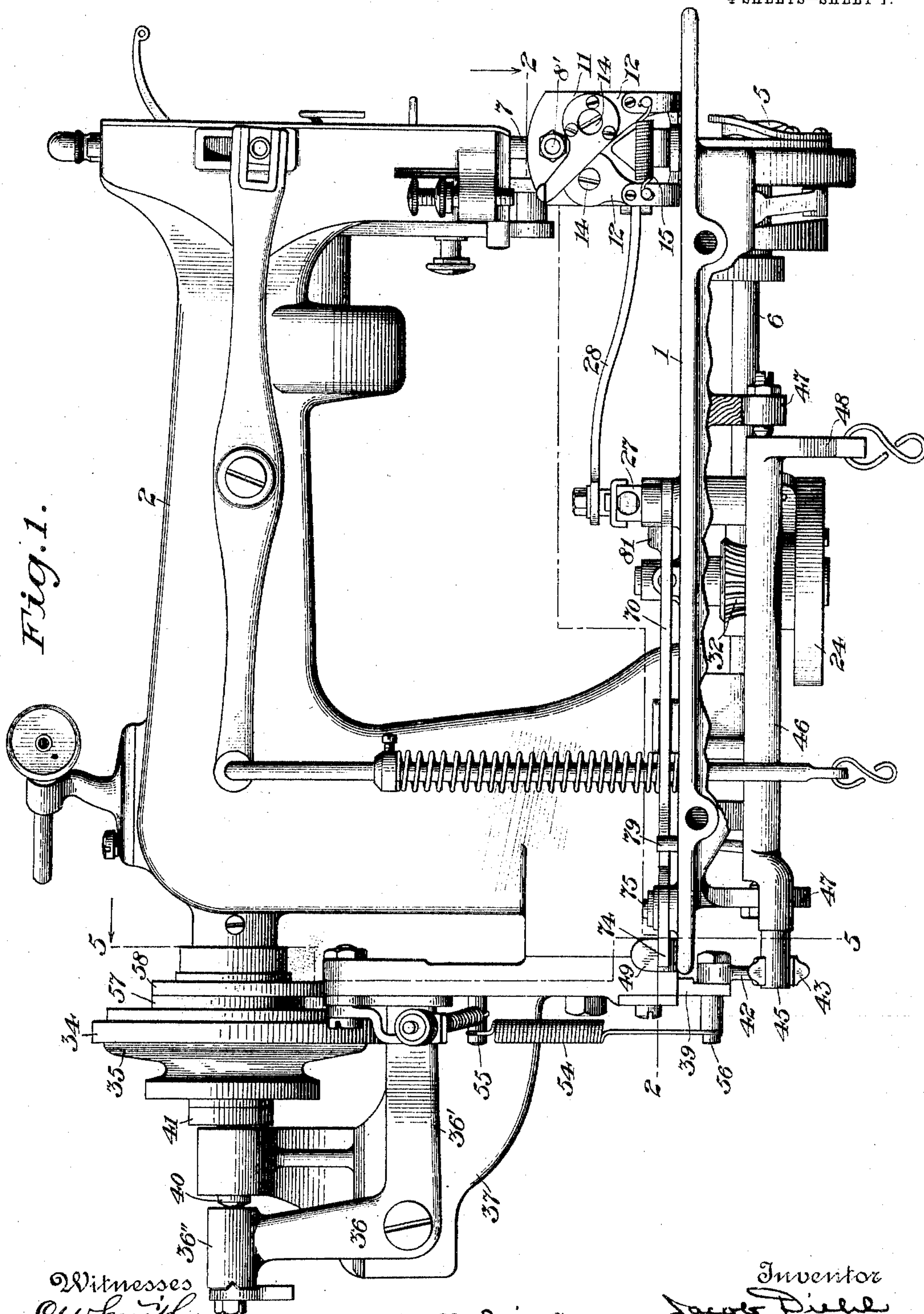
PATENTED AUG. 9, 1904.

J. DIEHL.
MACHINE FOR SEWING ON BUTTONS.

APPLICATION FILED JAN. 23, 1900.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses
C. W. Smith
M. L. Forrest.

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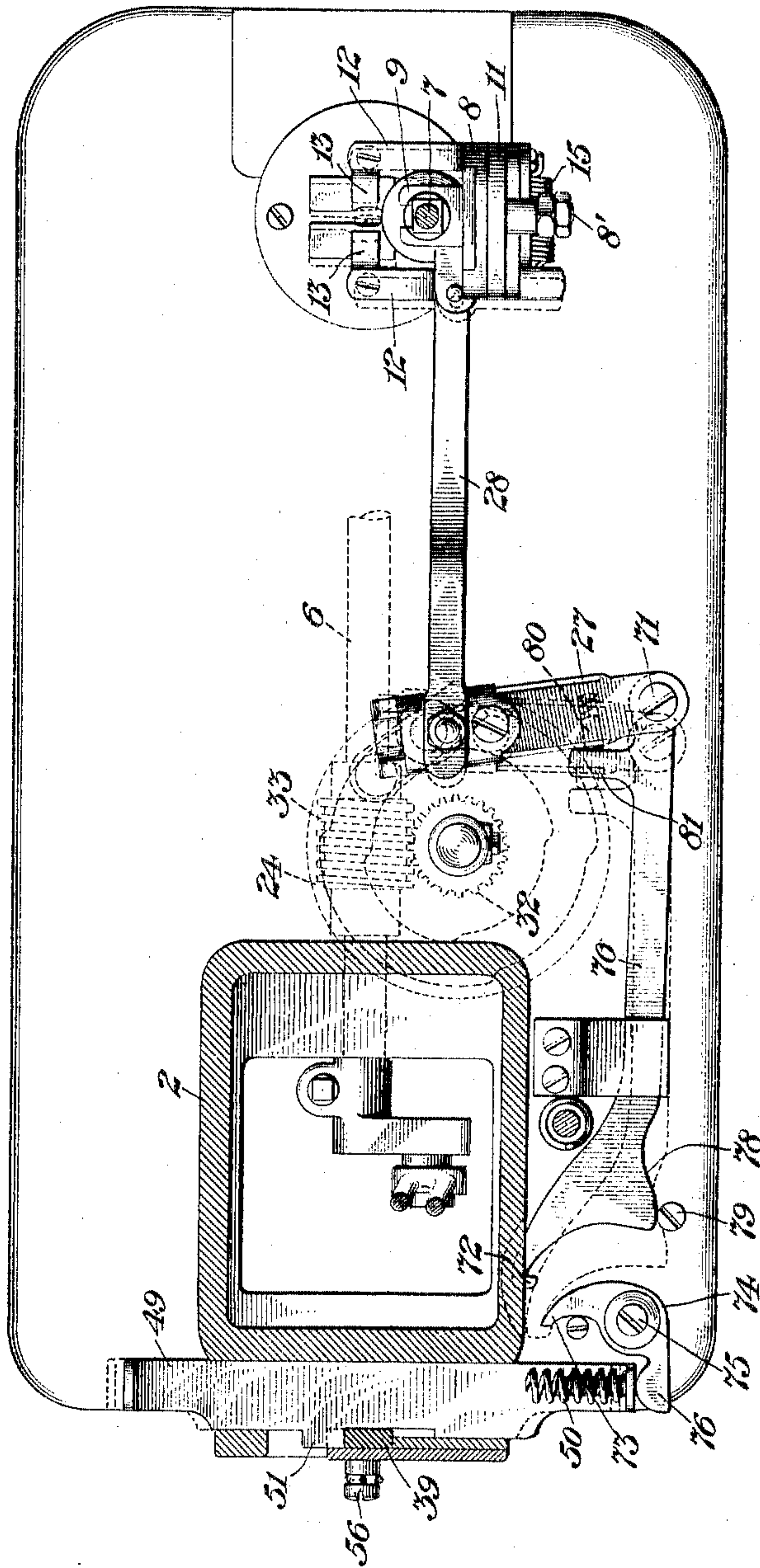
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 5.

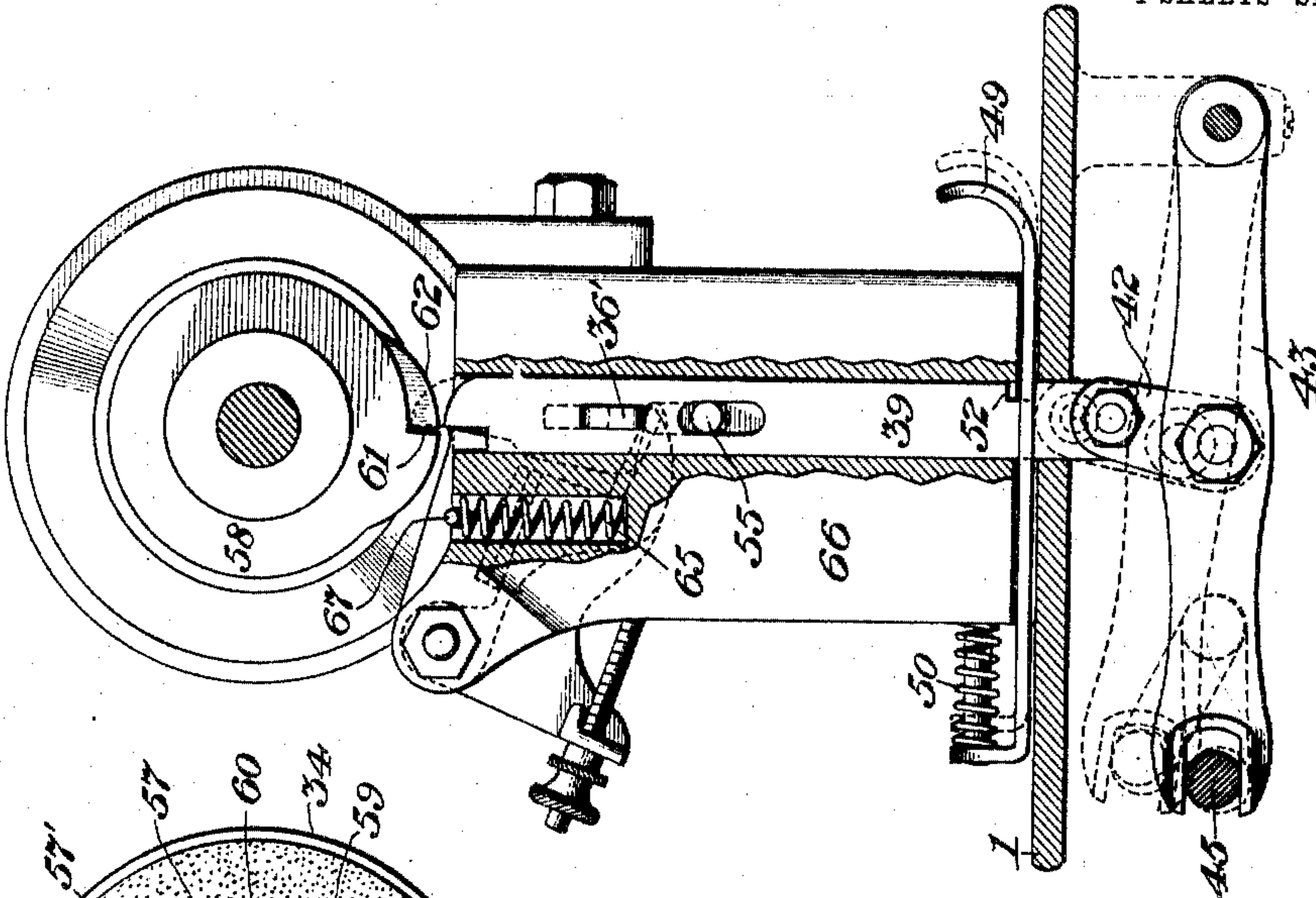


Fig. 4.

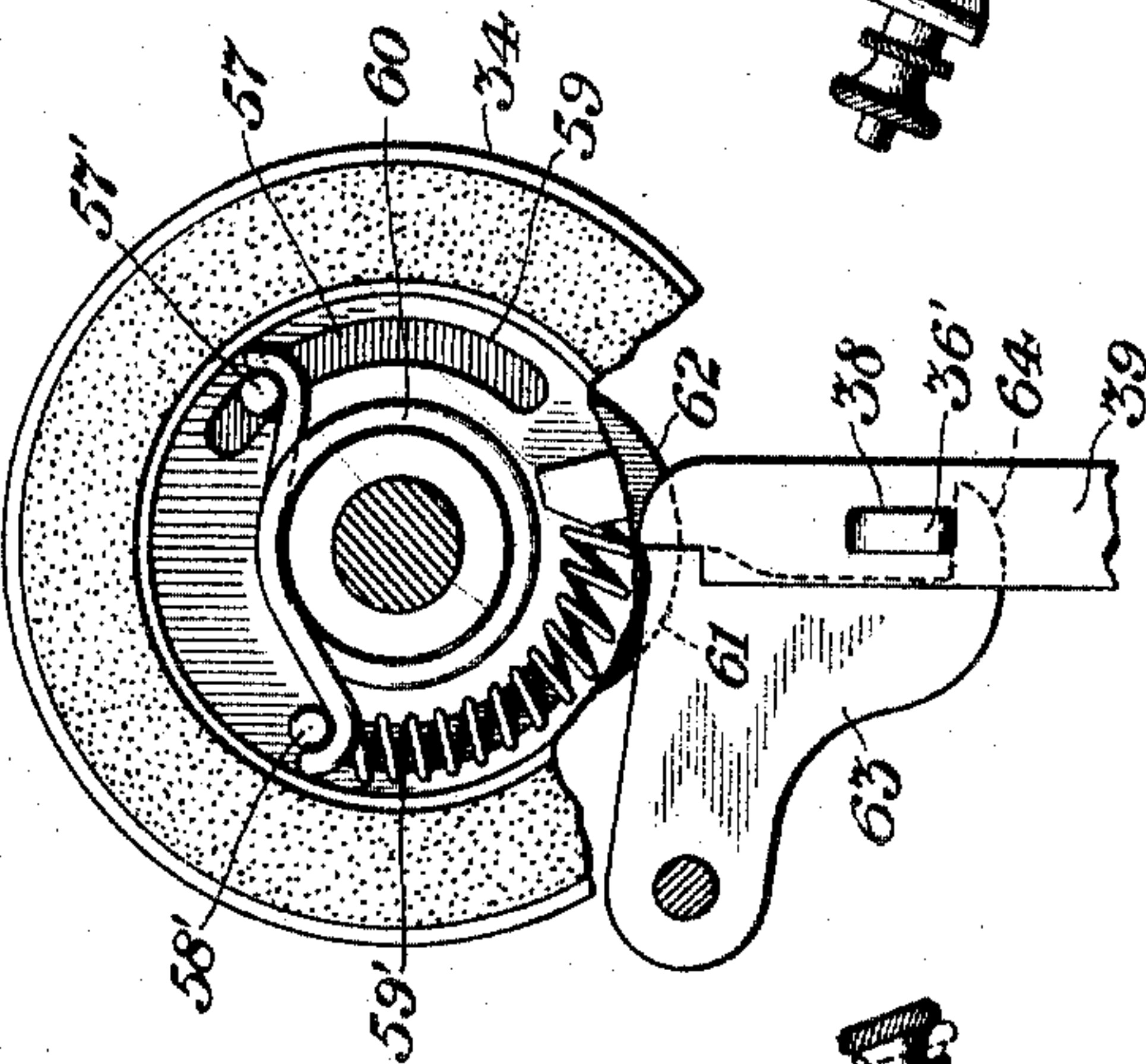
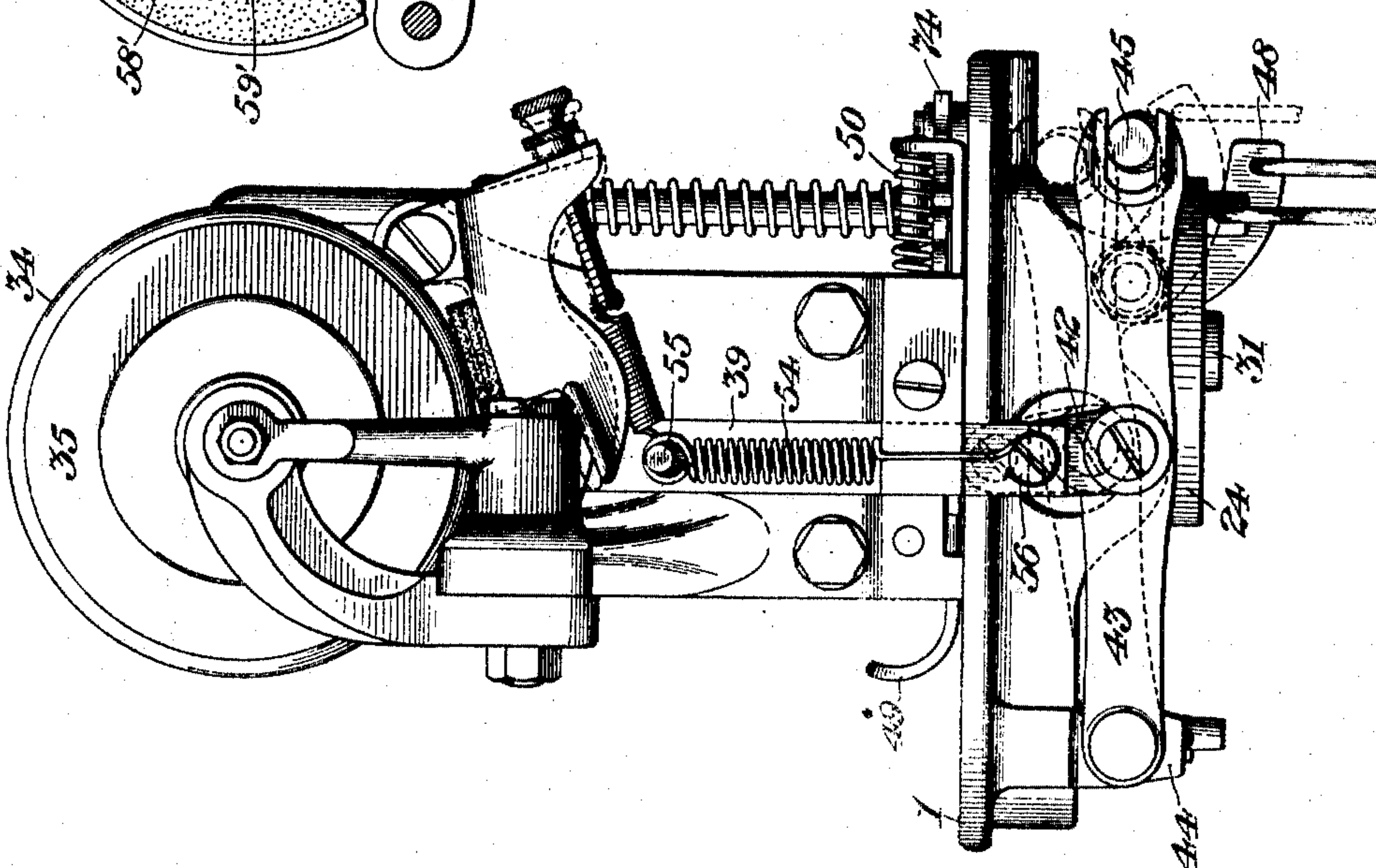


Fig. 3.



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Fig. 6.

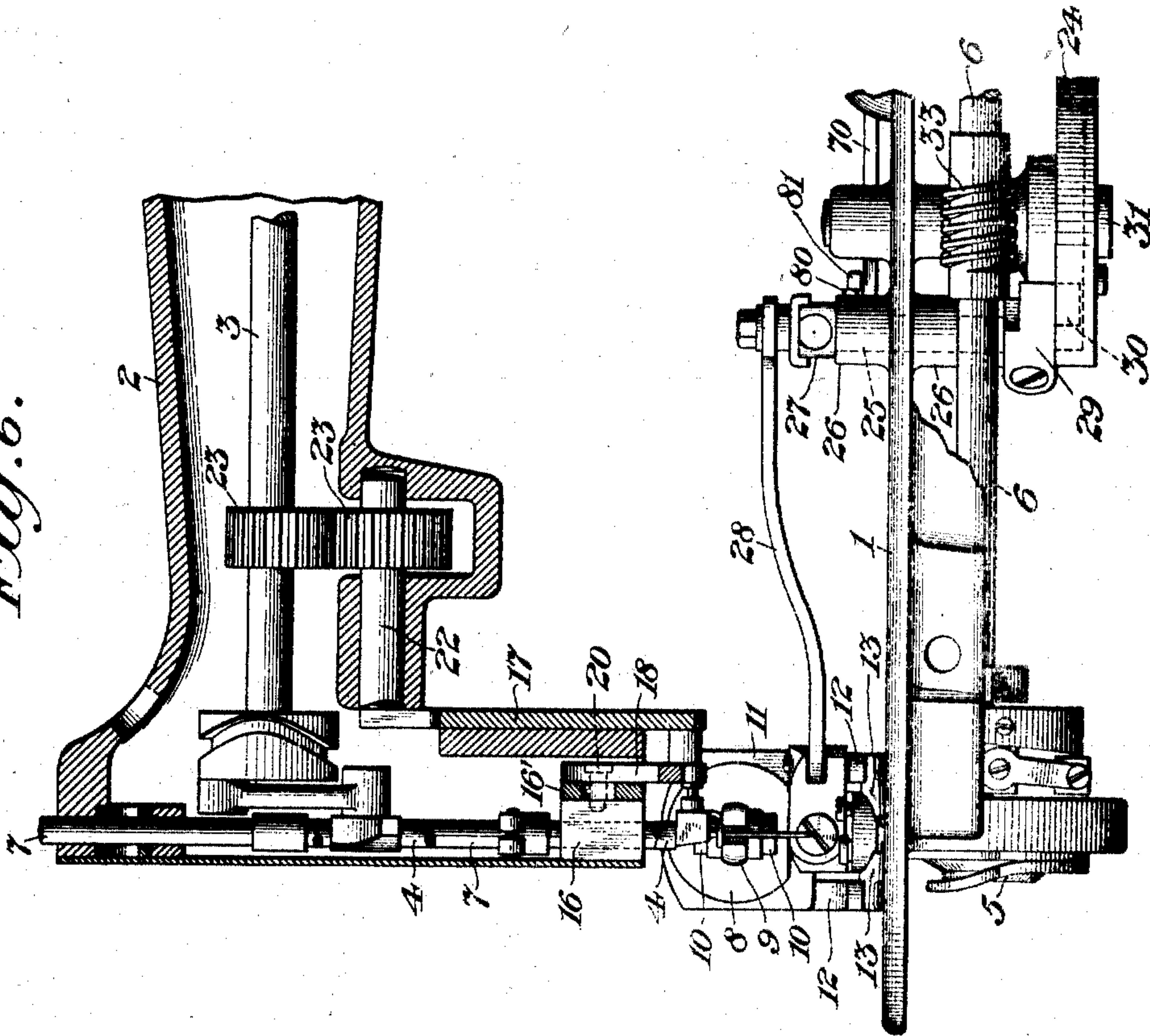
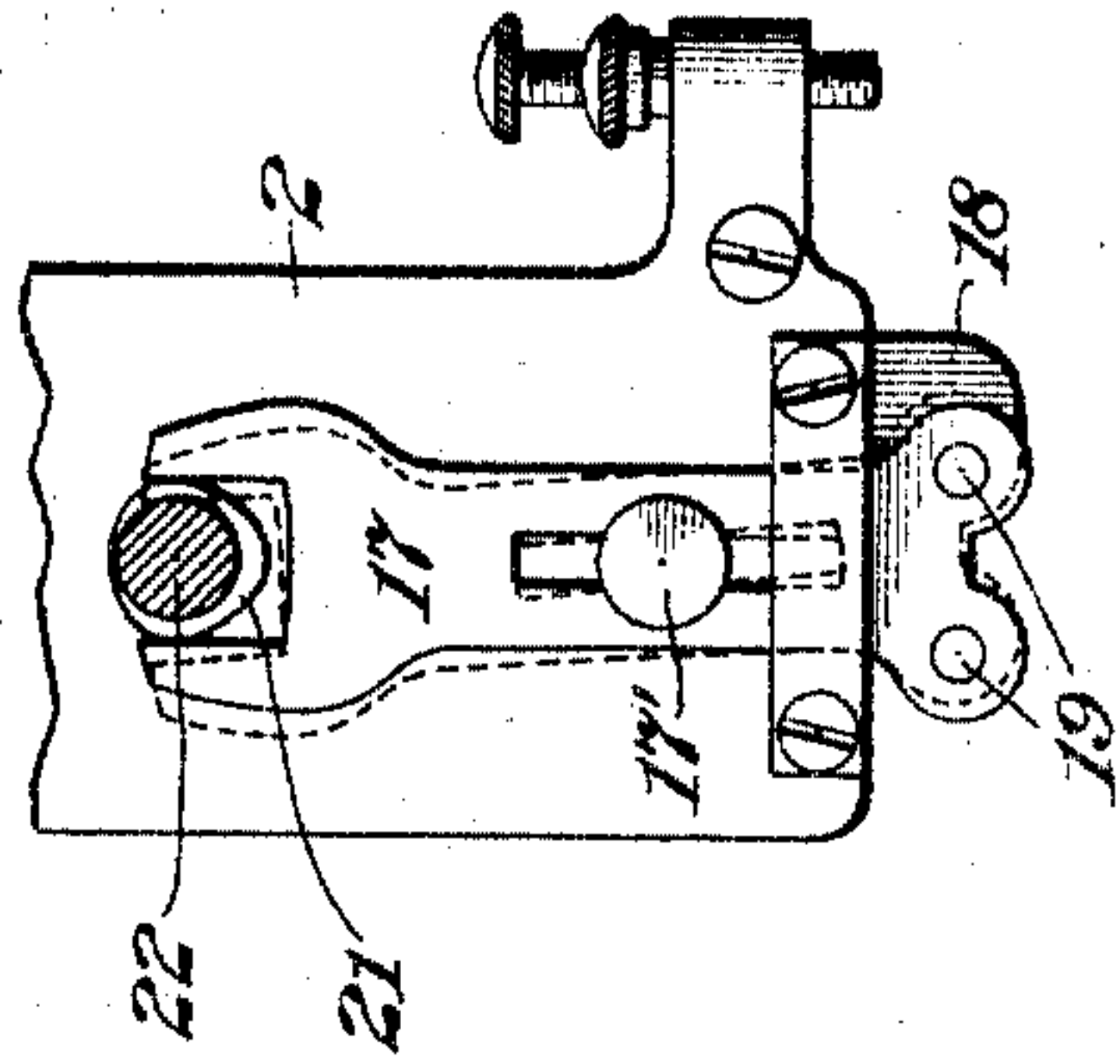


Fig. 7.



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UNITED STATES PATENT OFFICE.

JACOB DIEHL, OF CLEVELAND, OHIO, ASSIGNOR TO THE STANDARD SEWING MACHINE COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

MACHINE FOR SEWING ON BUTTONS.

SPECIFICATION forming part of Letters Patent No. 766,814, dated August 9, 1904.

Application filed January 23, 1900. Serial No. 2,439. (No model.)

To all whom it may concern:

Be it known that I, JACOB DIEHL, a citizen of the United States, and a resident of Cleveland, Cuyahoga county, State of Ohio, have
 5 invented certain new and useful Improvements in Machines for Sewing on Buttons, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

10 This invention relates to additional improvements upon the machine for sewing on buttons, forming the subject-matter of the application filed by W. A. Mack December 23, 1899, bearing Serial No. 741,378; and it consists in the mechanism whereby the machine
 15 is automatically stopped after a desired predetermined number of stitches have been made in sewing the button to a garment or other article.

20 In the machine set forth in the said application referred to the button-holder is actuated by suitable mechanism to receive a vibrating movement in one direction, so as to enable the needle to descend first through one
 25 and then another of a pair of holes in the button at one side of its center until a certain predetermined number of stitches have been made, after which the button-holder is automatically shifted in a lateral direction or at
 30 right angles to the direction of its vibrating movement, so as to bring the other pair of holes (in the event of a four-eyed button being sewed) into position to be vibrated relative to the needle and receive a like number
 35 of stitches. The mechanism for communicating such lateral movement to the button-holder comprises a cam-controlled lever-arm which is arranged above the bed-plate and connected with the button-holder through the medium
 40 of a suitable connecting-rod, and in accordance with my invention I employ a simple and effective means whereby a suitable stop mechanism may be actuated and controlled by the said button-holder-shifting mechanism, so
 45 as to cause the machine to be brought to a stop upon the completion of the sewing on of a button and with the button-holder in starting position ready to receive the next button.

Referring to the drawings, in which I have illustrated my invention as applied to one of the well-known "Standard" sewing-machines, Figure 1 is a rear elevation of the machine embodying my present invention, with the web on the under side of the bed-plate broken away to more clearly show the mechanism beneath said plate. Fig. 2 is a section through line 2 2 of Fig. 1 looking down, showing different positions assumed by certain of the parts at different times during the operation of the machine and also showing in dotted
 50 lines the switch-cam on the under side of the bed-plate and a part of its actuating mechanism. Fig. 3 is an end view of the machine, looking toward the right as viewed in Fig. 1. Fig. 4 is a detail view of a portion of the stop
 55 mechanism. Fig. 5 is a section through line 5 5 of Fig. 1 with a portion of the frame or casting partly broken away. Fig. 6 is a view of the front end of the machine broken away looking toward the side opposite that shown
 60 in Fig. 1, with the frame or arm in section, the web on the under side of the bed-plate partly broken away, and portions of the needle-bar broken away. Fig. 7 is a detail view to be hereinafter referred to.

75 In said drawings the bed-plate 1, the overhanging arm 2, the upper driving-shaft 3, supported in bearings in said arm 2, the vertically-reciprocating needle-bar 4, operated from the driving-shaft 3, the shuttle 5, and
 80 the rotary shuttle-driving shaft 6, supported in bearings on the under side of the bed-plate and operated from the upper shaft 3 through the medium of suitable operative connections, are all substantially as found in said Standard
 85 sewing-machine and adapted to operate to form stitches as in such machine.

As herein illustrated, the button-holder is constructed, supported, and actuated in the same manner as set forth in detail in the said
 90 application filed December 23, 1899, bearing Serial No. 741,378. To explain herein more briefly, the presser-bar 7 is pivotally supported at its upper end in the arm of the machine, so that its lower end, to which the but-
 95 ton-holder is attached, may be capable of hav-

ing a swinging or oscillating movement. The button-holder carried by said presser-bar comprises a supporting-plate 8, having a forked projection 9 on its front side, which is adapted to embrace the presser-bar and be detachably clamped in fixed connection therewith between two nuts 10 10. This plate 8 is provided on its rear side with a pin or stud 8', upon which is pivotally mounted a plate 11. Upon the rear side of the latter two lever-arms 12 12 for carrying the button-gripping jaws 13 13 are pivotally secured by means of screws 14 14. These lever-arms are each formed with an angle therein, so that that end or portion of the same which carries the button-gripping jaws extends horizontally over the bed-plate, as shown. A coiled spring 15, connecting at its ends with the opposite lever-arms 12 12, acts to hold the free ends of the latter with a yielding pressure toward each other, whereby the jaws carried thereby will be caused to firmly grip and hold a button located between the same.

The button-holder is actuated to receive a vibrating movement and present first one and then another of a pair of holes in the button in position to be entered by the needle in a manner as follows: The presser-bar, to which the button-holder is attached, extends through an opening in a block 16, which is attached to a sliding plate 16', supported in the arm of the machine. A vibrating lever 17 for communicating like movement to the presser-bar and its attached button-holder is pivotally supported in the rear of the front end of the arm 2, with its lower end having an arm 18 rigidly connected therewith by means of screws 19 19, the end of which arm is pivotally connected with the sliding plate 16' by means of a screw 20. The upper end of the said vibrating lever 17 is bifurcated and embraces an actuating-cam 21, (see Fig. 8,) located on a short counter-shaft 22, which is supported in bearings in the arm 2 and driven from the main driving-shaft 3 through the medium of gears 23 23, as clearly shown in Fig. 6. After the button-holder has been vibrated to enable a certain predetermined number of stitches to be made through one pair of holes in the button carried thereby its pivotally-supported plate 11 is then automatically moved or swung in a lateral direction or at right angles to the path of its vibrating movement, so as to present the other pair of holes in position to be sewed. Such lateral movement of the button-holder is communicated thereto from a rotary switch-cam 24, as follows: A short vertically-arranged shaft 25 extends through the bed-plate 1 and has an extended bearing in lugs 26 26, projecting from the opposite sides of said bed-plate. This shaft is provided at its upper end with a rigidly-connected arm 27, which has an operative connection with the plate 11 of the button-holder through the medium of a connecting-rod 28, and at its lower

end the said shaft 25 is provided with a second arm 29, which is provided with a pin 30, (shown by dotted lines in Figs. 2 and 6,) extending within the groove of the said cam 24, which latter is mounted in a horizontal position upon a stud 31, depending from the under side of the bed-plate and provided with a connected worm-gear 32, which meshes with a worm 33 on the rotary driving-shaft 6, whereby the cam is given its rotary movement. The cam 24 acting upon the arm 29 will cause at certain predetermined times a rocking or oscillating movement of the shaft 25 in its bearing, and thereby communicate a lateral movement to its upper arm 27 and the connected button-holder.

In the operation of the machine the cam 24, through the medium of the connections described, acts to hold the button-holder laterally stationary while the same is being vibrated to receive stitches through one pair of holes in the button carried thereby, then move the same laterally to present the second pair of holes in position to receive a predetermined number of stitches, and then return the button-holder to its original position, the lateral swing of the arm 27 occurring upon such lateral movements of the button-holder, causing movement of the stop-controlling mechanism, as will be hereinafter described.

The stop mechanism proper, as herein shown, is substantially the same as that shown and described in Letters Patent No. 635,267, dated October 17, 1899. As in said patent, the hand wheel or pulley 34 is made fast upon the shaft 3 and the driving or loose pulley 35 is loose upon the latter, so as to be capable of having a rotary and longitudinal movement thereon. As a means for moving said driving-pulley into operative frictional engagement with the fast pulley 34, and thereby communicate motion to the machine, an elbow-lever 36 is pivotally supported upon a bracket-arm 37, with the end of one arm, 36', entering an opening 38 in a vertically-operating slide-bar 39, so as to be operated by the latter, and its other arm, 36'', extending into position to engage with one end of a longitudinally-sliding pin 40, which latter connects with a collar 41, which is loose on the shaft 3 and engages with the hub of the driving-pulley 35. (See Fig. 1.) The lower end of the slide-bar 39 is connected, through the medium of a pivoted link 42, (see Figs. 3 and 5,) with a lever 43, one end of which latter is pivotally supported, in connection with a lug 44, on the under side of the bed-plate and at its opposite end is bifurcated and embraces an arm 45 of a rock-shaft 46. This rock-shaft 46, as clearly shown in Fig. 1, is mounted upon two tapered bearing-pins which are supported in lugs 47 47 on the under side of the bed-plate and is provided with a second arm, 48, adapted for connection with the usual foot-treadle. (Not shown in the drawings.) By this ar-

rangement of parts the shaft 46 may be
 rocked in one direction to depress the lever
 43, and thereby the connected slide 39, which
 movement of the latter rocks the connected
 5 elbow-lever 36 in a direction to force the
 driving-pulley into operative engagement
 with the fast pulley, and so set the machine in
 motion. When the parts are thus moved to
 set the machine in motion, they are retained
 10 in such operative position, with the driving-
 pulley held in engagement with the fast pul-
 ley, by means of a horizontally-acting slide-
 latch 49, arranged on the bed-plate of the ma-
 chine, which is automatically actuated by
 15 means of a spring 50 to enter a projection 51
 on one side thereof into a notch 52 in the
 slide-bar 39 when the latter is depressed, as
 described, to bring its said notch opposite the
 latch, as shown in Fig. 2. By withdrawing
 20 the slide-latch 49 from engagement with the
 slide-bar 39 the latter will be automatically
 elevated and the other parts returned to their
 normal position to release the loose pulley
 from engagement with the fast pulley by
 25 means of a spring 54, which connects at one
 end with a stationary pin 55 and at its oppo-
 site end with a pin 56 on the said slide-bar 39
 and exerts a normal upward pressure on the
 latter.

30 To secure the immediate stopping of the
 machine as the driving-pulley is released from
 its engagement with the fast pulley, two stop-
 rings 57 58 (as in said Patent No. 635,267)
 are located upon the hub of the fast pulley 34,
 35 the ring 57, nearest the pulley, being provided
 with a fixed pin 57', which projects through an
 elongated slot 59 in the latter, and the other
 ring, 58, being also provided with a fixed pin
 58', which projects through an elongated slot
 40 in the ring 57 and a second similar-shaped
 slot 59' in the pulley 34, as shown in Fig. 4.
 On that side of the pulley opposite the stop-
 rings and within a recess therein a coiled
 spring 60 is supported, with its opposite ends
 45 bearing against the projecting ends of the said
 stop-ring pins 57' and 58', respectively, and
 exerting a pressure upon the same to yield-
 ingly hold them in a normal position toward
 one end of each of the slots in the pulley, and
 50 thereby yieldingly holding the rings in a nor-
 mal stationary position relative to said pulley.
 When the slide-bar 39 is raised under the ac-
 tion of the spring 54 to rock the lever 36,
 and thereby release the driving-pulley from
 55 engagement with the fast pulley, the upper
 end of said slide-bar 39 is moved into a posi-
 tion to engage with a lip or projection 61 on
 the periphery of the ring 58, and so bring the
 latter to a positive stop. After the ring 58
 60 has thus been brought to a stop the pulley 34
 and the second ring 57 continue their rota-
 tion under the momentum of the machine;
 but such further rotation is against the pres-
 sure of the connecting-spring 60, one end of
 65 which has been made stationary with the

spring 58, and after the momentum has been
 overcome by said spring the reaction of the
 same then causes the backward or return
 movement of the pulley and ring 57 to the
 position assumed at the time the ring 58 is 70
 first brought to a stop. As the pulley and
 the connected ring 57 return to their normal
 stopping position a lip or projection 62 on
 said ring 57 is engaged by a stop-lever 63, as
 shown in Fig. 4, and held against further 75
 movement in a direction opposite to that in
 which the other ring, 58, is held by the slide-
 bar 39, thus causing the machine to be brought
 to a standstill with the parts in a desired po-
 sition and without undue jar or shock to the 80
 same.

The lever 63 is provided with an extension
 64, which projects beneath the lower arm of
 the elbow-lever 36, adjacent to its point of
 connection with the slide-bar 39, against which 85
 it is held to be upwardly movable therewith
 by means of a coiled spring 65, which is seat-
 ed in a pocket in the frame 66, with its upper
 end pressing upwardly against a pin 67 on
 said lever, as shown in Fig. 5. By this means 90
 when the slide-bar 39 is moved upward into
 position to engage with the lip on the ring 58
 the lever 63 is also moved upward therewith
 into position to engage with the lip on the
 ring 57, and when the said slide-bar 39 is 95
 moved downward to release the ring 58 and
 operate the lever 36 to force the driving-pul-
 ley into engagement with the fast pulley the
 lever 63 is also thereby lowered from engage-
 ment with the lip on the ring 57. The stop- 100
 ring-engaging devices are thus moved into
 operative position simultaneously with the
 releasing of the driving or loose pulley from
 contact with the fast pulley and moved from
 their said operative position simultaneously 105
 with the moving of the loose pulley into en-
 gagement with the fast pulley.

I will now describe the means by which the
 loose pulley and the stop mechanism are con-
 trolled by the lateral movement of the arm 27 110
 of the button-holder-actuating mechanism, as
 hereinbefore referred to.

A horizontally-arranged bar 70 is pivotally
 connected at one end with the free end of the
 lever-arm 27 by means of a screw 71. The 115
 free end of this bar 70 extends toward the
 rear end of the machine and is provided with
 a hook-shaped projection 72, which is adapted
 for engagement with one arm, 73, of an elbow-
 lever 74, which latter is mounted upon a sta- 120
 tionary pivot-pin 75, secured in the bed-plate
 of the machine, with its second arm, 76, extend-
 ing into a position to engage with one end of
 the slide-latch 49, as clearly shown in Fig. 2.
 In the operation of the machine when it is 125
 ready to set the same in motion the several
 parts assume the position shown by full lines
 in Fig. 2, with the slide-latch 49 holding the
 slide-bar 39 in its lowered position with the
 loose pulley in contact with the fast pulley 130

and both stop-rings free to rotate with the latter. Now as the machine is set in motion the arm 27 and the several connections between it and the slide-latch 49 remain stationary as the button-holder is vibrated to receive stitches through one pair of holes in the button carried thereby. Then as the arm 27 is swung laterally by the cam 24 to shift the position of the button-holder and bring the other pair of holes in position to receive stitches such movement of the arm 27 moves the bar 70 in a longitudinal direction until its hook projection 72 engages with the end of the lever 74, as indicated by dotted lines in Fig. 2. The parts now remain stationary in such latter position until the desired predetermined number of stitches have been taken in the second pair of holes in the button, after which the arm 27 is again actuated by the cam 24 to return the button-holder to its original starting position. This latter return movement of the arm 27, however, causes the connected bar 70 to rock the engaged elbow-lever 74 on its pivot, and thereby move the slide-latch 49, with which it engages, in a longitudinal direction to release the vertical slide-bar 39, which latter is thereupon moved upward under the action of the spring 54 to secure the release of the loose or driving pulley from engagement with the fast pulley and cause the immediate stopping of the machine in the manner hereinbefore described. In such described manner the machine is automatically stopped as the button-holder is returned to its starting position upon the completion of the sewing on of each button. To again start the machine in motion, the shaft 46 is rocked from its treadle connection so as to lower the slide-bar 39, and thereby locate the connected parts in proper starting position, as before described, the slide-bar 39 being automatically locked when lowered to the proper position by means of the self-acting slide-latch 49. The free end of the bar 70 is controlled in its lateral movements in being moved to and from engagement with the elbow-lever 74 as follows: A cam-surface 78 is formed in one edge of the bar adjacent to its free end, which is adapted to work or slide against a stationary pin 79 on the bed-plate during the longitudinal movements of said bar. The form of this cam-surface is such as to cause the hook projection 72 at the end of the bar to move into operative engagement with the end of the elbow-lever 74 when said bar is moved in one direction and to disengage therefrom at the proper time when moved in the opposite direction. A spring-pressed pin 80 is seated in a pocket in one side of the arm 27, as shown by dotted lines in Fig. 2, with its projecting end bearing against an arm 81 of the bar 70 and acting to yieldingly hold the latter in op-

erative engagement with the pin 79 during its movements, as described.

Having thus set forth a practical embodiment of my invention, I do not wish to be understood as confining myself to the particular forms of the button-holder-actuating mechanism and the stop mechanism as shown and described, as they may be very materially modified without departure from my invention, for

What I claim is—

1. In a button-sewing machine, the combination, with the button-sewing mechanism, and a stop mechanism, the latter including a latch device for controlling its action, of a latch-operating device, a reciprocating bar actuated by the sewing mechanism for operating said latch-operating device, and means for automatically effecting engagement and disengagement of said bar with the latch-operating device, for the purpose set forth.

2. In a button-sewing machine, the combination, with the button-sewing mechanism, and a stop mechanism, the latter including a latch device for controlling its action, of a pivoted lever for acting upon said latch device, a bar connected with and actuated by the sewing mechanism for operating said lever, and means for effecting engagement and disengagement of said operating-bar with the lever, for the purpose set forth.

3. In a button-sewing machine, the combination, with the button-sewing mechanism, and a stop mechanism, the latter including a latch device for controlling its action, of a pivoted elbow-lever for acting upon said latch device, a reciprocating bar for operating said lever having a pivotal connection with a moving part of the sewing mechanism to be operated thereby, and means for effecting engagement and disengagement of said operating-bar with the lever, for the purpose set forth.

4. In a button-sewing machine, the combination, with the button-sewing mechanism, and a stop mechanism, the latter including a latch device for controlling its action, of a latch-engaging device, a reciprocating bar connected with and actuated by the sewing mechanism for operating said latch-engaging device, the said bar being provided with a cam-surface for engagement with a stationary pin whereby it will be caused to have a lateral movement to and from engagement with the said latch-engaging device during its reciprocating movement, and means for yieldingly holding said bar in sliding engagement with the said stationary pin, for the purpose set forth.

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