

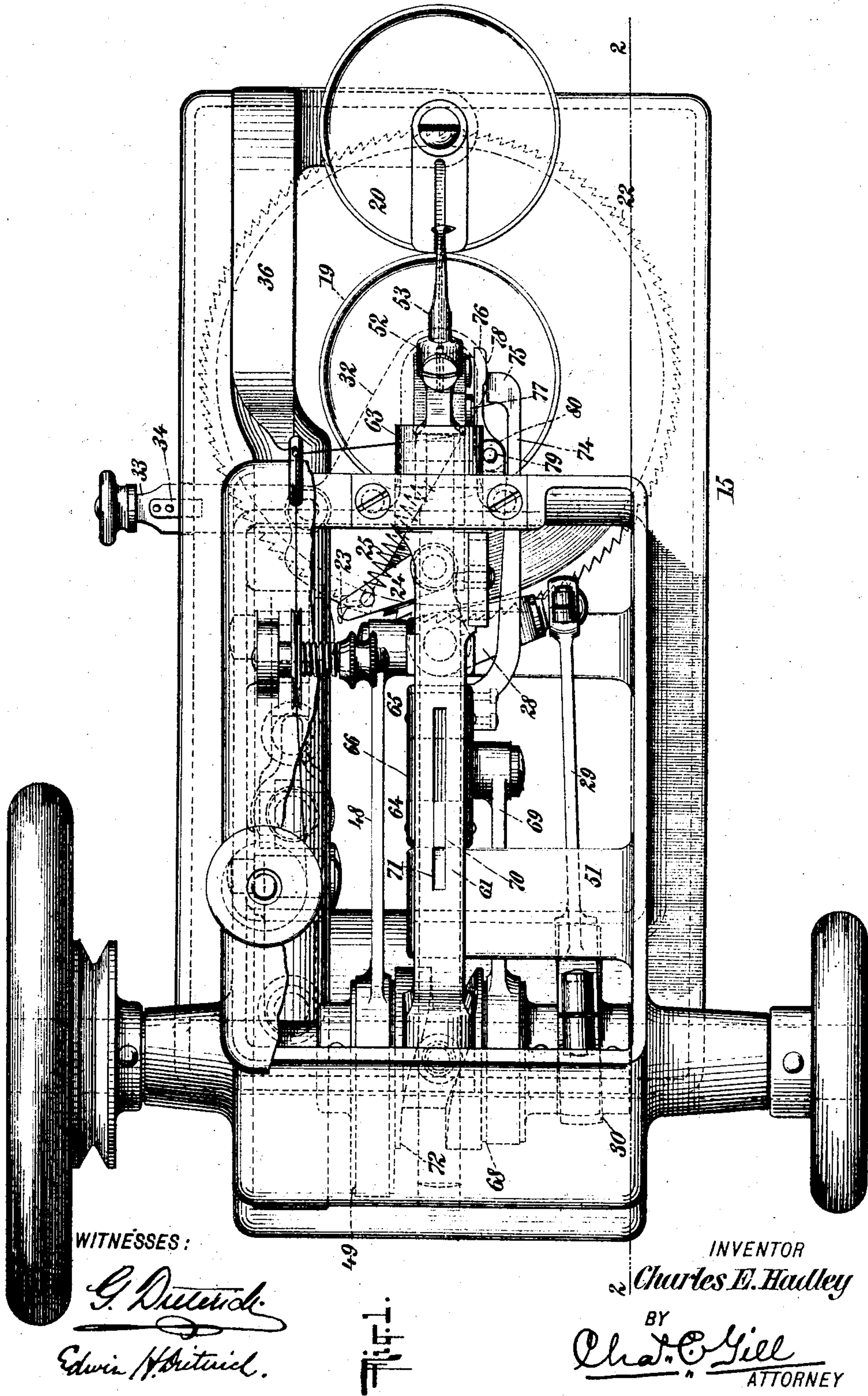
No. 765,239.

PATENTED JULY 19, 1904.

C. E. HADLEY.
FOR SEWING MACHINE.
APPLICATION FILED APR. 11, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



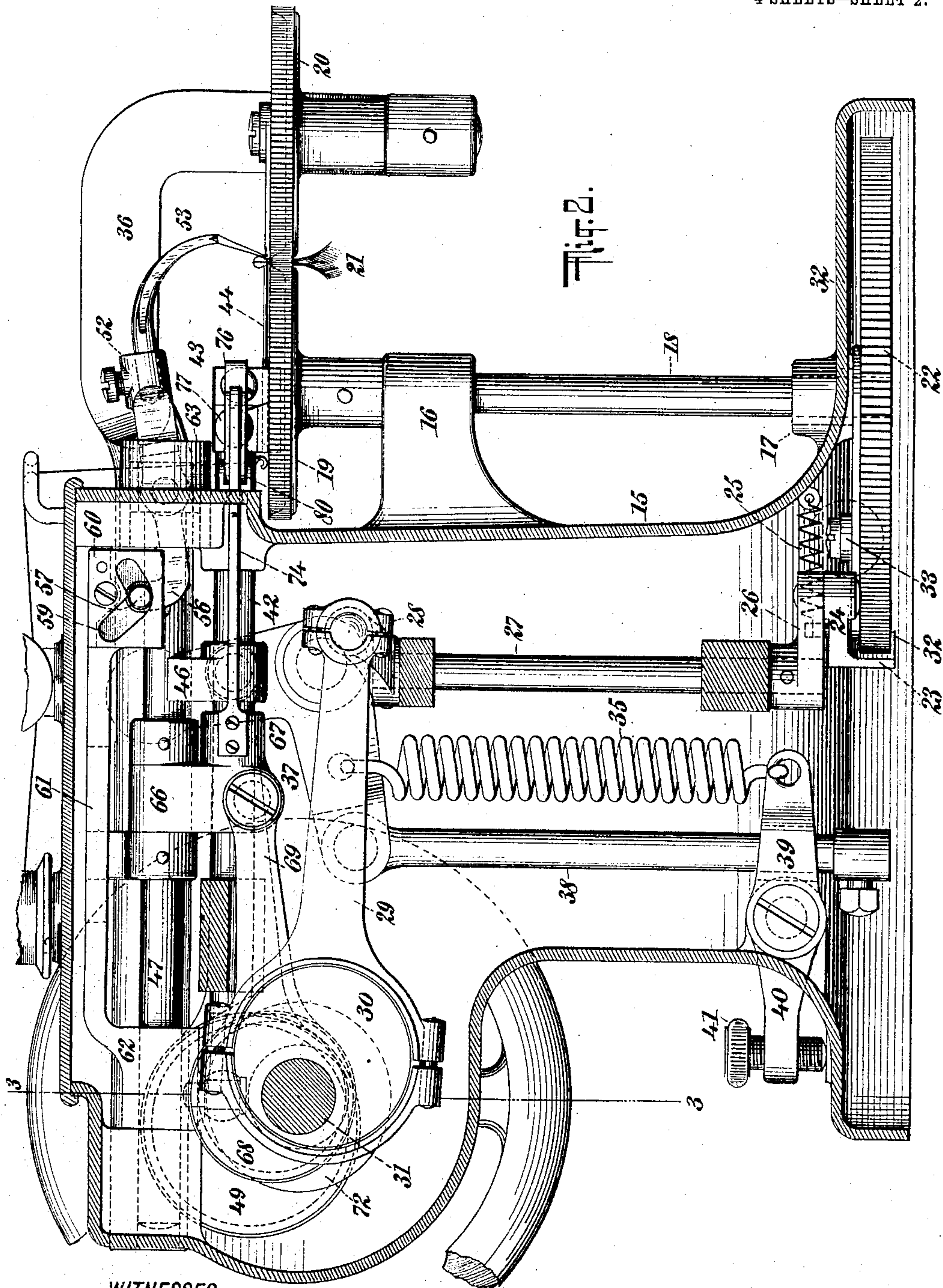
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WITNESSES:

G. Dietrich
Edwin H. Dietrich

INVENTOR

Charles E. Hadley

BY

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ATTORNEY

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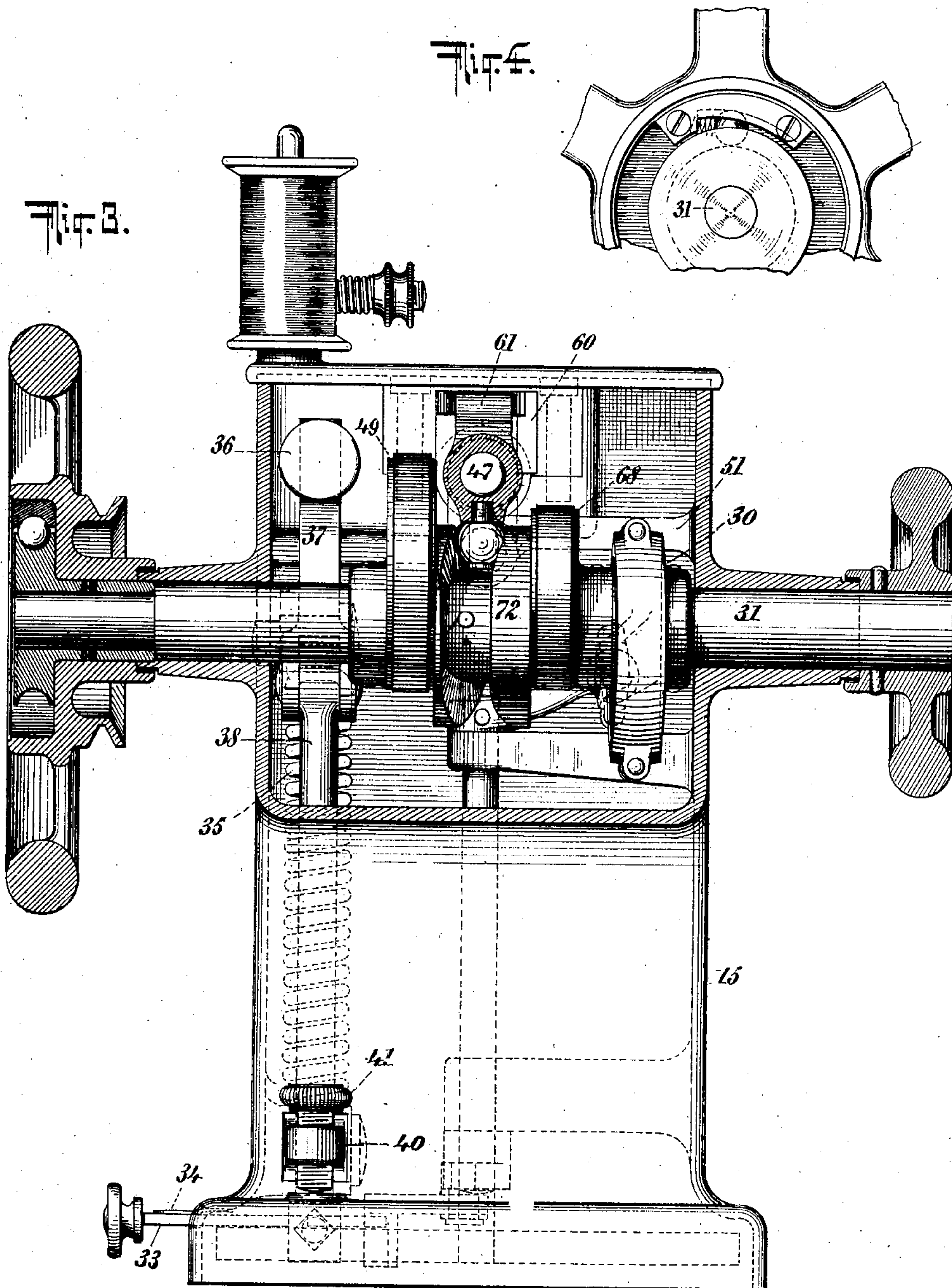
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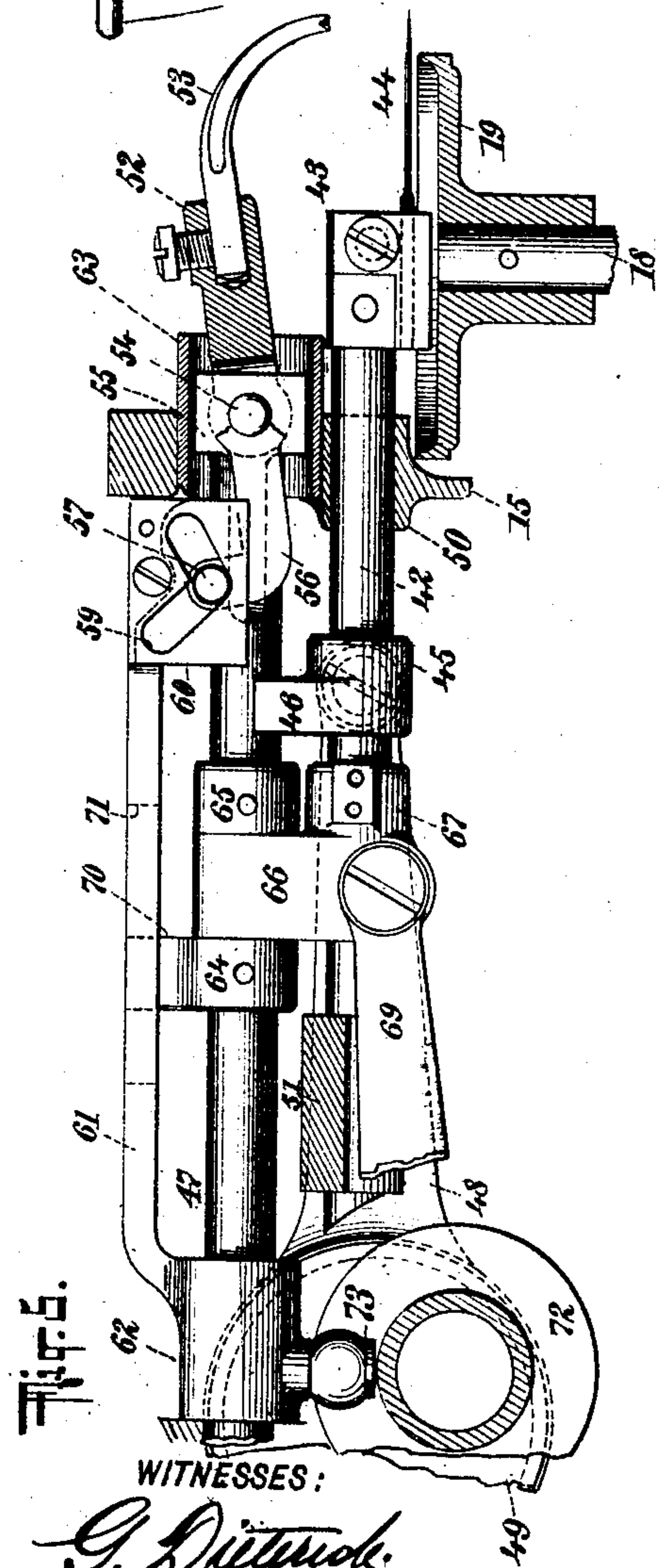
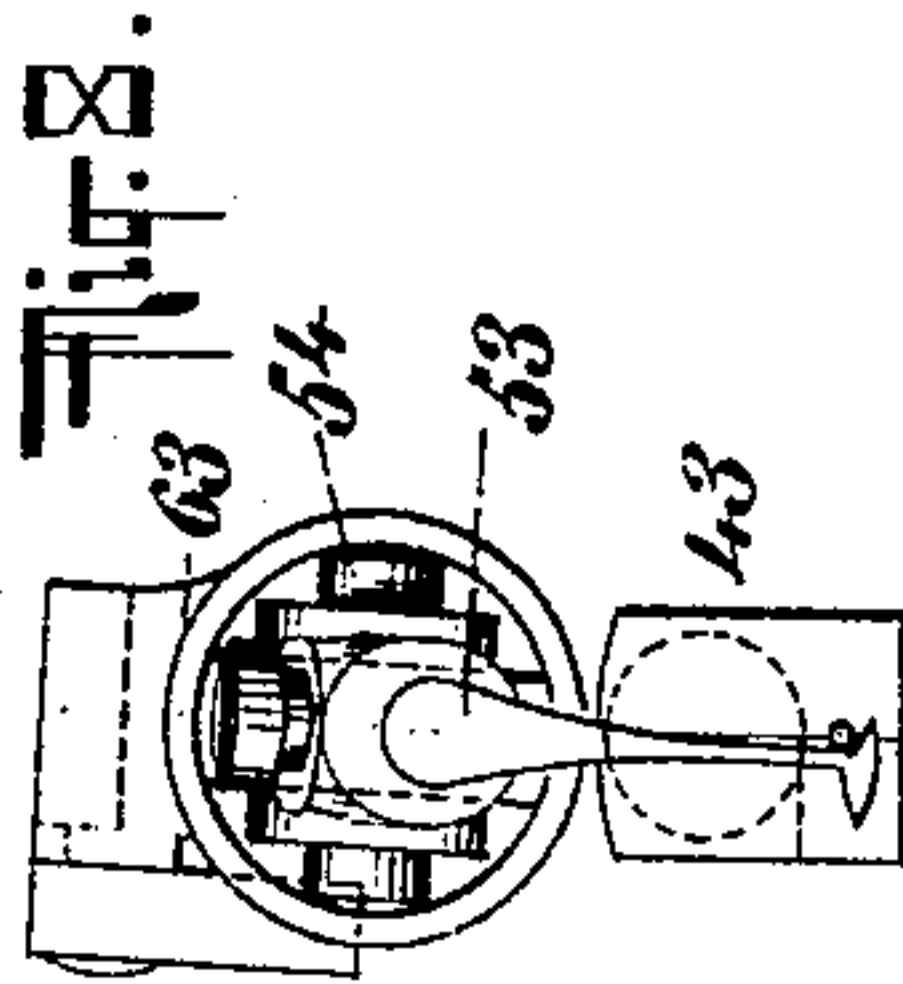
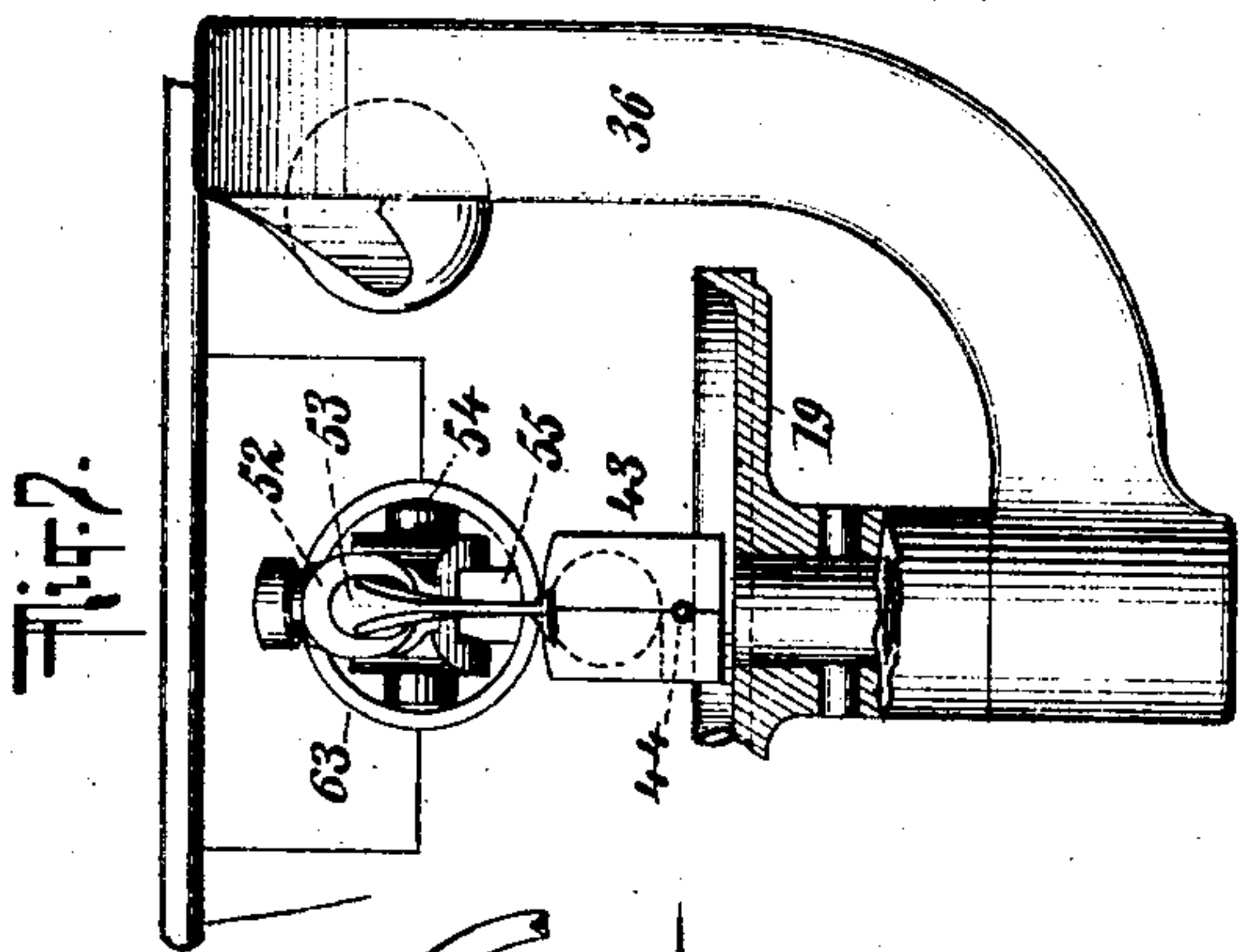
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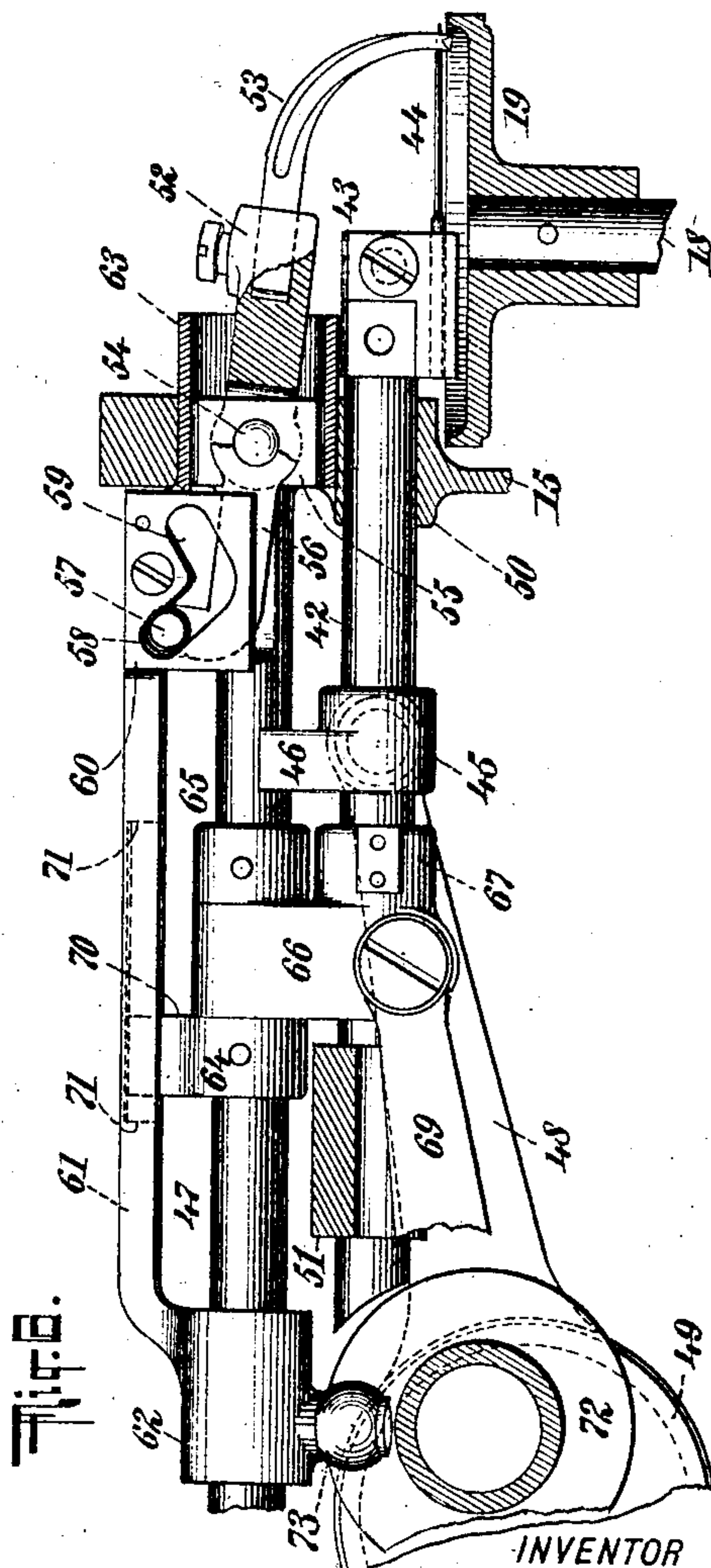
4 SHEETS—SHEET 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES E. HADLEY, OF CHICOPEE, MASSACHUSETTS, ASSIGNOR TO
JEROME W. HYDE, OF SPRINGFIELD, MASSACHUSETTS.

FUR-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 765,239, dated July 19, 1904.

Application filed April 11, 1903. Serial No. 152,113. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. HADLEY, a citizen of the United States, and a resident of Chicopee, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Fur-Sewing Machines, of which the following is a specification.

The invention relates to improvements in fur-sewing machines; and it consists in the novel features, arrangements, and combinations of parts hereinafter described, and particularly pointed out in the claims.

I present my invention in this application as embodied in a fur-sewing machine, and the novel features of my invention pertain more especially to the needle, looper, and cooperating mechanism, all of which will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a top view, with the cover partly broken away, of a machine constructed in accordance with and embodying the invention. Fig. 2 is a vertical section, partly broken away, of same on the dotted line 2 2 of Fig. 1. Fig. 3 is a vertical section of a portion of same on the dotted line 3 3 of Fig. 2. Fig. 4 is an enlarged view of a portion of the face of the drive-wheel and is presented to indicate a clutch for preventing reverse motion from being imparted to the mechanism. Fig. 5 is a detached vertical section through a portion of the machine on the line of the needle-bar and looper-rod. Fig. 6 is a like view of same, but illustrating the parts in a different position. Fig. 7 is a front view of same, this figure being a projection from the right-hand end of Fig. 5. Fig. 8 is a front view or projection from the right-hand end of Fig. 6.

In the drawings, 15 designates the general hollow supporting-frame of the machine, which frame, generally speaking, is of known character. Suitably mounted in the bearings 16 17 at the front end of the machine is a vertical feed-shaft 18, carrying upon its upper end a known form of horizontal feed-wheel 19, between which and a corresponding wheel 20 the fabric to be sewed is fed in a well-known manner, this fabric being indicated in Fig. 2 by the numeral 21. Upon the lower end of

the vertical shaft 18 is secured a ratchet-wheel 22, which is adapted to be engaged by a pawl 23, Fig. 1, carried by an arm 24, to which a spring 25 is connected for drawing the pawl 23 against the teeth of the ratchet-wheel 22. The pawl-arm 24 is pivotally mounted in and carried by a crank-arm 26, Fig. 2, secured upon the lower end of a vertical rock-shaft 27, carrying at its upper end a crank-arm 28, whose outer end is engaged by an eccentric-rod 29, the latter at its rear end being provided with an eccentric-strap secured upon the eccentric 30, carried by the driving-shaft 31. The front end of the rod 29 is connected with the crank-arm 28 by a ball-and-socket joint, and during the rotation of the shaft 31 the eccentric 30 and rod 29 will, through the crank-arm 28, impart an axial oscillatory motion to the vertical shaft 27, and this shaft 27 will, through the crank-arm 26, impart the requisite movement to the pawl-arm 24 for driving by intermittent movements the ratchet-wheel 22, vertical shaft 18, and feed-wheel 19. I provide special means for regulating the extent of throw which may be imparted to the ratchet-wheel 22 from the pawl-arm 24, and these means comprise a shield 32, pivoted upon the lower portion of the shaft 18, immediately over the wheel 22, and extending thence outwardly and then downwardly and below the outer edges of said wheel, as clearly illustrated in Figs. 1 and 2. The shield 32 is adapted to cover a certain portion of the periphery of the wheel 22, and it may be moved toward or from the pawl 23 by means of an adjusting-bar 33, extending through the side of the machine-casing and pivotally connected with said shield. When the shield 32 is, for illustration, moved inwardly toward the pawl 23, it will cover up certain of the teeth, which were the shield in an outward position the pawl 23 could engage in driving the wheel 22, and hence the shield 32 is intended to expose only such number of the teeth of the ratchet-wheel 22 to the action of the pawl 23 as may be required for securing the proper feed motion in the feed-wheel 19. The shield 32 does not interfere with the pawl-arm 24 at all times performing its full movement; but it may be utilized for

covering some of the teeth of the ratchet-wheel 22, so that the pawl 23 during the throw of the arm 24 may not engage or act upon the same. The outer edge of the shield is close
 5 against the outer periphery of the wheel 22, and hence the pawl 23 may slide along the outer vertical edges of said shield. The bar 33 should be provided with some means for retaining it in its adjusted positions, and it is
 10 well known that various means for accomplishing this result may be employed. At present I illustrate a friction-spring 34, carried by the bar 33 and engaging the wall of the aperture in the machine-casing through
 15 which the bar passes.

The outer feed-disk 20 is movable toward and from the feed-disk 19, a spring 35 exerting a tension to hold the disk 20 against the disk 19, and a treadle ordinarily being em-
 20 ployed in machines of this character for moving the disk 20 in a direction outwardly from the disk 19. The disk 20 is pivotally mounted upon a longitudinally-disposed arm 36, this arm being adapted to slide in guiding-apertures formed in front and rear ends of the machine-casing 15. Within the interior of the casing 15 is mounted a bell-crank lever 37,
 25 one arm of which extends upwardly and engages a slot in the arm 36, while the other end of said bell-crank lever 37 extends rearwardly and is pivotally connected with a treadle-rod 38 and spring 35. The rod 38 is of usual character. The upper end of the spring 35 is connected with the rearwardly-
 30 extending arm of the bell-crank lever 37, as shown in Fig. 2, and the lower end of said spring is connected with a pivotally-mounted arm 39, having an exposed projecting arm or extension 40, carrying a stop-screw 41, whose
 40 lower end is adapted to engage a portion of the base of the casing 15. It will be obvious that by adjusting the screw 41 in the arm 40 the tension of the spring 35 may be increased or diminished at will, and thereby the pres-
 45 sure of the feed disk or wheel 20 against the disk or wheel 19 conveniently regulated. The upwardly-extending arm of the bell-crank lever 37 engages the arm 36 and is utilized for sliding said arm 36 frontwardly for the pur-
 50 pose of moving the wheel 20 from the wheel 19.

The needle-bar is designated by the numeral 42; and it is a plain straight bar guided in the framing of the machine and carries at its front end a usual form of head 43 for re-
 55 ceiving the shank end of the needle 44, the latter also being of usual construction. Upon the bar 42 is applied a sleeve 45, Figs. 5 and 6, having an upwardly-extending portion 46, concaved at its upper end to guide upon the
 60 lower surfaces of the looper-rod 47. The sleeve 45 is fastened to the needle-bar 42, but slides freely on the looper-rod 47 and has no axial motion, and to the sleeve 45 is pivotally fastened the forward end of an eccentric-rod 48,
 65 which drives the needle-bar 42 and receives

its motion from the eccentric 49, mounted on the driving-shaft 31. The needle-bar 42 is supported in apertures formed in the boss 50 and lug 51. The looper-rod 47 is simply a plain straight rod, except at its front portion,
 70 where it is in the form of a pivoted section 52, carrying the looper 53, the section 52 being pivotally secured to the main body of the rod 47 by means of a pin 54, and the inwardly-extending portion of the section 52 being bi-
 75 furcated to straddle the head 55 on the front end of the rod 47, and one of the arms 56 of this bifurcated portion of the section 52 extending rearwardly and then upwardly, as shown in Figs. 5 and 6, and carrying on a
 80 transversely-disposed pin 57 an antifriction-roller 58 to play within a cam-slot 59, formed in a plate 60, secured upon the forward portion of a frame 61, the position of the pin 57 in the cam-slot 59 determining the posi-
 85 tion of the looper 53. The looper 53 performs its usual movements; but in the present instance these movements are secured by acting upon the front section 52 of the looper-rod, the main body of said rod in the present ma-
 90 chine not being tilted to secure the movements of the looper. The frame 61 has at its rear end a sleeve 62, freely mounted upon the rear portion of the rod 47, and at its front end the frame 61 has a sleeve 63, freely
 95 mounted within an aperture in the front of the machine-frame, and the head 55 on the front end of the rod 47 is free to slide within the sleeve 63, said head 55 extending from the upper to the lower inner surfaces of the
 100 said sleeve 63, and the ends of the pin 54 extending laterally to the opposite inner surfaces of said sleeve, whereby the front end of the looper-rod may be properly guided and sustained within said sleeve. The frame
 105 61 has no reciprocatory motion, but has an axial oscillatory motion, being pivotally mounted at its opposite ends. The looper-rod 47 has a reciprocatory motion and also when acted upon by the frame 61 an axial
 110 oscillatory motion. The looper-rod 47 is provided with the sleeves 64 65, between which is mounted upon the rod 47 the upper end of a driver 66, which by means of a sleeve 67 is freely mounted upon a needle-
 115 bar 42. The driver 66 is given a reciprocatory motion from the driving-shaft 31 through the eccentric 68 and eccentric-rod 69, whose forward end is pivoted to said driver 66. The movement of the rod 69 will be communi-
 120 cated to the driver 66 and through the latter to the looper-rod 47, said driver by reason of the sleeves 64 65 having no longitudinally-sliding movement on said rod 47. The sleeve 64 has an upwardly-extending arm 70, which
 125 freely enters a slot 71, formed in the oscillatory frame 61, and the purpose of said arm and slot is to impart the oscillatory motion of the frame 61 to the looper-rod 47, where-
 130 by the looper 53 is given its movement across

the path of the needle 44. The slot 71 is elongated, so that the looper-rod 47 may perform its longitudinal movement without restraint from the frame 61. The oscillatory motion of the frame 61 is communicated to it from the driving-shaft 31 through the grooved cam 72 and lug 73, the latter being carried by the sleeve 62 of said frame 61 and entering the groove of said cam 72.

During the operation of the machine the needle-bar 42 is given its usual longitudinal movement from the driving-shaft 31 through the eccentric 49 and rod 48, and the looper-rod 47 is given its longitudinal movement from the said driving-shaft through the eccentric 68, rod 69, and driver 66, while the axial motion of the looper-rod 47 is imparted to it from the driving-shaft 31 through the cam 72, frame 61, and arm 70. The tilting or up-and-down motion of the looper 53 is secured by reason of the pivoting of the front section 52 of the looper-rod and the engagement of the rearwardly-extending arm 56 of said section with the walls of the cam-slot 59. During the reciprocation of the rod 47 the roller 58, carried in the cam-slot 59 by the inwardly-extending arm 56, will be compelled to follow the outline of said slot, and hence the slot 59 will be given a form designed to secure the proper up-and-down movement of the looper 53. In the present instance the slot 59 is of right-angular form, and hence it will effect the proper dipping motion in the looper 53, two positions of the looper being illustrated, and the looper in the present machine being of known character and performing known movements in this art. These movements of the looper 53 are, however, in the present instance secured by novel mechanism, by which the looper is placed under better control than in any machines of this class heretofore known to me.

A further feature of the invention relates to the mechanism for placing a tension on the thread when the needle is on its back stroke, these means not acting as a sewing tension, or while the stitch is being formed, but only acting as a loop-forming tension, and this feature of the invention is more clearly illustrated in Figs. 1 and 2 and comprises a bar 74, fastened to the forward end of the driver 66 and extending through the front of the machine-casing 15, where it is formed with the inwardly-turned head 75 to cooperate with a pivoted plate 76, adapted to press against the usual button-head 77, behind which the sewing-thread customarily passes for having auxiliary tension applied to it during the stitch-forming operation. The plate 76 has an outwardly-projecting or cam surface 78 to be engaged by the head 75 of the bar 74, and the said plate 76 is secured by a vertical pin 79 to a stud 80, projecting from the front of the machine-casing. In the position of the parts of the machine shown in the drawings

the needle is on its back stroke and the head 75 of the bar 74 is against the cam-surface 78 of the plate 76, under which condition a tension is placed on the sewing-thread. The thread becomes pinched by the button-head 77 at the beginning of the back stroke of the needle, and this pinching or tension is retained on the thread by means of the plate 76 and bar 74 until the looper has caught the loop. The plate 76 is long enough to cover the button 77 during all parts of the stroke of the needle-bar; but the bar 74 does not act on the plate 76 during the forward movement of the needle-bar, but preferably only at the beginning of the return movement of the needle-bar or at the time of the formation of the loop. The bar 74 and plate 76 are enabled to place a tension on the sewing-thread only on the back stroke of the needle-bar by reason of the head 75 and cam-surface 78 and also by reason of the fact that the needle-bar performs about a one and one-quarter inch movement while the looper-rod performs about a five-eighths-of-an-inch movement.

The operation of the machine hereinbefore described will be substantially understood from the description hereinbefore presented and but slight further explanation of the operation is necessary. The stitch formed by the present machine is the well-known stitch produced by fur-sewing machines, and the needle and looper perform their usual functions. The machine is adapted to be driven by power applied to the shaft 31, from which the feed, needle, and looper mechanisms are conveniently driven by mechanism lacking in complexity and capable of being conveniently and properly adjusted. The tension of the feed-wheels upon the fabric may be conveniently regulated by means of the adjusting-screw 41, and the length of the intermittent movements of the feed-wheels 19 20 may be regulated by means of the bar 33 and shield 32, the latter according to its position covering or exposing a greater or smaller number of the teeth of the ratchet-wheel 22 to the pawl 23. The needle-bar 42 is driven by means of the eccentric 49 and rod 48, and the looper-rod 47 is driven by means of the driver 66, rod 69, and eccentric 68, while its axial motion is acquired from the frame 61, which is actuated from the main driving-shaft 31 through the cam 72. The looper 53 is given its up-and-down movements by means of the cam 60 and pivoted looper-rod section 52, and the looper 53 may be operated quickly and kept under proper control by reason of the fact that it is carried by the pivoted section 52 instead of by a long looper-rod in one piece pivoted at its rear end.

I deem it as important in securing a correct formation of the loop that the tension be placed on the sewing-thread at the beginning of the back stroke of the needle and that this part of the tension be kept from off the thread

during the outstroke of the needle, and these results are secured by means of the bar 74 and pivoted plate 76, said bar 74 being carried by the driver 66 for the looper-rod.

5 What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a sewing-machine comprising a driving-shaft, and needle, looper and feed mechanisms to be actuated therefrom, the feed-wheel 20 to press the fabric against the feed-wheel 19 of the feed mechanism, the sliding bar 36 carrying said wheel 20, the bell-crank lever 37 within the machine-casing and connected at one arm with said bar 36 for imparting motion to the same, the treadle-rod 38 extending downwardly within said casing and connected with the other arm of said bell-crank lever for moving said lever in one direction, and the vertically-disposed coiled spring 35 within said casing and connected with said bell-crank lever for normally pressing said wheel 20 against said wheel 19, combined with the pivoted arm 39 to which the lower end of said spring 35 is connected within said casing and which has an exposed arm 40 extended through an opening in said casing, and the adjusting-screw 41 mounted in said arm 40 and adapted to engage a part of the said machine-casing as a stop, for regulating the tension of said spring; substantially as set forth.

2. In a sewing-machine comprising a driving-shaft and needle and feed mechanisms to be actuated therefrom, the looper-rod 47 adapted to have a reciprocating motion imparted to it from said shaft and provided with a front pivoted section 52 carrying the looper, combined with an oscillatory frame having a loose connection with said rod for imparting an axial motion thereto, means connected with said driving-shaft for actuating said oscillatory frame, and the cam carried by said oscillatory frame and engaging said pivoted section 52 for imparting, during the reciprocating movement of the looper-rod, the proper up-and-down movements to said looper; substantially as set forth.

3. In a sewing-machine comprising a driving-shaft and needle and feed mechanisms to be actuated therefrom, the looper-rod 47 adapted to have a reciprocating motion imparted to it from said shaft and provided with a front pivoted section 52 carrying the looper, combined with the oscillatory frame 61 having the slot 71 and adapted to oscillate said looper-rod, means connected with said driving-shaft for actuating said frame, the arm 70 connected with said looper-rod and adapted to said slot 71 in said frame, and the cam 60 having the cam-slot 59 receiving a part of said pivoted section 52, for actuating said section upon its pivot during the reciprocating motion of said rod 47; substantially as set forth.

65 4. In a sewing-machine comprising a driv-

ing-shaft and needle and feed mechanisms to be actuated therefrom, the looper-rod 47 adapted to have a reciprocating motion imparted to it from said shaft and provided with a front pivoted section 52 carrying the looper, said pivoted section having the inwardly-projecting arm 56 carrying the pin 57, combined with the oscillatory frame 61 having a loose connection with said rod for imparting an axial motion thereto, means connected with said driving-shaft for actuating said oscillatory frame, and the cam 60 having the cam-slot 59 and carried by said frame 61 for receiving said pin 57, whereby during the reciprocating movement of said rod 47 said cam may actuate the section 52 upon its pivot; substantially as set forth.

5. In a sewing-machine comprising a driving-shaft and feed mechanism to be actuated therefrom, the needle-bar adapted to have a reciprocating motion imparted to it from said shaft, the looper-rod located above said needle-bar, the driver 66 loosely mounted upon said needle-bar and engaging said rod 47 for imparting reciprocating motion to the latter, means for actuating said driver from said shaft, the pivoted section 52 connected with the front end of said rod 47 and carrying the looper 53, the oscillatory frame 61 having a loose connection with said looper-rod for imparting an axial motion thereto, means connected with said driving-shaft for actuating said frame 61, and a cam for moving said section 52 upon its pivot during the reciprocating motion of said rod; substantially as set forth.

6. In a sewing-machine comprising the driving-shaft and needle, looper and feed mechanisms to be actuated therefrom, the bar 74, and means for imparting longitudinal movement thereto corresponding with the looper-rod, combined with the plate 76 to be engaged by the front end of said bar during its return movement with the looper-rod, and means to be engaged by said plate 76 for placing a tension on the sewing-thread on the back stroke of the needle-bar; substantially as set forth.

7. In a sewing-machine comprising a driving-shaft and needle, looper and feed mechanisms to be actuated therefrom, the bar 74, and means for reciprocating said bar with the movement of the looper-rod, combined with the plate 76 to be engaged by said bar during the return stroke of the needle-bar, and the button-head 77 carried by the needle-bar and behind which the sewing-thread is placed, said plate 76 being adapted under the action of said bar 74, to press said head against said thread on the return stroke of the needle-bar and to be idle during the forward stroke of said bar; substantially as set forth.

8. In a sewing-machine comprising a driving-shaft and needle, looper and feed mechanisms to be actuated therefrom, the bar 74 having the head 75, and means for imparting re-

ciprocating motion to said bar with the move-
ment of the looper-rod, combined with the
hinged plate 76 having the cam-surfaces 78
to be engaged by the forward end of said bar
5 74 on the return stroke of the needle-bar, and
means to be acted upon by said plate 76 for
binding against the sewing-thread during such
return stroke of said needle-bar, said looper-
rod and needle - bar having such relative
10 strokes and said bar 74 and plate 76 being so

proportioned that said plate 76 and bar 74 are
idle during the outstroke of the needle-bar;
substantially as set forth.

Signed at New York, in the county of New
York and State of New York, this 31st day of 15
March, A. D. 1903.

CHARLES E. HADLEY.

Witnesses:

CHAS. C. GILL,
ARTHUR MARION.