

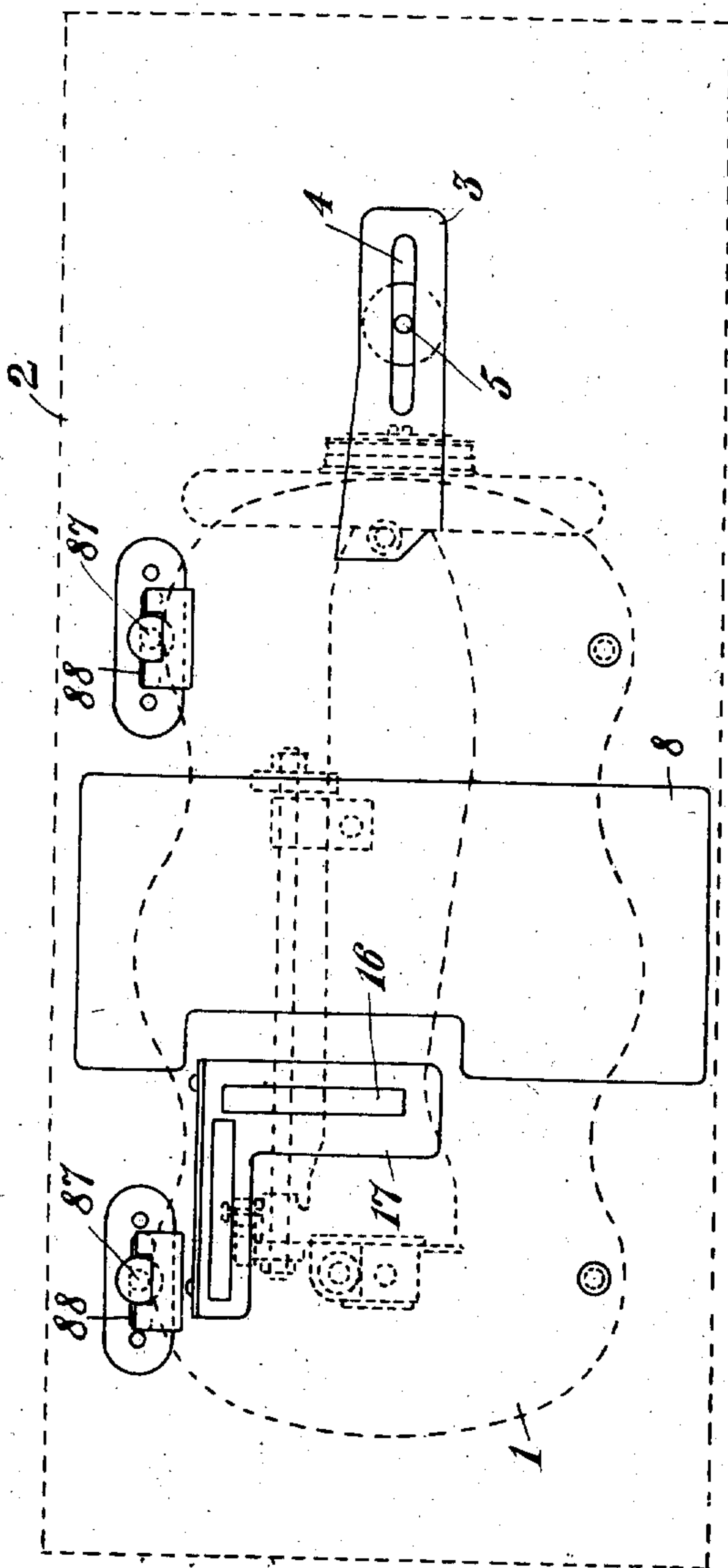
No. 897,553.

PATENTED SEPT. 1, 1908.

C. J. PÅLSSON.
SEWING MACHINERY.
APPLICATION FILED JAN. 25, 1907.

8 SHEETS—SHEET 1.

FIG. 1.



Witnesses

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No. 897,553.

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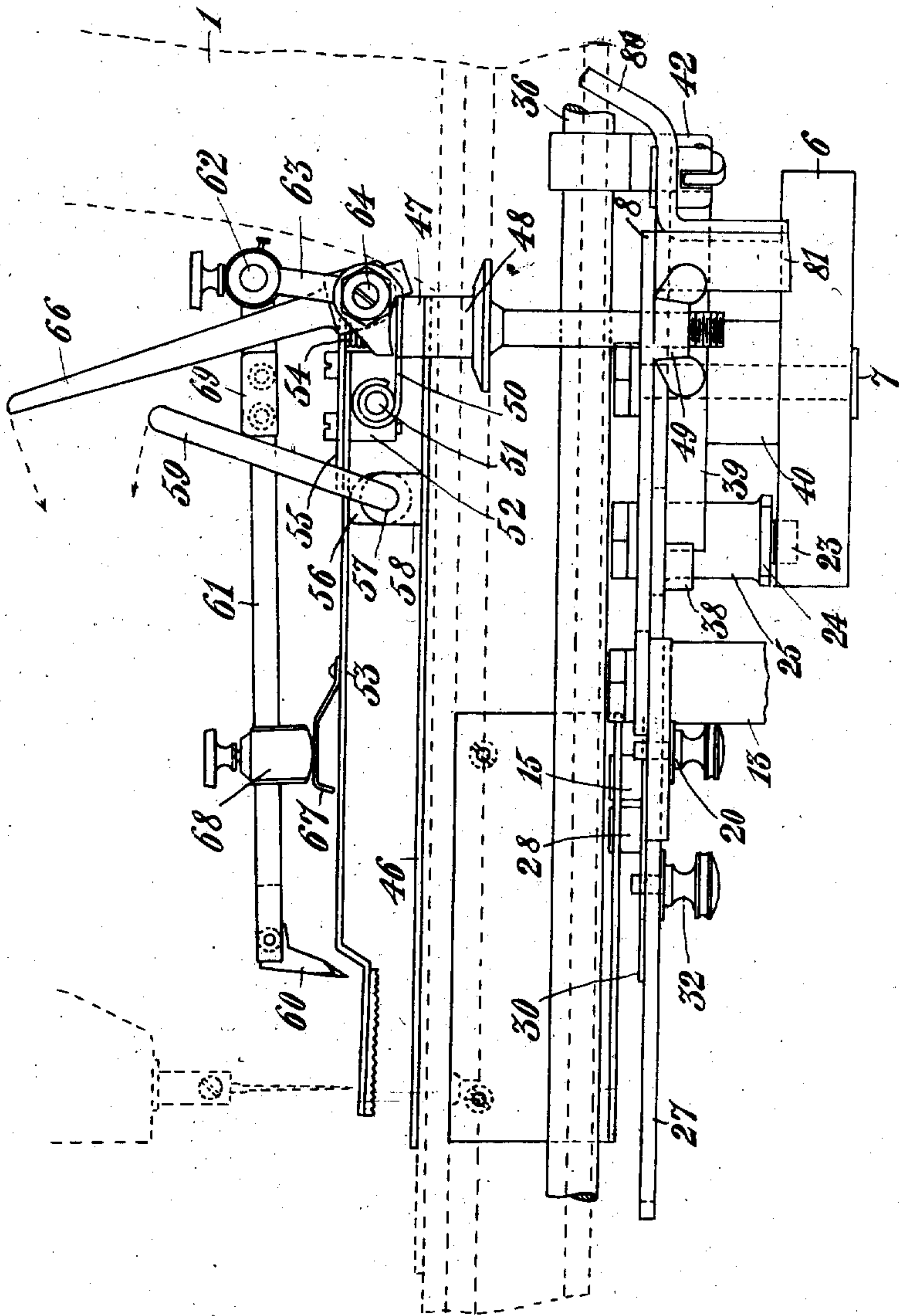
C. J. PÄLSSON.

SEWING MACHINERY.

APPLICATION FILED JAN. 25, 1907.

8 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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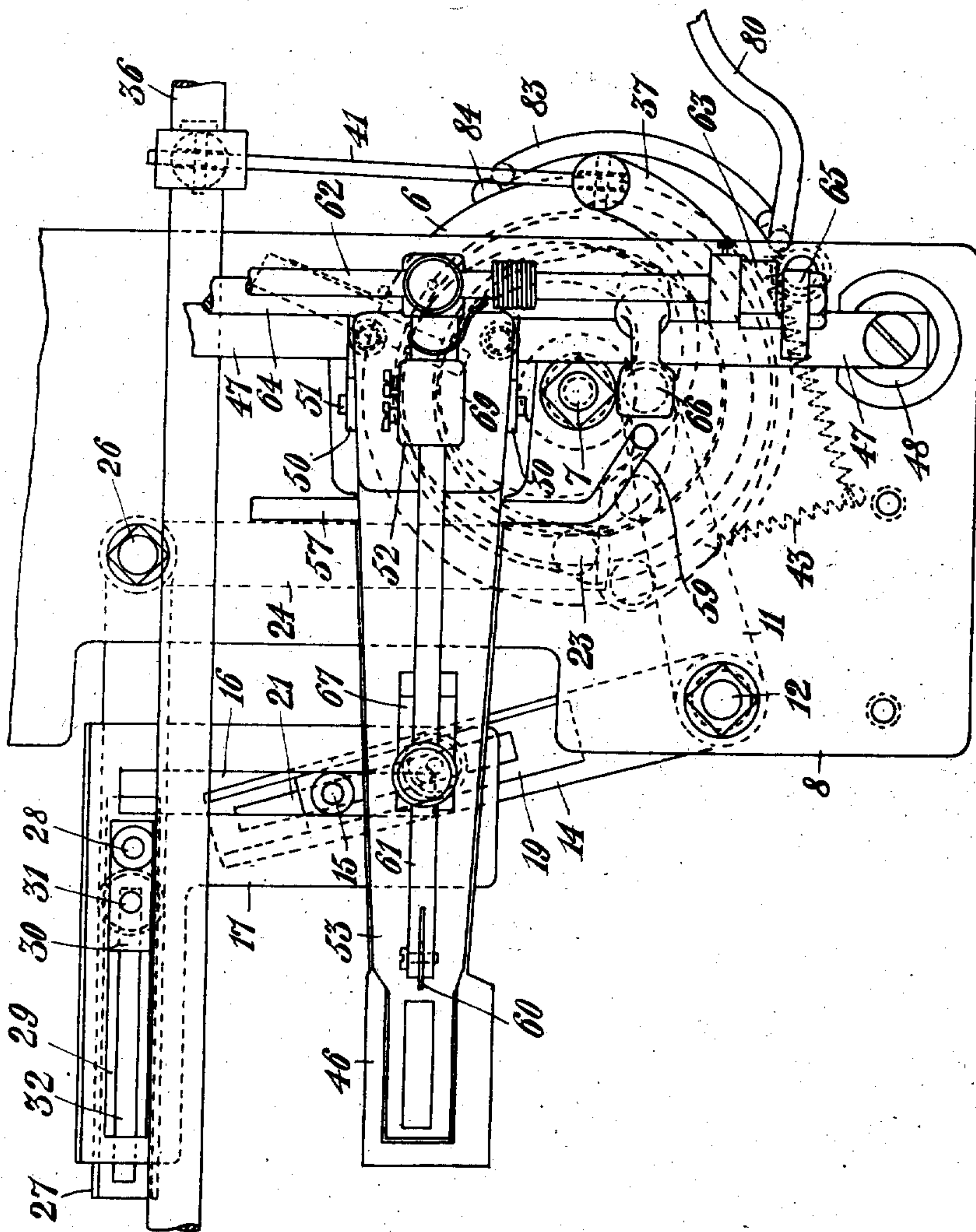
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8 SHEETS—SHEET 3.

Fig. 3.



Witnesses

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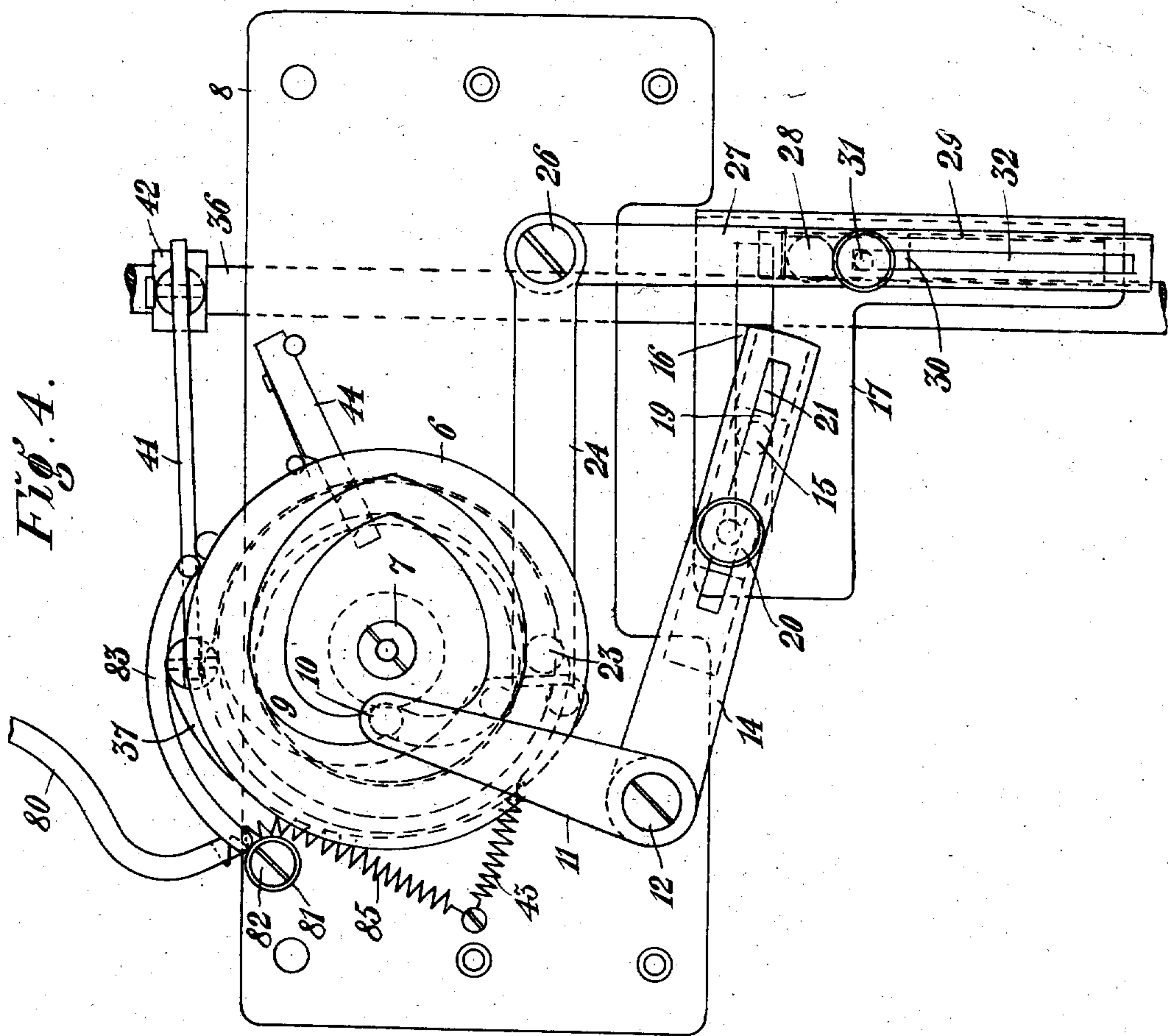
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PATENTED SEPT. 1, 1908.

C. J. PÅLSSON.
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APPLICATION FILED JAN. 25, 1907.

8 SHEETS—SHEET 4.



Witnesses

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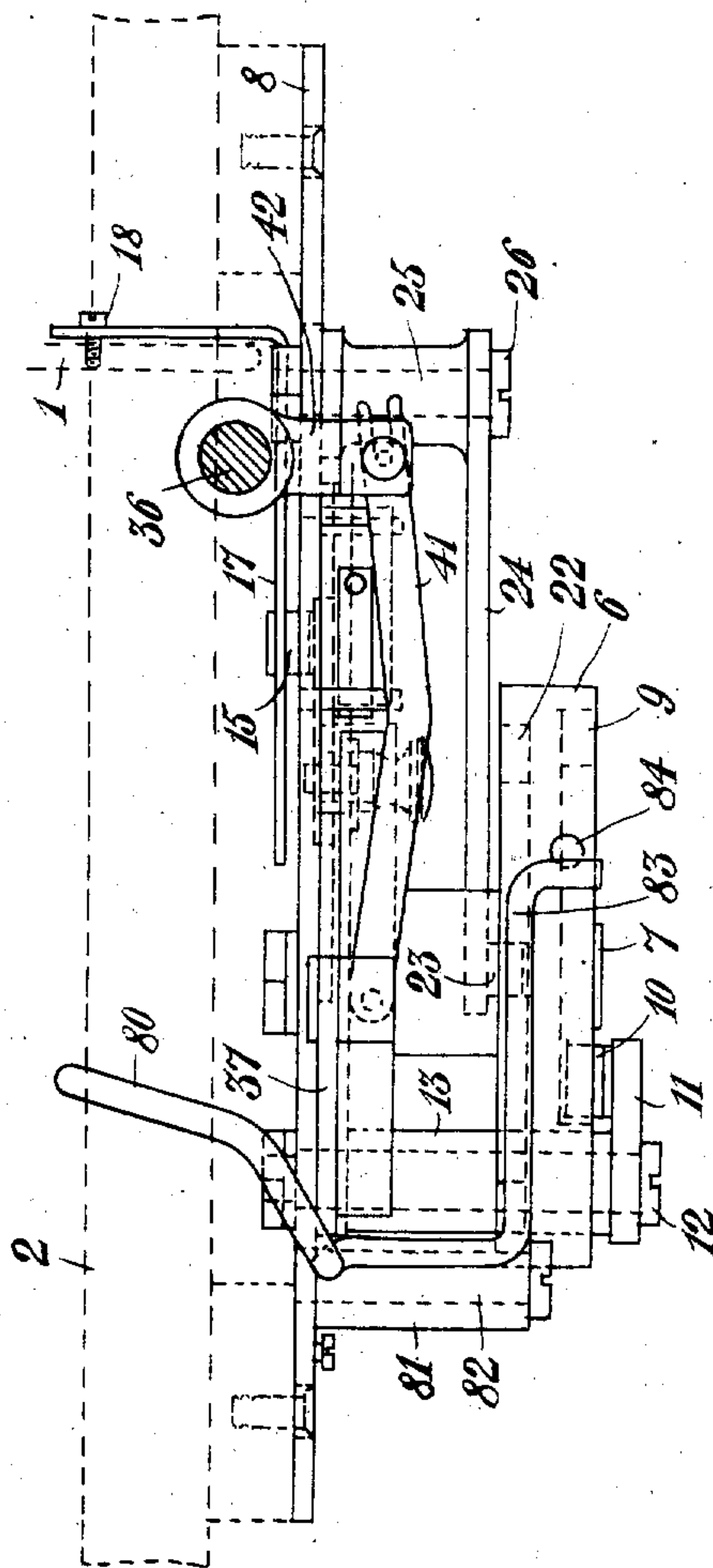
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SEWING MACHINERY.

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8 SHEETS—SHEET 5.

Fig. 5.



Witnesses

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APPLICATION FILED JAN. 26, 1907.

8 SHEETS—SHEET 6.

Fig. 6.

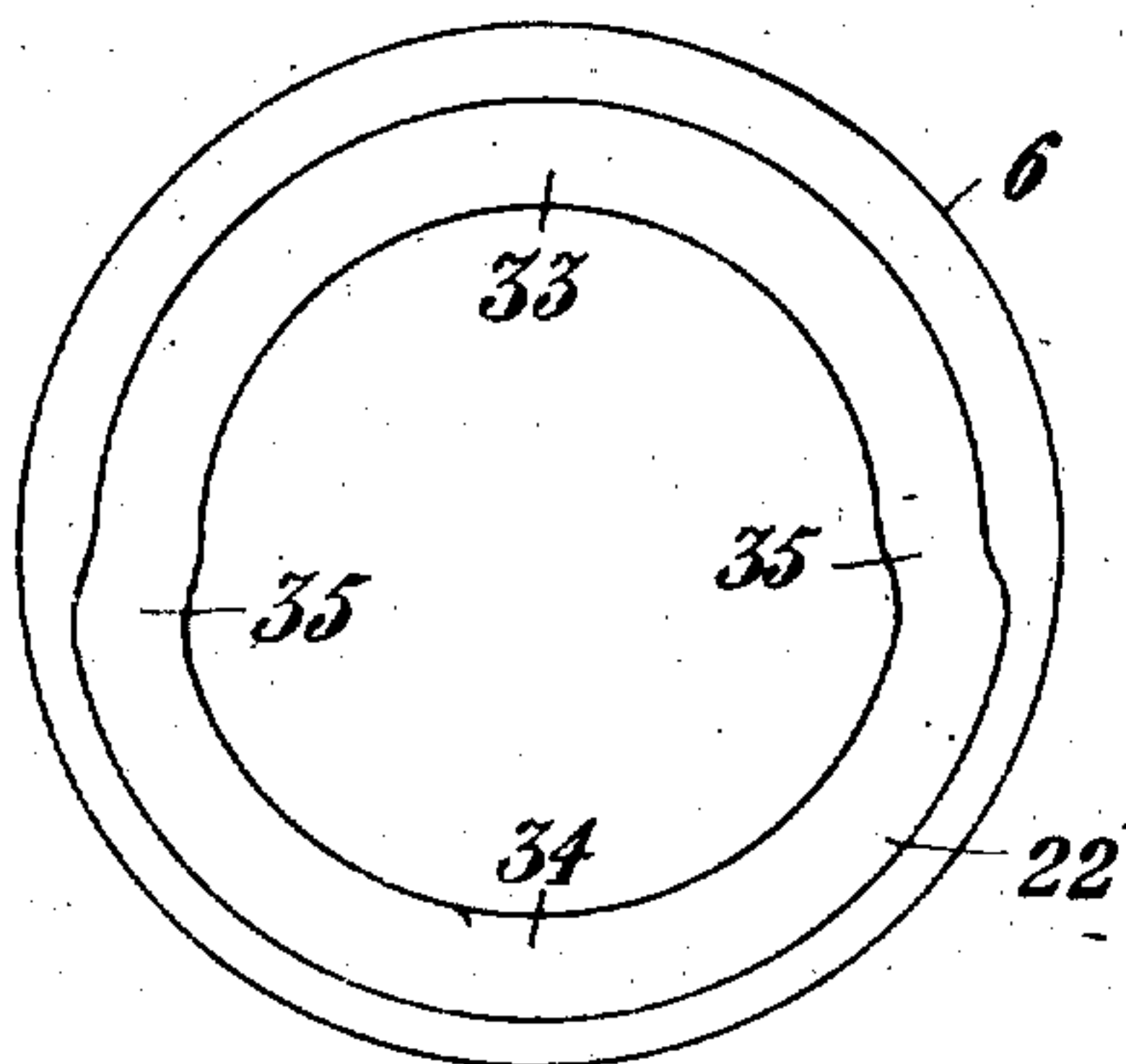


Fig. 7.

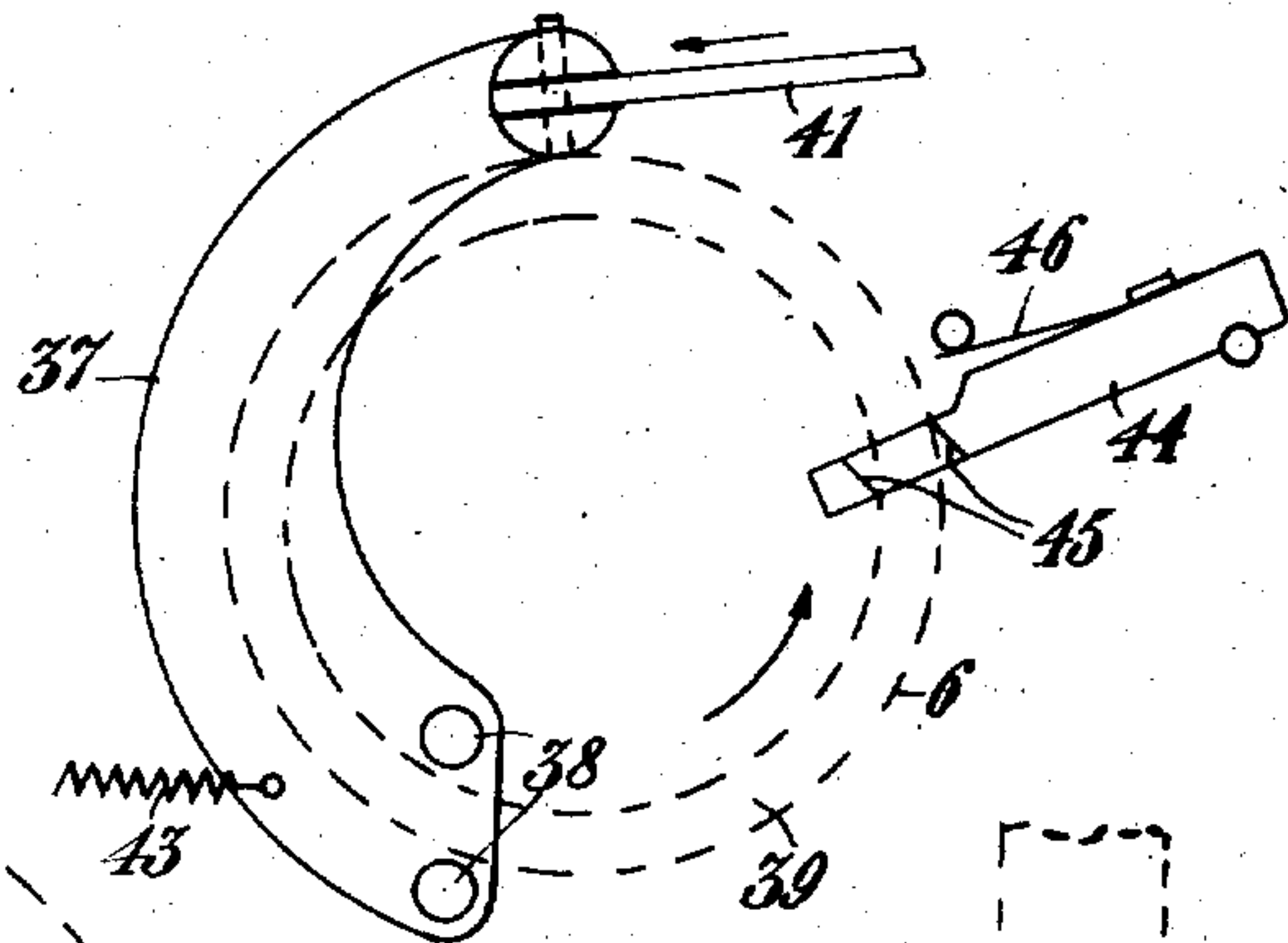


Fig. 8.

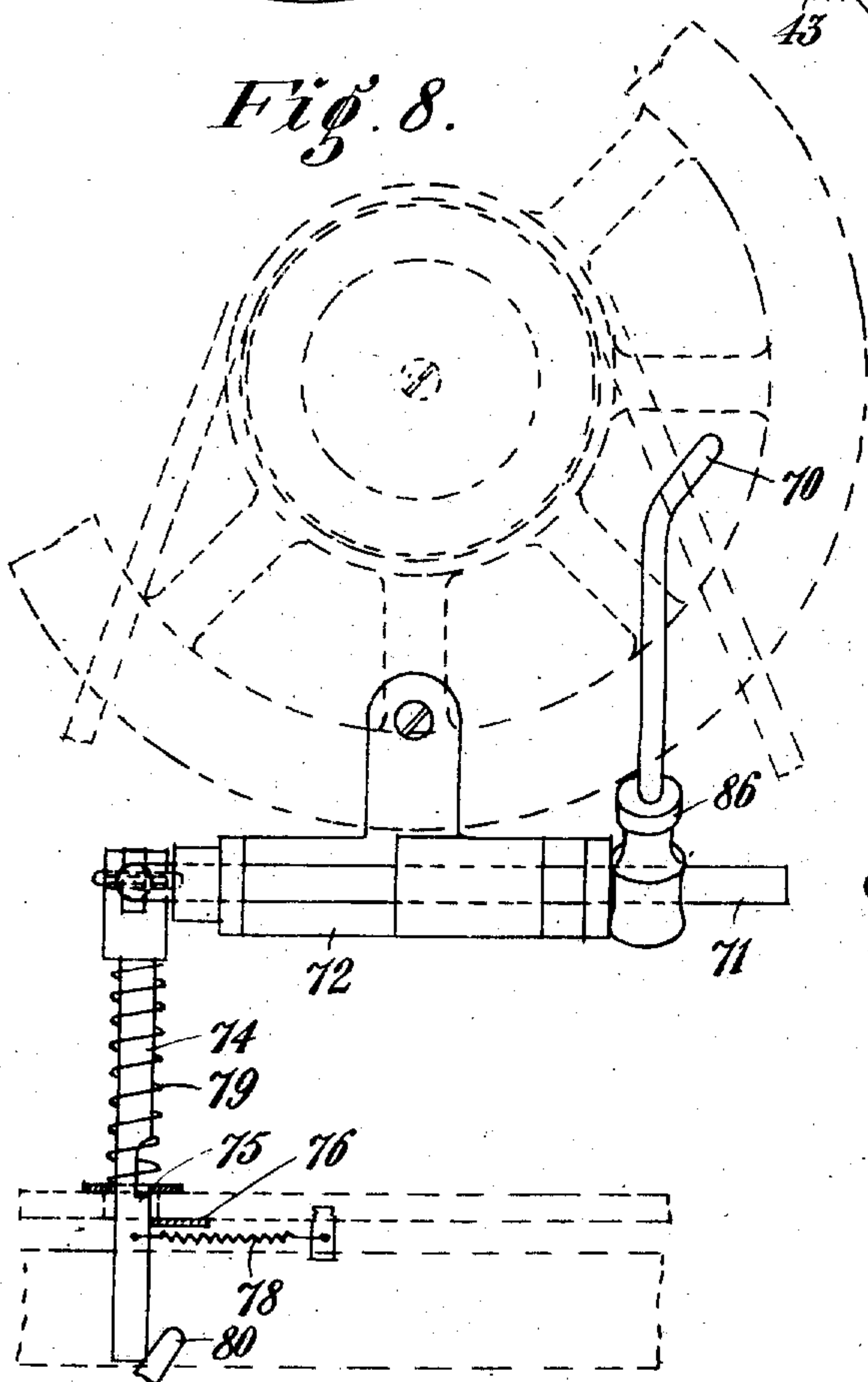
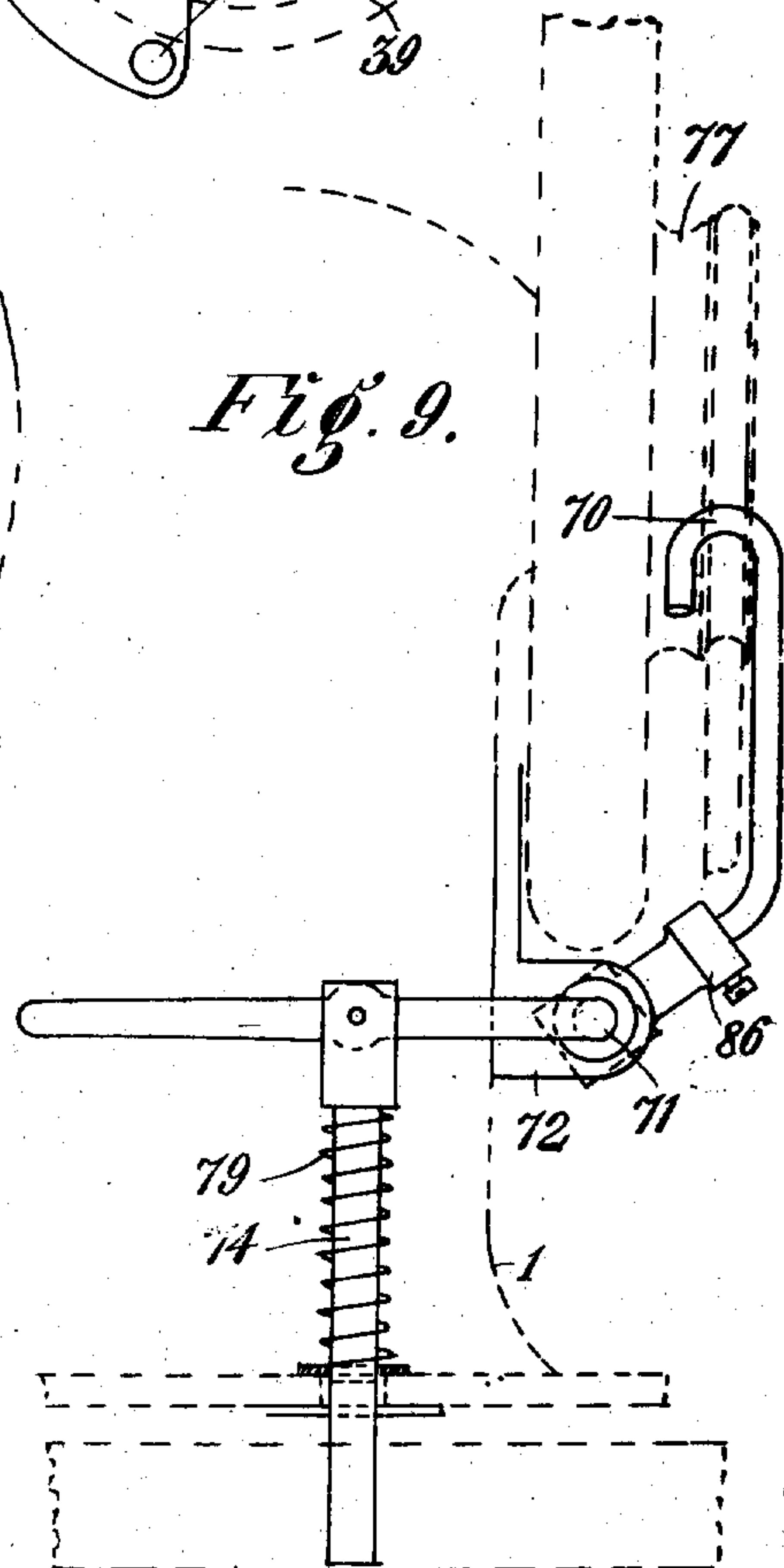


Fig. 9.



Witnesses

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APPLICATION FILED JAN. 25, 1907

8 SHEETS—SHEET 7

Fig. 10.

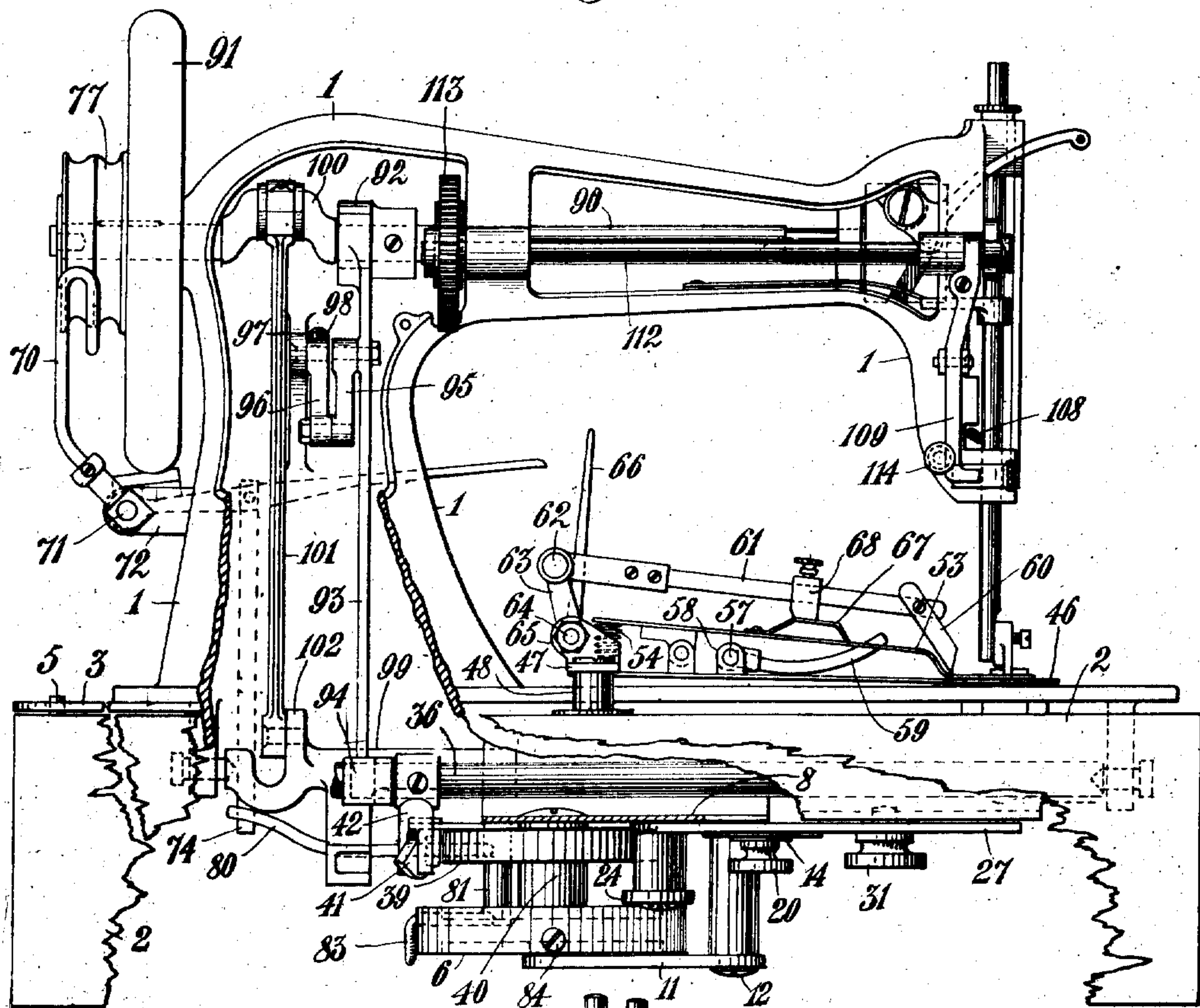
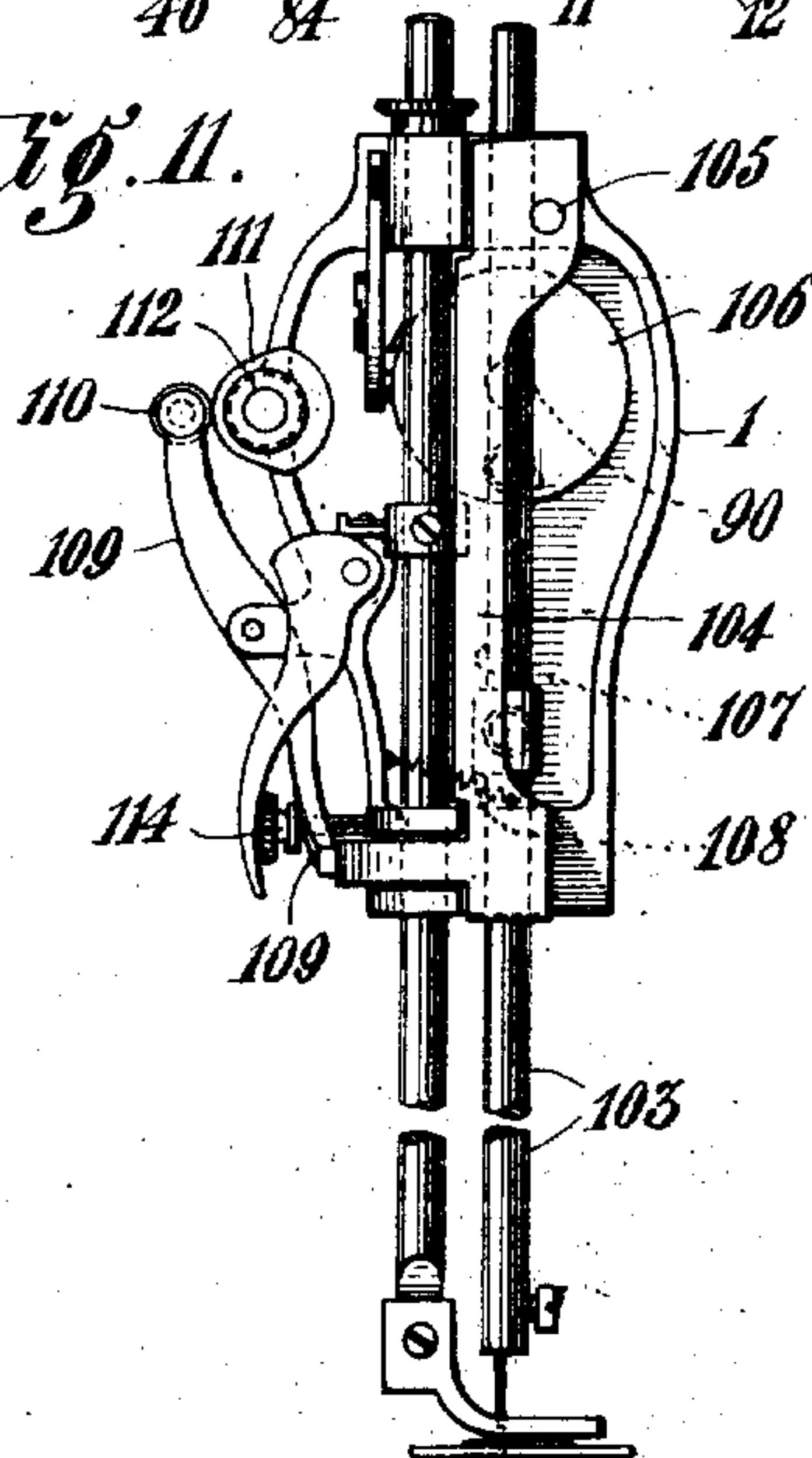


Fig. 11.



Witnesses

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SEWING MACHINERY.
APPLICATION FILED JAN. 25, 1907.

8 SHEETS—SHEET 8.

Fig. 12.

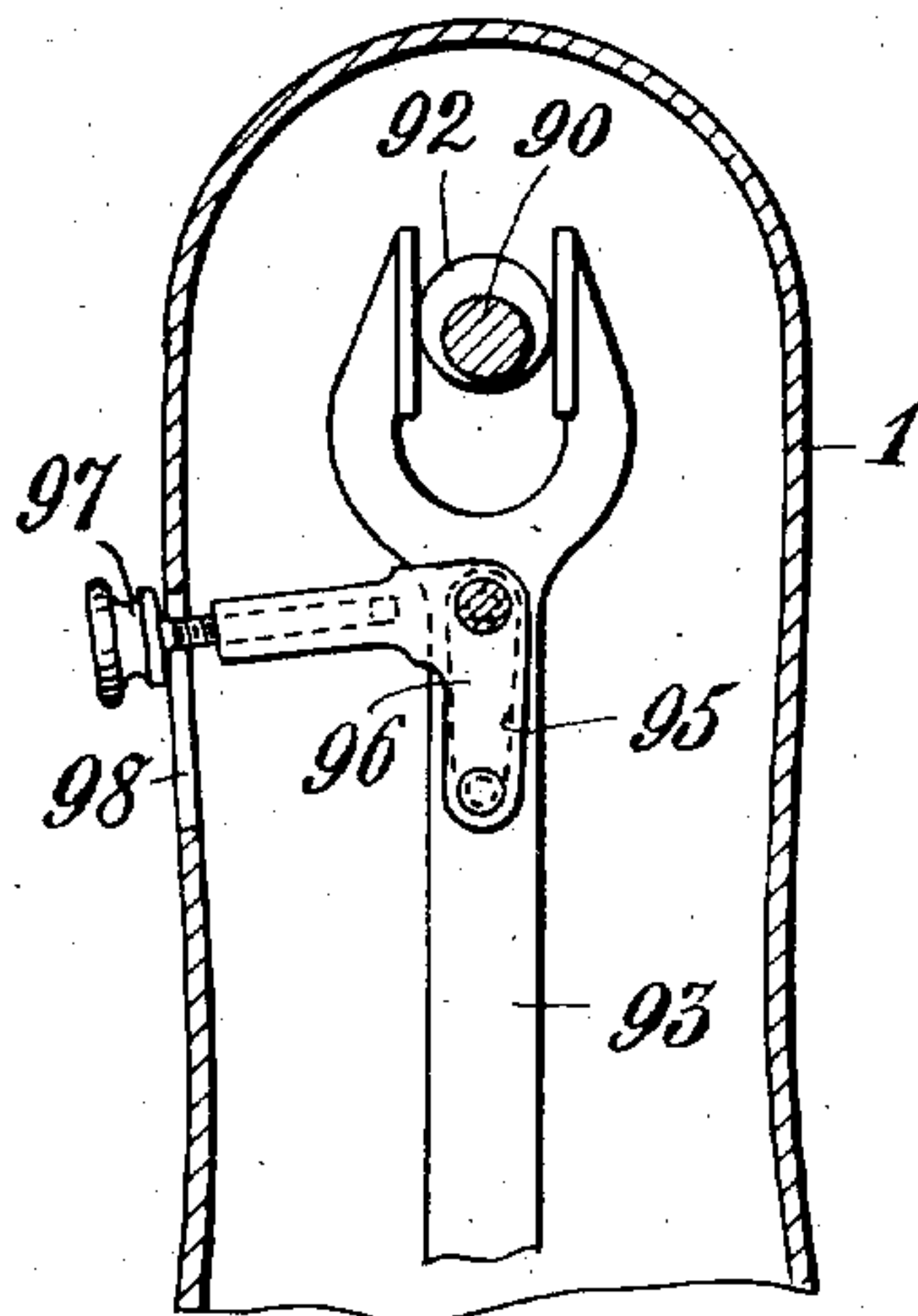
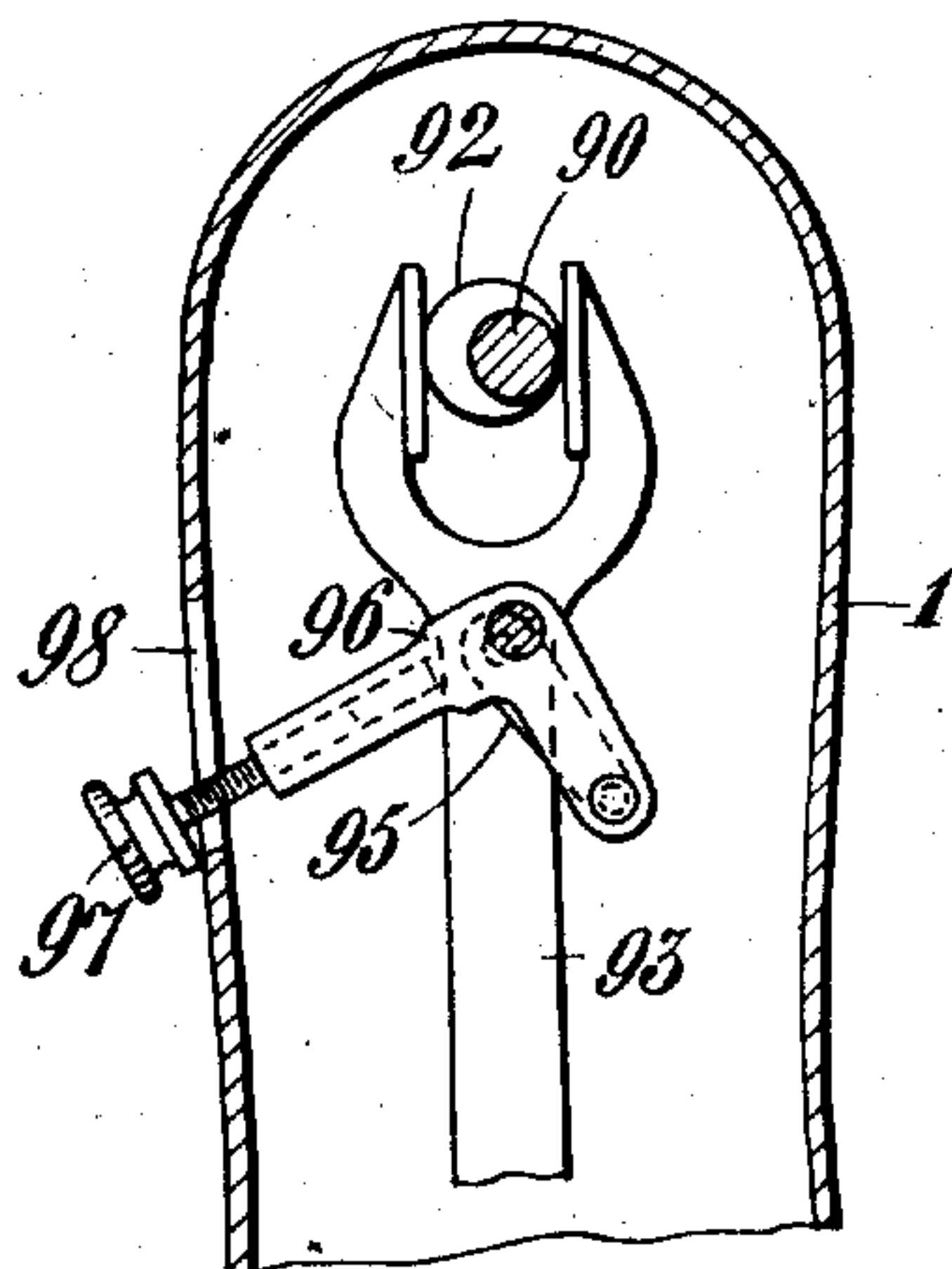


Fig. 13.



Witnesses

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UNITED STATES PATENT OFFICE.

CARL JOHAN PÅLSSON, OF CHRISTIANIA, NORWAY, ASSIGNOR TO CARL GUNNAR ANDERSON,
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SEWING MACHINERY.

No. 897,553.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed January 25, 1907. Serial No. 353,984.

To all whom it may concern:

Be it known that I, CARL JOHAN PÅLSSON, a subject of the King of Sweden, and resident of Christiania, Norway, have invented new and useful Improvements in Sewing Machinery, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof.

This invention relates to improvements in sewing machinery.

The object of the invention is to provide a machine for stitching button holes or for plain stitching, as may be desired.

In carrying out my invention I make use of a machine having a stationary work-holding clamp, a stitching frame movable in relation to the table, means for moving the said stitching frame in such a manner as to cause the needle to move along the outline of a button-hole, and means for imparting to the needle-bar a lateral vibration adapted for side stitching. Such machines are before known but they are all adapted only for stitching button-holes and cannot be used for plain-stitching.

The present invention consists, chiefly, in so arranging the frame-operating means and the means for vibrating the needle-bar laterally that they can be readily thrown out of operation, and, further, in making the work-holding clamp easily detachable, the machine being, moreover, provided with means for feeding the work as in usual plain-stitching machines, so as to be easily convertible for plain-stitching, or for button-hole stitching, as may be desired.

The invention, further, consists in a novel arrangement of the movable stitching frame. As before stated, movable stitching frames are before known, but such frames were hitherto journaled in a horizontally swinging crane or bracket in such a manner as to be able to swing about a vertical axis therein. In such an arrangement it is of importance to most accurately balance the frame, and even in such case oblique pressures cannot always be avoided by which the pivots etc. will be irregularly worn necessitating adjustment and repair. According to this invention, these drawbacks are obviated by the whole stitching frame being slidably supported on the table so as to be carried directly by the latter. By this means a practically sufficient stability is obtained which has hitherto not been possible to obtain.

In the drawings, Figure 1 is a plan-view of the machine showing the rear guide and parts of the mechanism for transmitting motion from the operating mechanism to the stitching parts of the frame, and also means for fastening the frame to the table, when the machine is to be used for plain stitching. Fig. 2 is a side view of the mechanism for operating the stitching frame and of the work-holding clamp and cutting device, the outlines of the frame and of the table being shown by dotted lines. Fig. 3 is a plan view of the same. Fig. 4 is a bottom plan-view of the operating mechanism. Fig. 5 is a rear view of the operating mechanism. Fig. 6 is a detail view of a cam-grooved disk serving to impart to the frame the aforesaid motion causing the needle-bar to describe a movement corresponding to the outline of the buttonhole. Fig. 7 is a detail view of the mechanism for rotating the said cam-grooved disk. Fig. 8 is a rear view of the mechanism for throwing the machine out of operation. Fig. 9 is a side view of the said latter mechanism. Fig. 10 is a side-view of the table and the stitching frame, parts thereof being removed in order to show the operating mechanism and the connections between the said mechanism and the stitching parts. Fig. 11 is a front view of the stitching-frame, the fore protecting-plate being removed so as to uncover the stitching parts inclosed within the head of the stitching frame. Figs. 12 and 13 are cross-sectional views of the upper part of the hollow standard of the frame showing the upper part of the lever actuating the rocking shaft of the machine and the means for throwing said lever into operative position (Fig. 13) or out of such position (Fig. 12).

Referring to the drawings, the frame 1 of the machine is slidably mounted on the table 2, the movement of the said frame being controlled by a mechanism secured to the underside of the table, while the rear end of the frame is guided by a tongue or tailpiece 3 (Figs. 1 and 10) extending backward and provided with a slot 4 engaging a pivot 5 secured to the table.

In the embodiment illustrated, the mechanism for moving the frame 1 consists of a cam-grooved disk 6, which is rotatably mounted on a pivot 7 secured to a plate 8 fastened to the underside of the table 2 (see Figs. 2, 3, 4 and 5). For transmitting the longitudinal movements to the frame 1 cor-

responding to the sides of the buttonhole, the said disk 6 is, on the under side, provided with a cam-groove 9, Fig. 4, which engages a pin 10, Fig. 5, attached to the end of an arm 11 fulcrumed on a pivot 12 fixed to the plate 8. The said arm 11 is rigidly fixed to the bottom end of a hub or sleeve 13 (Fig. 5), to the upper end of which is rigidly fixed another arm 14. The end of the latter has a pin 15, Figs. 3 and 4, which engages a slot 16 formed in plate 17 secured to the frame 1 with screws 18 (Fig. 5). The pin 15 is mounted on a separate part 19 which is secured to the arm 14 by means of a screw 20 engaging a slot 21 in the said arm 14 so as to allow of adjustment of the operating length of the arm 14 for different lengths of buttonholes to be stitched.

In order to perform the transverse movement of the frame 1 so as to shift the stitching needle from the one side of the buttonhole to the other, after the former has been finished, the said disk 6 is, on the top side, provided with another cam-groove 22 (Fig. 6) which engages a pin 23 (Figs. 3, 4, and 5) attached to an arm 24 rigidly fixed to a sleeve, or hub, which is mounted on a pivot 26 secured to the base plate 8, the said hub being provided with an arm 27 having a pin 28 engaging a slot 29 in the aforesaid plate 17. For the adjustment of the transverse movement of the frame 1 the pin 28 is mounted on a separate part 30 secured to the arm 27 by means of a screw 31 inserted through a slot 32 in the said arm. The cam-groove 22 (Fig. 6) is composed of two semicircular parts 33 and 34 corresponding to the movements of the needle along the sides of the buttonhole, and of two parts 35 connecting the said semicircular parts and producing the movements of the needle at the buttonhole ends. Obviously, the relative position of the cam-grooves 9 and 22 must be such that the different movements of the needle during one revolution of the disk succeed each other. Fig. 3 shows the position of the parts during the travel of the needle from the one side of the buttonhole to the other.

The disk 6 is operated from the oscillating shaft 36 (Figs. 2, 3, 4, 5 and 10), and the mechanism for turning the said disk consists, in the embodiment illustrated, of a plate 37 (Fig. 7) having the shape of a curved pawl, said plate having two pegs or knobs 38 engaging the flange or rim 39 of a disk formed by an extension of the hub 40 of the disk 6. The plate 37 is connected to a rod 41, and the latter is connected to an arm 42 (Figs. 4 and 5) secured to the shaft 36. The connection between the rod 41 and the arm 42 consists in the forked end of the rod 41 loosely engaging a cross-pin inserted through the split end of the arm 42 so that the arm 42 operates the plate 37 only when pushing the rod 41 in the direction of the arrow, Fig. 7. In order to

pull the plate back again, I employ a coiled spring 43 attached to the plate 37 and to the base plate 8, Fig. 4. The positions of the knobs 38 in relation to the rim 39 are such that the knobs will firmly clamp the rim and cause the disk to turn, when the rod 41 acts, in the direction of the arrow (Fig. 7), on the end of the plate 37 connected thereto. When the arm 42 swings backwardly, the spring 43 turns the plate 37 with the knobs 38 in relation to the rim 39 so that the plate 37 can be pulled back by the spring 43, the knobs 38 being caused, during this backward movement of the plate 37, to loosely glide along the sides of the rim 39. In order to prevent the disk 6 from turning backwardly with the plate 37 I provide a detent consisting of a clamp 44 mounted between pins from the base plate 8 and provided with a recess having slanting sides 45 which are held against the sides of the rim 39 by a spring 46 in such a manner as to prevent the backward turning of the disk but to offer no resistance against the turning of the disk in the direction of the arrow.

The work holding clamp (Figs. 2, 3 and 10) is detachably fastened to the table and held stationary with respect to the stitching mechanism. In the embodiment illustrated it consists of a plate 46 attached to a cross plate 47 resting on supports 48 secured to the table by nuts 49, the plate 46 being, thereby, kept in such a position as to lie flat on the top of the bottom plate of the frame of the machine. Carried by a shaft 51 journaled in brackets 50 mounted on the top side of the cross plate 47 (Figs. 2 and 3) or directly on the plate 46 (Fig. 10) is a part 52 carrying the upper plate 53 of the work holding clamp. 54 is a spring pressing upon an extension of the plate 53 on the other side of the shaft 51 so as to press the toothed front end of the latter against the cloth. In Figs. 2 and 3, the said extension consists of a separate part 55 screwed onto the top of the plate 53. In order to raise the plate 53, when the cloth is to be inserted, or removed, I provide an eccentric cam 56 mounted on a shaft 57 journaled in bearings 58 on the plate 46. For operating the cam 56 the shaft 57 is provided with a handle 59.

The device for cutting the button hole, after the stitching has been performed, may consist of a cutter 60 mounted at the end of a rod 61. In the embodiment illustrated the said rod is, at its other end, journaled around a shaft 62 mounted in arms 63 on a shaft 64 journaled in brackets 65 on the cross plate 47. For enabling the shaft 64 to be turned it is provided with a handle 66. For guiding the cutter 60 during the cutting operation I provide, on the holding plate 53, a cam 67 adapted to engage a cam 68 on the knife holder 61, the latter cam 68 being adjustable for the purpose of enabling the length of the

cut to be regulated. The rod 61 is, suitably, made in two parts connected by a union 69 so as to enable the length of the said rod to be adjusted.

5 In order to automatically stop the motion of the machine, when the stitching of a button-hole is finished, there may be used a mechanism, suitably consisting of a hook 70, Figs. 8 and 9, engaging the driving cord.
 10 Said hook is shown secured to a shaft 71 journaled in a bracket 72 attached to the frame 1 of the machine. The shaft 71 has a crank 73, to which is connected a vertical post 74 passing down through an aperture in the bottom plate of the frame 1. The said post 74
 15 is provided with a projection 75 engaging a plate 76 during the stitching operation, when the cord is running on a fixed pulley 77, the said projection 75 being held in engagement
 20 with the plate 76 by a spring 78. A coiled spring 79 is inserted on the said post 74, said spring bearing against the bottom plate of the frame of the machine and against the head of the post so as to exert an upward
 25 pressure on the post and raise the latter, when it is thrown out of engagement with the plate 76, thereby turning the shaft 71 and the hook 70 so as to shift the driving cord from the fixed pulley 77 onto the loose pulley
 30 (the position of the parts as shown in Figs. 7 and 8). In order to effect the automatic disengagement of the post and the plate 76 I provide an arm 80, the free end of which engages the lower extremity of the post 74, said
 35 arm 80, Figs. 2, 3, 4, 5 and 8, being attached to a sleeve or hub 81 mounted on a pivot 82 fastened to the base plate 8. Attached to the said hub 81 is another arm 83 adapted to be engaged by a knob 84 on the circumference of the cam-grooved disk 6. In the embodiment illustrated, the arms 80 and 83
 40 both form parts of a single, strong wire attached to the hub 81. The arm 83 is held by a spring 85 against the circumference of the disk 6. When the stitching of the button-hole is finished, the knob 84 engages the arm 83 and turns the arms 83 and 80, the latter
 45 throwing the post 74 out of engagement with the plate 76. The post is then raised, thereby turning the shaft 71 and the hook 70, which latter moves the cord onto the loose pulley.
 50

For the purpose of maintaining the engagement of the post 74 with the plate 76, when
 55 it is desired to perform a double stitching around the button hole, I provide the said shaft 71 with an extension, or handle 86, so as to be able to press down the post during the turning of the arm 80, whereby the engagement is continued until the next disengaging operation of the said arm.
 60

The rocking shaft 36 is driven from a rotary shaft 90 (Fig. 10) journaled centrally in the overhanging upper part of the stitching
 65 frame 1 and carrying the usual hand-wheel

91 and the pulley 77 for transmitting motion from the main shaft of the machine to the said rotary shaft 90. The connection between the rotary shaft 90 and the rocking shaft 36 may be of any kind suitable for the
 70 purpose. In the embodiment illustrated in Fig. 10 the shaft 90 has a cam 92 attached thereto, said cam being engaged by the upper, forked end of a lever 93 (see also Figs. 12 and 13) pivotally connected, at its lower end,
 75 to the end of a crank-arm secured to the rocking shaft. (In Fig. 10 only the hub 94 of the said crank-arm is visible). The lever 93 is pivotally connected, at a point somewhat beneath the upper, forked end thereof, to the
 80 free end of a link 95 pivoted to the end of one arm of an angle-lever 96 journaled in the frame. The other arm of the angle-lever 96 has a threaded hole adapted to receive a screw 97 inserted through a longitudinal slot
 85 98 in the frame and having a head adapted to tighten against the outer edge of the slot 98, when the screw 97 is screwed into the hole at the end of the angle-lever 96. By this means the angle-lever 96 can be secured in different
 90 positions so that the center of oscillation of the link 95 can be raised or lowered. When the center of oscillation of the link 95 is raised, (Fig. 13) the lever 93 is caused to move up
 95 and down during the lateral vibration imparted to it by the rotary cam 92, the shaft 36 being thereby caused to oscillate and move the frame. If, on the contrary, the center of oscillation of the link 95 is lowered,
 100 (Fig. 12) the lever 93 is caused to swing laterally without moving up and down sufficiently to cause the shaft 36 to oscillate. Thus, the mechanism imparting to the frame its sliding motion can be thrown into or out
 105 of action by simply securing the angle-lever 96 in one or another position.

The shuttle-mechanism (not shown) is attached to a rocking shaft 99 driven from the rotary shaft 90 by any suitable means. In the
 110 embodiment illustrated, the shaft 90 is bent to a double crank 100 which is engaged by the head of a connecting rod 101 pivotally connected, at its lower end, to the end of an arm 102 projecting from the rocking shaft 99.

Referring to Fig. 11, the needle-bar 103 is
 115 movably mounted in a carrier 104 pivoted, at its upper end, about a pin 105 secured to the head of the frame. The up- and downwardly reciprocating motion of the needle-bar 103 is imparted thereto by a crank-disk 106 secured to the fore end of the rotary shaft 90,
 120 and a connecting rod 107 pivotally connected to the crank-disk and to the needle-bar. The lateral vibration of the needle-bar 103 is obtained by causing the carrier 104 to swing
 125 about its pivot pin 105. To this end, the carrier 104 is kept, by a spring 108, in contact with the lower end of a lever 109 pivotally mounted at the outer side of the frame and carrying, at its upper end, a roller
 130

actuated by a cam 111 secured to a rotary shaft 112 journaled at the outer side of the frame and driven from the shaft 90 by a toothed gearing 113 (Fig. 10). When the machine is put in motion, the cam 111 is caused to rotate and, thereby, causes the lever 109 to swing, by which a lateral vibration is imparted to the carrier 104, the roller 110 being kept in contact with the cam 111 by the spring 108 acting upon the carrier.

Screwed into the side-wall of the head of the stitching frame is a screw 114 the head of which can be made to bear on the lower arm of the lever 109. If the screw 114 is sufficiently tightened against the lever 109, the roller 110 is brought out of reach of the cam 111 so that no lateral vibration of the carrier 104 and needle-bar 103 will take place. By tightening the screw 114, securing the lever 96 in a position in which the center of oscillation of the link 95 is the lowest possible, and removing the work-holding clamp, the machine may, thus, be used for plain stitching. If desired, the position of the frame 1 on the table can be secured by means of two threaded bolts 87 inserted through slots 88 in the bottom plane of the frame and in the table, said slots being long and wide enough to allow for the movements of the frame during the stitching of buttonholes.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a sewing machine, the combination of a frame carrying the stitching mechanism including a needle-bar, of means adapted to actuate said frame bodily so as to impart to it a motion to cause the needle bar to move along the outline of a button-hole, means adapted to impart to the needle-bar a lateral vibration, means for throwing the frame-operating means into or out of operation, and

means for throwing the needle-bar-vibrating means into or out of operation, substantially as and for the purpose set forth.

2. In a sewing machine, the combination of a table, a stitching frame movable bodily in relation to the said table, a needle-bar carried by the said frame, a mechanism adapted to actuate the said frame so as to impart thereto a motion causing the needle-bar to move along the outline of a button-hole, a mechanism adapted to impart to the needle-bar a lateral vibration adapted for side stitching, a stationary work-holding clamp detachably secured to the table, means for throwing the frame-operating mechanism into or out of operation, and means for throwing the needle-bar-vibrating mechanism into or out of operation, substantially as and for the purpose set forth.

3. In a sewing machine, the combination of a table, a stitching frame slidably mounted on the said table, a needle-bar carried by the said frame, a mechanism adapted to actuate the said frame bodily so as to impart thereto a motion causing the needle-bar to move along the outline of a button-hole, a mechanism adapted to impart to the needle-bar a lateral vibration adapted for side stitching, a stationary work-holding clamp detachably secured to the table, means for throwing the frame-operating mechanism into or out of operation, and means for throwing the needle-bar-vibrating mechanism into or out of operation, substantially as and for the purpose set forth.

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

CARL JOHAN PALSSON.

Witnesses:

OSCAR DE FEON,
CARL W. ASP.