

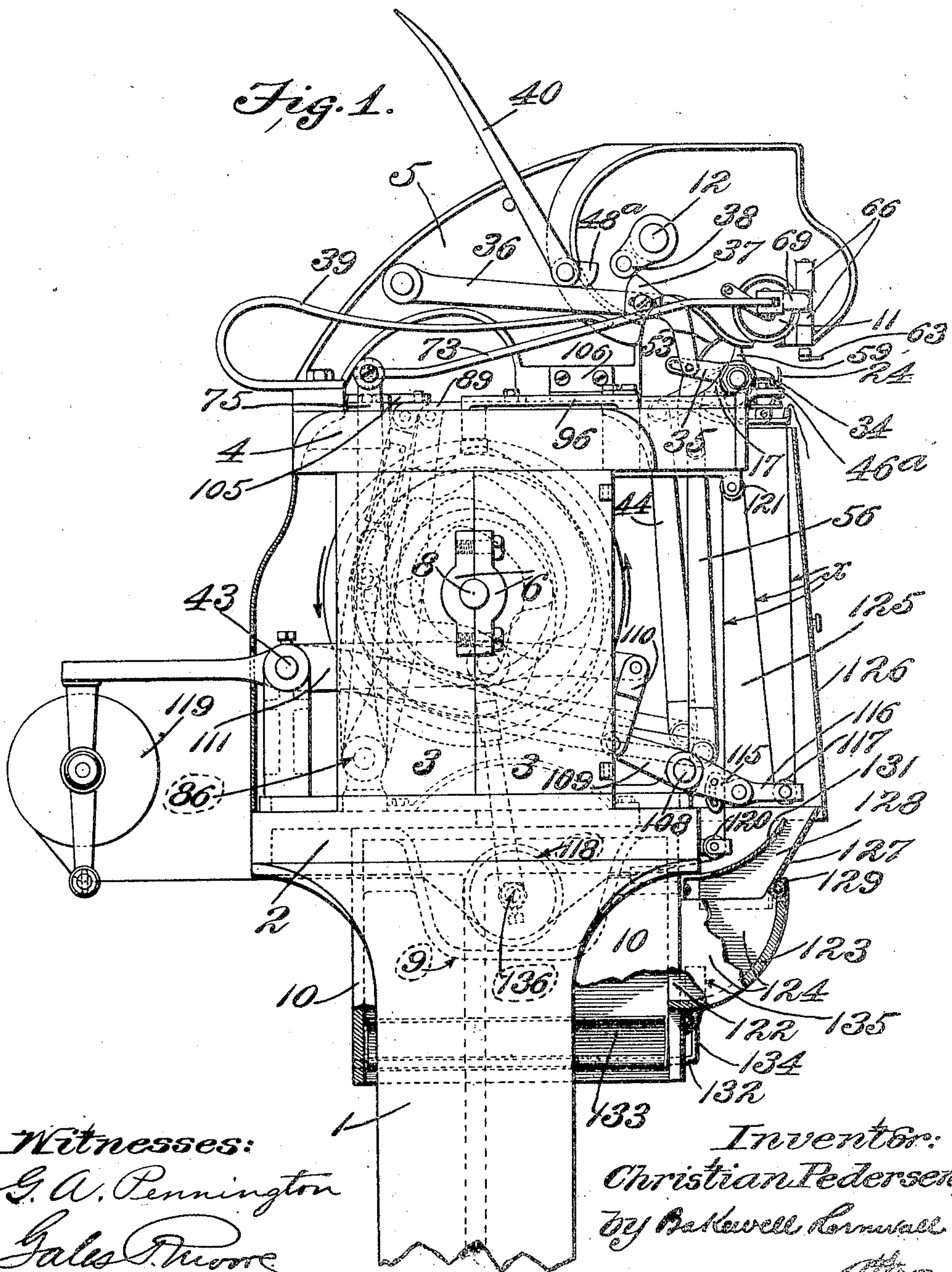
No. 821,826.

PATENTED MAY 29, 1906

C. PEDERSEN.
SEWING MACHINE.

APPLICATION FILED SEPT. 16, 1903.

7 SHEETS—SHEET 1.



Witnesses:
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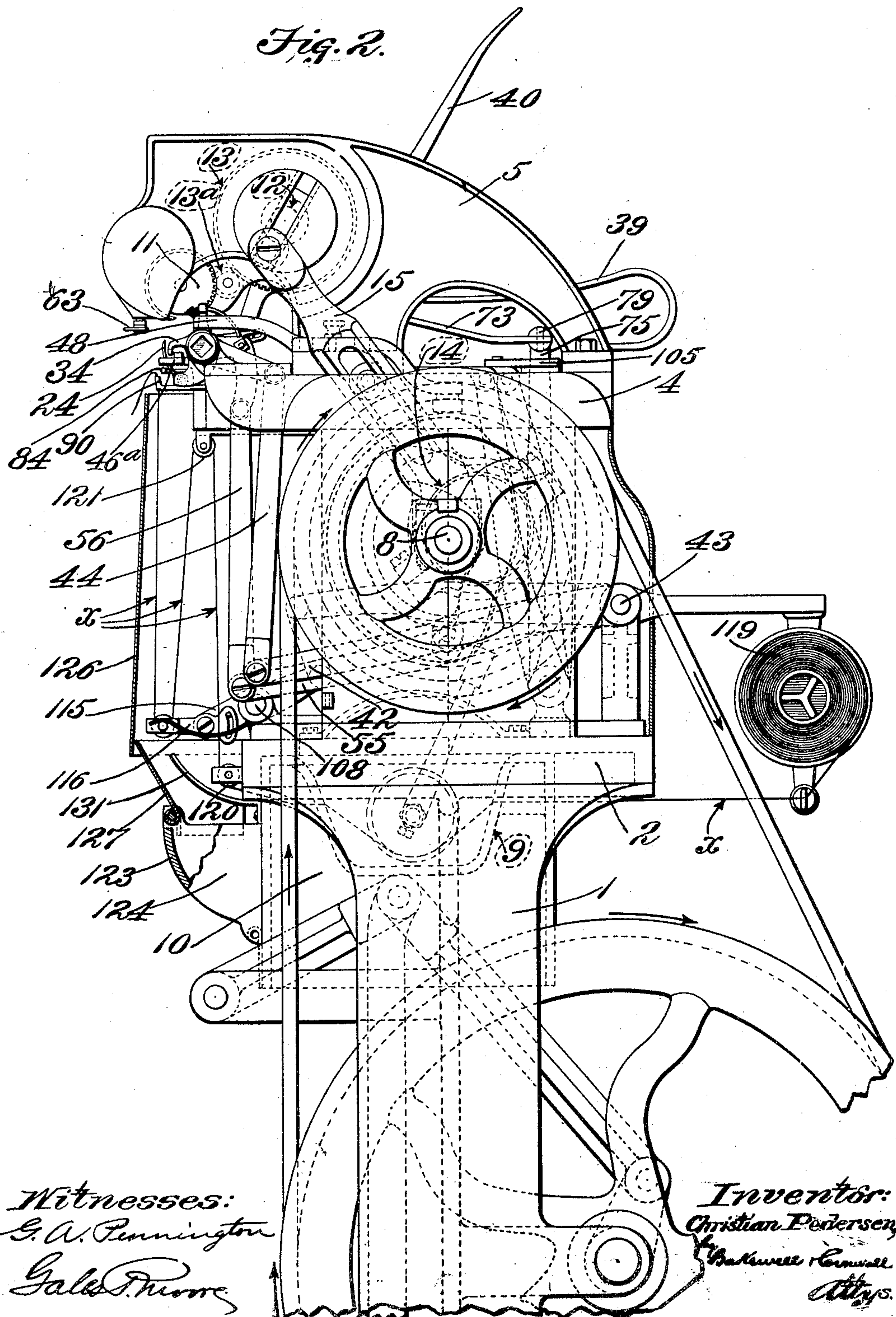
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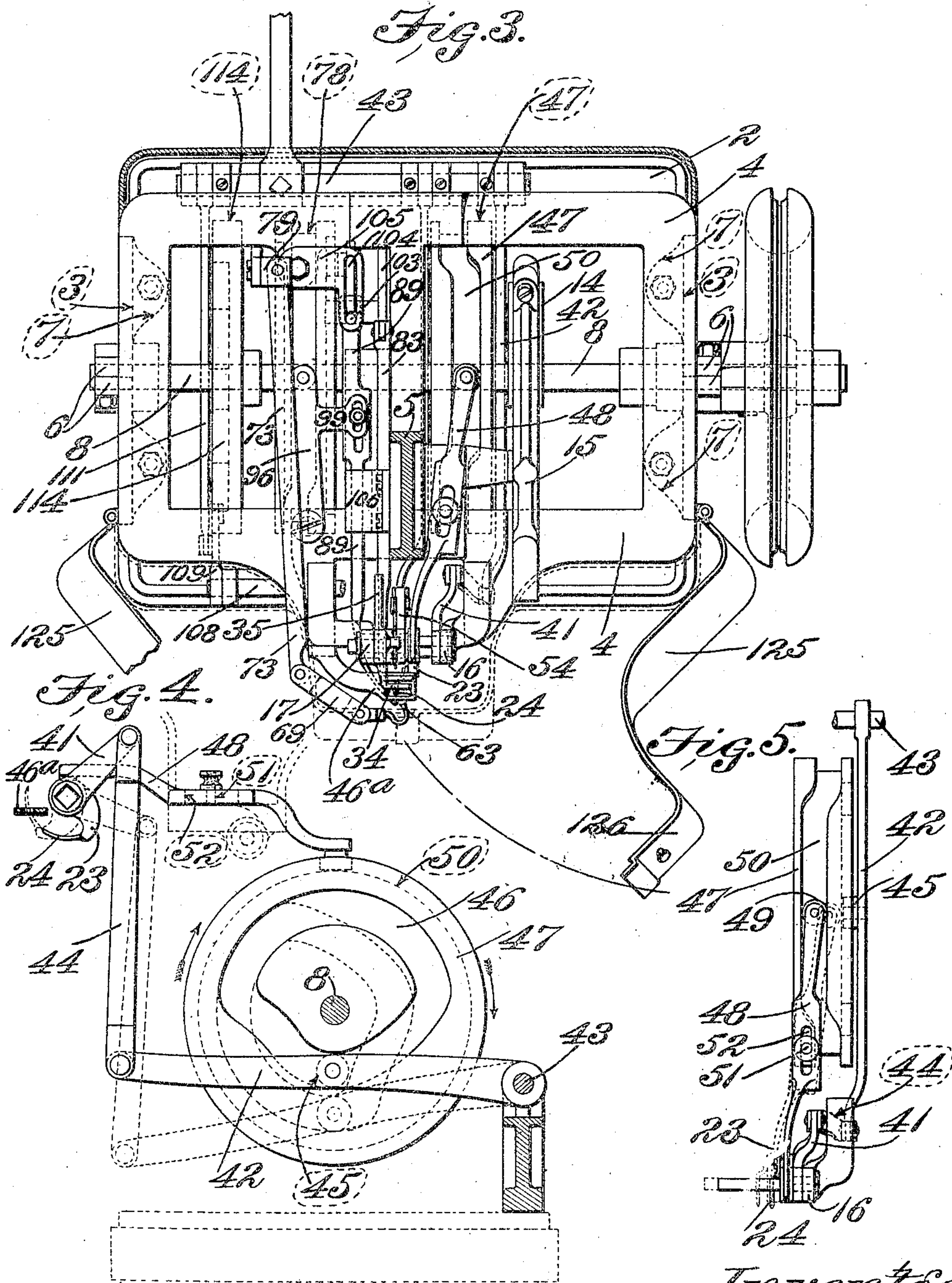
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7 SHEETS—SHEET 3.



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7 SHEETS—SHEET 4.

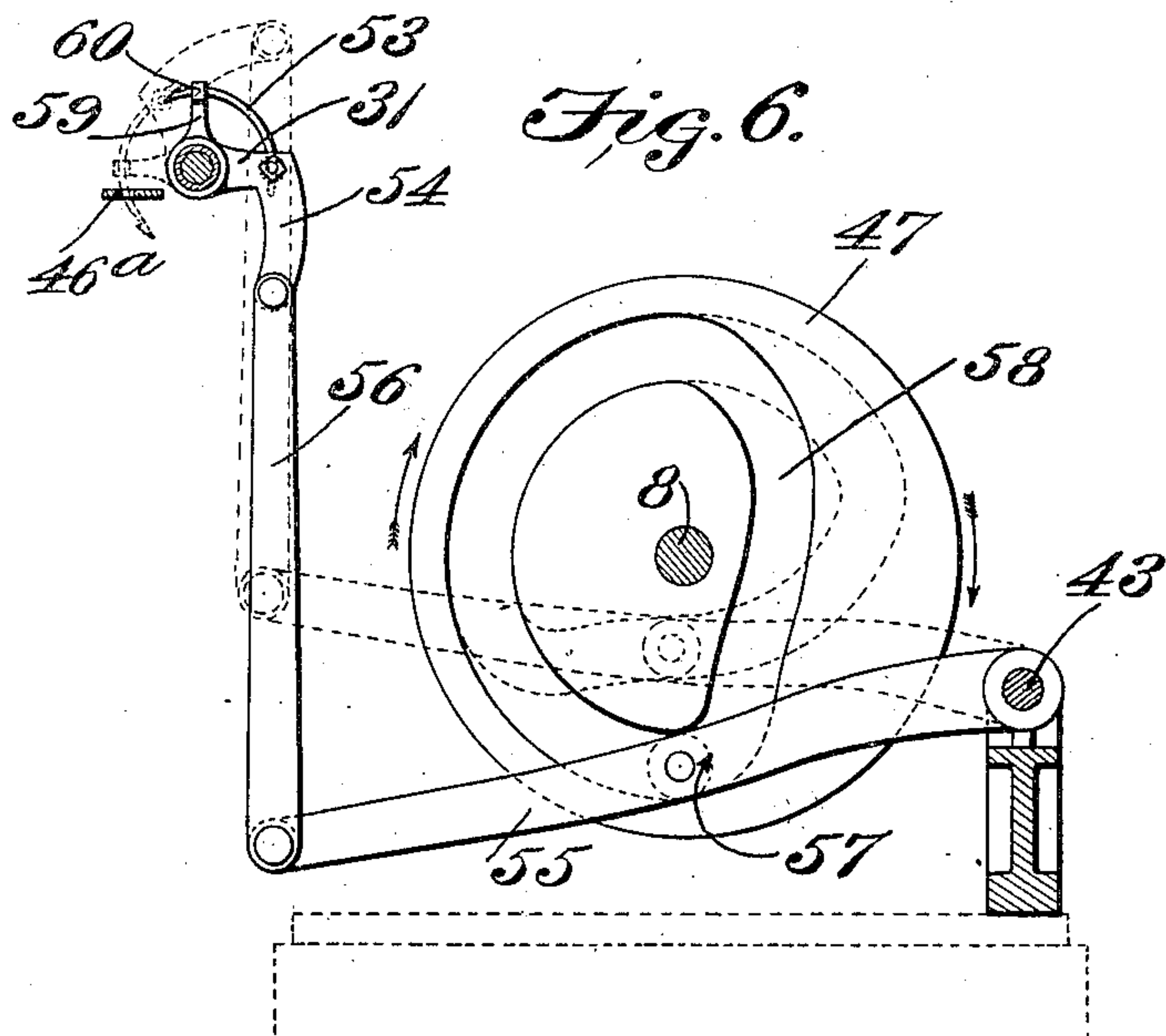


Fig. 7.

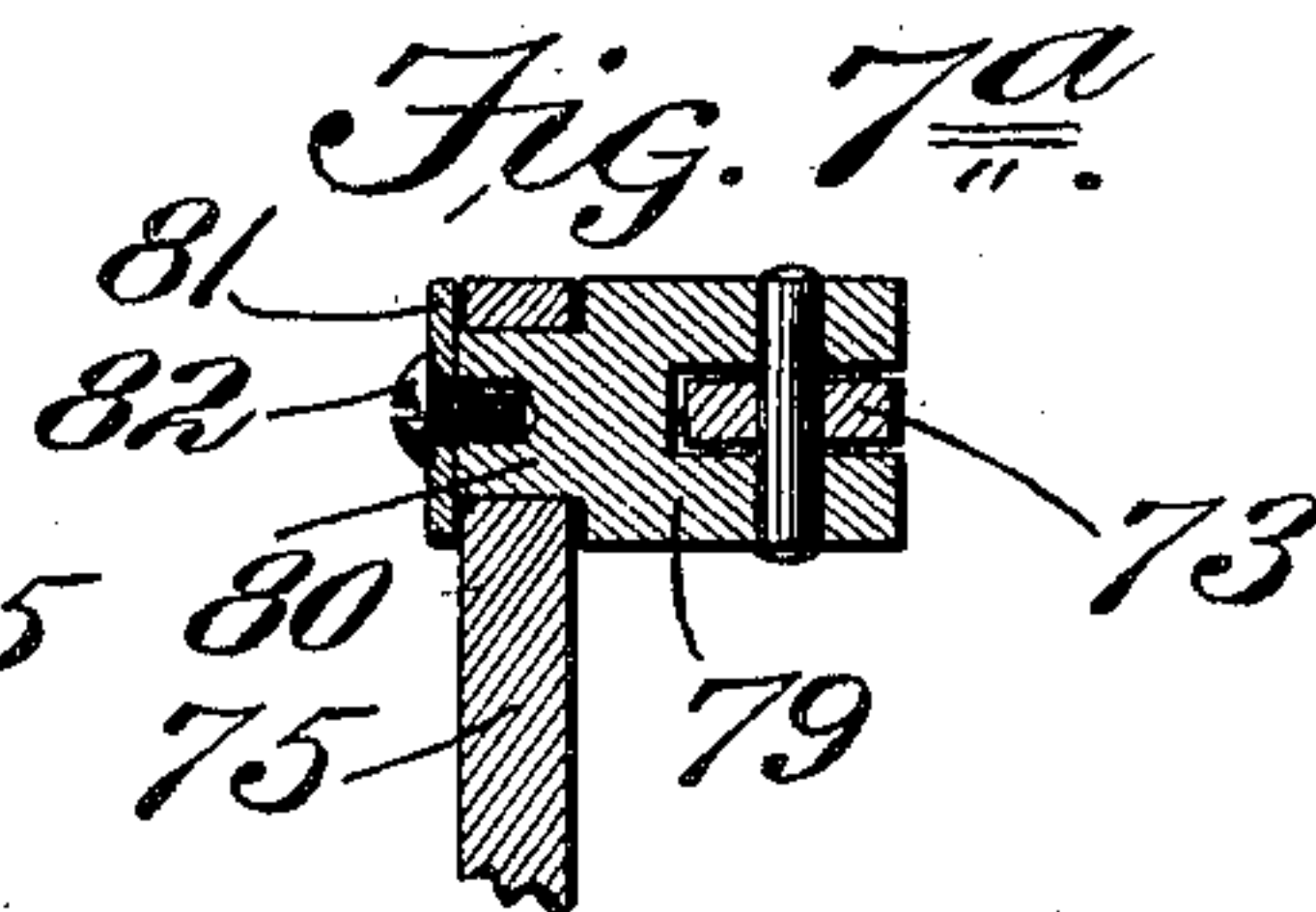
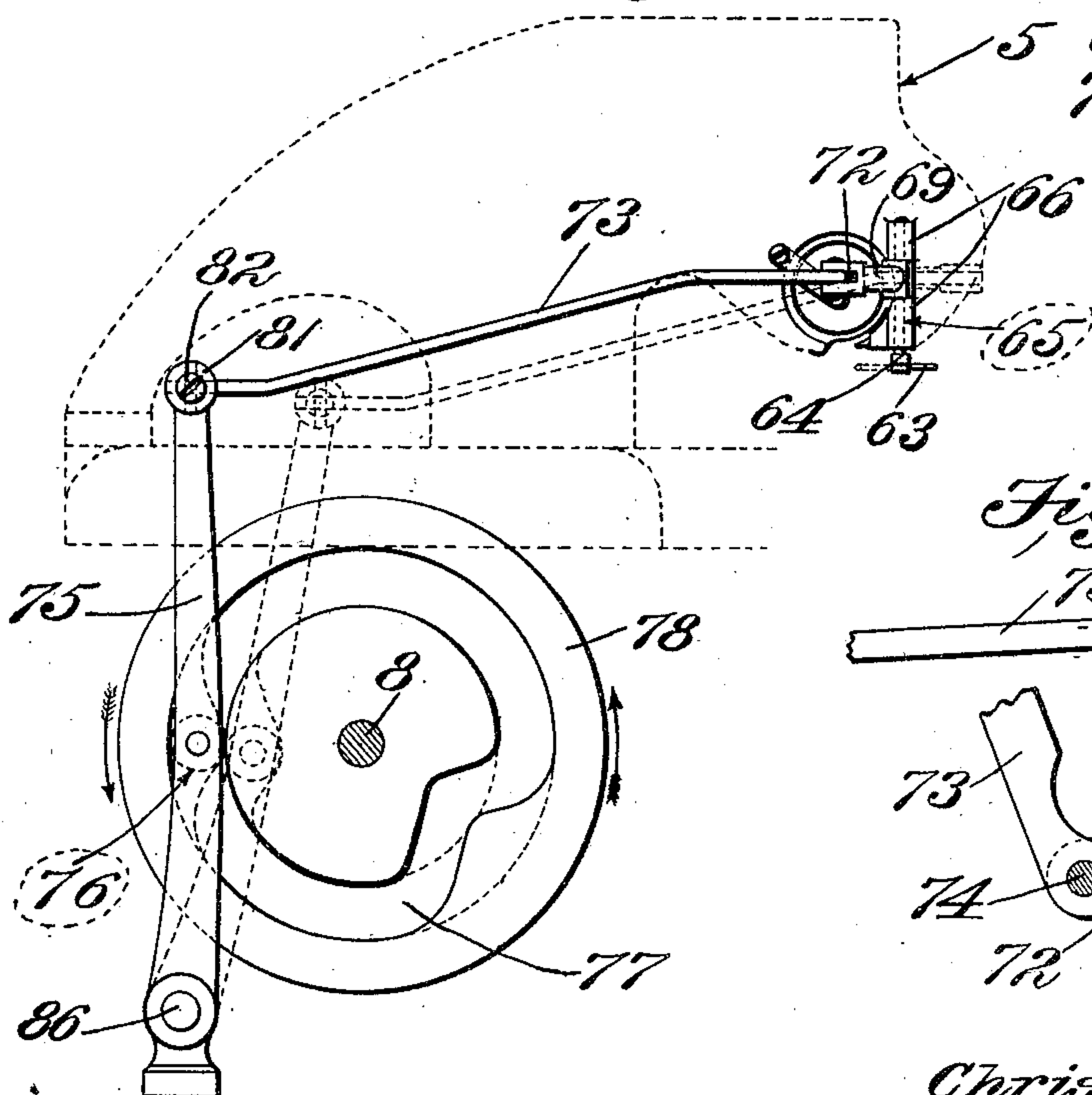


Fig. 8.

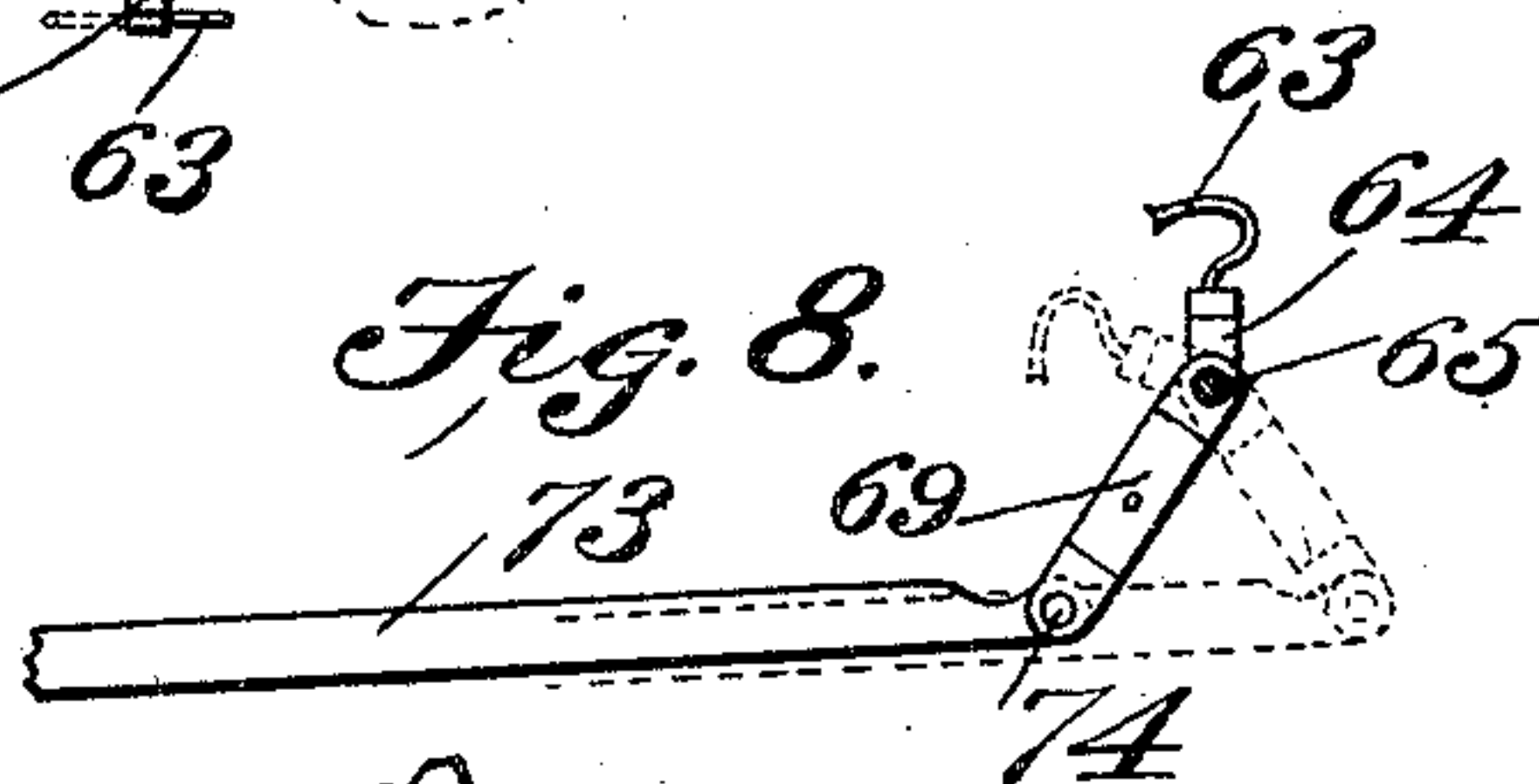
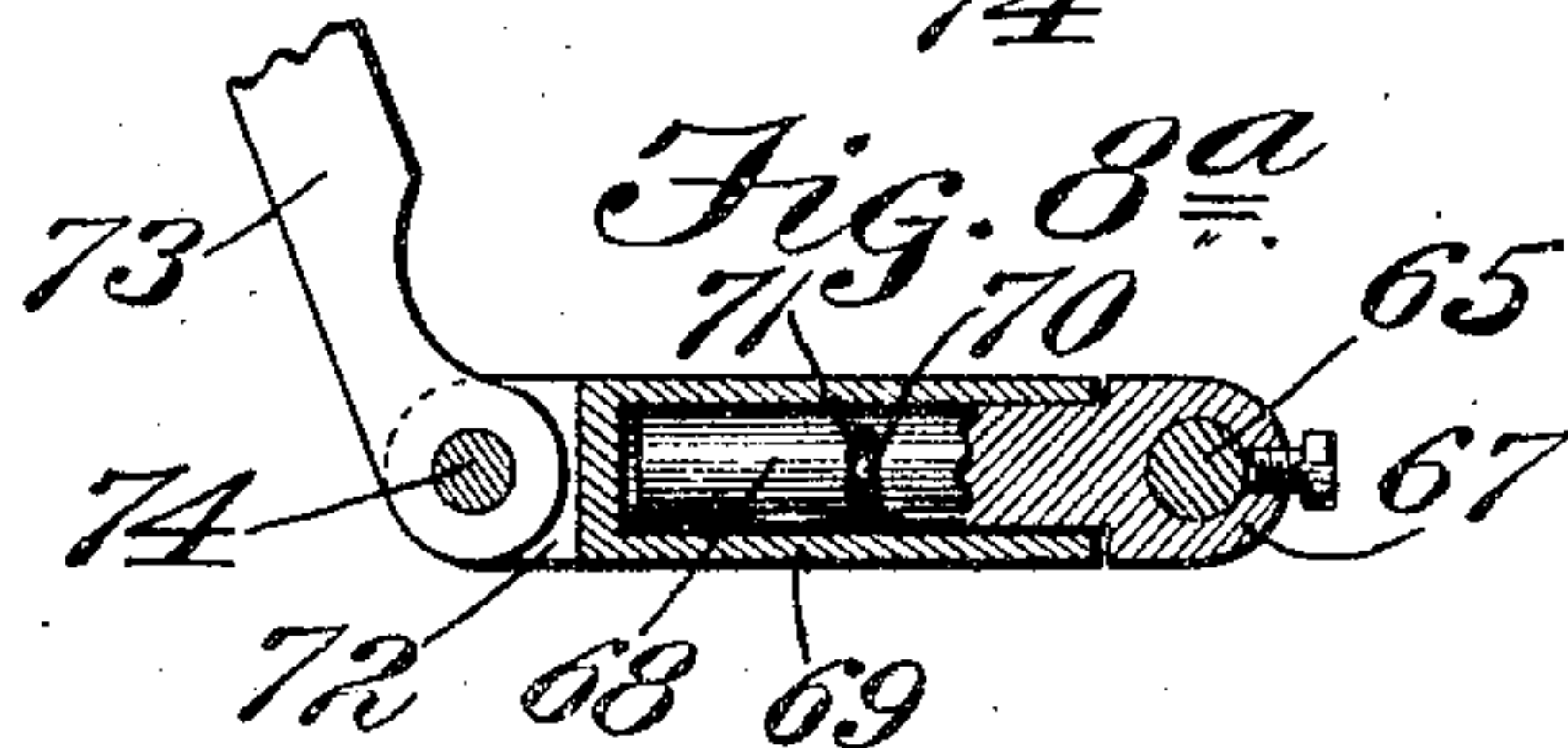


Fig. 8a.



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7 SHEETS—SHEET 5.

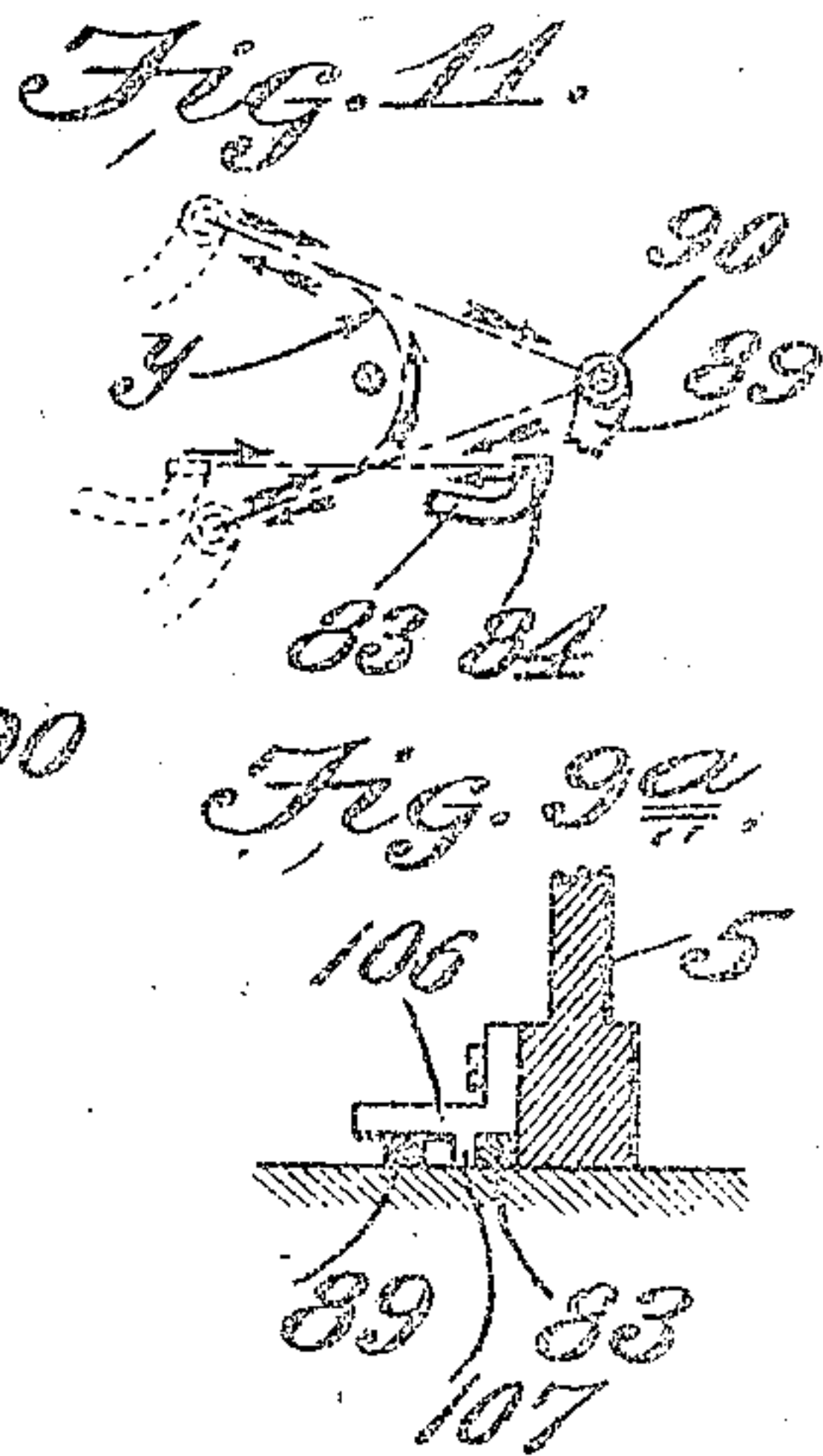
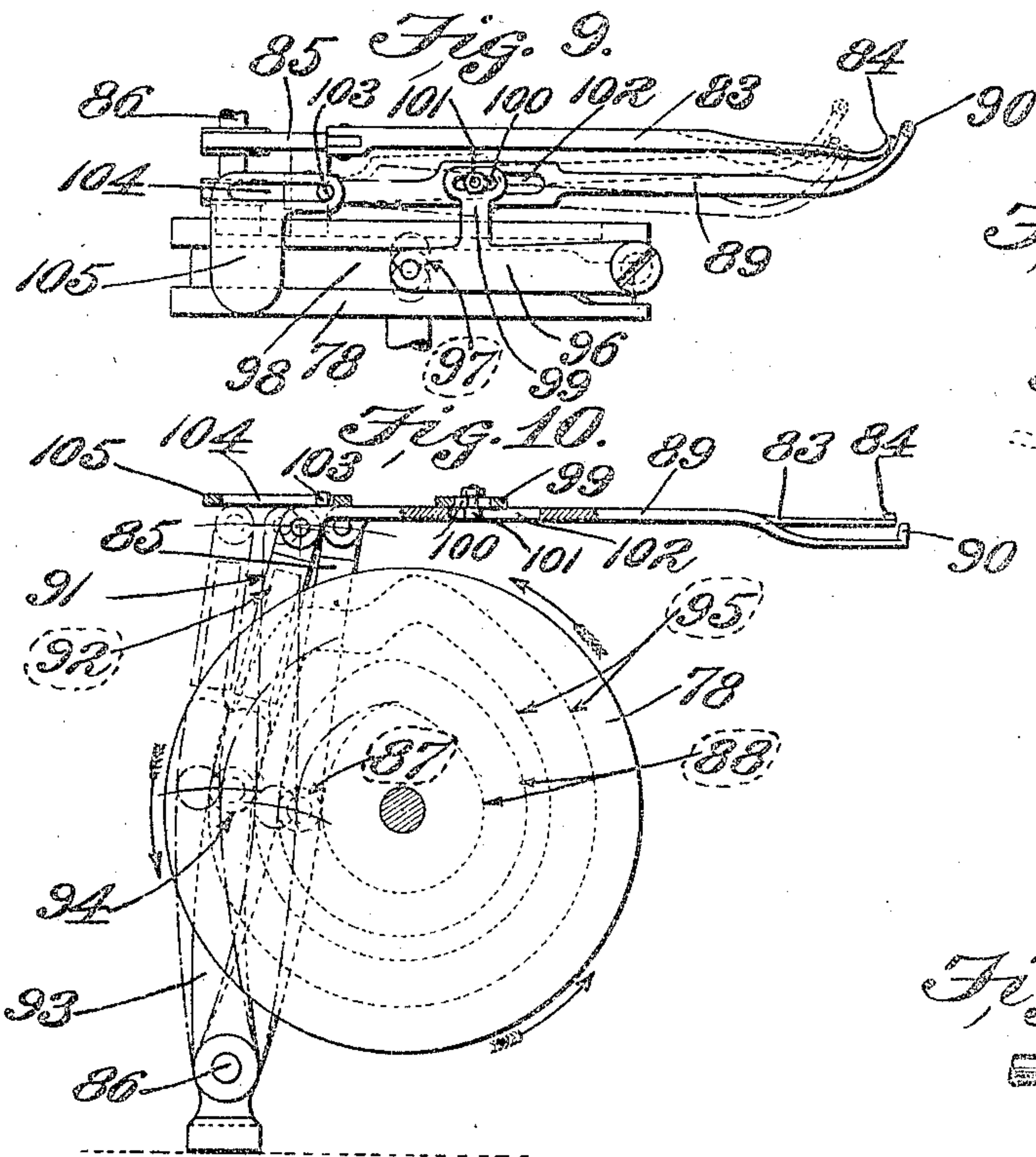
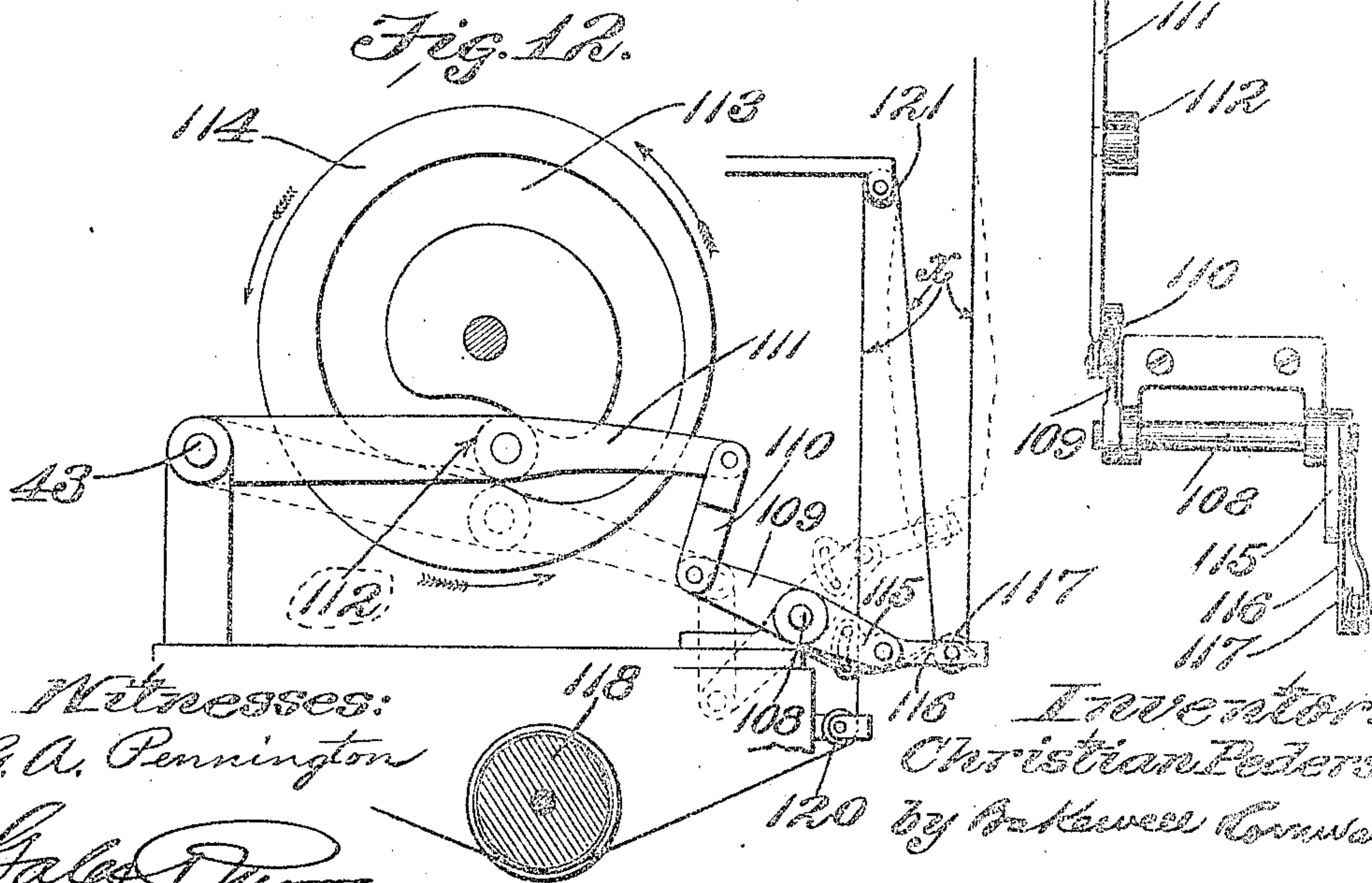


Fig. 12a.

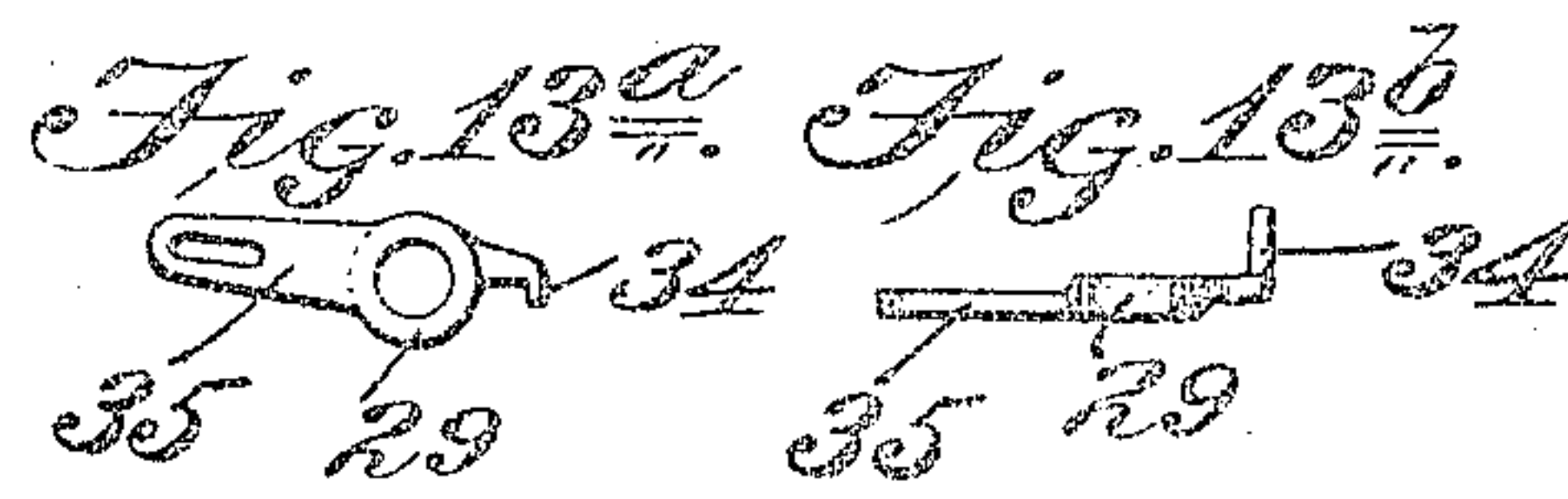
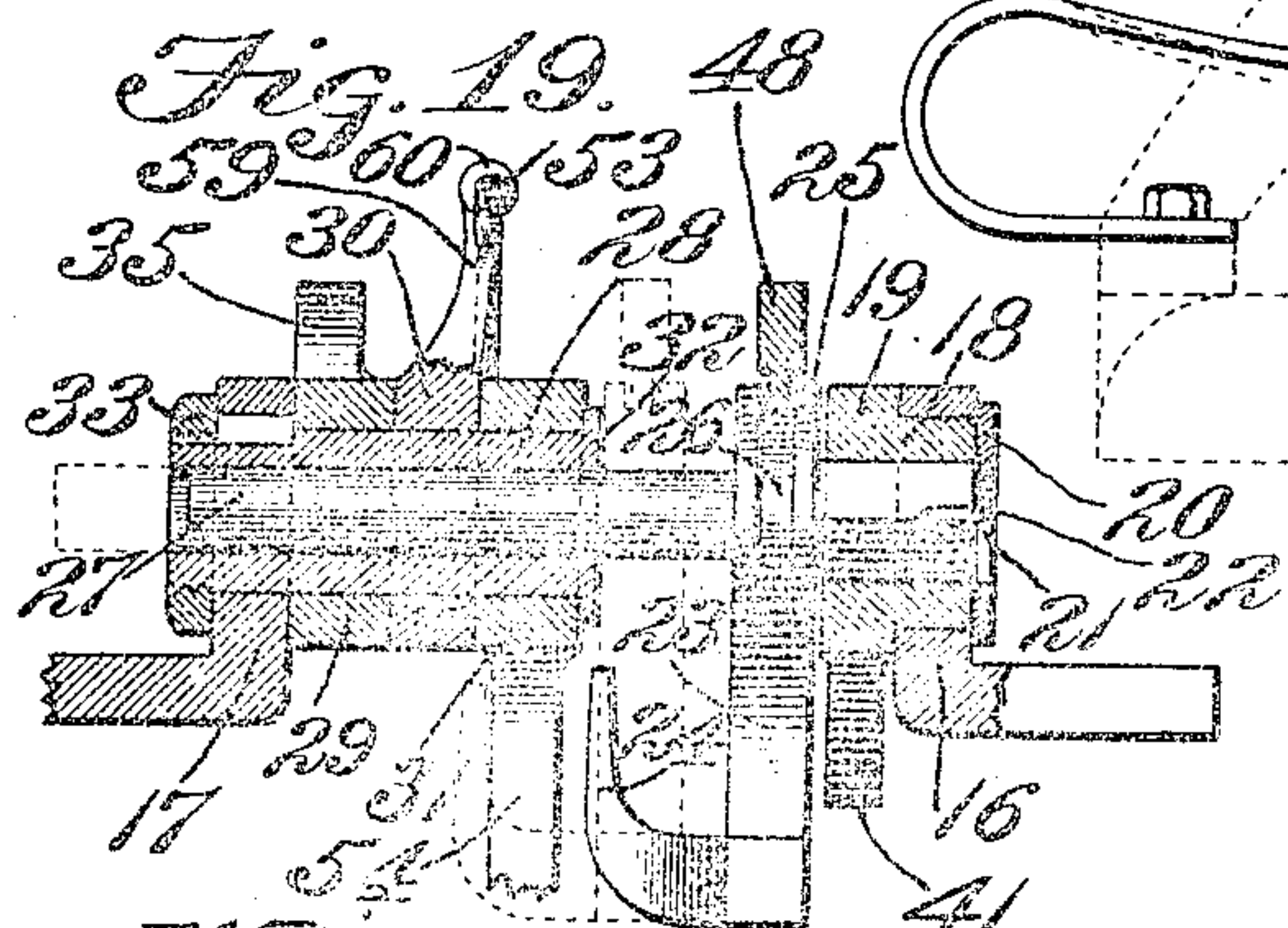
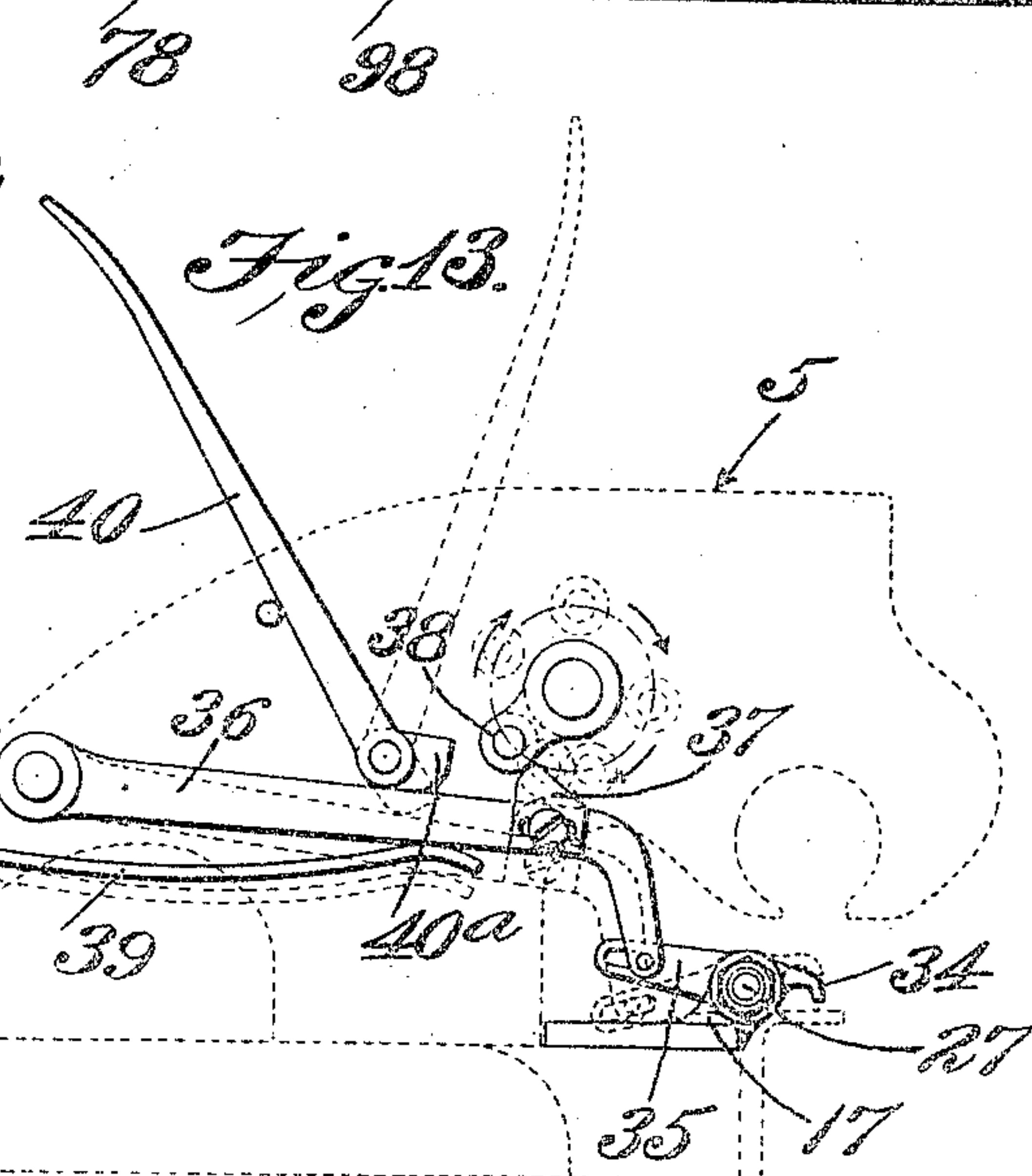
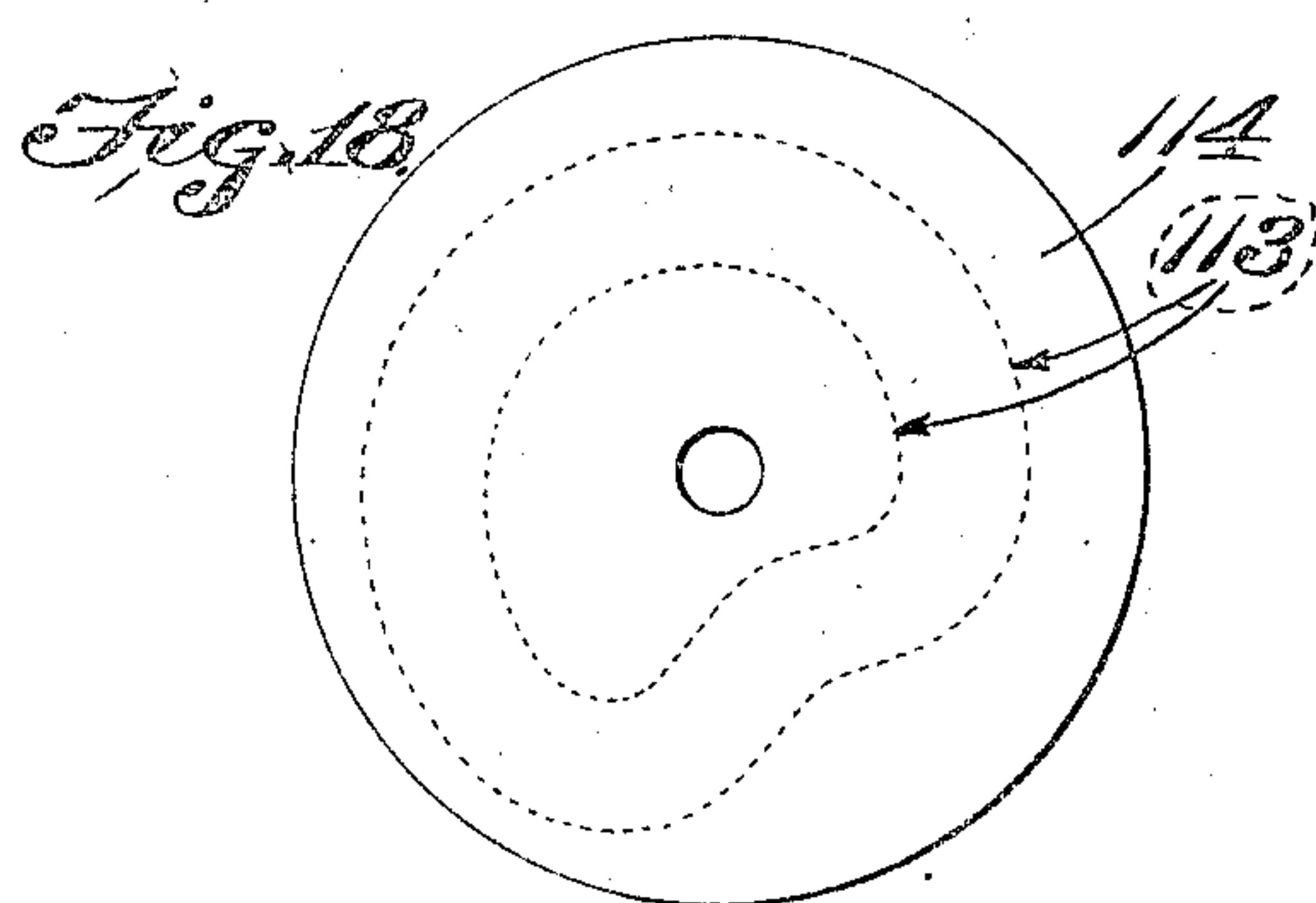
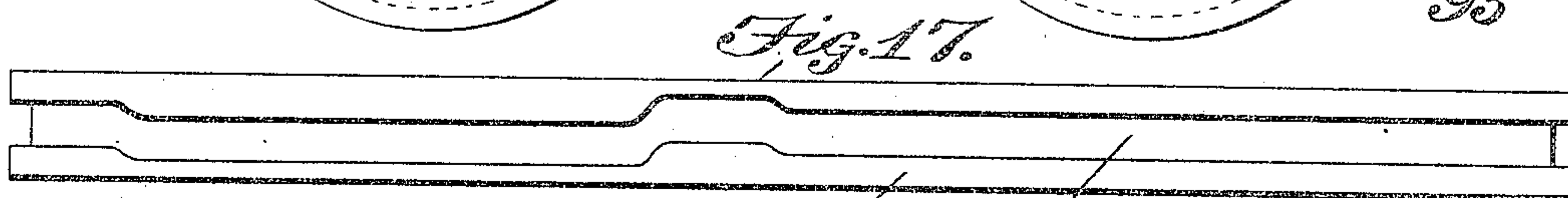
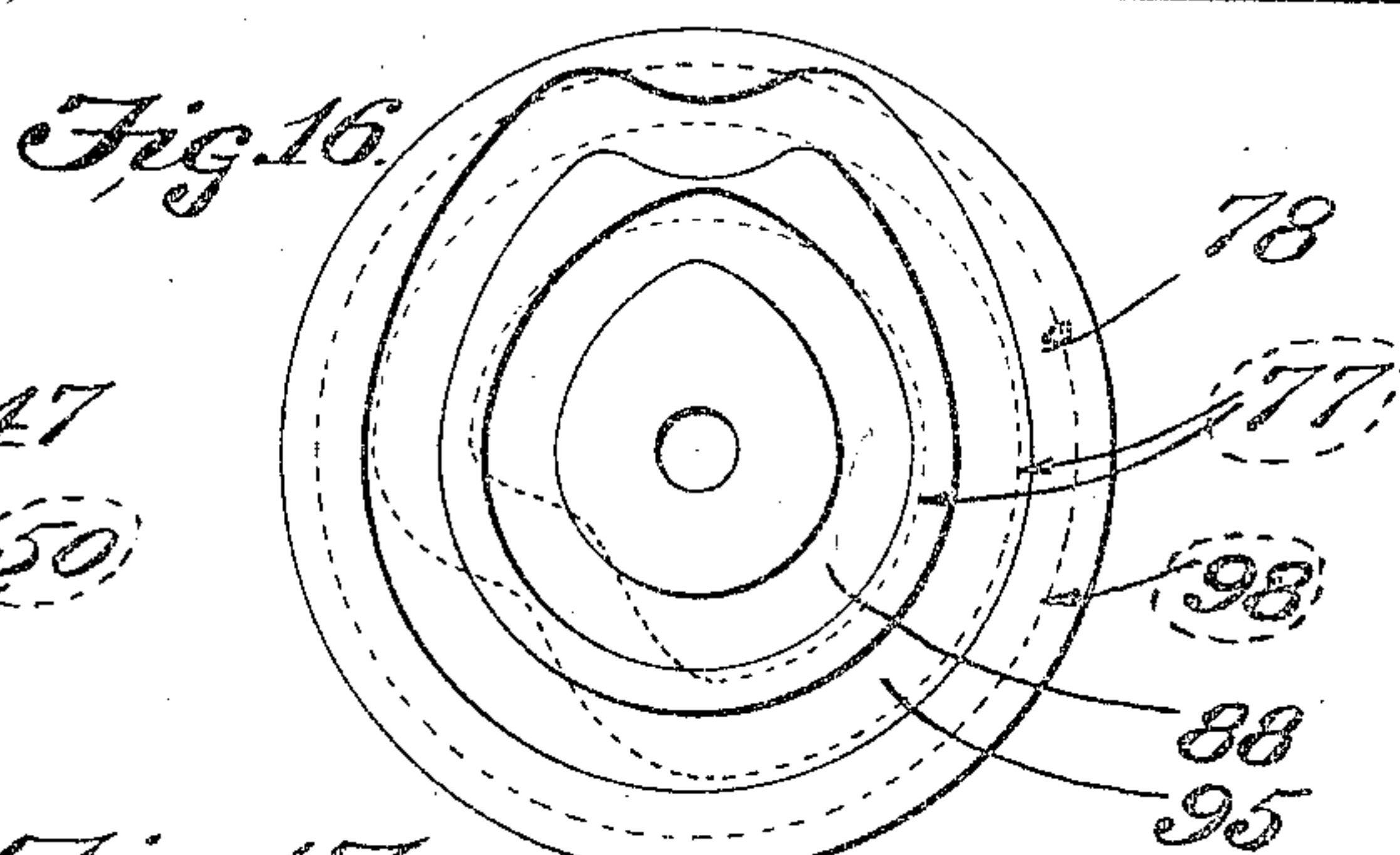
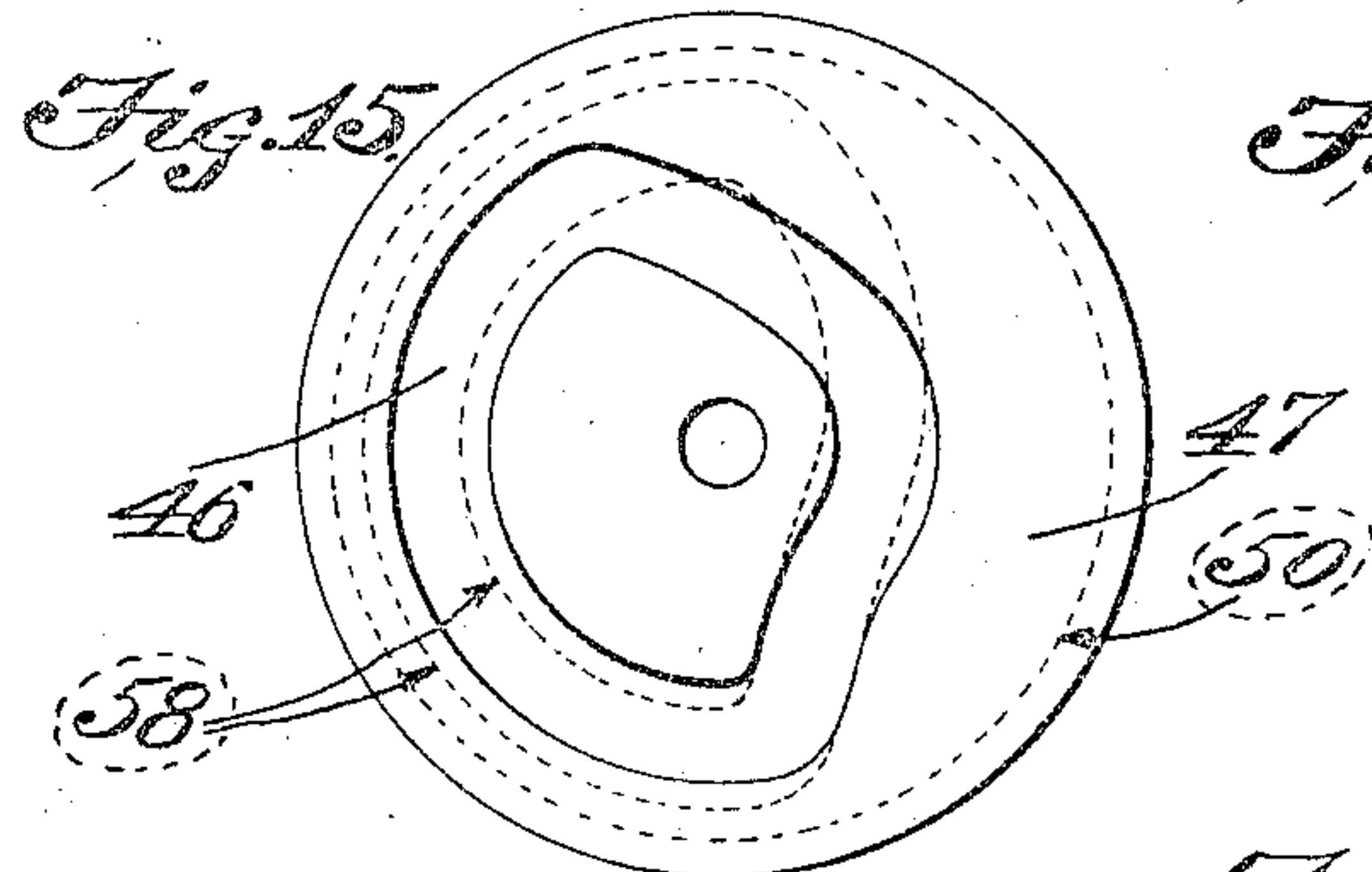
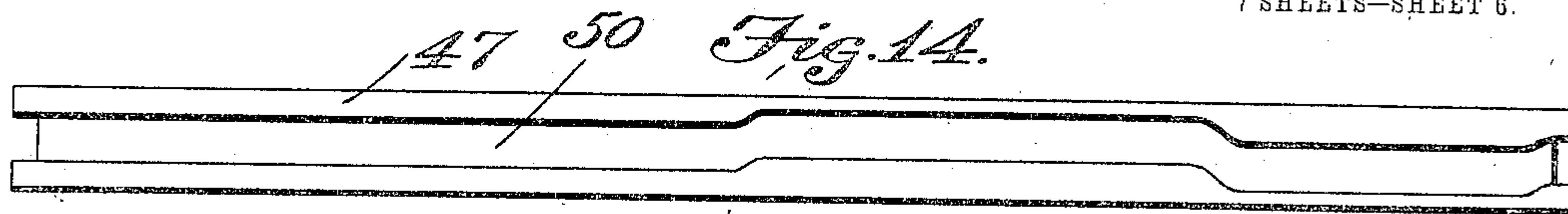


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SEWING MACHINE.
APPLICATION FILED SEPT. 16, 1903.

7 SHEETS—SHEET 6.



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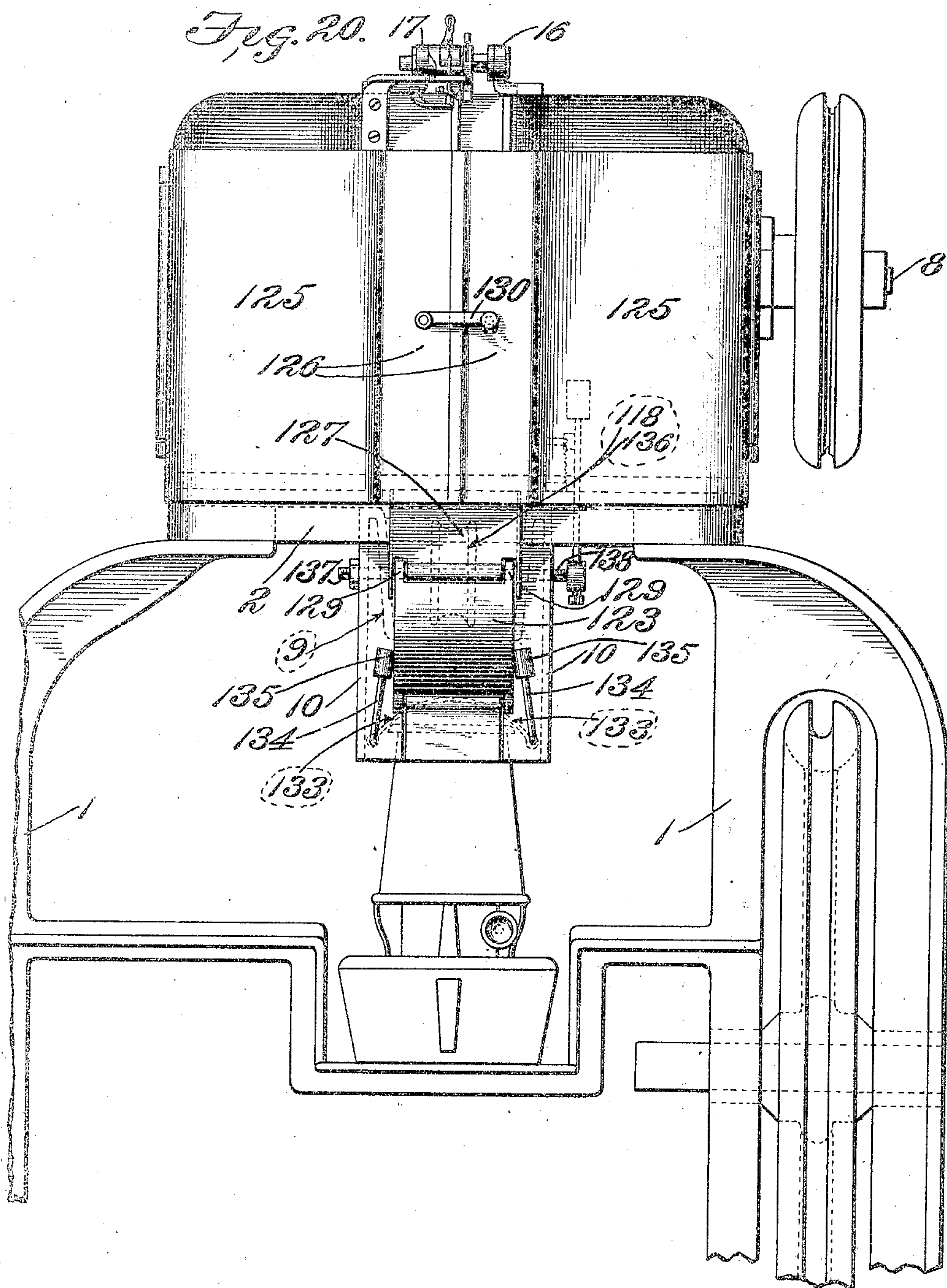
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C. PEDERSEN,
SEWING MACHINE.

APPLICATION FILED SEPT. 16, 1903.

7 SHEETS—SHEET 7.



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UNITED STATES PATENT OFFICE.

CHRISTIAN PEDERSEN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO LANDIS MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

SEWING-MACHINE.

No. 821,826.

Specification of Letters Patent.

Patented May 29, 1906.

Application filed September 18, 1903. Serial No. 173,410.

To all whom it may concern:

Be it known that I, CHRISTIAN PEDERSEN, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Sewing-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation looking from one side of the machine. Fig. 2 is a side elevation looking from the opposite side of the machine. Fig. 3 is a top plan view. Fig. 4 is a side elevation of the awl and its operative mechanism. Fig. 5 is a top plan view of the same. Fig. 6 is a side elevation of the needle and its operative mechanism. Fig. 7 is a side elevation illustrating the loop-spreader and its operative mechanism. Fig. 7^a is a sectional detail relating to the same. Fig. 8 is a fragmentary top plan view of the loop-spreader. Fig. 8^a is a detail, partly in section, relating to the same. Fig. 9 is a top plan view of the thread-laying devices and their operative mechanism. Fig. 9^a is a detail, partly in section, relating to the same. Fig. 10 is a side view, partly in section, of the same. Fig. 11 is a diagrammatic view showing the movements of the thread-laying devices with relation to the needle. Fig. 12 is a side elevation illustrating the take-up mechanism. Fig. 12^a is a top plan view of the same. Fig. 13 is a side elevation illustrating the presser-foot and its operative mechanism. Figs. 13^a and 13^b are respectively side and top views of the presser-foot. Fig. 14 shows a development of the peripheral cam-groove which controls the shifting movement of the awl. Fig. 15 shows in full lines the cam-groove which controls the rocking movement of the awl and in dotted lines the cam-groove which controls the needle. Fig. 16 shows in full lines the cam-grooves which control the longitudinal movements of the thread-laying devices and in dotted lines the cam-groove which controls the movement of the loop-spreader. Fig. 17 shows a development of the peripheral cam-groove which controls the transverse movement of one of the thread-laying devices. Fig. 18 illustrates the cam-groove which controls the operation

of the take-up mechanism. Fig. 19 is a sectional elevation illustrating the mounting of the awl, the needle-carrier, the needle-guide, and the presser-foot carrier; and Fig. 20 is a front view of the machine, the shuttle-supporting head being omitted.

This invention relates to improvements in sewing-machines, and more particularly to wax-thread sewing-machines.

The objects are, first, to provide a simple structure with the parts conveniently arranged; secondly, to provide a structure which permits access to be readily had to the various elements of the organism; thirdly, to provide a structure whereby a single source of heat supplies heat to the wax-pot and also to the thread and the machine elements at the point at which the stitch is formed.

To these ends and also to improve generally upon machines of the character indicated the invention consists in the various matters hereinafter described and claimed.

Referring now more particularly to the drawings, 1 represents the supporting-base of the machine, which has a rectangular top 2. Upon this top are end plates 3, (shown in dotted lines in Fig. 3,) and supported upon said end plates is a rectangular supporting-frame 4, from substantially the center of which rises a head-frame 5. The plates 3 at each end are arranged in pairs, each of which carries a half-journal portion 6, and said end plates are suitably secured upon the top of the supporting-base and the supporting-frame 4, as by means of screws or bolts passing through lugs 7 upon the said end plates. One of each pair of end plates being placed in position, the main shaft 8 of the machine is placed in the bearings 6, carried by said end plates, and the remaining end plates 3 are then slipped in position to hold the main shaft, as shown most clearly in Fig. 1, said remaining end plates being then securely fastened. By reason of this construction the main shaft of the machine can be removed from its bearings merely by withdrawing one of each set of end plates. The wax-pot 9 is supported upon the standard 1 below the main shaft of the machine and is a part of the casting, which also includes walls 10, which depend about said wax-pot, the lamp, gas-jet, or other appropriate source of heat being supported in any suitable manner so that its upper end is

slightly above the bottom edge of said walls 10, the flame being thus surrounded by said walls.

The shuttle 11 is of the same construction 5 as that disclosed by patent to Whipple, No. 730,848, dated June 9, 1903, and is supported upon the head 5 and is driven by the same mechanism as illustrated in said patent, 12 being the rotatable shaft upon which the 10 master-gear 13 is mounted, 14 being the eccentric on the driving-shaft 8, and 15 being the lever which forms the connection between said eccentric and the said shaft 12.

The supporting-frame 4 has short uprights 15 or standards 16 and 17 at its front. Extending through a suitable journal-opening in the upright 16 is a sleeve 18, which has a flange 19 upon its inner end, while a ring-plate 20 is screwed or otherwise secured to the outer end 20 of said sleeve, so that the flange and the portion of the ring-plate which projects outwardly from the periphery of said sleeve lie upon opposite sides of said standard 16, and thus prevent said sleeve from displacement, 25 although the sleeve can turn freely in the bearing. Said sleeve has a non-circular opening 21, in which is received a correspondingly non-circular portion 22 of a rock-shaft, so that this rock-shaft turns with the said sleeve 30 18, but has longitudinal movement therein. Formed integral with said rock-shaft is an arm 23, to which the awl 24 is attached in any suitable manner, and also integral with said shaft is an enlargement 25, provided 35 with a peripheral groove 26. Upon one side of said arm 23 is the before-mentioned squared or non-circular portion 22 of the said rock-shaft, while upon the other side of said enlargement and arm the rock-shaft is reduced in diameter and is circular, as shown 40 at 27. Extending through the opening in the standard 17 is a sleeve 28, which is keyed or otherwise non-rotatably secured to said standard, said sleeve having a longitudinal 45 opening in which the circular portion 27 of the rock-shaft is journaled, said rock-shaft having longitudinal movement through the said sleeve. Rotatably mounted upon the said sleeve 28 and upon the inner side of the 50 said standard 17 are the presser-foot carrier 29, the needle-guide carrier 30, and the needle-carrier 31, these various parts being substantially three plates strung upon the said sleeve. The inner end of the sleeve is provided with a flange or outwardly-extending 55 shoulder 32, the said presser-foot carrier, needle-guide carrier, and needle-carrier lying between the said shoulder and the said standard 17, while the outer end of said sleeve is threaded and provided with a nut 33, which bears against the outer face of the standard 17. Thus the sleeve 28 is prevented from either rocking or moving longitudinally.

The presser-foot 34 extends from what may 65 be termed the "forward" side of the before-

mentioned presser-foot carrier 29, and extending rearwardly from said presser-foot carrier is an arm 35. A lever 36, pivoted at one end upon the head-frame 5, has its other end in engagement with said arm 35 and is 70 also provided with a cam-block 37, adapted to be struck by a projection or arm 38 upon the before-mentioned shaft 12 of the shuttle mechanism. A spring 39, acting upon the 75 before-mentioned lever 36, normally holds the presser-foot in work-engaging position, and said arm 38, acting in opposition to said spring at the proper times, serves to elevate the presser-foot in a manner which will be ap- 80 parent. A hand-lever 40, having a cam end 40^a, which is adapted to engage said lever 36, enables the presser-foot to be manually raised when necessary. This mechanism relating to the presser-foot is not herein claimed, as it is made the subject of a separate application 85 for patent.

Extending from the before-mentioned sleeve 18 and integral therewith is an arm 41. A lever 42, hung at one end upon a shaft 43, is connected to said arm 41 through the link 90 44, and said lever 42 carries a cam-roll 45, which is received in a cam-groove 46 in one side face of a disk 47, secured upon the main shaft 8. Rotation of said disk serves, through the connections just indicated, to rock the 95 sleeve 18 and the shaft 27, and as the awl 24 is carried by the arm 23 integral with said shaft this rocking of the shaft serves to reciprocate the awl through the work which may be supported upon the work-table 46^a. A 100 lever 48 has one end received in the before-mentioned slot 26 in the enlargement 25 upon said shaft 27 and has its other end provided with a cam-roll 49, which enters a cam-groove 50 in the periphery of said before-mentioned 105 disk 47. A pivot-pin 51, suitably adjustably supported upon the frame of the machine, passes through an elongated slot 52 in said before-mentioned lever 48, whereby the throw of the forward end of said lever can be 110 varied. As the said disk 47 rotates the said lever 48 is rocked upon its pivot and the said shaft 27, with the awl carried thereby, is shifted longitudinally. This shifting of the shaft 115 in what may be termed its "forward" direction occurs while the awl is through the work, so that the work is fed in a manner which will be well understood. In the cycle of movements imparted to the awl said awl is 120 first elevated to cause the same to pierce the work. The awl is then shifted forwardly to feed the work. The awl then backs out of the work, and the awl is then moved longitudinally to its initial position.

The needle-carrier 31 has the needle 53 125 clamped thereto in any suitable manner and is provided with an arm 54. Upon the before-mentioned shaft 43 is a lever 55, which is connected to the said arm 54 through a link 56 and is provided with a cam-roll 57, which 130

is received in the cam-groove 58, formed in the face of the disk 47 opposite to the before-mentioned face in which the cam-groove 46 is formed. It will be manifest that as said disk 47 rotates the needle is reciprocated through the work in a manner which will be readily understood, the needle moving in the vertical plane in which the awl lies at the end of its forward feeding movement, so that as the awl backs out of the work the needle follows said awl through the hole which has been pierced by the latter.

The needle-guide 59 is an arm extending from the before-mentioned needle-guide carrier 30 and provided with an eye 60, in which the curved needle is received and through which it can move; but as the needle-guide forms no part of my present invention further description of same is deemed unnecessary.

The loop-spreader 63 is secured to an arm 64 upon a rock-shaft 65, which is suitably journaled in lugs 66 upon the before-mentioned head-frame 5. Upon said rock-shaft, between the said lugs 66, is secured (as by a set-screw) a sleeve 67, which has a cylindrical arm 68 projecting therefrom. A connector 69 has in one end a cylindrical socket in which the said arm 68 is received, and a pin 70, fastened upon said connector, extends through an elongated slot 71 in said arm 68, so that, although said connector 69 is held against separation from said arm 68, the connector can rock upon said arm. The end of said connector 69 not provided with the before-mentioned socket is slotted or bifurcated, as shown at 72, and in this horizontal slot is received one end of a link 73, the link being pivotally connected to said connector 69, as by a pin 74.

A lever 75 has its lower end pivotally connected to the frame of the machine and carries a cam-roll 76, which enters a cam-groove 77 in one face of a disk 78. A block 79 has a reduced shank 80, which extends through and is pivotally supported in the upper end of said lever 75, the lever end being held between the body portion of said connector-block 79 and a washer 81, held in position by a set-screw 82, entering the end of said reduced shank 80. The connector-block 79 is slotted or bifurcated, and in this horizontal slot is received what may be termed the "inner" end of the before-mentioned link 73, said link being pivotally connected to said block 79.

From the foregoing it will be apparent that as the disk 78 rotates the loop-spreader 63 is reciprocated. The described connections between the lever 75 and the loop-spreader 63 permit the latter to be properly operated without any strain upon the parts.

The thread-laying mechanism is now to be considered. A horizontal longitudinally-reciprocatory arm 83 has its forward end bent

to produce a thread-retaining finger 84, and the rear end of this arm is pivoted to the upper end of a lever 85, whose lower end is hung upon the shaft 86, upon which the lower end of the before-mentioned lever 75 is hung. This lever 85 is provided with a cam-roll 87, which is received in a cam-groove 88 in the face of the before-mentioned disk 78 opposite to that face of said disk in which the before-mentioned cam-groove 77 is formed. It will thus be apparent that as the said disk 78 rotates the said arm 83, with its thread-engaging finger 84, is reciprocated longitudinally.

A horizontal longitudinally-reciprocatory arm 89 has a thread-eye 90 in its forward end, so that said arm is a thread-carrier, and the rear end of said arm is pivotally connected to a connector 91, which is provided with a cylindrical socket receiving the cylindrical upper end 92 of a substantially vertical lever 93, whose lower end is hung upon the before-mentioned shaft 86. Said lever 93 is provided with a cam-roll 94, which enters a cam-groove 95 in the same face of the disk 78 in which the before-mentioned cam-groove 88 is formed. A lever 96, suitably pivoted upon the before-mentioned frame 4, has a cam-roll 97 received in a cam-groove 98, formed in the periphery of the before-mentioned disk 78, and an arm 99 upon said lever has adjusably secured in an elongated slot 100 therein a pivot-pin 101, which enters an elongated slot 102 in the said thread-carrying arm 89. It will thus be apparent that as said disk 78 rotates said thread-carrying arm is reciprocated longitudinally by means of the lever 93 and is rocked transversely on the end 92 of said lever as a pivot by the said lever 96. A pin 103 upon said arm 89 plays in an elongated slot 104 in a plate 105, suitably secured to the machine-frame, and serves to guide the said arm 89 in its longitudinal reciprocations.

The thread x from the take-up passes through the threaded eye 90 in the arm 89 and thence to the work upon the work-table 47. The thread-retaining finger 84 is above said thread-eye 90. The operation of the thread-laying devices can be best understood by reference to Fig. 11. The barbed needle 53 having passed downwardly through the work, the thread-carrying arm 89 is acted upon by both the levers 93 and 96, so that the thread is carried across what may be termed the "rear" side of the retaining-finger 84, and the retaining-finger and thread-carrier are then both moved backwardly into the position shown by dotted lines in the lower part of Fig. 11. The retaining-finger thus engaging the thread, the thread-carrier then moves forwardly and around the needle, as shown by the line y in Fig. 11, thus laying the thread in the barb of the needle. The needle then rises with the thread and both the thread-carrier 89 and the retaining-finger

84 move forwardly to their normal positions, in which they are shown by full lines in Fig. 11.

An angle-plate 106, secured to the head-frame 5, extends over the said arms 83 and 89, thus preventing the same from rising, and a depending rib 107 upon said angle-plate lies between the said arms, and thus prevents them from interfering with each other. The said arms are guided between the before-mentioned angle-plate and the upper surface of the frame 4, while the arm 83 is also guided between the said rib 107 and the side face of the said head-plate 5.

Suitably journaled at the front of the machine-frame is a rock-shaft 108, which has a rearwardly-extending rock-arm 109, connected by a link 110 at the forward end of a lever 111, the rear end of said lever being hung upon the before-mentioned shaft 43, a cam-roll 112 upon said lever entering a cam-groove 113 in a disk 114. A second rock-arm 115 extends forwardly from said rock-shaft 108 and has the take-up lever 116 pivoted thereto, said take-up lever being provided with a pulley or other suitable thread-guide 117. Rotation of the disk 114 serves to reciprocate the take-up lever 116 in a manner which will be readily understood, and the operation of this take-up lever will be readily apparent.

In the before-mentioned wax-pot 9 is a thread-guide 118. The thread from the supply 119 passes about this thread-guide 118 through the wax-pot, thence over the thread-guide 120 at the front of the machine, thence upwardly over a thread-guide 121 at the front of the machine, thence downwardly and about the pulley 117 in the take-up lever, thence upwardly through the thread-eye 90 in the thread-carrier 89, and thence to the work.

In the general operation of the machine it will be assumed that the needle is in raised or retracted position, that the awl is in lowered or retracted position, that the thread-laying arms 83 and 89 are in their normal forward positions, that the loop-spreader is in its projected position, having just spread the loop of the stitch about to be completed, and that the presser-foot is in work-engaging position. As the machine commences a cycle of operations the awl rises and pierces the work for a new stitch, the beak of the shuttle at about the same time entering the loop of the stitch about to be completed. The loop-spreader then returns to normal position, the presser-foot rises, and the awl shifts forwardly to feed the work and bring the hole just pierced under the needle. The presser-foot then falls, whereupon the awl retreats and the needle commences to descend through the work. While the needle is descending the awl shifts back to its normal position, the thread-carrier 89 moves backwardly to carry the thread across the rear side of the retaining-finger

84, the said retaining-finger moves backwardly, and the said thread-carrier then moves forwardly and across the front of the needle to lay the thread in the barb of the latter. The needle then commences to rise, and during its rise both the thread-carrier 89 and the retaining-finger 84 move forwardly to their normal positions. The loop-spreader then spreads the loop, and the beak of the shuttle catches this spread loop and carries it around in a well-understood manner, the awl commencing to operate for a new cycle of operations as the loop is caught by the shuttle. The take-up operates upon the thread in a manner which is well understood.

In the present machine the head-frame 5 projects at the front, so that the shuttle is substantially above the needle and the awl, and the thread between the guide 120 and the thread-eye 90 lies substantially below the needle and the shuttle. The forward wall 10 about the wax-pot and surrounding the flame is slotted, as shown at 122, and a plate 123, curved upwardly and outwardly, extends from said wall and has its ends connected to the latter by end walls 124, a flue from the heat-receiving space inclosed by the walls 10 being thus produced. Hinged to the frame of the machine at a point near the forward edge of each forward end plate 3 is a housing-plate 125, whose free edge extends to substantially the vertical plane in which the thread x is included, the portion of each housing-plate near its free edge being bulged outwardly, as shown at 126, so that when these plates are swung together they produce a flue which incloses the thread between the thread-guide 120 and the thread-eye 90, the needle and the shuttle lying directly above the open upper end of said flue. A flue-section having a front plate 127 and side plates 128 is hinged between lugs 129 upon said end plates 124, and when this flue-section is swung upwardly its upper end is received inside of the flue produced by the extending portions 126 of the housing-plates 125, and this flue-section connects the flue produced by said housing-plates with the flue produced by the plates 123 and 124. A suitable latch 130 serves to lock the housing-plates 125 together. A deflector-plate 131 extends immediately below the thread-guide 120 in order to protect the thread upon said guide from heat thrown into the before-mentioned flue.

Rods 132, journaled in the front and back walls 10, have deflector-plates 133 carried thereon, and the ends of these rods extend beyond the forward plate 10 and are upturned to produce handles 134, these handles being preferably weighted, as shown at 135. When the machine is to be started, the handles 134 are thrown in order to carry the deflector-plates 133 away from each other, and thus leave the bottom of the wax-pot 9 exposed to the heat from the heater. After the wax has

been sufficiently heated, however, the deflector-plates 133 are thrown into closed position, and the heat is thus deflected into the before-mentioned flue produced by the housing-plates 125, the heated air flowing upon the thread between the guide 120 and the thread-eye 90 and also flowing upon the needle and shuttle, so that the single source of heat serves to heat the wax and also to keep the thread in a properly-heated condition while being operated upon. Of course even when the deflector-plates 133 are in open position heat passes through the flue in the manner just indicated. The deflector-plates, however, prevent the wax from becoming unduly heated and cause substantially all of the heat to be thrown into the flue when desired. The weights 135 serve to retain the deflector-plates in open and closed positions.

Preferably the before-mentioned thread-guide in wax-pot 9 is a tension member 136, this tension member being here shown as a wheel or pulley held between a suitable support 137 and a threaded rod 138, so that as this threaded rod is rocked in its threaded bearing the tension upon the thread-guide can be varied. By placing the tension device in the wax-pot it is possible to economize space and to place the tension device at a point at which it is fully protected. This tension mechanism forms the subject-matter of a separate application and is therefore not herein claimed.

I have not herein claimed those features of the present machine which relate to the regulation and distribution of the heat, as said features have been made the subject-matter of a separate application for Letters Patent filed on or about July 7, 1904, and given Serial No. 215,599.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a sewing-machine, the combination with stitch-forming mechanism, of a support having a journal-opening therein, a sleeve journaled in said opening, a shaft in said sleeve and having longitudinal movement in the same, means for preventing said shaft from turning in said sleeve, means for rocking said sleeve, means for longitudinally reciprocating said shaft, a work-shifting tool connected to said shaft to rock therewith, a second tool which coöperates with said work-shifting tool in the operation of sewing, said second tool being mounted upon said shaft, and means for rocking said second tool; substantially as described.

2. In a sewing-machine, the combination

with stitch-forming mechanism, of a support having a journal-opening therein, a sleeve journaled in said opening, a shaft in said sleeve and having longitudinal movement in the same, means for preventing said shaft from turning in said sleeve, means for rocking said sleeve, means for longitudinally reciprocating said shaft, an awl connected to said shaft to rock therewith, a needle-carrier mounted about said shaft, and means for rocking said needle-carrier; substantially as described.

3. In a sewing-machine, a support having a journal-opening therein, a sleeve having a reduced portion journaled in said opening, a plate secured upon the end of said reduced portion, whereby said support is received between the said plate and the body portion of said sleeve, means for rocking said sleeve, a shaft in said sleeve and having longitudinal reciprocation therein, means for preventing rocking of said shaft with relation to said sleeve, a work-shifting tool secured to said shaft to rock therewith, a second tool which coöperates with said work-shifting tool in the operation of sewing, said second tool being mounted about said sleeve, and means for rocking said second tool; substantially as described.

4. In a sewing-machine, a support having a journal-opening therein, a sleeve having a reduced portion journaled in said opening, a plate secured upon the end of said reduced portion, whereby said support is received between the said plate and the body portion of said sleeve, means for rocking said sleeve, a shaft in said sleeve and having longitudinal reciprocation therein, means for preventing rocking of said shaft with relation to said sleeve, an awl secured to said shaft to rock therewith, a needle-carrier mounted about said sleeve, and means for rocking said needle-carrier; substantially as described.

5. In a sewing-machine, the combination with stitch-forming mechanism, of a support provided with a journal-opening, a sleeve journaled in said support, means for rocking said sleeve, a shaft longitudinally movable in said sleeve and connected to said sleeve to move therewith, a work-shifting tool connected to said shaft to rock therewith, a lever, means for reciprocating said lever, and connection between said lever and said shaft whereby in the reciprocations of the former said shaft is reciprocated longitudinally; substantially as described.

6. In a sewing-machine, the combination with stitch-forming mechanism, of a support provided with a journal-opening, a sleeve journaled in said support, means for rocking said sleeve, a shaft longitudinally movable in said sleeve and connected to said sleeve to move therewith, an awl connected to said shaft to rock therewith, a lever, means for reciprocating said lever, and connection be-

tween said lever and said shaft whereby in the reciprocations of the former said shaft is reciprocated longitudinally; substantially as described.

5 7. In a sewing-machine, the combination with stitch-forming mechanism, of a support having a journal-opening, a sleeve in said opening, means for rocking said sleeve, a shaft longitudinally movable in said sleeve
10 and connected to the same to rock therewith, said shaft being provided with a groove, a work-shifting tool supported upon said shaft to rock therewith, a lever having a portion entering said groove, and means for reciprocating said lever; substantially as described.

15 8. In a sewing-machine, the combination with stitch-forming mechanism, of a support having a journal-opening, a sleeve in said opening, means for rocking said sleeve, a shaft longitudinally movable in said sleeve
20 and connected to the same to rock therewith, said shaft being provided with a groove, an awl supported upon said shaft to rock therewith, a lever having a portion entering said groove, and means for reciprocating said lever; substantially as described.

25 9. In a sewing-machine, the combination with stitch-forming mechanism, of a support, a sleeve therein and having one of the elements of said stitch-forming mechanism
30 mounted thereon and movable with respect to the same, means for so moving said element, a shaft movably mounted in said sleeve, means for moving said shaft with respect to said sleeve, and operative connection be-
35 tween said shaft and one of the elements of said stitch-forming mechanism; substantially as described.

40 10. In a sewing-machine, the combination with stitch-forming mechanism, of a support, a sleeve therein, a shaft journaled in said sleeve, a needle-carrier mounted upon said sleeve to rock thereon, means for rocking said
45 needle-carrier, and operative connection between said shaft and an element of said stitch-forming mechanism; substantially as described.

50 11. In a sewing-machine, the combination with stitch-forming mechanism, of a support, a sleeve in said support, a shaft journaled in said sleeve, a needle-carrier upon said sleeve, a presser-foot carrier upon said sleeve, means
55 for rocking said needle-carrier, and said presser-foot carrier, and operative connection between said shaft and an element of said stitch-forming mechanism; substantially as described.

60 12. In a sewing-machine, the combination with stitch-forming mechanism, of a support having a journal-opening therein, a sleeve journaled in said support, means for rocking
65 said sleeve, a second support, a second sleeve non-rotatably mounted upon said support and having one of the elements of said stitch-forming mechanism mounted thereon to

move with respect thereto, means for so moving said element, a longitudinally-reciprocatory shaft journaled in said second sleeve and also entering said first-mentioned sleeve, means for connecting said first-men- 70
tioned sleeve and said shaft to cause said elements to rock together, means for longitudinally reciprocating said shaft, and operative connection between said shaft and one of the elements of said stitch-forming mechanism; 75
substantially as described.

13. In a sewing-machine, the combination with stitch-forming mechanism, of a support having a journal-opening therein, a sleeve journaled in said support, means for rocking 80
said sleeve, a second support, a second sleeve non-rotatably mounted upon said support, a longitudinally-reciprocatory shaft journaled in said second sleeve and also entering said first-mentioned sleeve, means for connecting 85
said first-mentioned sleeve and said shaft to cause said elements to rock together, a needle-carrier mounted upon said second-mentioned sleeve, means for rocking said needle-carrier, an awl carried by said shaft, and 90
means for longitudinally reciprocating said shaft; substantially as described.

14. In a sewing-machine, the combination with stitch-forming mechanism, of a rock-shaft, a loop-spreader thereon, a rock-arm 95
upon said rock-shaft a connector having rocking connection about said rock-arm, an operating-lever, and a link having one end in connection with said operating-lever and its other end pivoted upon said connector; sub- 100
stantially as described.

15. In a sewing-machine, the combination with stitch-forming mechanism, of a rock-shaft, a loop-spreader thereon, an arm upon said rock-shaft, a connector having a socket 105
receiving said arm, whereby said connector can rock about said arm, an operating-lever, a connector having rocking connection with said operating-lever, and a link pivoted to said connectors; substantially as described. 110

16. In a sewing-machine, the combination with stitch-forming mechanism, of a longitudinally-reciprocatory arm provided with a thread-guide, an operating-lever, a connector pivotally mounted upon said lever by 115
having a socket receiving the end of said lever, whereby said connector can rock about said lever as a pivot, pivotal connection between said connector and said arm, and means for rocking said arm transversely; 120
substantially as described.

17. In a sewing-machine, the combination with stitch-forming mechanism, of a longitudinally-reciprocatory arm provided with a thread-guide, an operating-lever, a connector 125
pivotally mounted upon said lever by having a socket receiving the end of said lever, whereby said connector can rock about said lever as a pivot, pivotal connection between said connector and said arm, a second lever, 130

means for rocking said second lever, and pivotal connection between said second lever and said arm, whereby in the reciprocations of said second lever said arm is rocked transversely; substantially as described.

18. In a sewing-machine, the combination with stitch-forming mechanism, of a longitudinally-reciprocatory arm provided with a thread-guide, an operating-lever, a connector, connection between said connector and said operating-lever whereby said connector can rock about said lever, pivotal connection between said connector and said arm, a second lever, means for rocking said second lever,

pivotal connection between said second lever and said arm whereby movement of said second lever causes said arm to rock transversely, a relatively stationary guide, and guiding connection between said guide and said arm; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 31st day of August, 1903.

CHRISTIAN PEDERSEN.

Witnesses:

GALES P. MOORE,
GEORGE BAKEWELL