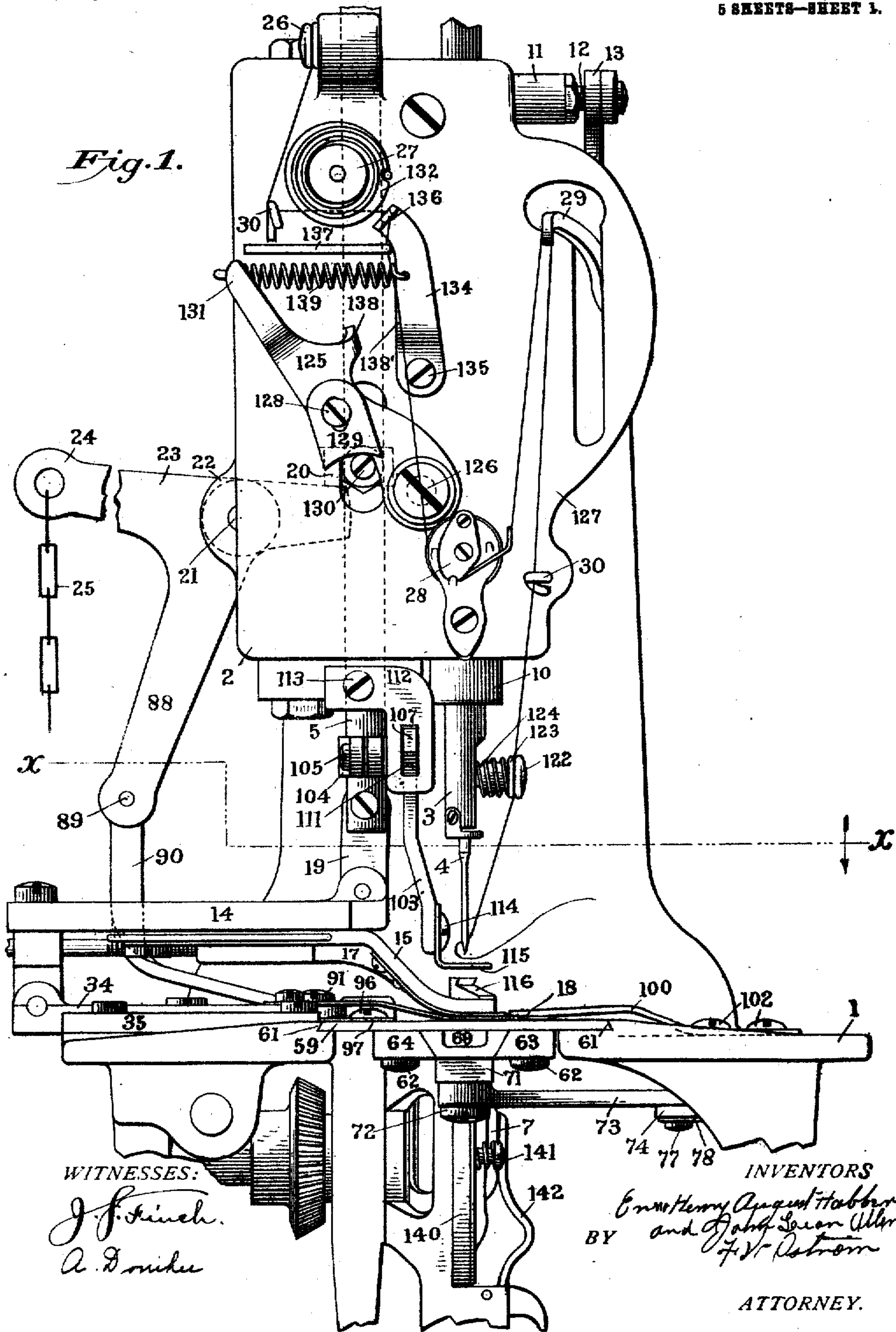


E. H. A. HABBERT & J. L. ALLEN.
 THREAD CUTTING DEVICE FOR SEWING MACHINES.
 APPLICATION FILED MAR. 6, 1908.

924,768.

Patented June 15, 1909.
 5 SHEETS—SHEET 1.



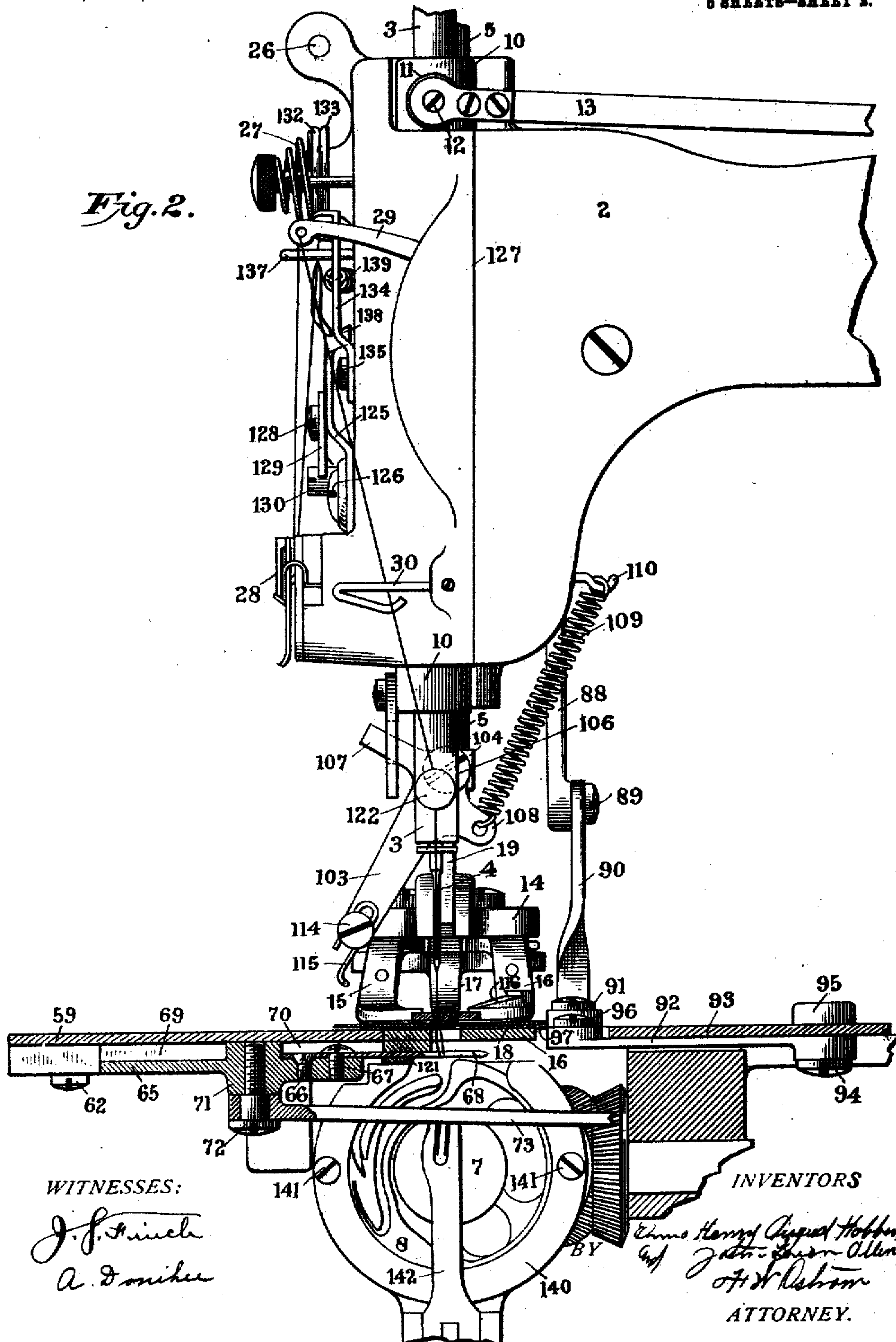
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6 SHEETS—SHEET 2.

Fig. 2.



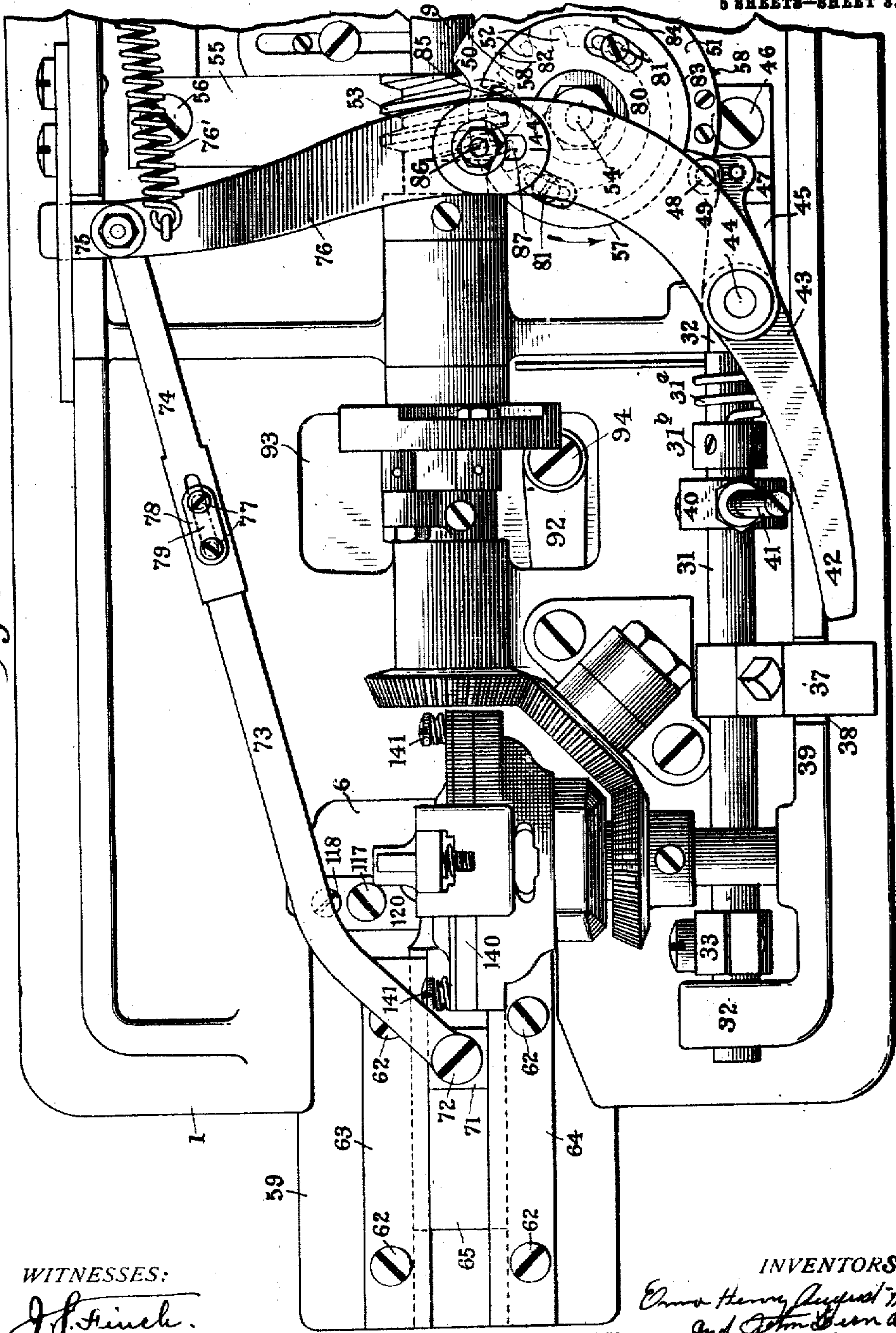
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5 SHEETS—SHEET 3.

Fig. 3.



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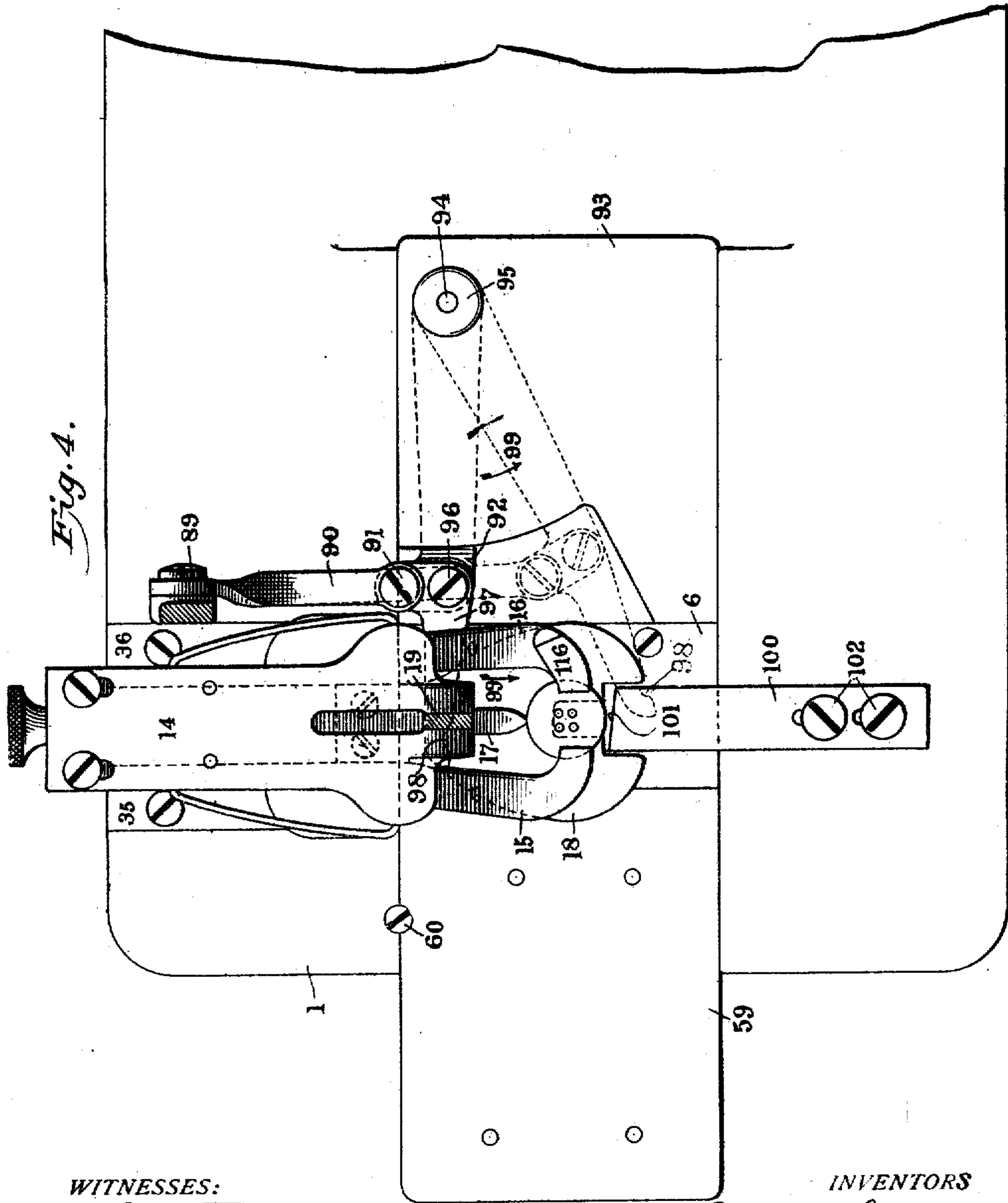
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 5 SHEETS—SHEET 4.



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6 SHEETS—SHEET 5.

Fig. 5.

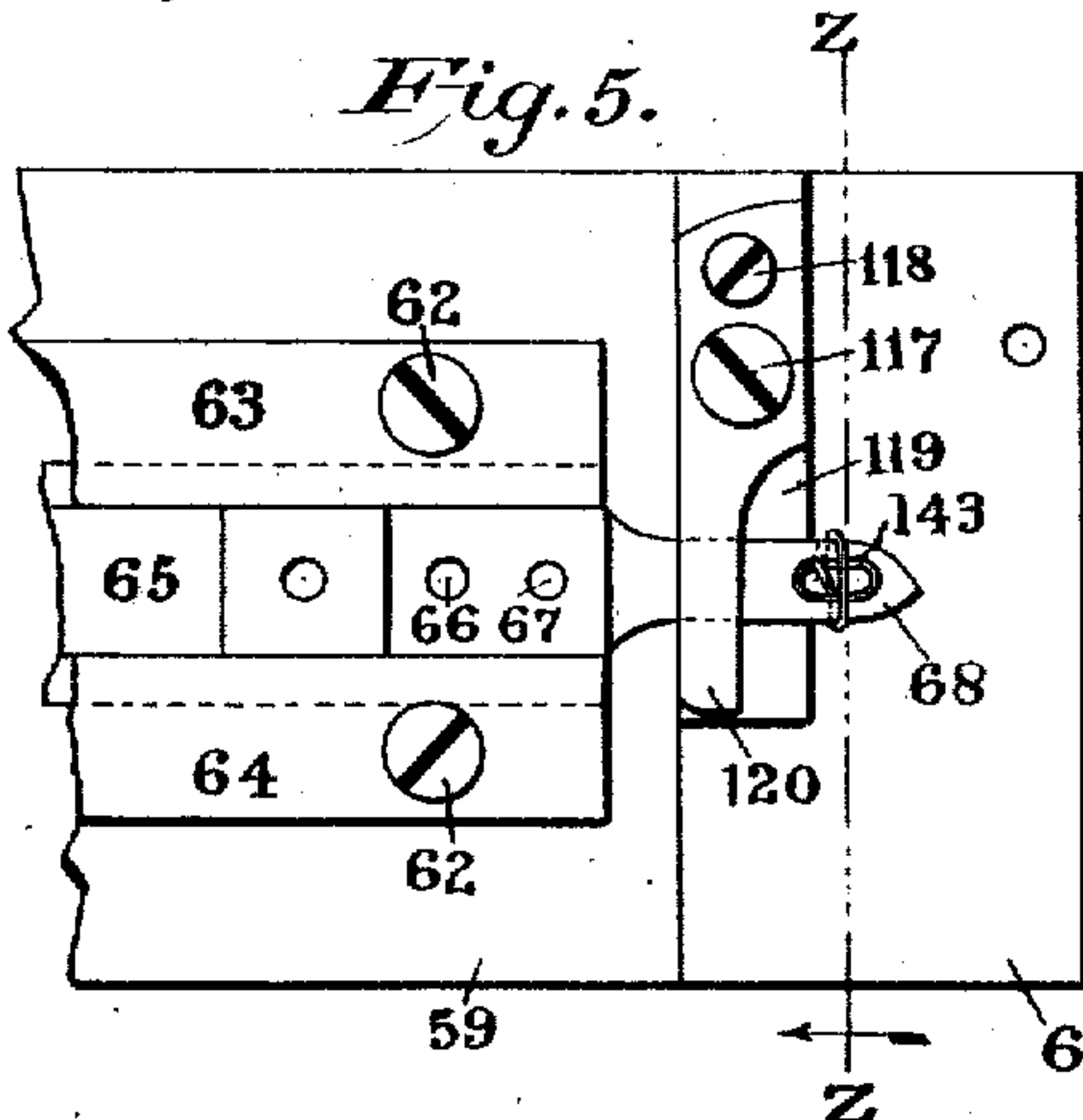


Fig. 6.

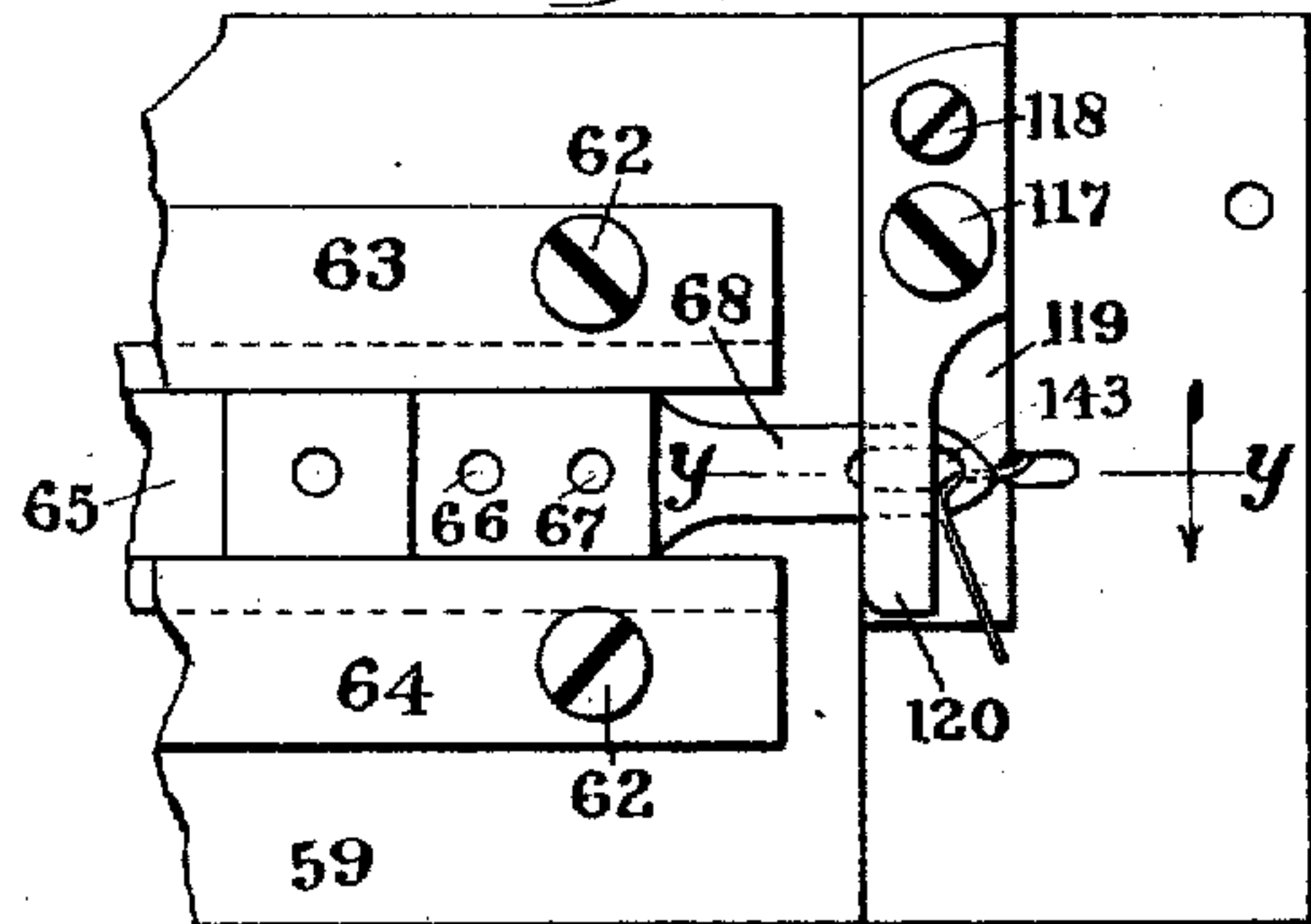


Fig. 7.

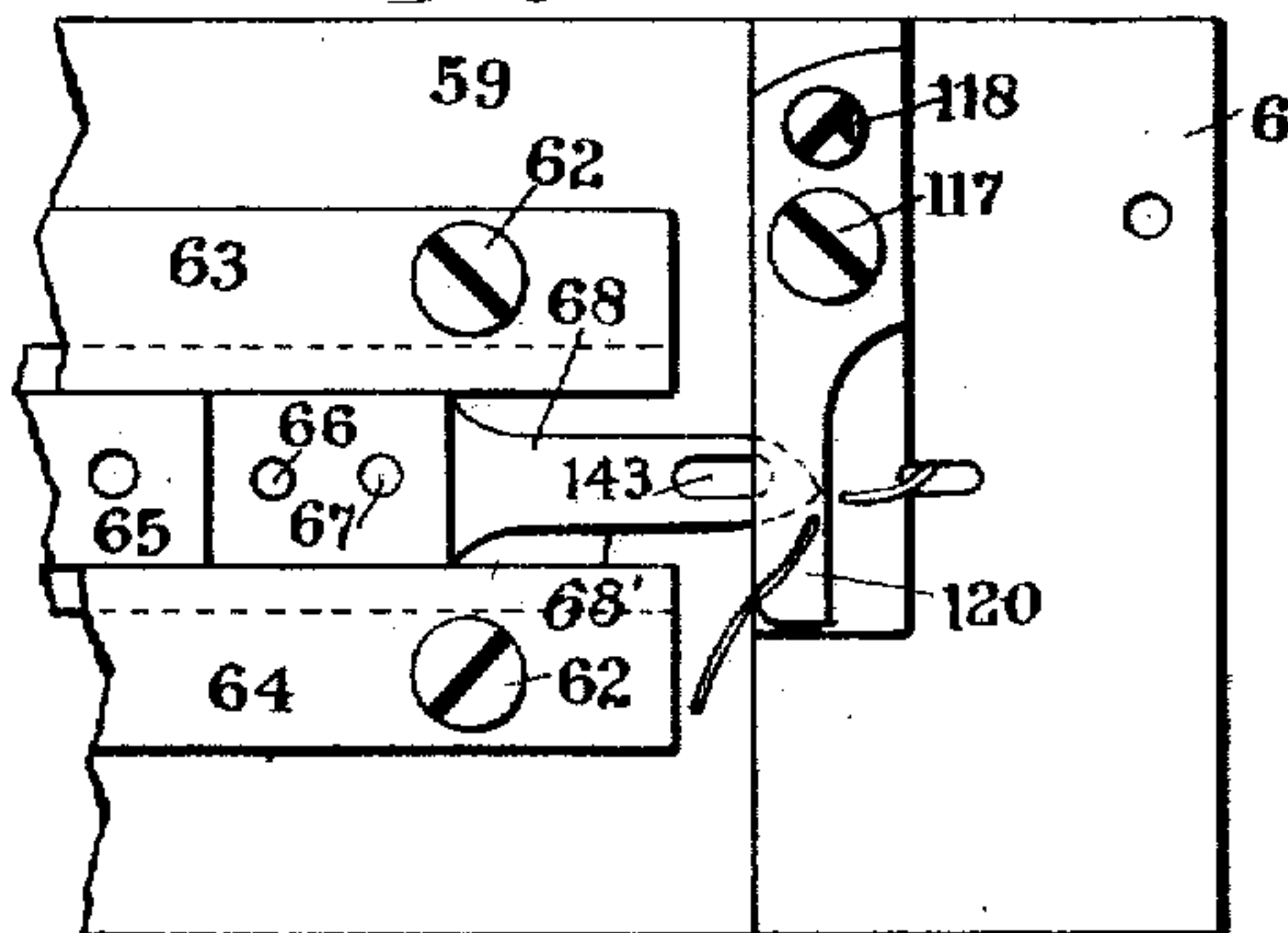


Fig. 8.

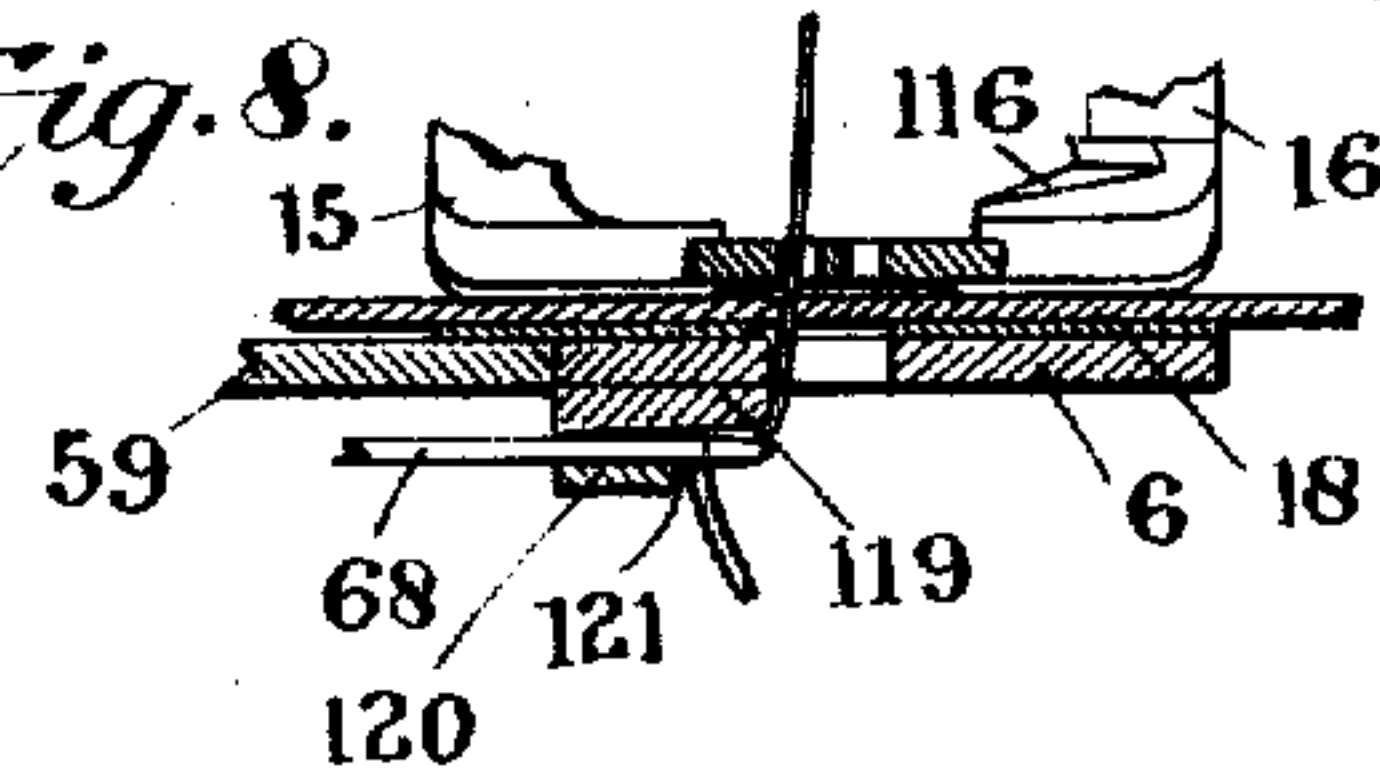


Fig. 9.

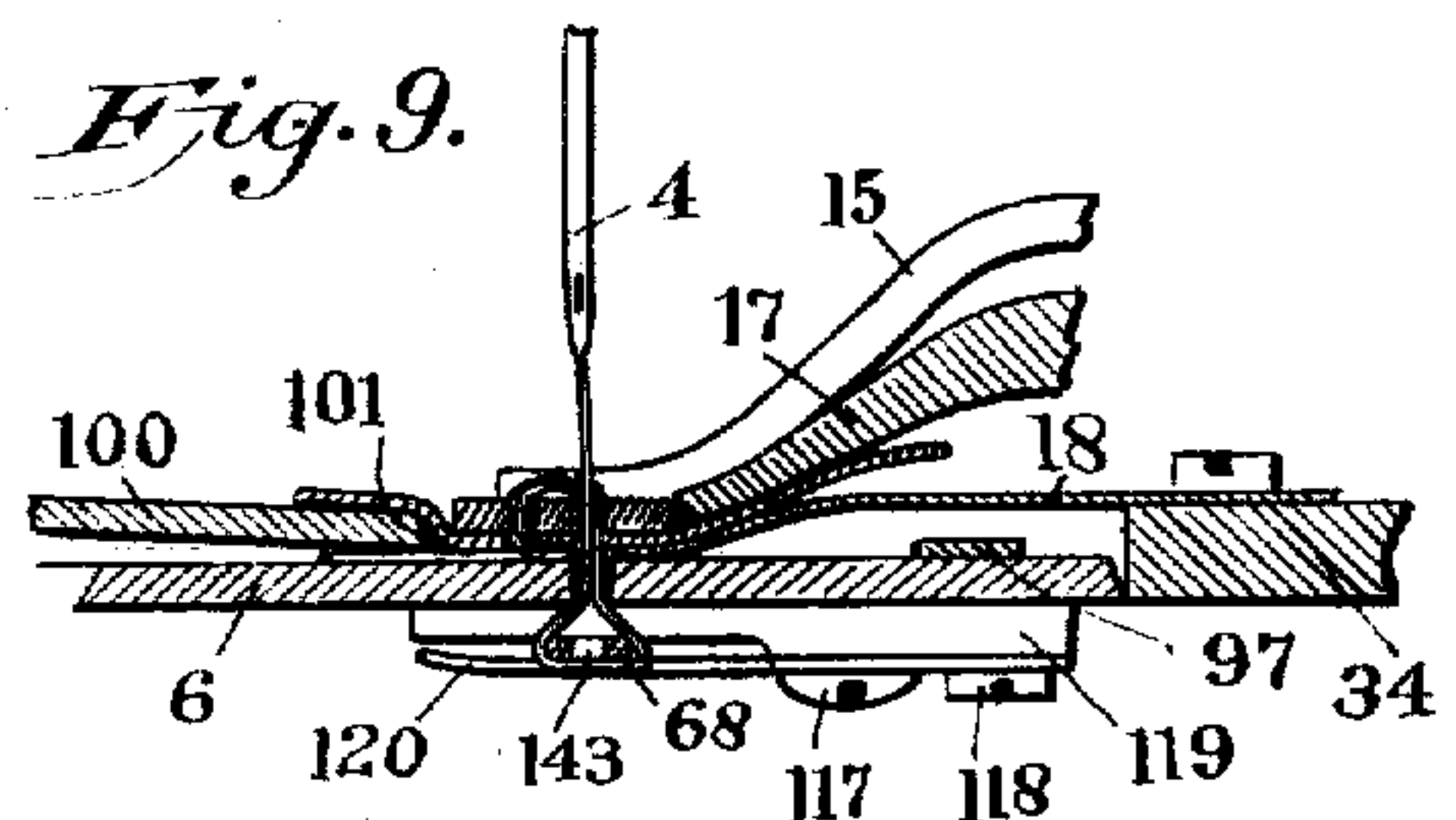


Fig. 10.

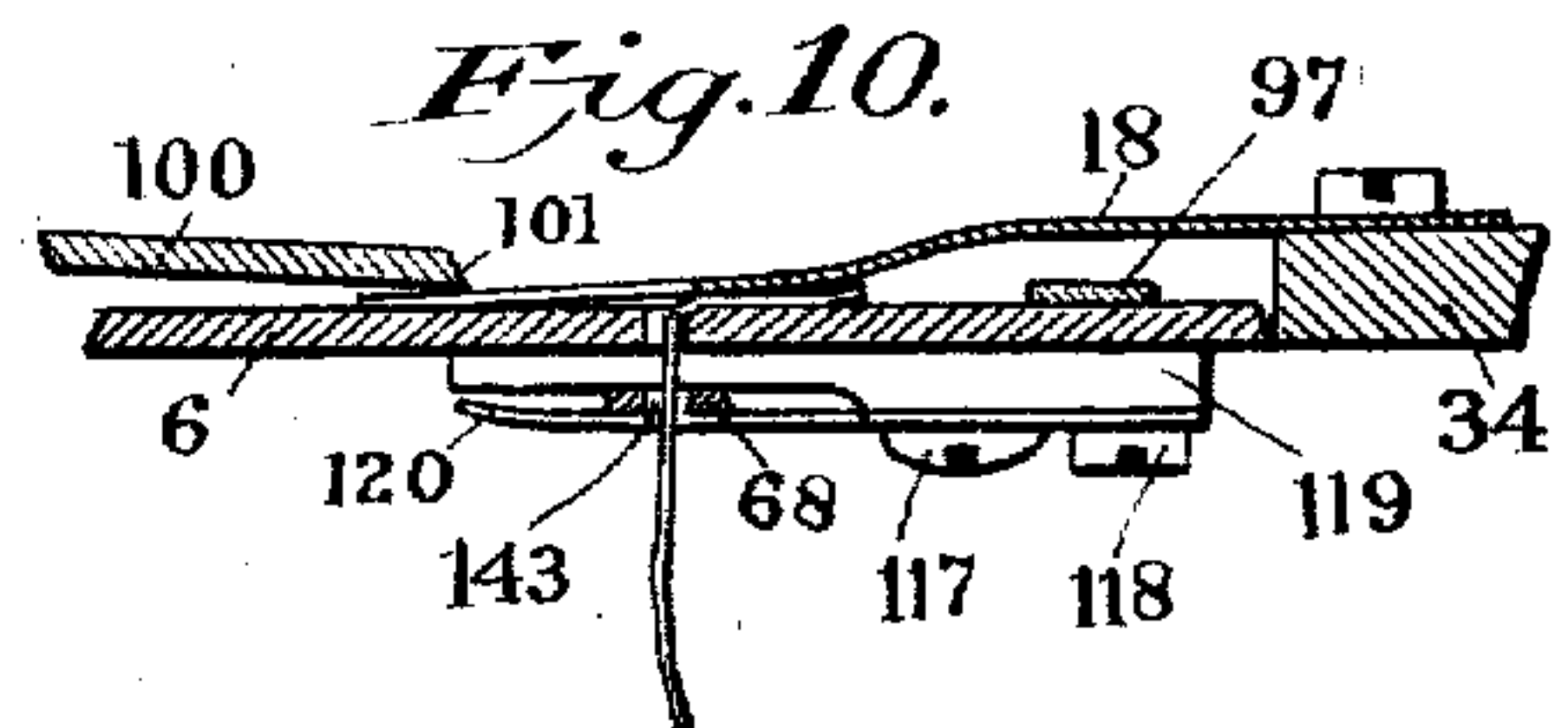
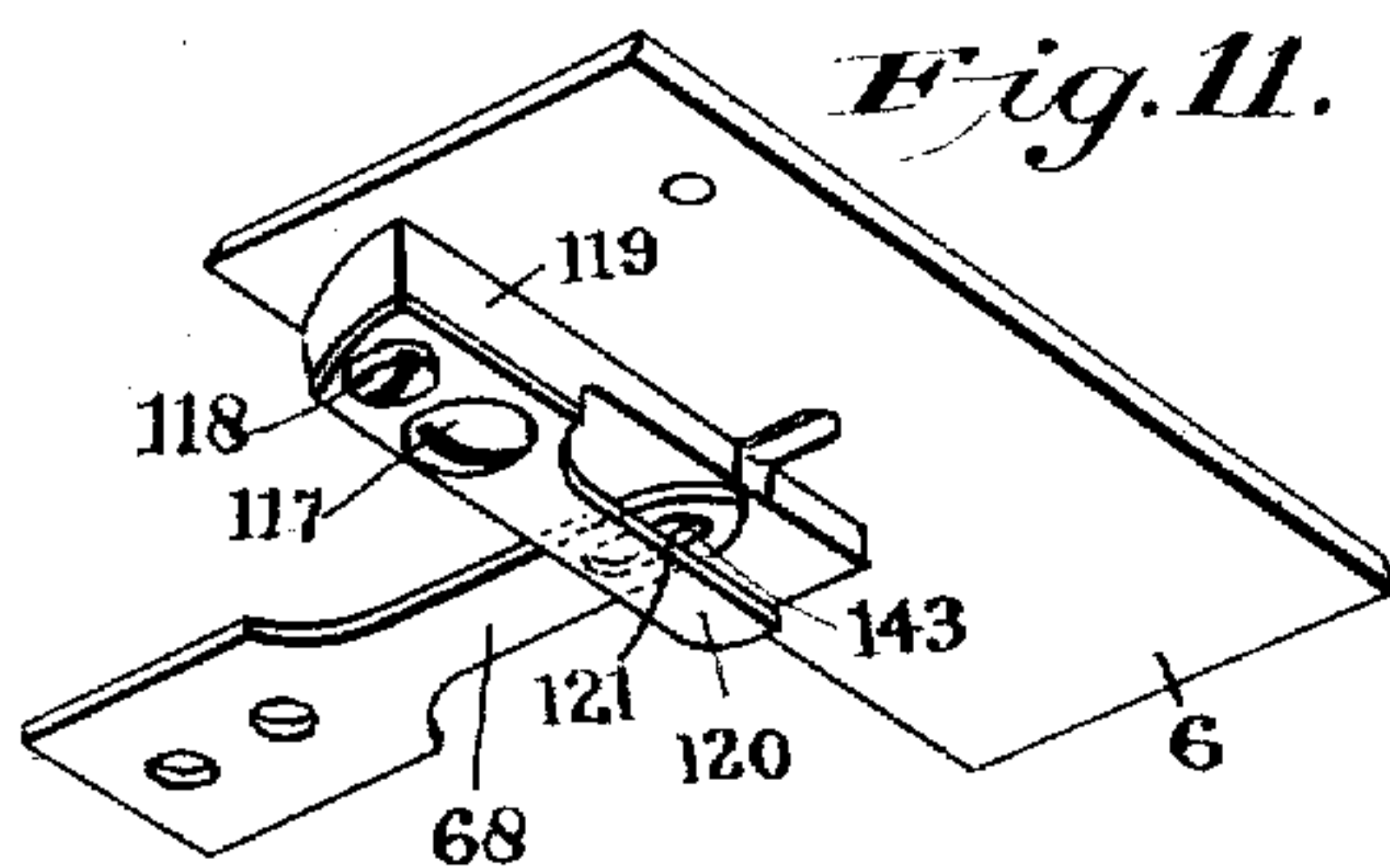


Fig. 11.



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UNITED STATES PATENT OFFICE.

ENNO HENRY AUGUST HABBERT AND JOHN LEON ALLEN, OF TROY, NEW YORK, ASSIGNORS,
BY MESNE ASSIGNMENTS, TO THE SINGER MANUFACTURING COMPANY, A CORPORATION
OF NEW JERSEY.

THREAD-CUTTING DEVICE FOR SEWING-MACHINES.

No. 924,768.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed March 6, 1906. Serial No. 304,605

To all whom it may concern:

Be it known that we, ENNO HENRY AUGUST HABBERT and JOHN LEON ALLEN, citizens of the United States, and residents of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Thread-Cutting Devices for Sewing-Machines, of which the following is a specification.

Our invention relates to improvements in thread-cutting devices for sewing machines, and has for its object to provide simple and effective means for first severing and then securing the free ends of the sewing threads, and later severing the free end of the needle-thread not consumed in the formation of the first stitch of the series of stitches next to be made.

For the purpose of illustration we have shown our invention as applied to the button-sewing machine commercially known as the "Union", but we wish it to be understood that our invention is applicable to sewing-machines for other purposes.

In the accompanying drawings illustrating our invention, in the several figures of which like parts are similarly designated, Figure 1 is a view in front end elevation of a button-sewing machine equipped with our improved mechanism; Fig. 2 a front side elevation, partially in section, of the front end portion of the overhanging arm and bed-plate of the sewing-machine; Fig. 3 an underside view of so much of the bed-plate of the sewing-machine as is necessary to illustrate the mechanism for controlling the action of the loop-engaging finger; Fig. 4 a plan view of the front end portion of the bed-plate below the line X, X, Fig. 1; Fig. 5 an underside view of the throat-plate or work-support showing the needle-thread looped around the loop-engaging finger; Fig. 6 a view similar to Fig. 5 showing the loop-engaging finger moved back out of line with the needle actuation and intermediate its field of action; Fig. 7 a view similar to Figs. 5 and 6, showing the loop-engaging finger at the limit of its backward stroke; Fig. 8 a view in section on the line Y, Y, Fig. 6; Fig. 9 a view in section on the line Z, Z, Fig. 5; Fig. 10 a view in section on the line Z, Z, Fig. 5, showing the free end of the bobbin-thread held between the work-support and the button-plate; and Fig. 11 a view in perspective of the underside

of the work-support, loop-engaging finger 55 and thread-cutter, the loop-engaging finger shown in substantially the same position as in Figs. 6 and 8.

In describing our improvements, only such limited reference will be made to the usual well-known parts of the button-sewing machine as is deemed necessary for a proper understanding of our invention.

1 is the frame or bed-plate of the sewing-machine, 2 the overhanging arm, 3 the needle-bar, 4 the needle, 5 the presser-bar, 6 the throat-plate or work-support, 7 the bobbin-case and 8 the loop-taker, the latter operatively connected, through the usually employed connections, with the lower main or hook driving shaft 9.

10 is the needle-bar-carrying gate provided at its upper end with a lug 11 into which is threaded a screw 12 carrying one end of a connection 13, which connection at its opposite end is adjustably connected with the usual segment lever (not shown) for transmitting, through the needle-bar-carrying gate, lateral movements to the needle.

14 is a work-holder of any approved construction, which, in the present instance, is provided with the button jaws 15, 16, button-stop 17 and button-plate 18. The work-holder 14 is connected, by a suitable link 19, with the lower end of the presser-bar 5, which latter is provided with an adjustable collar 20, shown in dotted lines only, between which and the upper bearing of the presser-bar is mounted the usual presser-bar spring (not shown). Upon a pin 21, secured in a suitable lug 22, formed on the head of the overhanging arm, is pivotally mounted a lever 23, one end of which bears against the underside of the adjustable collar 20, its opposite end 24 connected, by a suitable chain as 25, with a suitable foot treadle (not shown) which, when pressed down, causes the lever 23, through its action upon the collar 20, to raise the presser-bar in opposition to the resiliency of the presser-bar spring, thus, causing the work-holder 14 to raise the jaws 15, 16, up from the button-plate 18 and work-support 6.

26 is the usually employed thread-check, 27 the thread-tension, 28 the thread-controller, 29 take-up, and 30, 30, thread-leaders.

The work-holder 14, in the present in-

stance, is actuated to present the button to the action of the stitch-forming mechanism in the same manner as in the button-sewing machine (Union) previously referred to, and comprises the rock-shaft 31 mounted in bearings 32, 32, formed on the underside of the bed-plate, the front end of said shaft operatively connected, through the adjustable lug 33, with the lower member 34 of the work-holder, the member 34 being slidably mounted between the ways 35 and 36. Upon the rear or right hand end of the rock-shaft 31 is mounted a spring 31^a, one end of which rests against the underside of the bed-plate, its opposite end secured in an adjustable collar 31^b mounted upon the rock-shaft 31, the radial adjustment of which torsions the said spring so as to hold the rock-shaft with the adjustable stop 37 pressed against the bearing surface 38 formed in the rib 39 of the bed-plate, which is the position of the several parts for the placing of the stitches in the two back holes of the button or the position for sewing bar or two holed buttons.

When it is desired to adapt the machine to the sewing on of four holed buttons, the adjustable collar 40, mounted on the rock-shaft 31, is adjusted to the position shown in Fig. 3, which brings the finger 41 in the range of travel of the end 42 of the lever 43 mounted on a stud 44 secured in the bracket 45, which bracket is attached, by screw 46, to the underside of the bed-plate of the sewing machine. To effect the actuation of the lever 43, its end 47 is provided with a stud 48 and roller 49, which latter, in the operation of the machine, contacts with the wall 50 of the cam 51 carried by the gear 52 (shown in dotted lines only, Fig. 3) which in turn meshes with a worm gear 53 secured on the hook driving shaft 9, said gear and cam being mounted upon a stud 54 secured in a plate 55, which latter is secured by screws 56 and 46 to the underside of the bed-plate.

When the roller 49 is opposite the small diameter 57 of the cam 51, the rock-shaft 31 is held, by the torsion of the spring mounted on the rear or back end of said shaft, in the position illustrated in Fig. 3, but when the roller 49 is acted upon by the cam portion 50 of the cam 51, the lever 43 is rocked upon its fulcrum 44, causing its end 42 to contact with the finger 41 and rock the shaft 31 in a direction opposite to that controlled by the spring mounted upon said rock-shaft, thus adjusting the work-holder to the position required for sewing through the two holes nearest the operator.

59 is a plate, secured by screw 60, in suitable guideways 61 formed in the front end of the bed-plate 1. To the underside of the plate 59 are secured, by screws 62, two oppositely arranged guideways 63 and 64, between which is slidably mounted the loop-engaging finger carrier 65, to which latter is

secured, by screws 66 and 67, the loop-engaging finger 68. The carrier 65 is cut away at its upper side for a portion of its length and width, as indicated at 69 and 70, Figs. 1 and 2, for lightness of construction and convenience of attaching the loop-engaging finger 68. The carrier 65 is provided with a boss or hub 71 into which is threaded a screw 72, and upon the latter is pivotally mounted one end of a connection 73 adjustably secured to a second connection 74, the opposite end of which is pivotally attached to the end 75 of the lever 76, the opposite end of the lever 76 pivotally mounted upon the stud 44 and at the underside of the lever 43. The adjustments of the connections 73 and 74, relatively to each other, are controlled by the screws 77 which pass through a suitable washer 78 and slot 79, the latter formed in the connection 74, and the screws threaded into the connection 73.

80 is a cam adjustably secured, by screws 81, 81, to the underside of the cam 51, the cam 80 being formed with concentric portions 82 and 83, cam portion 84 and cam notch 85, which latter, together with the cam portion 84, acts to control, through a stud 86 adjustably mounted in a slot 87 in the lever 76 and roller mounted on said stud 86, the movements of the lever 76 in opposition to the resiliency of the spring 76', which lever in turn transmits, through the connections previously described (71 to 74, both inclusive), the movements of the loop-engaging finger 68 necessary to hold and sever the needle-thread at the desired time, relatively to the formation of the series of stitches, as will be later more fully pointed out.

88 is an arm extending downwardly from the lever 23 and connected at its lower end, by a screw 89, to a connection 90, which in turn is attached, by a screw 91, to a lever 92 pivotally secured on the underside of the back slide plate 93 by a stud 94 secured by a collar 95. To the forward end of the lever 92 is secured, by screws 91 and 96, a thread-engaging finger 97 provided with a notch 98. When the lever 23 is rocked, through the action of the foot treadle, upon its pivot pin 21 to raise the work-holder 14 away from the button-plate 18, the lever 88, through the connection 90, will move the lever 92 in the direction indicated by the arrow 99, thus causing the thread engaging finger 97 to move over the work-support and below the button-plate across the path of the vertical movements of the needle to the position shown in dotted lines below the cutting blade 100, and in doing so draw thread from the bobbin and carry it over the work-support against the cutting edge 101 of the cutter-blade 100, which latter is secured to the bed-plate by screws 102. The forward movement of the thread-engaging finger 97

is sufficient to carry its back wall or edge to or slightly past the cutting edge 101, as shown in dotted lines, Fig. 4, so that in its return to its normal position it carries the free end of the bobbin-thread to the back of the needle-hole, leaving the thread gripped between the work-support and the underside of the button-plate 18, see Fig. 10, where it is held for the commencement of the next series of stitches.

103 is a thread-nipping lever fulcrumed upon a stud (not shown) formed upon the pinch collar 104, which latter is secured, by the pinch screw 105, on the presser-bar 5, the lever 103 being held upon said stud by a screw 106. The lever 103 is provided with two oppositely arranged arms 107 and 108, the latter connected with one end of a spring 109, the opposite end of said spring being connected, through a wire 110, to the head of the overhanging arm. The arm 107 extends through an opening 111 formed in a bracket 112 secured, by a screw 113, to the lower front face of the head of the overhanging arm, and to the lower end of the lever 103 is secured, by a screw 114, a thread-engaging wire 115 which, when the presser-bar 5 raised, is swung, through the connecting parts 103 to 115, both inclusive, in contact with the needle thread extending through the needle eye and into the material, and as the needle-thread is severed from below the work-support the wire 115, through the action of the spring 109, draws the loose end of needle-thread up through the material and carries it over and upon the inclined surface 116 of the button-jaw 16, where it is held between the wire 115 and the surface 116 until the succeeding button has been positioned in the button-jaws when, as the work-holder is lowered, the lever 103 and its attached wire 115 are returned to their normal position.

While the present two-part construction of the lever 103 and wire 115 is desirable, it is evident that they could be formed so as to constitute a single piece and perform the required functions equally as well. To the underside of the work-support 6 is attached, by screws 117 and 118, a block 119 and thread-cutter 120, against the edge 121 of which the loop-engaging finger 68, in its backward or return movement, severs the loose end of needle-thread.

The needle-bar 3 is provided with a thread-check, consisting of a stud 122, washer 123 and spring 124, the needle thread passing between the inner wall of the head of the stud 122 and the washer 123, against which latter the spring 124 acts to lightly tension the thread as it passes from the take-up to the needle eye. The function of the thread-check is to hold the needle-thread against its being accidentally drawn out of the eye of the needle, and to give to the needle-thread

a slight tension on the needle side of the take-up, and by mounting the thread-check upon the needle-bar the thread is, during the stitching operation, held in a substantially straight line between the needle eye and the thread-check, avoiding the possibility of the needle-thread getting in-line with the descending needle.

125 is a tension releasing lever mounted to oscillate on a pivot screw 126 secured in the face plate 127 of the overhanging arm 2, and to said lever is adjustably secured, by a screw 128, a lug 129. As the presser-bar is raised the screw 130, which acts to secure the collar 20 on the presser-bar 5, contacts with the lower edge or wall of the lug 129, thus rocking the lever 125 sufficiently to force its free end 131 between the tension disks 132 and 133.

134 is a thread drawing lever mounted upon a screw 135 secured in the face plate 127, said thread drawing lever at its free end being provided with an opening 136 through which the needle thread passes in its travel from the tension 26 to the thread controller 28, the thread after leaving the opening 136 passing behind a wire 137, so that, as the lever 134 is moved by the lug 138 of the lever 125 acting against the wall 138' of the lever 134, as when releasing the tension, thread is drawn from the spool through the open tension disks. The friction produced upon the thread by its passing through the eye of the needle, the thread-check mounted upon the needle-bar, the take-up and the thread-controller, gives to the thread sufficient resistance to cause the action of the thread drawing lever 134 to draw from the spool sufficient thread to prevent the free end of the needle thread from being drawn out of the eye of the needle as the needle descends in the formation of the first stitch of the series.

139 is a spring secured at one end of the face plate 127, its opposite end secured to the lever 134, said spring acting to hold the thread drawing lever in its normal position, see Fig. 1, when not actuated by the movements of the tension releasing lever 125.

140 is the usual hook cap ring, 141 the hook cap screw and 142 the bobbin-case stop.

The button-sewing machine herein illustrated and described is equipped with a suitable stop-motion mechanism, but as such mechanism is commercially old and well understood, and as it forms no part of our present invention, we have not deemed it necessary to herein illustrate and describe it. At the time that the needle is approaching the upward limit of its stroke in the formation of the last stitch of the series, and the take-up is about midway of its upward stroke, the roller, mounted upon the stud 86 secured in the lever 76, is moved by the action of the spring 76' suddenly to the bottom wall of the cam notch 85, the cam 80 in its

rotation being timed to present the notch 85 to the action of the roller, at the time the finger 68 is to enter the thread loop, thus, through the connections previously described, carrying the free end of the loop-engaging finger 68 into the loop of needle-thread, the continued upward movement of the take-up causing the needle-thread to be looped about the finger 68 as shown in Fig. 5, at which stage in the operation of the stitch-forming mechanism the stop-motion mechanism is automatically operated to arrest the action of the machine.

After the machine has been brought to rest by the action of the stop-motion mechanism, leaving the parts in the positions above described, the operator, through suitable connections leading from the foot-treadle, raises the work-holder 14, thus causing the needle-thread to be drawn tight around the finger 68, and as the clamp is raised to its highest position the needle-thread is broken or severed by drawing it against the back edge of the finger 68, and to insure that the thread will be severed at this point such edge 68' is sharpened, as shown in Fig. 7. The raising of the work-holder 14 also causes the thread engaging finger 97 to be moved, as previously described, across the path of vertical movement of the needle, thus causing the bobbin-thread to be severed by the cutting edge 101 of the cutter-blade 100, and as the finger 97 is returned to its normal position it carries with it, owing to its having passed to the front side of the needle-thread during the cutting operation, the loose end of bobbin-thread, causing it to be positioned and held between the upper surface of the work-support and the lower side of the button-plate 18, and this same vertical movement of the work-holder permits the thread-nipping lever 103 to be swung, by the action of the spring 109, on its pivot sufficiently to carry the thread engaging wire 115 against the inclined surface 116 of the button-jaw 16; but if the needle-thread has not been severed, through the action of the work-holder, at such time as the wire 115 is to pass the path of vertical movement of the needle, the wire, due to its spring control, will rest against the needle-thread until it is severed and then carry the free end of the needle-thread over and against the inclined portion 116, where it is held during such time as the work-holder is held in its elevated position. After the work-holder has been lowered the machine is started, the first descent of the needle is through the opening 143 in the finger 68, and as the needle is returning in its upward stroke, the roller mounted upon the stud 86 rides the wall 144 of the notch 85 to the concentric portion 82, and in doing so causes the finger 68, through suitable connections previously described, to be moved backward, carrying the finger 68 out of line

with the needle path, and in doing so draws the free end of the needle-thread below the work-support and nips it between the underside of the bracket 119 (see Fig. 6) and the upper side of the loop-engaging finger 68. The further rotation of the cam 80, through the continued operation of the machine, brings the inclined or cam portion 84 in contact with the roller mounted on the stud 86, causing the finger to be moved to the limit of its backward stroke, and in doing so severs the loose end of needle-thread by bringing it into contact with the cutter 120, which completes the action of the several parts for effecting the severing and the holding of the sewing threads for the sewing on of a button.

Claims:—

1. In a thread-cutting device for sewing machines, a thread-cutting blade and a loop-engaging finger located below the throat-plate of the sewing machine, said loop-engaging finger provided with a cutting edge for severing the needle-thread, and an opening for the passage of the needle; and operatively connected with the actuating mechanism of the sewing machine and actuated by said mechanism to coact with said thread-cutting blade to sever the free end of the needle-thread.

2. In a thread-cutting device for sewing machines, a thread-cutter, a work-holder and a loop-engaging finger, said loop-engaging finger provided with a needle opening and a thread-cutting edge, said thread-cutting edge acting, through the manual manipulation of the work-holder, to sever the needle-thread below the work-support, in combination with means, including a cam for moving said loop-engaging finger in contact with a suitably mounted thread-cutter, for severing the free end of needle-thread.

3. A thread-cutting device for sewing machines comprising a work-support, a loop-engaging finger provided with a cutting edge, and a work-holder, said work-holder located above the bed-plate of the sewing machine and adapted to be manually operated to lift the work vertically away from the work-support and cause the needle-thread to be severed by drawing it over the cutting edge of the loop-engaging finger.

4. In a thread cutting device for sewing machines, a main drive-shaft, a work-support, a loop-engaging finger, a stationary thread-cutter having a cutting edge located below and separated from said work-support, and means, including a cam, in driving relation with said main shaft for moving said loop-engaging finger with respect to said thread-cutting edge, whereby the free end of the needle-thread is severed from the material below said work-support during the stitching operation.

5. In a thread-cutting device for sewing machines, a work-support, a thread-cutter, a

button-plate, a thread-engaging finger and manually operated means for moving said finger across the path of vertical movement of the needle to cause the thread-cutter to sever the bobbin-thread, the return movement of said finger causing the loose end of bobbin-thread to be carried back over the work-support and yieldingly held between said work-support and button-plate.

10 6. In a thread-cutting device for sewing machines, a work-holder, a tension releasing mechanism, manually operated means for effecting the vertical movements of said work-holder, a thread-cutting device located above
15 the work-plate of the sewing machine, a thread-cutting device located below the work-plate of the sewing machine, a needle-thread tension carried by the needle-bar, a thread drawing lever operated through the
20 movements of the tension releasing mechanism and a thread gripping device operatively connected with the manually controlled means for effecting the vertical movements of the work-holder, in combination with au-
25 tomatic means for severing the loose end of needle-thread not consumed in the formation of the first stitch of the series next to be made.

7. In a thread-cutting device for sewing
30 machines, a work-support, a work-holder, manually operated means for effecting the vertical movements of said work-holder, a thread-cutter located above the work-support, a thread-cutter located below the work-
35 support and a thread-tension carried by the needle-bar, said thread-tension yieldingly controlled to at all times frictionally control the passage of the needle-thread in combination with a pivotally mounted oscillating
40 thread holding lever operatively connected with the manually controlled means for raising the work-holder, and yieldingly controlled in its movement across the path of the ver-

tical movement of the needle, and means having a surface for coacting with said lever 45 for holding the needle-thread.

8. In a thread-cutting device for sewing machines, a work-support, a work-holder, manually operated means for effecting the vertical movements of said work-holder, a 50 needle-bar provided with a tension device and a loop-engaging finger around which the needle-thread is looped and by which the needle-thread is severed by raising the work-holder, in combination with an oscillating 55 thread-holding lever operatively connected with the mechanism for raising the work-holder, and provided with yielding means for moving said lever across the path of vertical movement of the needle. 60

9. In a thread-cutting device for sewing machines, means, including a work-support, a cutter blade, a manually operated work-holder provided with a button plate, and a loop-engaging finger, said finger acting to 65 hold the needle-thread in opposition to the manually controlled movements of the work-holder, automatic means for actuating said finger to draw the free end of the needle-thread below said work-support and in con- 70 tact with the cutter blade, and severing means having a cutting edge located above the under surface of the work-support, the return movement of said severing means delivering the free end of the bobbin thread be- 75 low the button plate of said work-support where it is held for the commencement of the series of stitches next to be made.

Signed at Troy, in the county of Rensselaer, and State of New York this twenty- 80 first day of February A. D. 1906.

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