

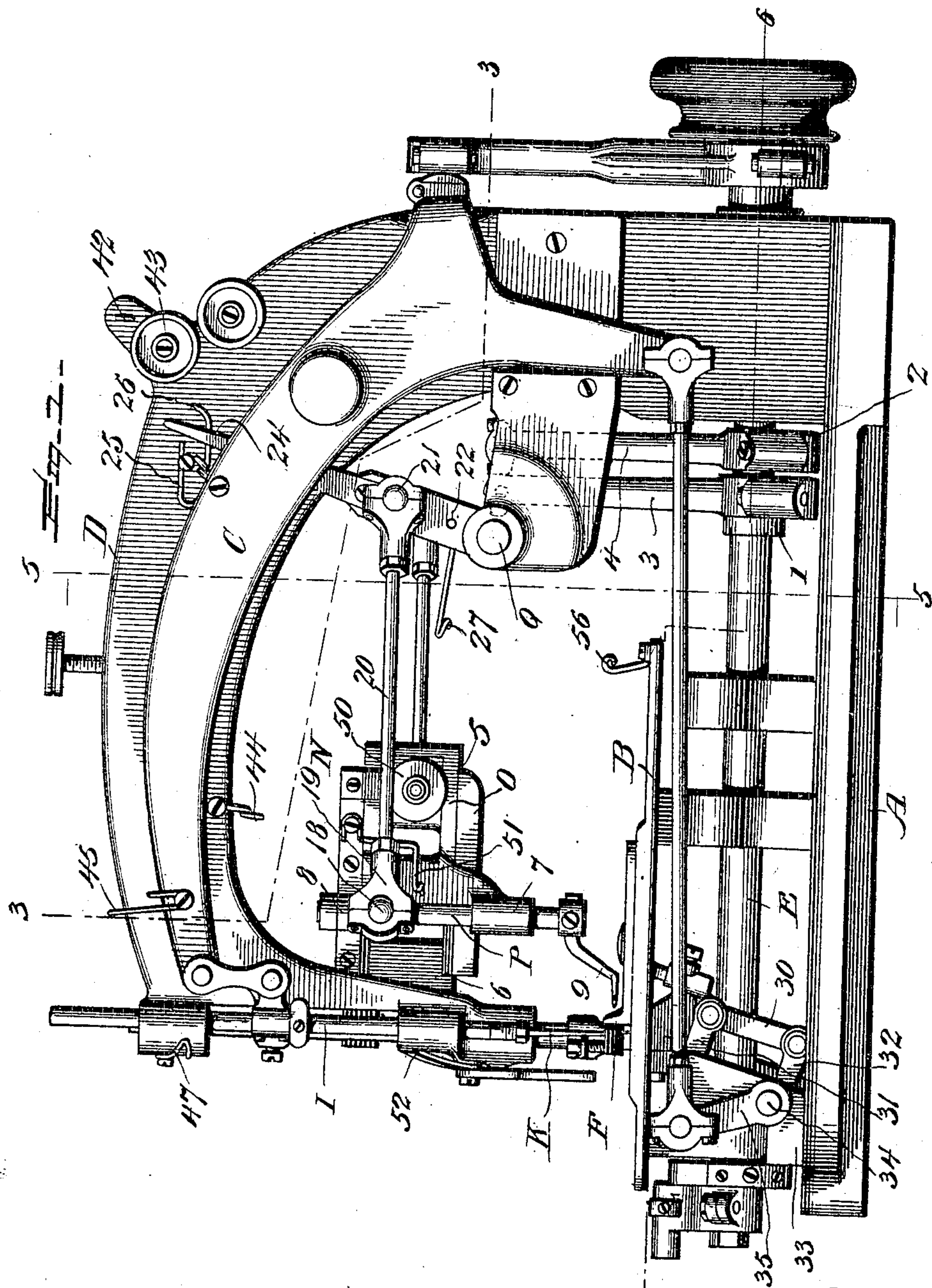
No. 837,529.

PATENTED DEC. 4, 1906.

R. G. WOODWARD.
OVERSEAMING SEWING MACHINE.

APPLICATION FILED NOV. 9, 1901.

5 SHEETS—SHEET 1.



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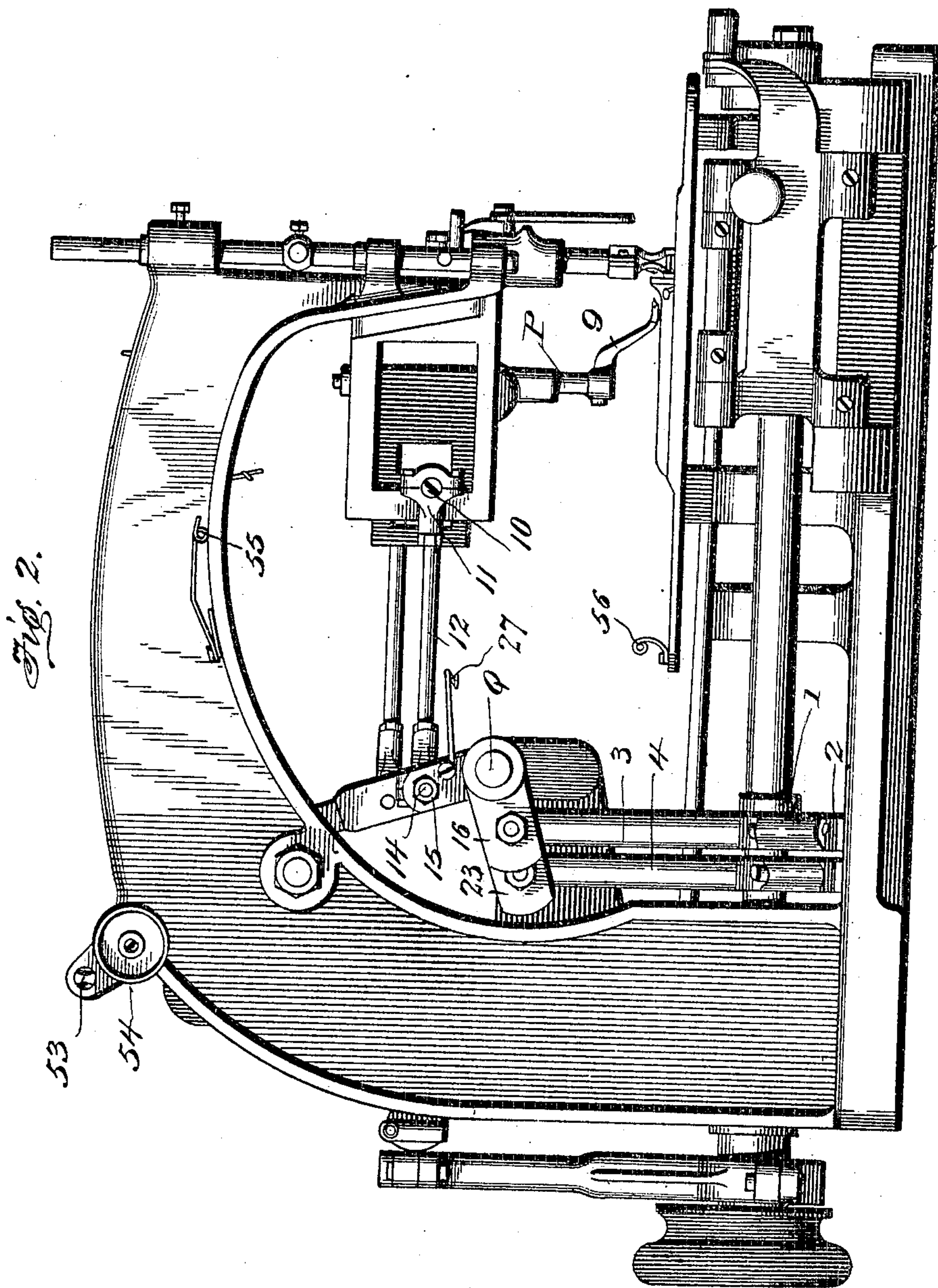
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6 SHEETS—SHEET 2.



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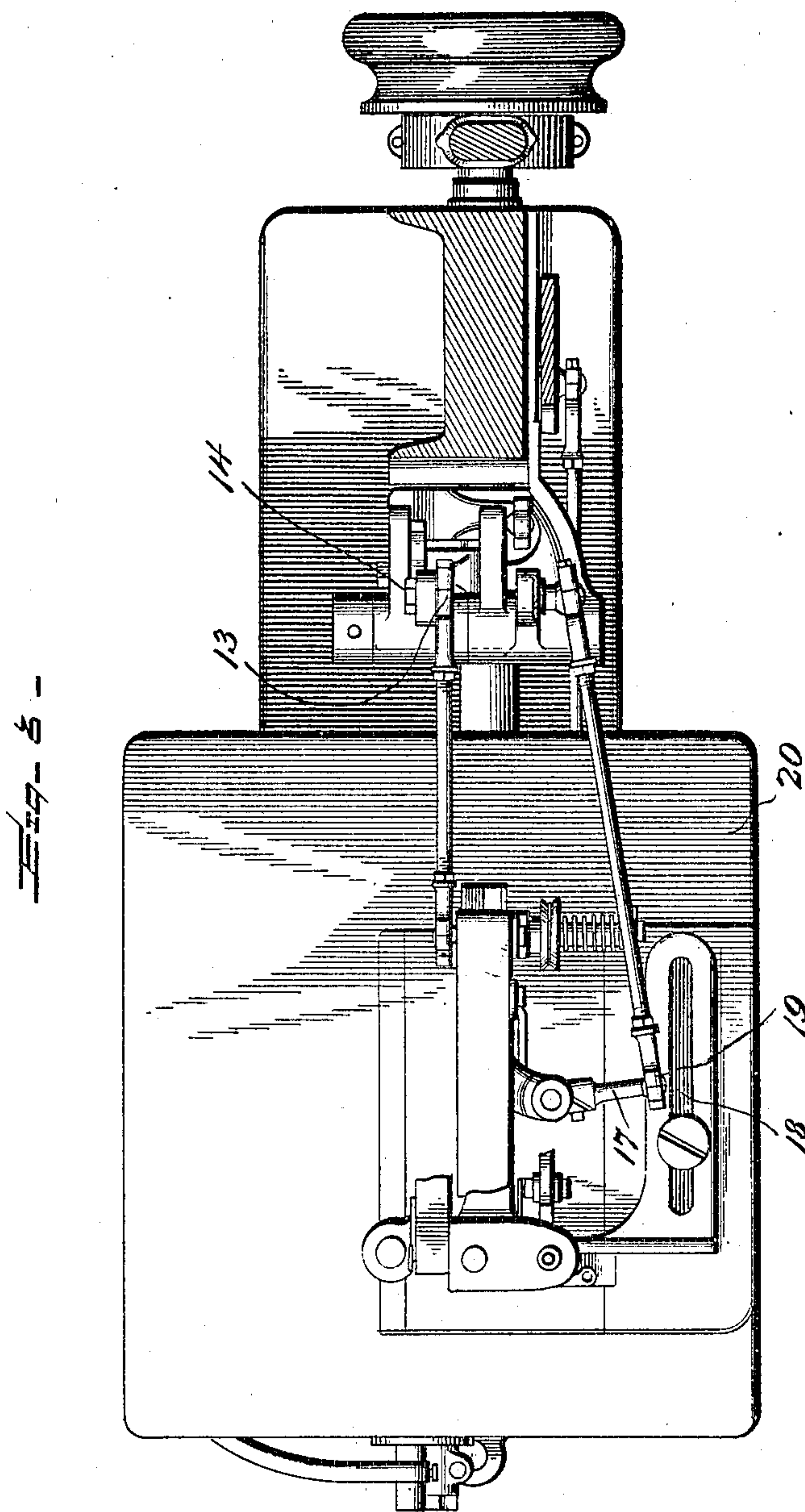
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5 SHEETS—SHEET 3.



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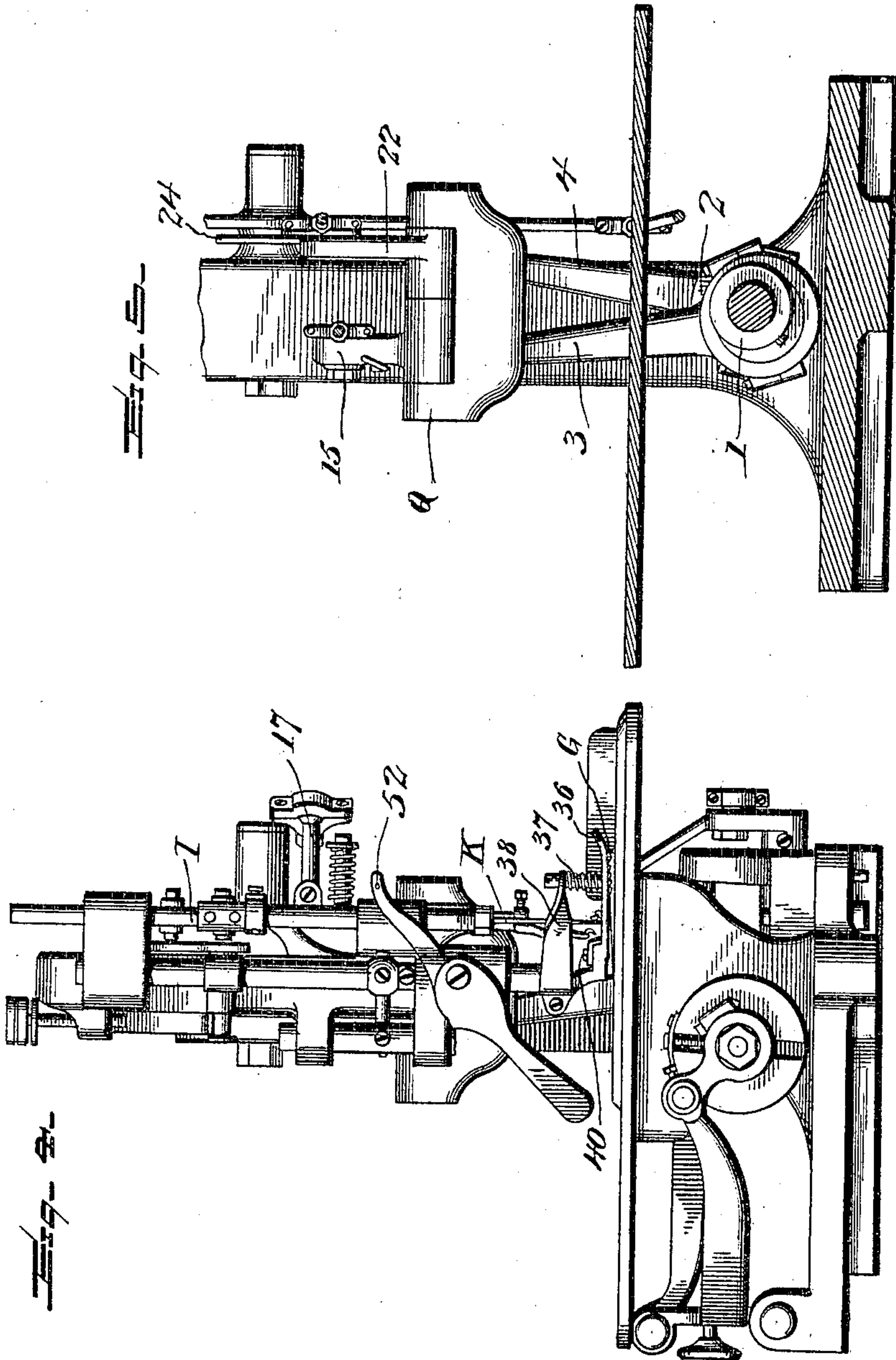
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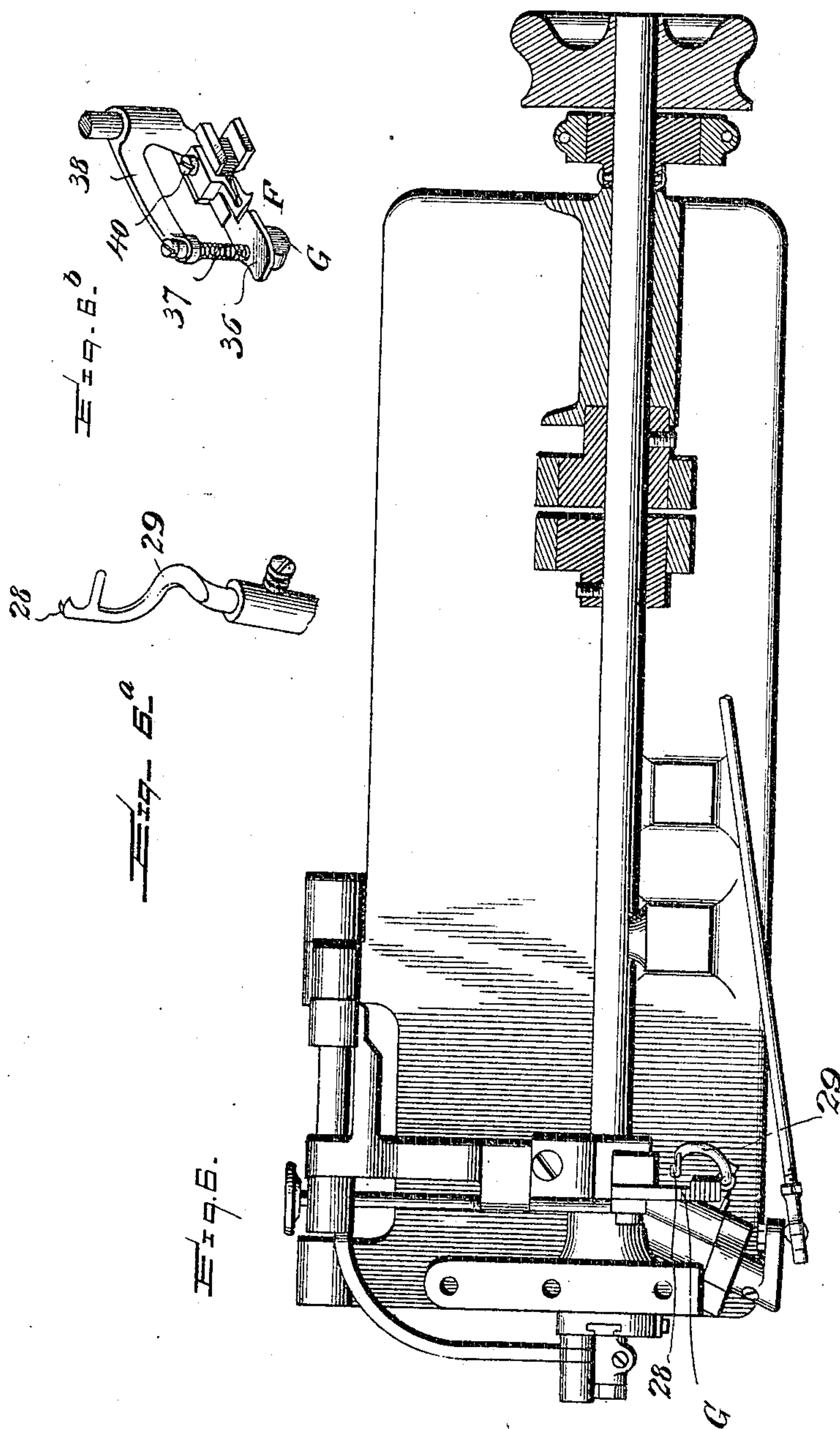
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6 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

RUSSEL G. WOODWARD, OF WAUKEGAN, ILLINOIS, ASSIGNOR TO UNION SPECIAL SEWING MACHINE CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

OVERSEAMING SEWING-MACHINE.

No. 837,529.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed November 9, 1901. Serial No. 81,768.

To all whom it may concern:

Be it known that I, RUSSEL G. WOODWARD, a citizen of the United States, residing at Waukegan, in the county of Lake, State of Illinois, have invented certain new and useful Improvements in Overseaming Sewing-Machines, of which the following is a description, reference being had to the accompanying drawings and to the letters and figures of reference marked thereon.

My invention relates to an improvement in overseaming-machines of that class in which the overedge-stitches are formed from two threads carried, respectively, by the vertically-reciprocating eye-pointed thread-carrying needle and a looper and in which the loops of needle-thread are taken from the needle below the work-plate by a spreader or looping-hook and carried out beyond the edge of the throat-plate in such position as to be entered above the material by the thread-carrying looper, which thread-carrying looper presents its thread in such position that the needle will pass through loops of looper-thread, thus making an overedge-seam suitable for ornamenting edging or for uniting edges of two superposed pieces of material.

The object of the present invention is to provide a novel construction of overseaming-machine of this class which shall be capable of maximum speed and highest efficiency.

The invention consists in the matters hereinafter described, and referred to in the appended claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a sewing-machine embodying my invention. Fig. 2 is a rear elevation of the same. Fig. 3 is a top plan view, partly in section, taken on the line 3 3 of Fig. 1. Fig. 4 is a front end view. Fig. 5 is a view, partly in section, taken on the line 5 5 of Fig. 1. Fig. 6 is a plan view, partly in section, taken on the line 6 6 of Fig. 1; and Fig. 6^a is a detail view of the spreader or looping-hook. Fig. 6^b is a detail view of the presser-foot.

In the drawings the main frame of the machine, together with the mechanism for operating the needle, is of the Union Special type and in general is illustrated in Patent No. 679,660, granted to me July 30, 1901,

and in which A represents the base of the sewing-machine; B, the cloth-plate; C, the needle-lever; D, the gooseneck; E, the driving-shaft; F, the presser-foot; G, the feed-dog; I, the needle-bar; K, the needle.

Upon the rear end of the driving-shaft E, adjacent the frame of the machine, are mounted two eccentrics or a part having two eccentric surfaces, over each of which is clamped the lower end of a connecting-rod, these connecting-rods being indicated by the numerals 3 4 and the parts which embrace the eccentric and in which it travels by 1 2.

Secured to the head of the sewing-machine by any suitable means is a rectangular frame or block N, supporting a sliding gate or frame. This gate or frame O has two lugs 7 8, projecting toward the front of the machine, provided with openings through which passes and in which is journaled a vertical bar or shaft P, to the lower end of which is secured the thread-carrying looper 9. To give the looper 9 its forward-and-backward bodily movement, the sliding gate or frame O is provided on its rear face with a ball-stud 10, fitting in a socket in the head 11, to which is secured one end of the connecting-rod 12, which at its opposite end is secured to a similar head 13, pivotally attached to the stud 14 on the upper arm 15 of a bell-crank lever sleeved on the shaft Q, the lower or transverse arm 16 of this bell-crank lever having a ball-and-stud or other flexible joint connection with the upper end of the eccentric connecting-rod 1.

In order to impart the proper oscillatory movement on a vertical axis to the thread-carrying looper, the looper-supporting rod or shaft P is oscillated on its axis as follows: This rod or shaft P has clamped about its upper end the end of a link 17, which at its opposite end is provided with a ball 18, fitting in a socket in the head 19 on the end of the connecting-rod 20, which at its opposite end is pivoted on the stud 21 on the end of the vertical arm 22 of a bell-crank lever journaled on the stationary shaft Q and having its horizontal arm 23 connected by a ball-and-socket or other flexible joint to the eccentric connecting-rod 2. By this arrangement when the driving-shaft E rotates the eccentric-rod 2 rises up and down and through the connections described oscillates the shaft P

and through it the thread-carrying looper. Thus by the two mechanisms just described the looper has imparted to it a combined bodily horizontal movement and an oscillating movement about its vertical axis. The thread-carrying looper 9 is preferably of the shape shown, and it will be seen that the resultant motion imparted to the looper by the mechanisms above described will be an elliptical one. The sidewise or oscillating movement is imparted to it in order that it may move away from the front of the needle after the needle has passed down through the loop presented by the looper. As the looper moves very close to the point of the needle, it has been found desirable to swing it to the front slightly before the return stroke. It has also been found desirable for convenience to attach to the vertical arm 22 of the bell-crank lever a pull-off lever 24, which coöperates with stationary eyelets 25 26 on the gooseneck, this pull-off acting properly upon the needle-thread at the desired moment. Furthermore, this vertical arm 22 of the bell-crank lever is also provided with an eyelet 27, which of course moves with the bell-crank lever and through which the looper-thread is guided on its way to the looper. The manner of threading the needle and looper will be hereinafter referred to.

The needle-bar of the machine is operated in the usual way and need not be herein specifically referred to.

The spreader or looping-hook (marked S) is of the form shown in Fig. 6^a. It has at its upper end the beak or fork 28 and below it the projecting member 29, which coöperates with a guard on the under side of the throat-plate and prevents deflection of the needle. This construction of spreader forms the subject-matter of claims in my application, Serial No. 54,897, filed April 8, 1901, and need not be more particularly referred to herein.

The shank of the spreader or looping-hook is removably secured in the socket on the upper end of the looping-hook or spreader carrier 30, which derives its movement in the following manner: It is mounted on two cranks 31 and 32, journaled in bearings in a bracket 33, secured to the bed of the machine. The shaft 34, to which the lower crank 32 is secured, is provided with a crank-arm 35, fixed thereon, the upper end of this crank-arm having a pitman connection with the extension of the needle-lever of the machine. The axes of oscillation of the two cranks are parallel with each other and slightly inclined to the line of feed. Supposing the two cranks be lowered to their extreme position, the spreader or looping-hook will then be below the cloth-plate and to the left of the needle. As they rise by reason of the connection to the needle-lever extension the beak or fork 28 catches the loop which has been thrown out by the needle and carries it forward, the

spreader passing in a combined lateral and vertical motion to a point where the beak carrying the needle-loop is above the cloth-plate and in such position with relation to the looper that the latter in its forward movement will carry its thread through the needle-looper. As soon as the looper has caught the needle-loop the spreader or looping-hook begins to recede, and the looper passing forward carries its own thread into position, so that the loop thereon will be engaged by the needle in its next descent.

It will be noticed that by the above-described mechanism for supporting and operating the spreader the spreader moves laterally and upwardly, not so much in the arc of a circle as in a lateral horizontal movement and then a vertical movement. This is very desirable in a machine of this character, for to prevent danger of skipping stitches and to insure the spreader always catching the needle-loop the operation is rendered more sure by having the spreader at the time it is about to engage the needle-loop move in a substantially horizontal plane parallel with the cloth-plate rather than in the arc of a circle. Furthermore, by this arrangement it is not necessary that the spreader should have such a great dip below the cloth-plate, as is usually the case in machines of this character. It is desirable also that this substantially horizontal movement should last until it passes nearly to or beyond the edge of the cloth-plate and then that a substantially vertical movement to carry up the needle-loop should take place. This is an important feature of the present machine and is believed to distinguish from prior machines of this character.

It will be readily understood that by changing the speed or time of operation of the spreader or looping-hook the exact form of the overseaming-stitch may be changed. For example, by giving the spreader or looping-hook a quick movement to allow it to get out of the loop before the needle tightens the thread the bead of the stitch may be formed on the edge of the seam.

F represents the presser-foot used on this machine, in which the foot portion 36 is hinged to the presser-foot shank in the usual way and being depressed by a spring 37, which bears on the front end and is attached to a screw passing through an arm 38, projecting from the presser-foot shank. The tongue 39, over which the stitches are formed, does not partake of the rocking movement of the bottom or shoe of the foot, but is rigidly attached by the screw 40 to the presser-foot shank.

The feeding mechanism includes the feed-dog G, mounted to swing on a pivot and adjustable by means of a screw having a finger-piece on the end, which when turned tilts the front of the feed-dog either up or down,

thereby causing a portion of the feed-dog to engage the work in front of the needle and crowd the goods up thereto before the main portion of the feed takes hold, thus obviating puckering. This adjustment can be accomplished without necessitating the removal of the cloth-plate and is a feature which is considered of considerable importance. This, however, is not herein specifically described, but forms the subject-matter of a separate application filed by me on the 9th day of November, 1901, Serial No. 81,770.

The needle-thread is preferably conducted to the needle through the thread-guide 42, through the tension 43, then through the eyelet 25 on the frame of the machine in front of the traveling pull-off 24 to the eyelet 26 on the needle-lever, thence to the eyelet 45, attached to the front end of the needle-bar C, then to the eyelet 47, attached to the upper needle-bar lug, thence to the needle. There is another way in which the thread may be conducted; but this is not particularly illustrated, as it is not deemed necessary. Briefly stated, the thread may be conducted through the eyelet 42 (not through the tension on the frame) to the eyelet 44, over the tension 50 on the movable gate, around this tension, through the thread-wire 51 and outside of the looper-shaft to the hole 52 in front of the needle-bar lug, then down to the needle.

The looper-thread is conducted as follows: through the thread-guide 53, over tension 54, to eyelet 55 on the back of the overhanging frame, down to the swinging eyelet 27, attached to the rocking lever 22, to the eyelet 56 on the cloth-plate, and then through the eyes of the looper.

The operation of the respective parts having been referred to in connection with the description of each separately, it is not necessary to go into a detailed discussion of their operation in combination except to say that suppose the needle to be in its lowest position the spreader or looping-hook will be retracted to its lowest position below the cloth-plate and the looper will be retracted to its farthest position away from the needle. As the needle moves up it throws out a loop, and the spreader or looping-hook moving forward at the same time its beak catches this needle-loop, the looper meanwhile also moving forward, and when the spreader or looping-hook has carried the needle-loop up to proper position it is engaged by the looper. The spreader or looping-hook then recedes from the needle-loop, leaving said needle-loop on the looper, and the looper carries its own thread forward into position to be engaged by the needle in its next descent. Then as the looper recedes from the needle-loop it leaves the latter, if the tensions are arranged properly, along the edge of the fabric.

Various minor modifications and changes in the details of construction of the parts

may be made without departing from the spirit of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an overseaming-machine, the combination with the needle and its operating mechanism, of a thread-carrying looper arranged entirely above the cloth-plate of the machine, and mounted to oscillate upon a vertical axis, with means for imparting to it such oscillation, means also for imparting to it a bodily movement toward and from the needle, and a looping-hook or spreader, with means for imparting combined bodily vertical and backward-and-forward swinging movement to said looping-hook or spreader, to cause it to take loops of needle-thread from beneath the work-plate, carry them above the work-plate and hold them in position to be entered by said thread-carrying looper; substantially as described.

2. In an overseaming-machine the combination with the needle and its operating mechanism, of a thread-carrying looper arranged entirely above the cloth-plate of the machine, a vertical bar or rod supporting said looper and means for oscillating said bar or rod on its axis, and a sliding gate or frame upon which said looper-supporting bar or rod is supported, with means for imparting forward and backward movements to said gate or frame, and a looping-hook or spreader with means for imparting combined bodily vertical and backward-and-forward swinging movement to said looping-hook or spreader, to cause it to take loops of needle-thread from beneath the work-plate, and carry them above the work-plate and hold them in position to be entered by said thread-carrying looper; substantially as described.

3. In an overseaming-machine, the combination with the needle and its operating mechanism, of a thread-carrying looper arranged entirely above the cloth-plate of the machine with means for imparting movement to it, a looping-hook or spreader with means for imparting to it a combined lateral and upward movement, the lateral movement being substantially in a horizontal plane to cause it to take loops of needle-thread beneath the work-plate and the upward movement being a substantially vertical movement to cause it to carry them above the work-plate and hold them in position to be entered by the thread-carrying looper; substantially as described.

4. In an overseaming-machine, the combination with the needle and its operating mechanism, of a thread-carrying looper arranged entirely above the cloth-plate of the machine and mounted upon a vertical support, with means for imparting to said looper a bodily movement toward and from the needle, and an oscillating movement about

its vertical axis, and a looping-hook or spreader with means for imparting combined bodily vertical and backward-and-forward swinging movement to said looping-hook or spreader to cause it to take loops of needle-thread from beneath the work-plate, carry them above the work-plate, and hold them in position to be entered by said thread-carrying looper, said means including double cranks upon which the spreader or looping-hook support is mounted, and connections to the driving-shaft for oscillating said cranks; substantially as described.

5. In an overseaming-machine, the combination with the needle and its operating mechanism, of a thread-carrying looper mounted to oscillate upon a vertical axis above the bed-plate of the machine arranged to pass through loops of needle-thread above the work, mechanism for operating said looper, a looping-hook or spreader supported to have a combined vertical bodily movement and forward-and-backward swinging movement, and means for imparting said movements to it, whereby it is caused to take loops of needle-thread from beneath the work-plate, carry them above the work-plate, and hold them in position to be entered by the said thread-carrying looper, said means including operative connections between the spreader or looping-hook support, and the needle-lever extension; substantially as described.

6. In an overseaming-machine, the combination with the needle and its operating mechanism, of a thread-carrying looper arranged entirely above the cloth-plate of the machine, and mounted to oscillate upon a vertical axis, with means for imparting to it such oscillation, means also for imparting to it a bodily movement toward and from the needle, and a looping-hook or spreader, with means for imparting combined bodily vertical and backward-and-forward swinging movement to said looping-hook or spreader, to cause it to take loops of needle-thread from beneath the work-plate, carry them above the work-plate and hold them in posi-

tion to be entered by said thread-carrying looper, and pull-off devices for both the needle and looper threads; substantially as described.

7. In an overseaming-machine, the combination with the needle and its operating mechanism, of a thread-carrying looper arranged entirely above the cloth-plate of the machine, a vertical support upon which the looper is carried, with means for imparting to said looper a bodily movement and also an oscillating movement about a vertical axis, said means including a rocking lever with connections between the same and the looper, and a pull-off for the needle-thread carried by said rocking lever; substantially as described.

8. In an overseaming-machine, the combination with the needle and its operating mechanism, of a thread-carrying looper arranged entirely above the cloth-plate of the machine, a vertical support upon which the looper is carried, with means for imparting to said looper a bodily movement and also an oscillating movement about a vertical axis, said means including a rocking lever with connections between the same and the looper, and a pull-off for the looper-thread carried by said rocking lever; substantially as described.

9. In an overseaming-machine, the combination with the needle and its operating mechanism, of a thread-carrying looper arranged entirely above the cloth-plate of the machine, with means for imparting to said looper a bodily movement, and also an oscillating movement about a vertical axis, said means including a rocking lever with connections between the same and the looper, and pull-offs for the needle and looper threads both carried by said rocking lever; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses

RUSSEL G. WOODWARD.

Witnesses:

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