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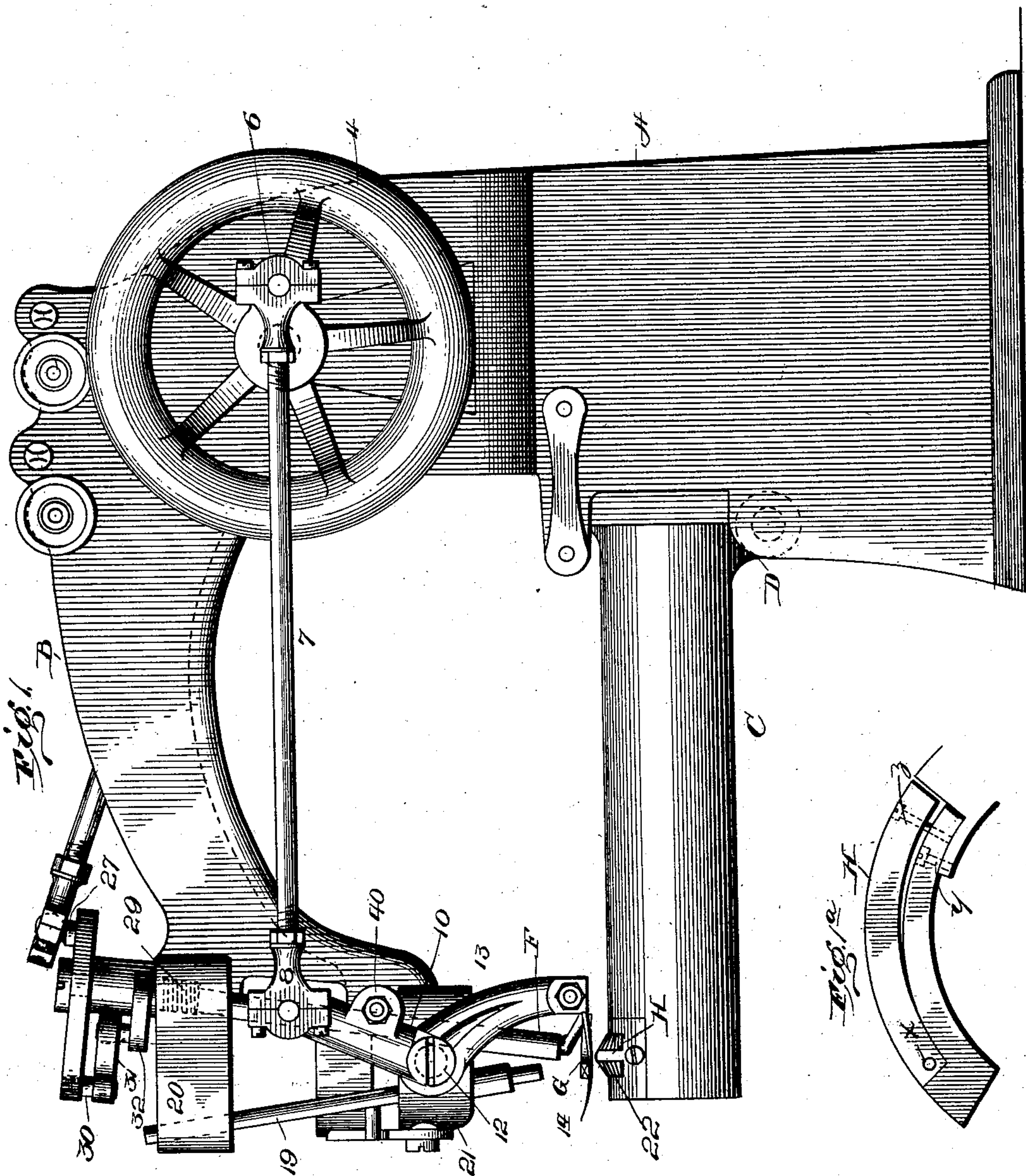
PATENTED FEB. 17, 1903.

L. ONDERDONK.
SEWING MACHINE.

APPLICATION FILED MAR. 29, 1899.

NO MODEL.

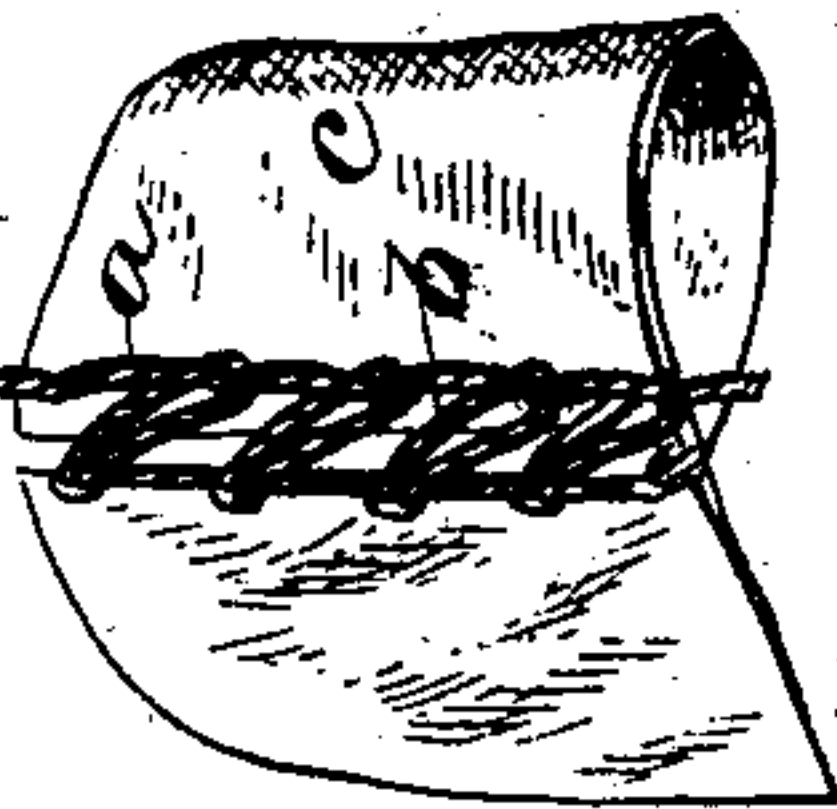
5 SHEETS—SHEET 1.



Witnesses:

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Fig. 7



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By C. S. Sturtevant
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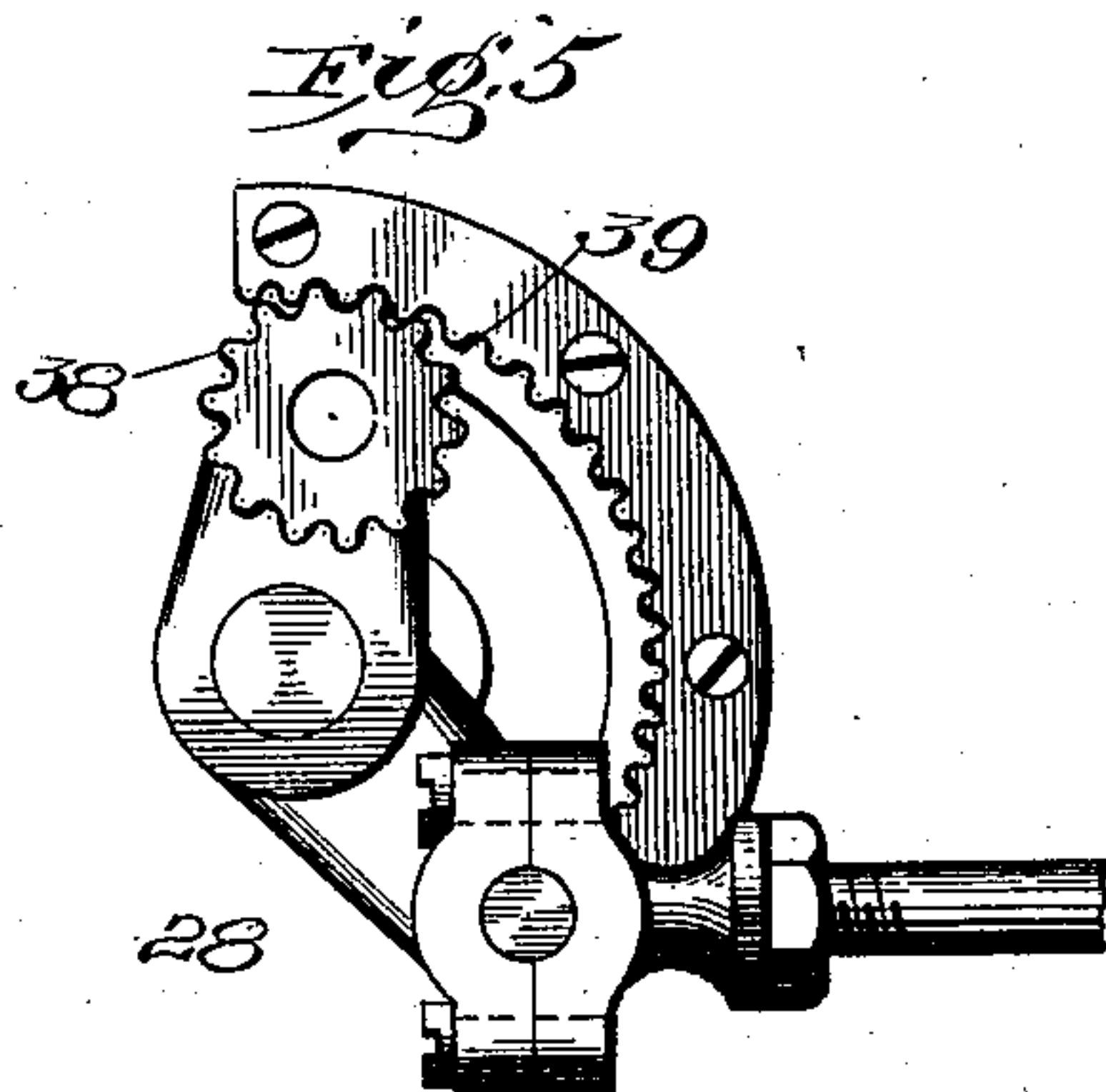
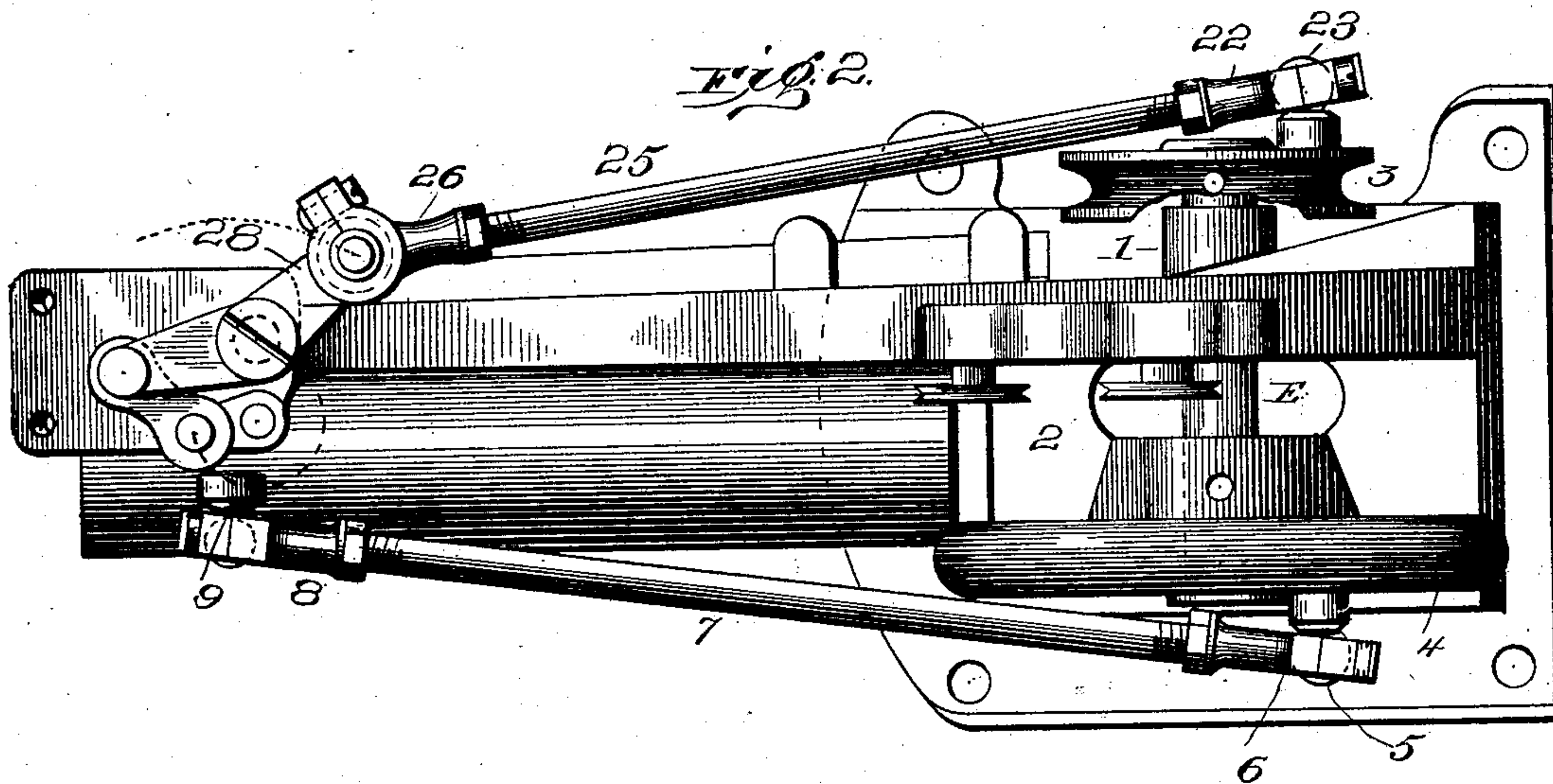
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NO MODEL.

5 SHEETS—SHEET 2.



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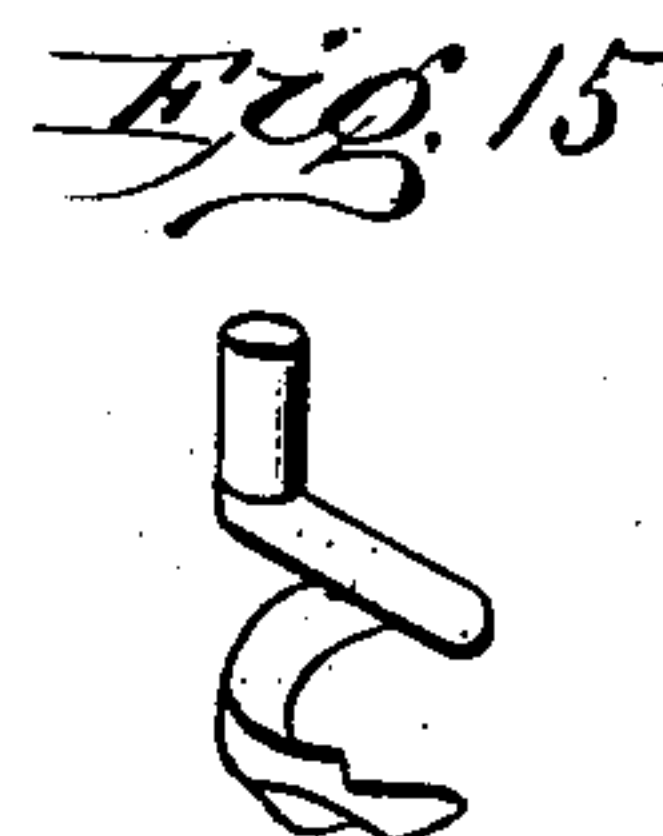
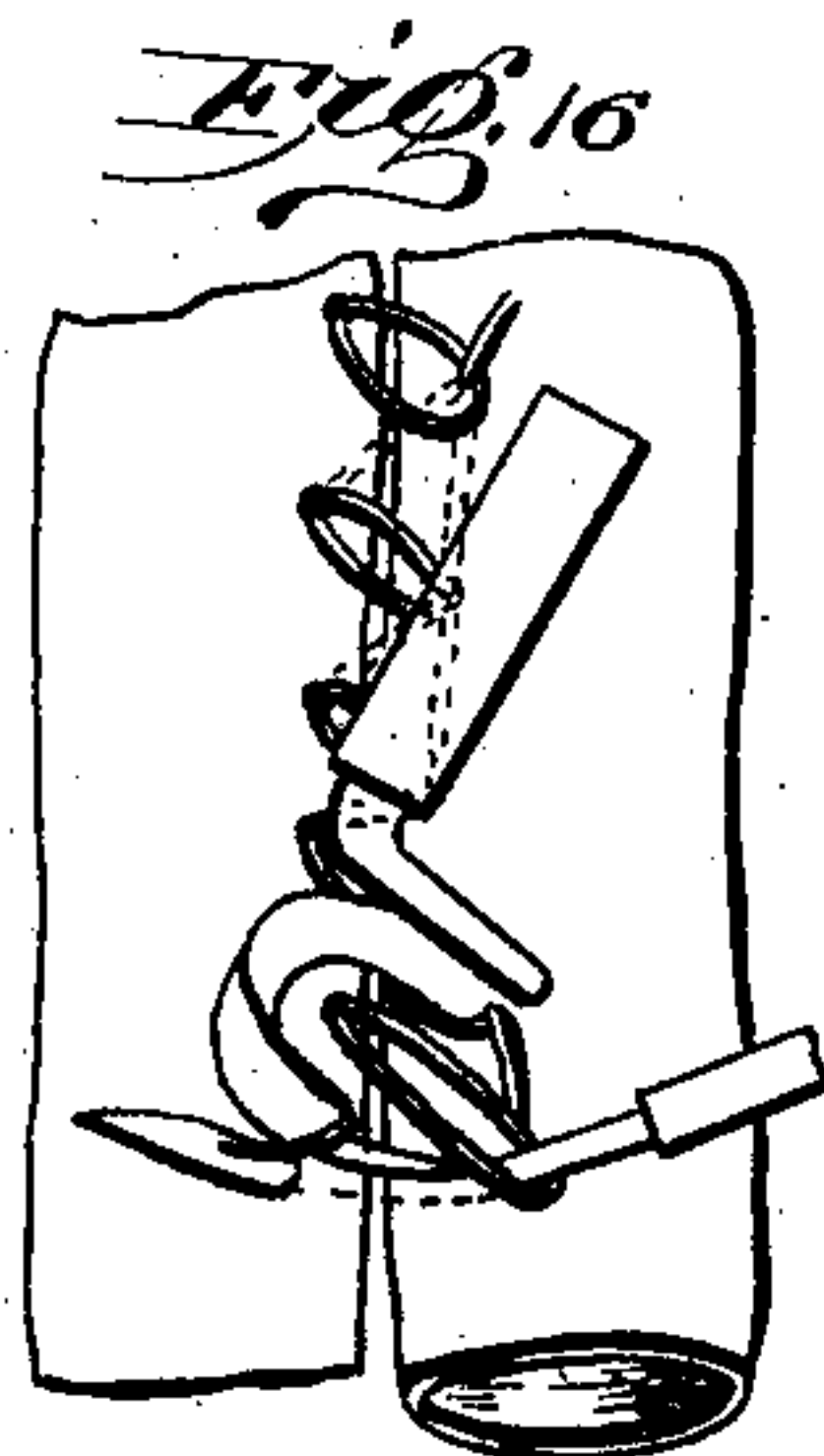
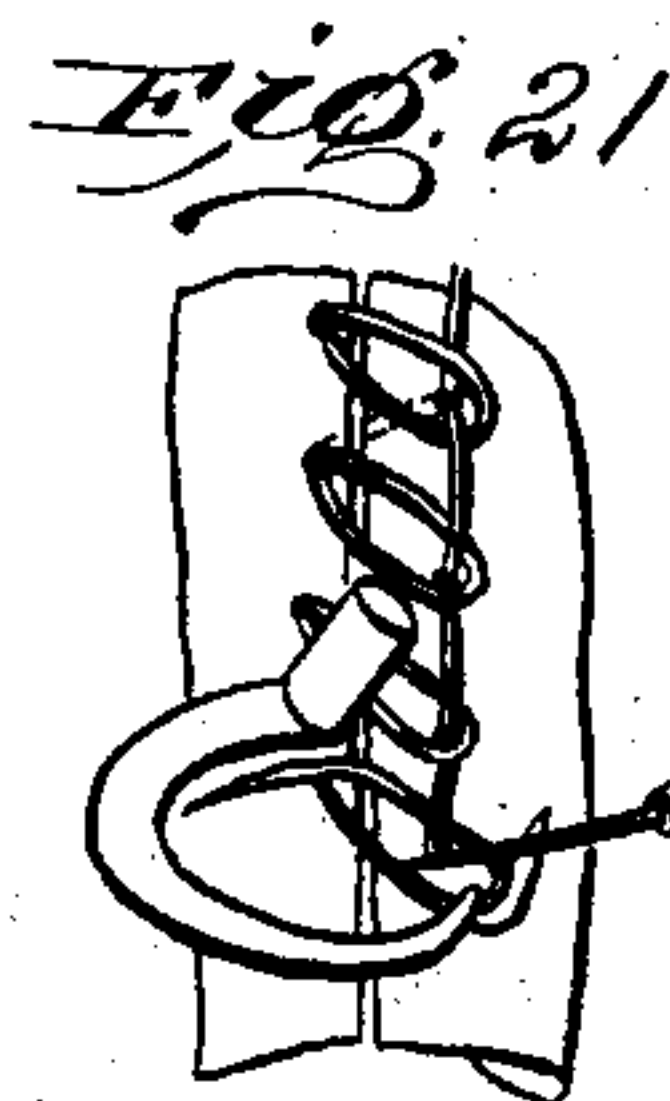
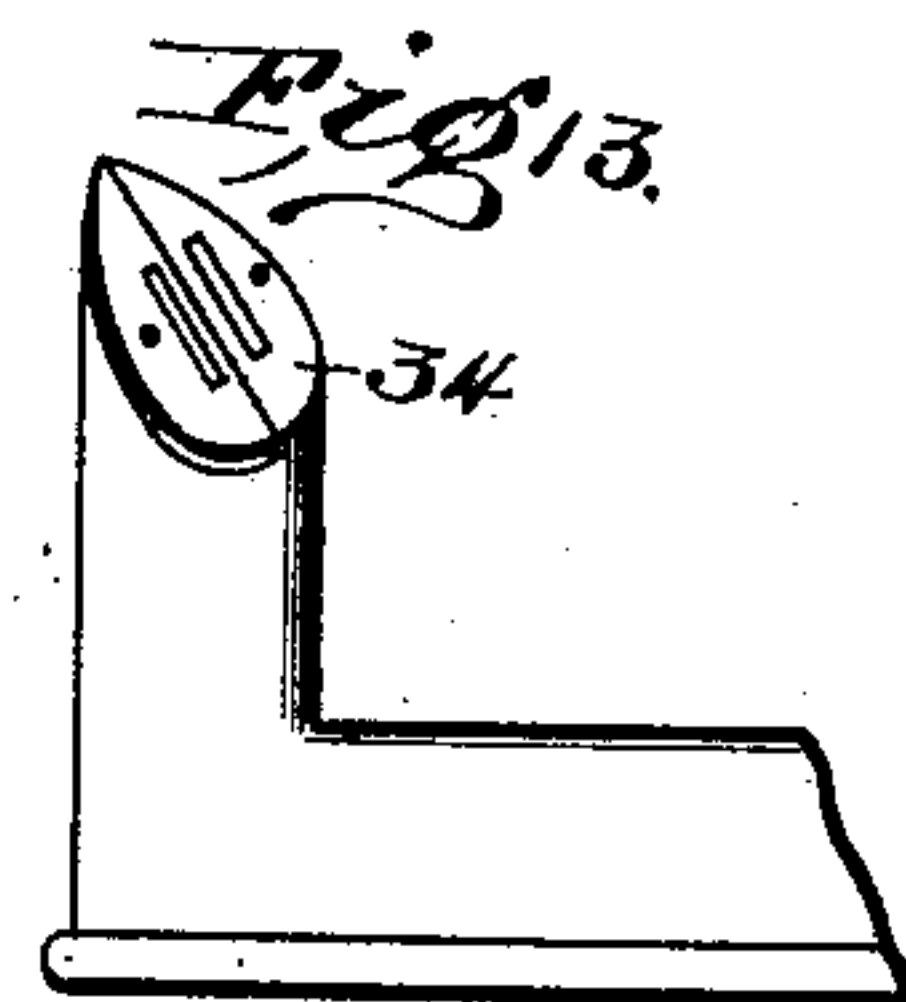
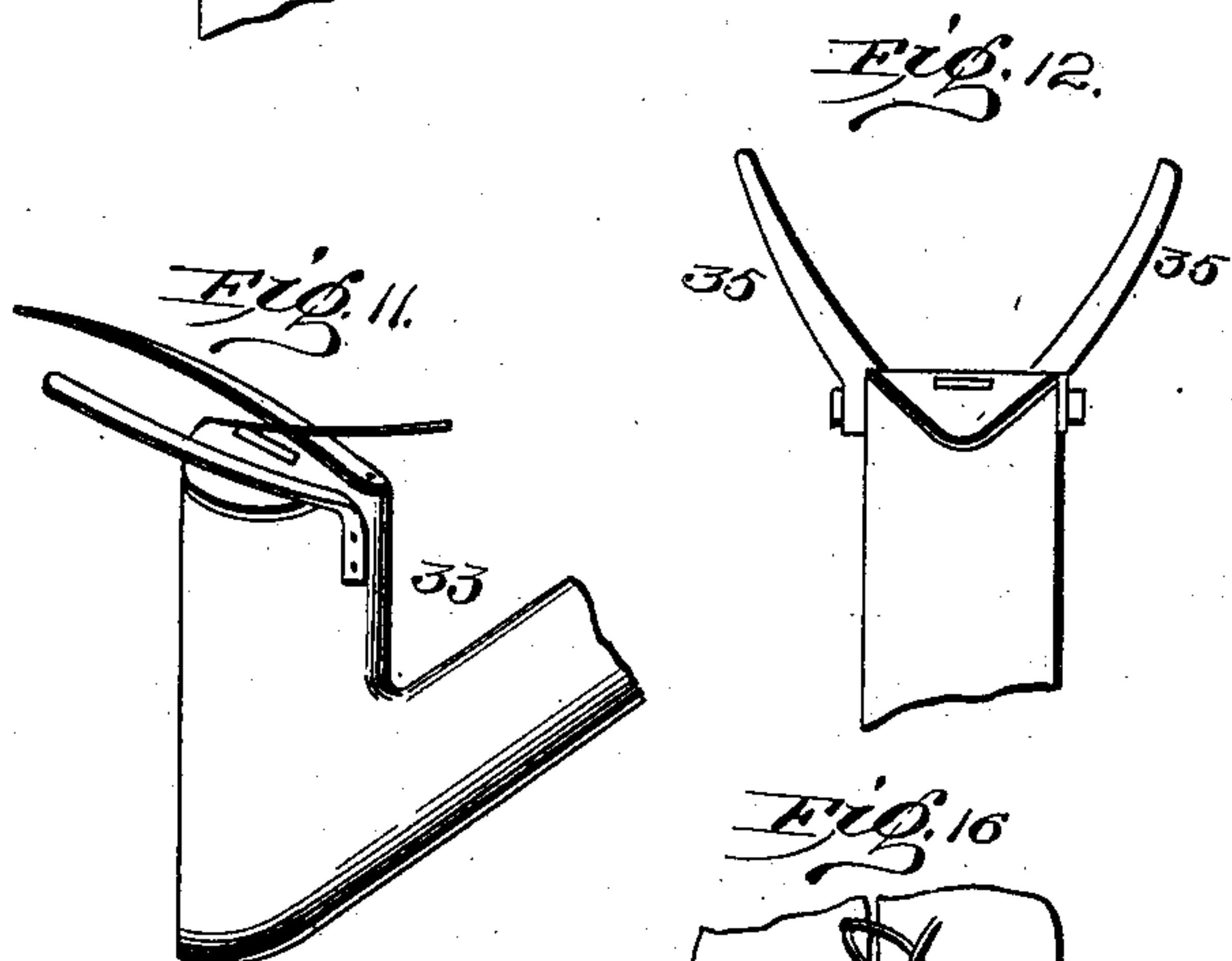
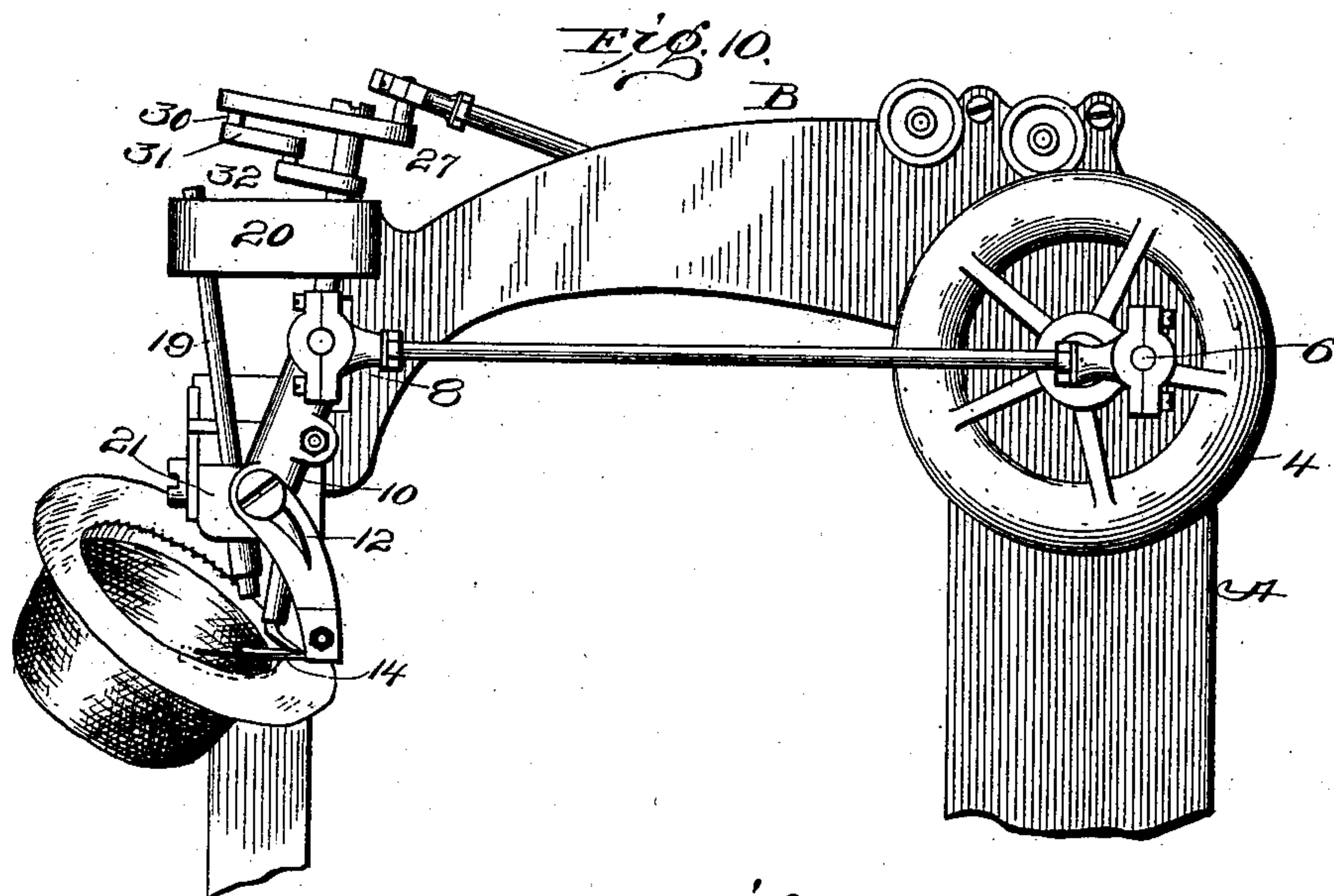
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APPLICATION FILED MAR. 29, 1899.

NO MODEL.

5 SHEETS—SHEET 4.



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No. 721,077.

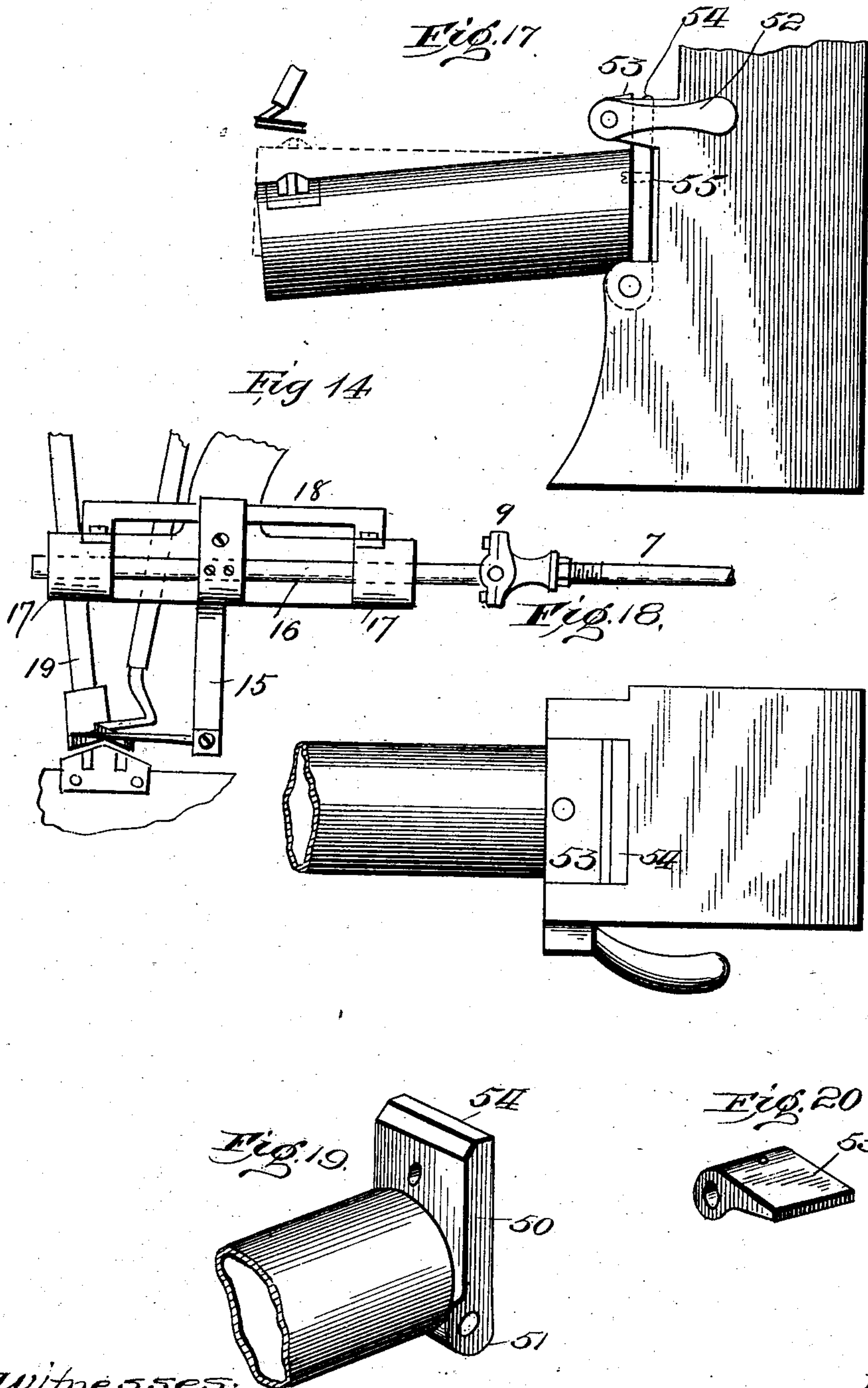
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L. ONDERDONK,
SEWING MACHINE.

APPLICATION FILED MAR. 29, 1899.

NO MODEL.

5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

LANSING ONDERDONK, OF NEW YORK, N. Y., ASSIGNOR TO THE UNION
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SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 721,077, dated February 17, 1903.

Application filed March 29, 1899. Serial No. 711,025. (No model.)

To all whom it may concern:

Be it known that I, LANSING ONDERDONK, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in 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.

This invention relates to an improvement in sewing-machines; and the object is to provide a sewing-machine of the single or double chain type adapted particularly for blind-stitching, although in certain respects not necessarily limited to blindstitching. The parts of the stitch-forming mechanism are arranged above the bed-plate, suitable feeding and work-supporting mechanism being provided.

The present application relates merely to the stitch-forming mechanism of a machine of such character, the feeding mechanism and various details of construction forming the subjects-matter of other applications filed in the United States Patent Office.

The invention therefore consists in the various details of construction and arrangement of parts and in other matters described and referred to in the appended claims.

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

Figure 1 is a side elevation of a sewing-machine embodying the invention. Fig. 1^a is a detail view of the piece H on the throat-plate over which the goods are bent, illustrating the means of adjustment. Fig. 2 is a top plan view of the same. Fig. 3 is a front end view. Figs. 3^a and 3^b are respectively front and top detail views of the link connections for guiding and bodily moving the looper-bar. Fig. 4 is a top plan view showing another mechanism for oscillating the looper-shaft. Fig. 5 is a similar view of still another such mechanism. Fig. 6 is a plan view of the stitch made on the machine. Fig. 7 is a plan view of a piece of fabric sewed with the stitch. Figs. 8 and 9 are detail views showing the relative positions of the needle and looper at the opposite extremities of their movement.

Fig. 10 is a side elevation of a sewing-machine adapted for sewing hat-sweats into hats and embodying my invention. Fig. 11 is a perspective front view of the work-supporting posts. Fig. 12 is a front view of the same from beneath the arm of the machine. Fig. 13 is a top perspective view of the cloth-plate attached to the top post. Fig. 14 is a sectional side view, part being broken away, showing an arrangement in which a straight needle having a horizontal reciprocation is used instead of a curved needle, as in the other figures of the drawings. Fig. 15 is a detached view of the looper used in my machine when it is desired to make a single chain-stitch. Figs. 16 and 17 are detail views representing the formation of a stitch. Figs. 18 and 19 are respectively side and plan views of a portion of a sewing-machine, showing the arrangement for dropping the work-plate; and Figs. 20 and 21 are respectively detail views, the one of the hinged end of the cylinder and the other of the holding-cam.

In the drawings, A represents the main standard or base of the machine, upon which is formed the upwardly and forwardly projecting arm or gooseneck B.

C represents the work-plate of the machine, which, as herein indicated, is hinged at D to the standard A in order to swing down to allow of the work being put in place. As herein shown, this work-plate is a cylindrical casing carrying the throat-plate, and within it is arranged the feeding mechanism; but no detailed description of said feeding mechanism is herein shown, as it forms the subject-matter of another application, referred to as Case D, filed the 31st day of July, 1902, Serial No. 117,878.

Referring now to the needle-operating mechanism, and calling attention particularly to Figs. 1, 2, and 3, E represents the main or driving shaft of the machine, which is transversely arranged with respect to the axis of the work-plate and is supported in suitable bearing in the lugs 1 2. Said shaft has at its inner end the belt wheel or pulley 3 and at its opposite end a balance-wheel 4. This balance-wheel 4 has projecting from it a lug, into which is screwed a ball-stud 5. A two-part

split head 6, formed with a socket into which the ball of the stud extends, has a screw-threaded opening in its end, into which is screwed the end of the pitman-rod 7, which at its opposite end is screwed into a socket in the two-part split head 8, this having a socket in which fits the ball on the stud 9, screwed in the upper end 10 of the needle-arm, which is sleeved, as at 11, to the stud 12, screwed into the head of the machine. This needle-arm, as shown, is an angle-arm, and the lower part 13 is formed at its lower end to receive the shaft of a needle 14, shown in certain of the figures as curved, and therefore moving in the arc of a circle, and in others as straight and moving in a horizontal line; but whether moving in the arc of a circle or in the straight horizontal line it will be understood that the line of movement is substantially in a horizontal plane and that the needle enters and emerges from the fabric above the cloth-plate and on opposite sides of the central line of the seam. A straight needle is shown in Fig. 14, this needle 14 being clamped on the lower end of a bar or needle-lever 15, secured to a bar 16, sliding in bearings in the lugs 17 and prevented from turning by the guide-bar 18, embraced by the slotted end of the lever 15, the rod 16 being reciprocated in its bearings by the pitman and ball-and-socket connections 9 7 6, &c., as above described. The bar which supports the presser-foot is illustrated at 19, and, as shown, it passes at an inclination through its bearings in lugs 20 and 21. The presser-foot itself is not shown in Fig. 1 for the sake of clearness, but is preferably formed as indicated in Fig. 14—that is, V-shaped in cross-section—to fit down over the beveled two-part feed-dog 22 and the raised ridge or piece H on the throat-plate, over which the goods are bent to enable the needle to take the proper bight, and this raised portion on the throat-plate may be made adjustable as desired, and the machine may be made to sew through and through, as well as to make a blind stitch. This arrangement for adjusting this ridge or piece H is shown in Fig. 1^a, in which said piece H is hinged at *x* to the throat-plate and is adjusted up and down by means of the screws *y z*, the screw *y* being a raising-screw which passes through the throat-plate into the frame of the bed-plate and the screws *z* being for the purpose of holding down the ridge against the top of the screw *y*, which may be adjusted to desired position.

Screwed into a lug on the belt-wheel 3 is a stud having a ball 23 on its outer end fitted within the socket in the head 24, which has a universal movement by reason of said ball-and-socket connection. Attached at one end to this head is a pitman 25, which at its opposite end is secured to another head 26, the socket of which fits over a ball on the end of a stud 27, screwed into one end of a horizontal arm or lever 28, pivoted on a bolt or stud 29, screwed into the lug 20 in the head of the

machine. At the other end the arm or lever 28 is provided with a downwardly-projecting stud 30, having a ball on its lower end jointed in a socket in one end of the link 31, the other end of said link being jointed to a ball-stud on the end of the arm-plate 32, to which the upper end of the looper-supporting rod or bar F is attached. Said rod or bar F passes through the lugs 20 and 21, having bearings therein in which it rocks, and may slide up and down, if desired. This rod or bar F at its lower end is fitted to receive the shank of a curved looper G. The rod or bar F is inclined from the vertical, as shown, and therefore as it oscillates on its axis through the connections above referred to the front of the looper G is at its highest point at one extremity of its movement and at its lowest point at the other extremity of its movement. I utilize this feature by so timing the movements of the needle and looper that when the needle is at the limit of its forward movement the looper is above the needle and moves forward to take the loop of needle-thread and carry its own loop through the needle-loop, while when the needle has receded to the point where it is about to go forward to pierce the goods the point of the looper is below the plane of the needle. The relative positions of the needle and looper at the extremities of their throw are shown in Figs. 8 and 9, and the stitch made where the looper, as well as the needle, carries a thread is shown in Figs. 6 and 7, in the latter figure the stitch being shown as applied to making a blind hem, *a* being the needle-thread, and *b* the looper-thread, and *c* the fabric being sewed.

In Figs. 16 and 17 is illustrated the formation of a single-thread overcast stitch on the present machine, the looper detached being shown in Fig. 15. Instead of carrying a looper-thread this looper 14' has a notch and a shoulder near the point. The point enters the loop of needle-thread. The shoulder engages the same and swings it around. The notch on the under side of the looper is to allow the thread on the under side of the looper to draw into it, so that between this notch and the shoulder the loop of needle-thread engaged is spread, as shown in Fig. 17, so that when the needle starts to enter the goods it enters the spread loop of its own thread made during the previous stitch. Fig. 17 represents the looper entering the needle-loop, and Fig. 16 the needle entering its own loop spread by the looper.

It will be noticed that by my arrangement either a double-thread whip-stitch or single-thread whip-stitch may be made by simply substituting one looper for another and perhaps changing the time of take-up slightly.

In Figs. 10, 11, 12, and 13 is shown a modification of the present machine adapted for sewing hat-sweats into hats. In this arrangement the looper movement is the same as that hereinbefore described; but for a bed or work plate the post 33 is provided, the top of the post being beveled and provided with a throat-

plate 34. This throat-plate should be made adjustable to admit of presenting a hat to the action of the needle at the point at which the crown attaches to the rim without having to bend the same. The supports 35 are simply arms extending from the post for the purpose of holding the hat in position.

In Fig. 4 is illustrated in top plan another mechanism for oscillating the looper-bar F and looper G. In this construction the pitman 26 is connected, as above, to the swinging lever 28, which lever is forked, as at 36, the sides of the fork embracing the stud or projection 37 on the arm or rod 32, attached to the upper end of the looper-bar F, this stud being flat on two sides to allow of the fork sliding thereon as it swings to oscillate the rod 32.

Still another mechanism for oscillating the looper-rod is shown in Fig. 5, in which the lever 28 is provided at its outer end with an opening through which the looper-rod passes, said looper-rod carrying in its upper end a pinion 38, in mesh with a segmental gear 39, secured to the frame of the machine, this being more clearly described in Case C, filed April 5, 1899, Serial No. 711,830. It will be seen that as the lever oscillates the looper-rod F will have imparted to it when properly supported below, preferably upon a universal joint, not only an oscillatory motion on its axis, but a gyratory movement on its point of support to cause it to swing up and down, as well as turn around.

In Fig. 3 I have illustrated a construction in which the swinging movement of the needle-supporting lever automatically imparts to the looper-bar a vertical bodily movement to raise and lower it during its forward-and-backward movement to cause it to pass over seams or other obstructions. The upper part of the needle-lever 10 has an offset lug 40, through which passes a stud 41, upon the inner end of which is pivotally sleeved the end of the link 42, while the opposite end 43 of the link 42 is similarly formed and pivoted upon the short fulcrum-block, having a squared portion 45, in which the looper-bar F is mounted to rotate, while the end 46 of a link transverse to link 42 and pivoted to the machine-frame embraces the opposite end of said short block 44. The squared portion 45 of the fulcrum-block 44 is confined between the collars 48, fixed to the looper-bar, so that as the needle-lever 10 swings the looper-bar by means of the link connections rises and falls without bind, and at the same time perfect freedom of movement on its axis is allowed. It will be understood that it is not necessary for the looper to be secured in a bar, as F, as a stud may be secured to the head of the machine on an incline, and a sleeve with lugs so secured by the stud can carry the looper and frame in direct connection with the driving-rod, this being clearly an equivalent of the mechanism heretofore described. This mechanism for

bodily raising and lowering the looper-supporting bar by connections to the needle-lever is not herein claimed, as it forms the subject-matter of a divisional application, filed on the 7th day of November, 1899, Serial No. 736,132, (Case H.) So, also, in connection with Fig. 14 it will be understood that the needle-carrying device may be made to rock and when rocked with the needle in the material would be, in effect, a needle-feed. The needle-lever 13 may be secured on a stud substantially the same as that marked 12, except the stud would be made to slide endwise in its bearings, in which event it would also be a needle-feed. It is preferred, however, to use a construction in which the needle acts in combination with a regular feed operating against the under side of the material, and this feed is either a wheel-feed or a four-motion feed, according to the class of work to be done. The needle may be driven to enter the goods either from the right or left, as may be desired, and to provide for this it will be understood that the looper-bar may be put in the place now occupied by the presser-bar in Fig. 1 and the presser-bar in the place of the looper-bar.

In Figs. 18 to 21, inclusive, are illustrated mechanism for dropping the work-plate to allow of the insertion of the work. The hinge for the cylindrical casing is shown at D, the cylinder being provided on its end with the part 50, the lower end of which is provided with a lug 51, through which passes the pin-
 100

52 represents the operating-lever, pivoted to the standard of the machine and provided with a cam 5^e, which in the downward movement of the lever 52 presses against the upper end 54 of the part 50 and forces the bed-plate into position, 55 being a stop-screw for adjusting the cylinder to and from the needle.

The matters herein shown and described, but not particularly claimed, form the subject-matter of the applications above referred to, and it will be understood that so far as the broadest features of the invention are concerned I do not wish to be limited to the exact arrangement of the looper-bar and
 115

It will be understood that I do not wish to confine myself to the shape or style of bed-plate used on this machine, nor to the character of feeding mechanism, whether rotary or ordinary four-motion feed, nor to the precise manner of supporting the looper and needle, nor do I wish to limit myself to the direction of the feed, whether across the bed-plate or arm or up the arm or off the arm, and even with the feed in the direction of the length of the arm or bed-plate, with the needle and looper arranged as shown in the drawings, then the ordinary straight-away chain-stitch or double chain-stitch would be made, and of course a plurality of needles or loopers might be used. I also propose to arrange a trimming device
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in advance of this stitch-forming mechanism, and by this arrangement two pieces of goods can be trimmed and their abutting edges joined and overseamed with a flat seam.

5 Various other modifications and changes may suggest themselves to any one skilled in the art, and these may be made without departing from the spirit of my invention.

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

1. In a sewing-machine, the combination of a work-support, feeding mechanism, and stitch-forming mechanism, including a needle vibrating back and forth across the line
15 of the seam and entering and emerging on the same face of the fabric, of a looper cooperating therewith to form stitches and moving in a plane which intersects the plane in which the needle moves, and is at one extremity of its movement above the needle and at its other extremity below the needle; substantially as described.

2. In a sewing-machine, the combination of
25 a work-support, feeding mechanism, and stitch-forming mechanism, including a needle vibrating in a substantially horizontal plane, and an oscillating looper cooperating therewith to form stitches, moving in a plane
30 which intersects said plane of movement of the needle, and is at one extremity of its movement above the needle and at its other extremity below said needle; substantially as described.

3. In a sewing-machine, the combination of
35 a work-support, feeding mechanism, and stitch-forming mechanism, including a needle vibrating in a substantially horizontal plane, and an oscillating looper moving in a plane which intersects the said plane of movement of the needle and is at one extremity of its movement above the needle and at its other extremity below said needle, said needle and looper being arranged and operating
40 entirely above the work-plate of the machine; substantially as described.

4. In a sewing-machine, the combination of the work-support, feeding mechanism, and stitch-forming mechanism, including a needle vibrating in a substantially horizontal plane, and a looper oscillating about an upright axis inclined to the vertical, whereby in its movement it crosses the path of the needle and is at one extremity of its movement above the needle and at its other extremity below said needle, both said needle and looper mechanism being located and operated entirely above the work-support; substantially as described.

5. In a sewing-machine, a stitch-forming mechanism including a needle reciprocating in a substantially horizontal plane, and a curved looper cooperating therewith to form stitches, with means for oscillating said looper
60 on its axis in a plane which intersects the plane of movement of the needle, the looper being at one extremity of its movement above

the needle and at its other extremity below said needle; substantially as described.

6. A sewing-machine having a suitable work-support, a feeding mechanism contained therein, and a stitch-forming mechanism comprising a needle with means for vibrating it in the direction of its length across the line of the seam, and a looper with means for oscillating it in a single plane to cause it to engage the needle-thread in one position, and then to move around the path of the needle to a point on the other side of the line of the seam and carry its thread into position to be engaged by said needle, both needle and looper being arranged and operating entirely above the work-support; substantially as described.

7. In a sewing-machine having a suitable work-support, means for crimping the work thereon, a needle mounted above the work-support vibrating back and forth across the line of the seam and entering and emerging on the same face of the fabric above the work-support, means for vibrating said needle, and a looper moving in a single plane, passing from a point above the needle across the line of the seam, to a point below said needle, and also operating above the work-support and cooperating with said needle to form stitches; substantially as described.

8. In a blindstitch sewing-machine, the combination with a work-support, feeding mechanism, of stitch-forming mechanism including a needle vibrating in a substantially horizontal plane, and a looper cooperating with the needle to form stitches, and moving in a single plane, and means for operating said looper to cause it to cooperate with the needle at one extremity of its movement above said needle, and at the other extremity below the needle, both needle and looper being arranged and operating above the work-support; substantially as described.

9. In a blindstitch sewing-machine, the combination of a work-support, and feeding mechanism, of stitch-forming mechanism including a substantially horizontal vibrating needle, and a vibrating looper moving in a single plane cooperating therewith to form stitches, both needle and looper being arranged and operating above the work-support, and means for operating said looper to cause it to cooperate with the needle at one extremity of its movement at one side the needle and at the other extremity below the needle; substantially as described.

10. In a sewing-machine, the combination with a work-support, and a feeding mechanism contained therein, a needle vibrating back and forth across the line of the seam above the work-support and an oscillating looper cooperating therewith to form stitches and moving in a single plane oblique to the line of feed from a point above the needle on one side the line of the same to a point below on the other side the line of the seam, said looper also being arranged and operat-

ing above the work-support, said work-support being provided with means for crimping the work; substantially as described.

11. In a sewing-machine, the combination
5 with a work-support, and a feeding mechanism contained therein, a needle vibrating back and forth across the line of the seam above the work-support and an oscillating
10 looper cooperating therewith to form stitches, said looper also being arranged and operating above the work-support, said work-support being provided with an adjustable raised
15 portion for crimping the work and varying the amount of bite of needle into the goods; substantially as described.

12. In a sewing-machine, the combination
20 of a work-support, means thereon for crimping the fabric to be sewed, feeding mechanism, and stitch-forming mechanism, including a looper and a needle cooperating with
25 each other to form stitches, said needle being arranged to vibrate back and forth in the direction of its length across the line of seam above the work-support and entering and
25 emerging on the same face of the fabric, said looper being arranged to oscillate in a single plane from a point above the needle on one

side the line of seam across the path traversed by the needle to deliver its thread at a point below the needle upon the opposite side of
30 the line of the seam; substantially as described.

13. In a blindstitch sewing-machine, the combination of a work-support, feeding mechanism and stitch-forming mechanism, the latter including a curved needle which vibrates
35 back and forth across the line of the seam and enters and emerges on the same face of the fabric, of a looper having a movement in a plane inclined to the work-support and
40 which enters the needle-loop at a point above the needle, passes around the path described by the needle and carries its thread across the line of the seam to a point adjacent to
45 and below the needle at its point of entry into the goods, whereby the needle may pass into the looper-thread on the looper; substantially as described.

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

LANSING ONDERDONK.

Witnesses:

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F. A. NORTH.