

L. ONDERDONK.
 OVERSEAMING SEWING MACHINE.
 APPLICATION FILED MAY 13, 1899.

929,698.

Patented Aug. 3, 1909.
 4 SHEETS—SHEET 1.

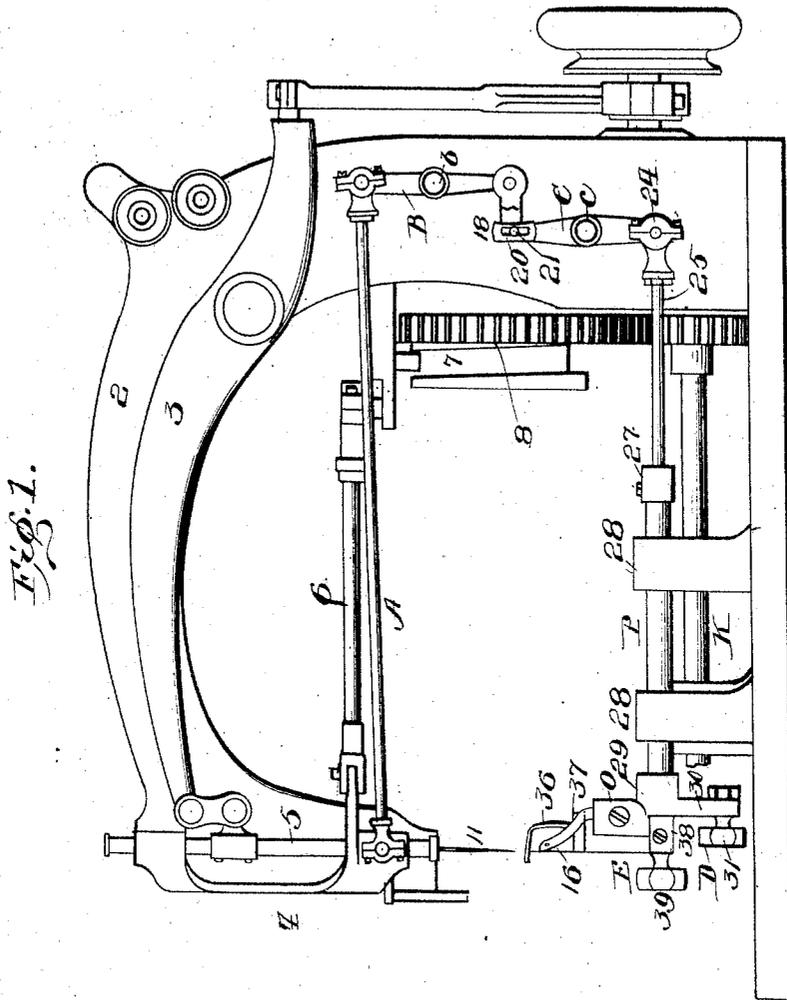


Fig. 1.

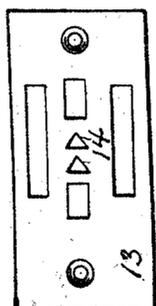


Fig. 2.

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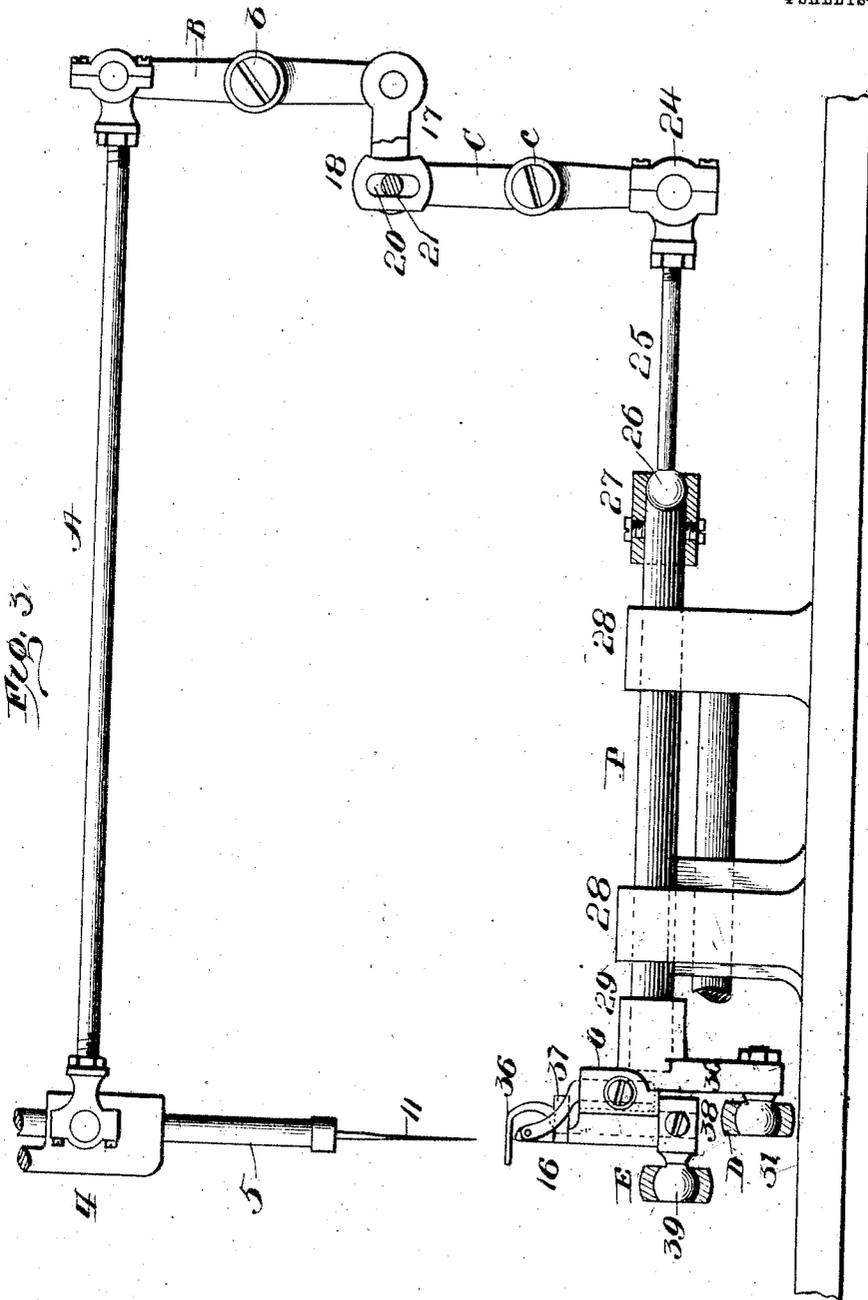
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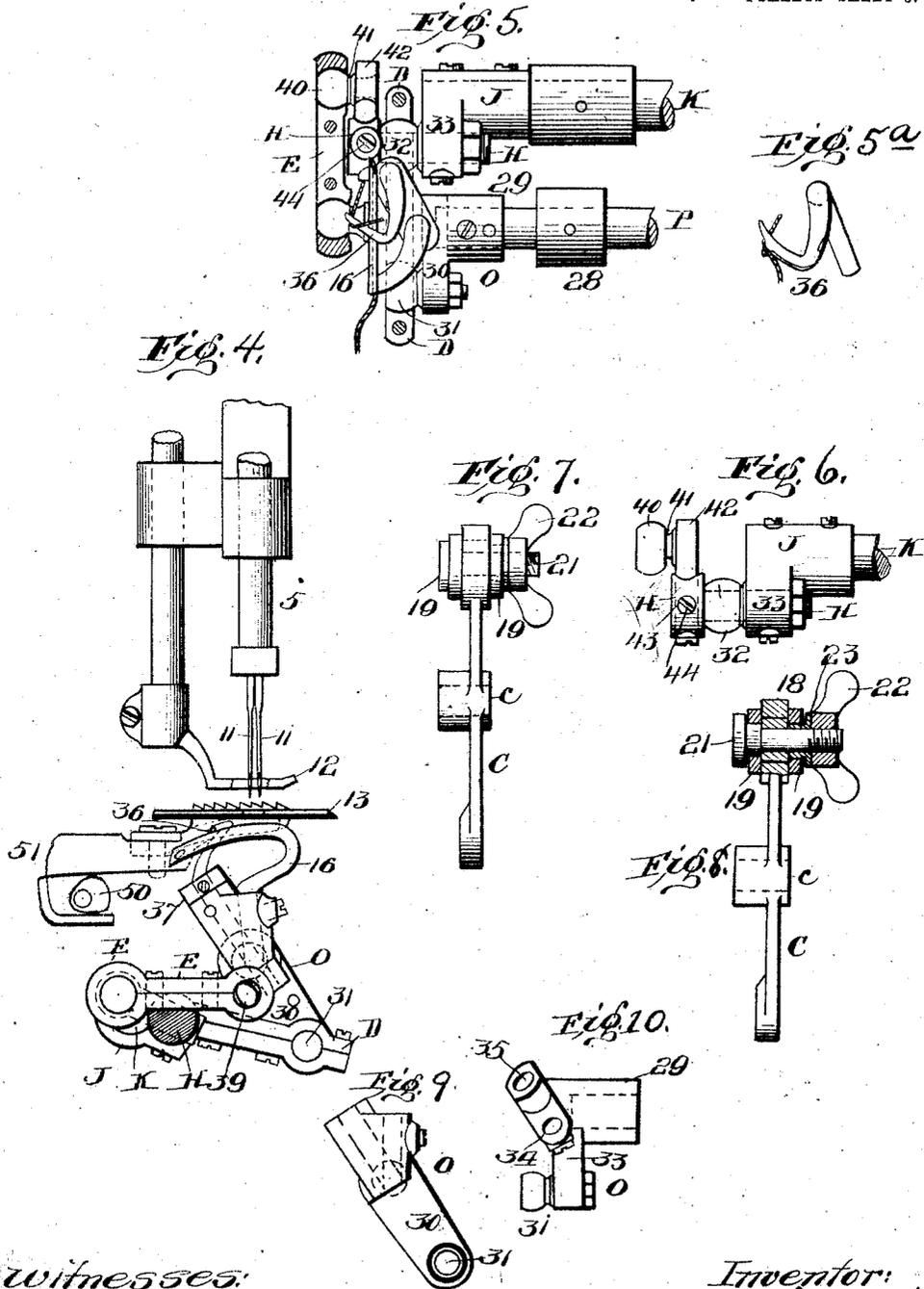
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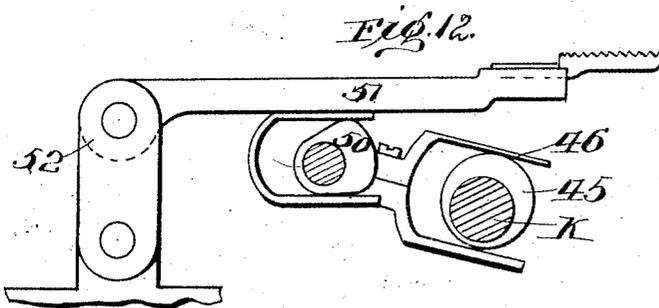
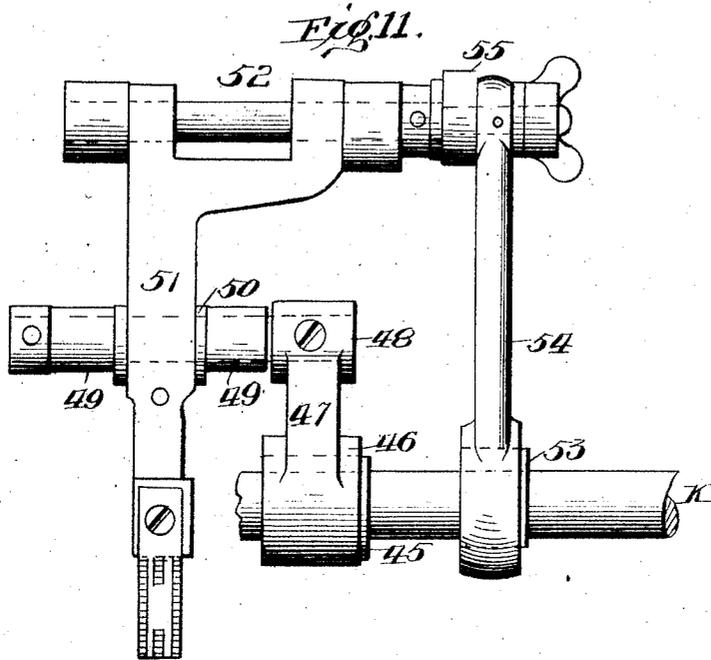
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

LANSING ONDERDONK, OF NEW YORK, N. Y., ASSIGNOR TO THE UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

OVERSEAMING SEWING-MACHINE.

No. 929,698.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed May 13, 1899. Serial No. 716,690.

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 Overseaming Sewing-Machines, of which the following is a description, reference being had to the accompanying drawing and to the letters and figures of reference marked thereon.

My invention relates to an improvement in sewing machines, and especially to those of the zigzag, overseaming or button hole type, and the object is to provide a machine of the type referred to, which may be adapted to make a chain stitch.

Heretofore most machines of the zigzag, button hole or overseaming type have been provided with a single needle, but it has also been proposed to provide them with a plurality of needles (two) arranged side by side, a line joining them being at right angles to the line of feed. I would say, however, that two needle zigzag machines of this character are used principally for ornamental stitching and very little for edge stitching. I have found that by using, in this character of machine, two needles, one directly back of the other and in the direction of the feed, that the stitch on the machine may be lengthened to double that of a single needle machine, at the same time covering the edge of the material or the body of the material with the same amount of covering that would be used in a single needle machine, and stitch only one half the length. In other words, my improvement enables the machines to accomplish double the amount of work possible in a single needle machine. In button hole machines when used with a single looper, it has the advantage of increasing the size of the purl cast on the under side of the material for the reason that two needle threads will be tied up with a single looper thread which will proportionately increase the size of the purl from that of a single needle tied up with the looper thread. In order to use this arrangement of needles, that is, one back of the other, and particularly in a zigzag machine where a single looper is used, the looper must run in the direction of the feed, and should have a lateral sidewise movement corresponding to the lateral side-

wise movement of the needle. Where the material sewn is vibrated and a plurality of needles is used one back of the other, it is not necessary to make the needles and looper move from side to side; but when running the looper in the direction of the feed of the work is used with either one or more needles arranged as set forth, this arrangement of the looper does not offer the advantage for casting the threads away from it, that it does when traveling at right angles to the line of feed, therefore, it is necessary to use a spreader, or device of some kind, for carrying the looper thread away from the looper sufficiently to enable the needles in their descent to engage the looper thread.

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 side elevation of a portion of a sewing machine, embodying that form of my invention in which one looper traveling in the direction of the feed cooperates with the needles to form stitches, a portion of the machine, and particularly that which relates to the mechanism for causing the looper to follow the movements of the needle and which is shown clearly in Fig. 3, being represented in diagram; Fig. 2 is a top plan view of the throat plate for use on the machine; Fig. 3 is an enlarged side elevation, illustrating the looper and loop spreader supporting mechanism and the mechanism for imparting to the looper its needle following movements; Fig. 4 is an end view of this form of machine showing the connection and arrangement between the driving shaft and looper supporting frame or rocker, the looper operating shaft; also the looper and loop spreader; Fig. 5 is a top plan view of the looper and loop spreader supporting and operating connections; Fig. 5^a is a detail view of a modified form of loop spreader; Fig. 6 is a plan view of the double adjustable crank forming a part of the loop spreader and looper operating mechanism; Figs. 7 and 8, are respectively side and partially sectional side views of one of the levers of the connections for giving the sidewise movement to the looper; Figs. 9 and 10 are detail views of the looper and spreader supporting frame; Fig. 11 is a

top plan view of the feed mechanism detached; Fig. 12 is an end view partly in section; and Fig. 13 is a detail of the adjusting arm for regulating the length of the stitch.

5 Referring to Fig. 1, the frame 1, gooseneck 2, needle lever 3, needle bar gate or frame 4, needle bar 5; needle cam 7 and gears 8 and 9 are all of the usual construction of the well known Union Special overseaming machine. 10 As shown in this Fig. 1, and in Figs. 3, 4, and 5, the needles 11, 11, are arranged one back of the other and in the direction of the feed, but a single looper 16, and that traveling in the direction of the feed, and cooperating to 15 take a loop of needle thread from both needles, is used. As the looper runs in the direction of the feed it is desirable that it should have a movement in unison with the zigzag movements of the needles, in other 20 words, that it should have a needle following movement, and this is imparted as follows: A represents a pitman having at its forward end a ball joint connection with the needle bar gate, or frame 4, and at its opposite end 25 having a similar connection with the upper end of a swinging arm or lever B, pivoted at b to the frame of the machine. From the lower end of this lever B, parallel with the pitman A, extends a link 17, pivoted to said 30 lever B, and having an adjustable stud and slot connection (shown in Figs. 7 and 8) with the upper end of the lever C. The link 17 is divided, the two ends embracing between them the slotted head 18 on the upper end of 35 said lever C, and through the divided ends 19 of the link 17, and the slot 20 passes a screw bolt 21, having a thumb nut 22, on the end bearing against a washer 23, and by this adjustment the amount of throw of the lever 40 C is adjusted, this lever C being pivoted at c to the frame of the machine. This is a convenient arrangement but not absolutely necessary.

45 To the lower end of the lever C is attached by a ball and stud connection a head 24, having a socket into which is screwed a short rod 25, having at its opposite end a ball 26, which fits within the end of a block 27, secured to the end of the looper shaft P, having 50 sliding and rocking bearings in the lugs 28. As the needle bar gate or frame 4 is oscillated the shaft P through the connections above described, will be reciprocated, and as the shaft P is oscillated, as hereinafter described, such movement will be allowed the 55 block 27 turning around the ball 26. This arrangement marked 25, 26, and 27 is similar to and may be exactly the same as the arrangement shown in patent granted R. 60 Stocker, May 12, 1897, #583,391. To the forward end of this sliding and rocking shaft P is fixed a looper supporting frame O shown in detail in two different positions in Figs. 9 and 10. This frame O has a sleeve portion 65 29 rigidly fixed upon the end of the shaft P.

This looper support or frame O has an arm or lug 30 extending downwardly from the sleeve 29 and secured upon its lower end is a stud having a ball head 31, over which fits 70 one end of a two part link or bar D, and at its opposite end this link or bar D is clamped over a ball sleeve 32 on the stud H, which stud H is secured in the arm 33 of the crank J which is fixed on the forward end of the main driving shaft K. The looper 16 is sup- 75 ported in a socket 34 in the frame O, and from the construction just described it will be seen that as the driving shaft K rotates, the bar D oscillates, and imparts an oscillating motion through the arm 30, and frame 80 O to the shaft P, thus giving the forward and backward movements to the looper, and at the same time the shaft P will reciprocate in the direction of its length to move the looper 85 sidewise in unison with the lateral vibration of the needle.

Instead of the pitman A, it will be understood that a connection may be provided between the pitman 6, or the oscillating frame to which it is attached and the lever B, so 90 that the looper following movement may be transmitted therefrom, the pitman A being omitted.

As a further and special improvement in machines of this character, I have provided a 95 loop spreader which is supported by the looper supporting frame, but has an oscillatory motion on its own axis across the plane of the looper to spread the looper thread so that the needle threads will engage 100 it, said spreader also being arranged to hold the needle loops back on the looper so that the needles will not interfere with their own threads. The looper supporting frame O has an opening 35, through it, arranged at an in- 105 cline to the socket 34 to receive the shank of a loop spreading device 36, this shank having secured at its upper end a collar 37 which rests upon the upper portion of the looper 110 supporting frame O, said shank extending through the opening 35 and being journaled to rotate therein, and having clamped around its lower end a head 38 provided with a ball 39, over which is clamped one end of a 115 split frame E, which split frame or link at its opposite end embraces the ball 40, on the stud 41, secured in the head of the crank 42, which crank 42 passes through and is secured in the head 43 of the bolt H, being secured therein by the screw 44, this being the 120 same bolt H which supports the ball sleeve 32. By this connection it will be noticed that as the driving shaft K rotates and the looper has an oscillating movement in the 125 direction of its length imparted to it, as well as a sidewise movement to follow the movements of the zigzag needle, that the loop spreader, besides traveling bodily with the looper will have an oscillatory movement in 130 the socket or bearing 35 on its own axis

across the path traversed by the looper to catch the looper loop and move it to one side to form a triangle into which the needles will pass and to hold the needle loops back on the looper until such time as danger of the needles interfering with their own loops has passed.

In addition to other features set forth, I believe I am the first to invent a loop spreader supported by the looper supporting frame and having bodily movement with the looper and having independent movement on its own axis. Two forms of loop spreader are herein illustrated, one in Fig. 5 and the other in Fig. 5^a, in the former the point of the loop spreader merely passes into the path of the looper thread and by reason of the angular position of the point of the loop spreader with respect to the body portion causes the looper thread when it comes in contact with the loop spreader to slide along the incline thus formed by the spreader, consequently causing the looper thread to be moved away from the looper, the needles in their descent passing between the looper and its thread, while at the same time moving the loops of needle thread to proper position; in Fig. 5^a the point or end of the loop spreader has a notch which positively engages the looper thread and forces it away from the looper a certain distance, after which the looper thread is left to draw off the incline as the looper and spreader move back.

In Figs. 11, 12 and 13, is shown the feeding mechanism devised by me for use in connection with this machine. The driving shaft K back of the point where the crank J is attached is provided with an eccentric 45 embraced by a fork 46, on one end of the arm 47, fixed at its opposite end to the shaft 48 journaled in lugs 49 on the bed of the machine, this shaft 48 being provided with a three cornered cam 50, adapted in the movement of the shaft 48 to raise and lower the feed dog carrying bar 51, which is pivoted to the feed dog carrying bar gate or frame 52 of the usual construction on Union Special machines. A second eccentric 53 on the shaft K with a connection rod 54 adjustably secured at its opposite end to the slotted piece 55, forming a part of the feed frame or gate seems to impart the forward and backward movement to the feed carrying bar.

It will be understood that various minor modifications and changes in the construction of the machine may be made without departing from the spirit of my invention. Furthermore, it will be understood that the invention may be applied to lock stitch sewing machine, and that a single hook may be used to cooperate with the needles, or a plurality of hooks.

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

1. A sewing machine having a plurality of needles arranged one behind the other and in line with the direction of feed, and cooperating stitch forming devices including an under thread carrying looper and means for moving the same bodily, and a loop spreader movable bodily with said looper with means for giving to said loop spreader a further movement independent of said looper; substantially as described.

2. A sewing machine having a plurality of needles arranged one behind the other and in the line of the feed, means for laterally vibrating said needles, and an under thread carrying looper with means for operating it to cause it to cooperate with said needles and a loop spreader; substantially as described.

3. A sewing machine having a laterally vibrating needle, a looper traveling in the direction of the feed, a spreader, and means for vibrating the looper laterally in unison with the lateral movement of the needle; substantially as described.

4. In a sewing machine, a looper support and means for oscillating the same, and a loop spreader mounted upon said looper support and moving bodily therewith, and means for imparting to the same an independent oscillatory movement across the path of the looper; substantially as described.

5. A sewing machine having a plurality of laterally moving needles, arranged one back of the other in the direction of the feed, a looper cooperating therewith to form stitches, a spreader, and means for bodily vibrating the looper sidewise in unison with the lateral vibrations of the needle; substantially as described.

6. A sewing machine having a plurality of laterally moving needles, arranged one back of the other in the direction of the feed, a looper cooperating therewith to form stitches, a spreader, and means for bodily vibrating the looper sidewise in unison with the lateral vibrations of the needle, said spreader having bodily movement with the looper and having an independent oscillatory movement; substantially as described.

7. In a sewing machine including a laterally vibrating needle, and a looper having a lateral movement in unison with the lateral movements of the needle, a loop spreader having also a bodily movement in unison with the lateral movements of the needle and looper; substantially as described.

8. In a sewing machine, having a laterally vibrating needle, and a looper supported to oscillate and to reciprocate laterally in unison with the movements of the needle, means for imparting said lateral movement to the looper, comprising a series of pivoted levers, and connections between the pivoted levers and the needle bar, and between the pivoted levers and the looper, said levers having an

adjustable link connection between them to vary the throw of that one connected to the looper; substantially as described.

9. In a sewing machine, having a laterally vibrating needle, and a looper supported to oscillate and to reciprocate laterally in unison with the movements of the needle, means for imparting said lateral movement to the looper, comprising the pivoted levers B, C, the link 17 connecting the upper end of lever C with the lower end of lever B, and connections between the lever B and the needle bar and between the lever C and the looper; substantially as described.

10. In a sewing machine having a laterally vibrating needle and a reciprocating and oscillating shaft; a looper support on said shaft, and means for reciprocating said shaft, said means including a series of levers pivoted together, with pivotal connections between the levers and the needle bar, and between the levers and looper supporting shaft; substantially as described.

11. In a sewing machine, a pivoted looper support, and means for oscillating it, comprising a driving shaft, a crank thereon with connections between the crank and the looper support, and a loop spreader carried by the looper support, with connections between said crank and the loop spreader for oscillating the latter; substantially as described.

12. In a sewing machine, a pivoted looper support, and means for oscillating it, comprising a driving shaft, a crank thereon, and connections between the crank and the looper support, a loop spreader carried by the looper support, with universal pivot connections between said crank and the loop spreader for oscillating the latter, whereby lateral vibration of the looper support without bind is permitted; substantially as described.

13. In a sewing machine, the driving shaft, the crank carried thereby, the ball sleeve on the crank, the looper support, connections between the ball sleeve and the looper support, the loop spreader, a pin or rod as connected with the crank, and connections between the pin or rod and the loop spreader; substantially as described.

14. In a sewing machine, a looper support, provided with means for the attachment of a looper and provided also with a bearing for an oscillating loop spreader, means for oscillating said looper support and

for oscillating the loop spreader across the path of movement of the looper; substantially as described.

15. In a sewing machine, a driving shaft and stitch forming mechanism, comprising a looper supporting shaft, and connections between the driving shaft and the looper supporting shaft for oscillating the latter, said connections including a link having a ball joint connection at one end with the looper supporting shaft and at the other end with the driving shaft; substantially as described.

16. In a sewing machine, a driving shaft, and stitch forming mechanism including a thread carrying looper, a loop spreader supporting shaft, and connections between the driving shaft and the loop spreader supporting shaft for oscillating the latter, said connections including a link having a ball joint connection at one end with the loop spreader supporting shaft, and at the other end with the driving shaft; substantially as described.

17. In a sewing machine, a driving shaft provided with a crank; stitch forming mechanism including a thread carrying looper, a loop spreader supporting shaft, and a link having a ball joint connection at one end with the loop spreader supporting shaft, and at the other end with the crank on the driving shaft; substantially as described.

18. In a sewing machine, the driving shaft, provided with a crank, a second shaft, and stitch forming mechanism including a loop spreader support attached to said second shaft, and provided with an arm, and a link having a ball joint connection at one end with said arm, and at the other end with the crank of the driving shaft; substantially as described.

19. In a sewing machine, a driving shaft, a second shaft, and stitch forming mechanism including a looper support upon said second shaft, ball and link connections between the driving shaft and the looper support whereby the latter is oscillated, and a spreader pivoted upon said looper support, and ball and link connections between the spreader and the driving shaft, whereby the former is oscillated; substantially as described.

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

LANSING ONDERDONK.

Witnesses:

CHAS. L. STURTEVANT,
GRAFTON L. MCGILL.