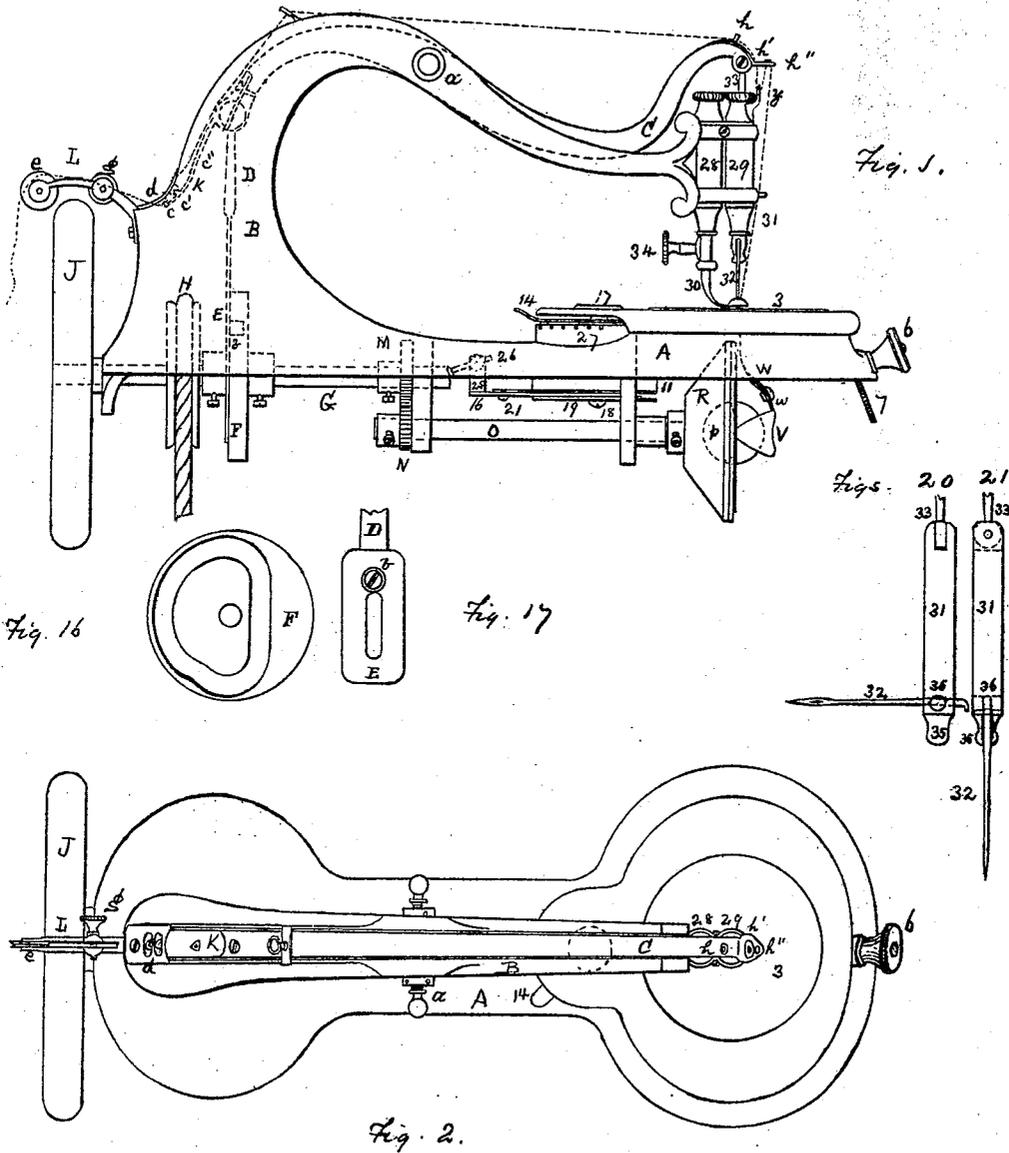


S. W. WARDWELL, Jr.  
Sewing-Machines.

No. 141,245.

Patented July 29, 1873.



WITNESSES

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Fig. 3.

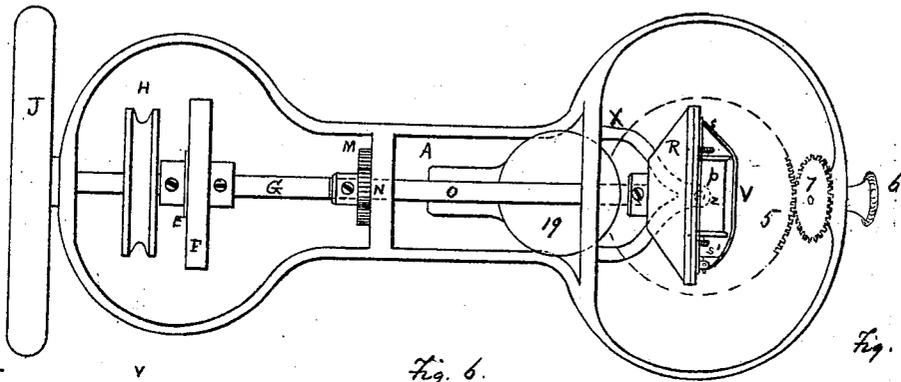


Fig. 5.

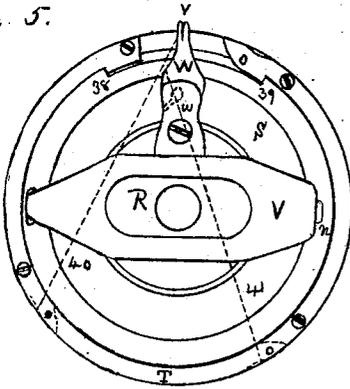


Fig. 6.

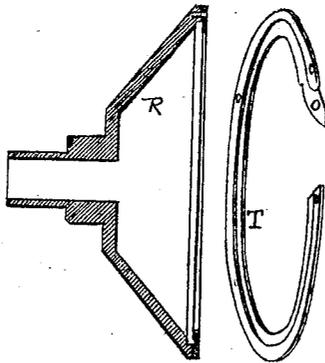


Fig. 10.

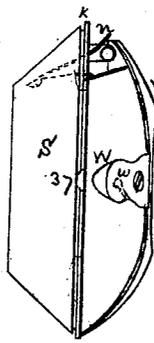
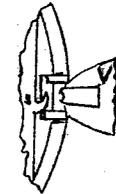
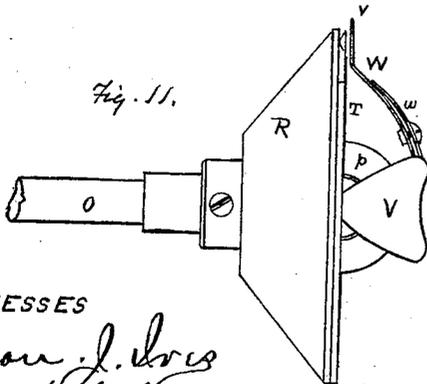


Fig. 7

Fig. 8

Fig. 9.

Fig. 11.



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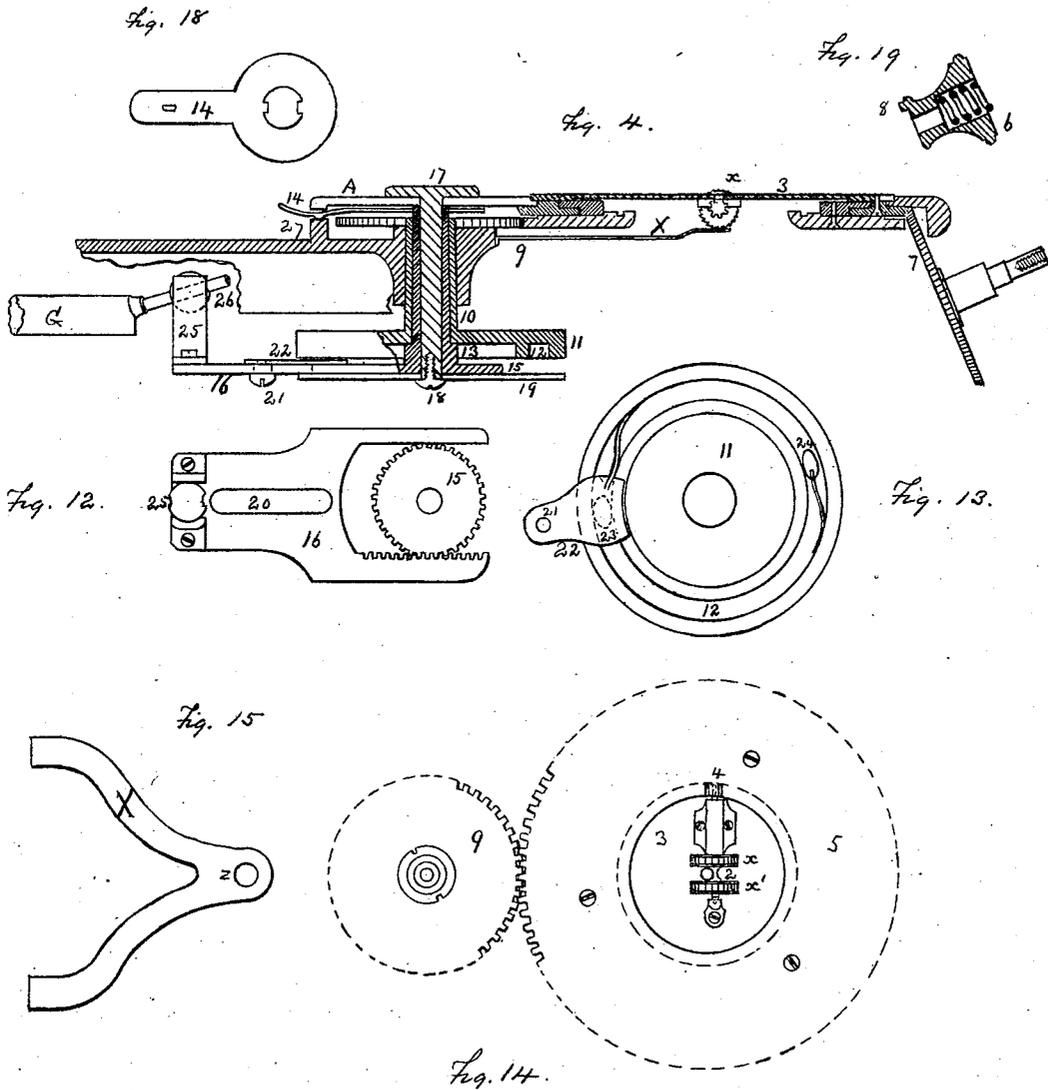
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# UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, JR., OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO GEORGE W. SHAW, OF SAME PLACE.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **141,245**, dated July 29, 1873; application filed June 28, 1872.

*To all whom it may concern:*

Be it known that I, SIMON W. WARDWELL, Jr., of the city and county of St. Louis, State of Missouri, have invented a new and useful Improved Sewing-Machine, of which the following is a full, clear, and exact description, reference being had to the annexed drawings making a part of this specification, in which—

Figures 1, 2, 3 represent, respectively, a side view and top and bottom plan views of my machine. Fig. 4 represents a longitudinal sectional view of a portion of Fig. 1, showing the feeding mechanism more clearly. Figs. 5, 6, 7, 8, 9, 10, and 11 represent different views of the spool case and holder. Figs. 12, 13, and 14 represent detached views of portions of the feeding mechanism. Figs. 15, 16, 17, 18, and 19 represent details hereinafter explained. Figs. 20 and 21 represent different views of the piston of the needle-holder.

Similar letters indicate like parts.

This invention is an improvement, and modification in some particulars, of the machine for which Letters Patent were granted me in the United States July 2, 1872, and, like it, is designed to form the lock-stitch from two ordinary spools, the devices, however, by which this is accomplished being, in many respects, essentially different in the two machines, as will be hereinafter seen.

This machine retains, also, the features of a universal feed and a self-setting needle.

A, Figs. 1, 2, 3, 4, is the bed-plate, having a fixed hollow arm, B, Figs. 1, 2, slotted to receive the vibrating arm C, which balances on the pivot *a* on which it is hung. On the inner end of the vibrating arm is a pitman, D, Figs. 1, 17, terminating in a slotted plate, E, provided with a pin, *v*, which engages with the cam in the plate-wheel F, Figs. 1, 3, 16, on the shaft G, which shaft also passes through the slot in the plate E. The shaft G has its bearings in the brackets beneath the bed-plate, as seen clearly in Figs. 1, 3. The belt-wheel H is on this shaft, and also the fly-wheel J. The arm C acts as the take-up, and for this purpose has upon its inner end the curved plate K, Figs. 1, 2, provided with eyelets *c c'*, the two former of which pass up through the slots of the plate *d*, Fig. 2, placed across the opening in the hollow arm B. From

the end of this plate *d* rises the curved arm L, Figs. 1, 2, provided at its end with an ordinary tension disk, *e*, (the arm being split to receive the disk,) and a thumb-screw, *g*, to regulate its pressure. The upper thread, as seen in Fig. 1, passes from the spool arranged on the table at any convenient place in the rear of the machine, through the tension-disk, and thence in and out of the openings in the plate *d* and the eyelets in the plate K, as seen clearly in Fig. 1, and through the eyelets *h h'* on the vibrating arm and eye *y* on the needle-barrel to the upper needle, as seen. It is evident that each time the needle rises the action of the arm will be to take up the thread, by reason of the depressing of its inner end, the arrangement and number of the slots in the plate *d* and the engaging eyelets on the vibrating arm and needle-barrel being such that the length of thread taken up shall be just sufficient to complete the stitch. On the end of the shaft G is a spur-wheel, M, Figs. 1, 3, engaging with a pinion, N, on the end of the arbor O, which carries on its other extremity the spool-case holder R, this connection, it is evident, being such that the arbor and the spool-holder have a regular motion, which is, at the same time, almost noiseless. This spool-case consists of substantially two parts—an outer casing, R, Figs. 6, 3, 1, 11, and an inner case, S, Figs. 5, 8, the inner case fitting within the case R and having a groove, *k*, Fig. 8, which receives the ring T, Figs. 5, 7, screwed to the outer case, as seen in the former figure. If preferred, this ring T and case R may be made in one piece, and the inner case sprung into it. This ring also constitutes the hook for catching the upper thread, the hook *o* being shaped as seen clearly in the two figures. The inner case S has a hinged oval cover, V, Figs. 1, 3, 5, 8, 10, 11, which is kept closed by the spring *n*, Figs. 5, 8. From the upper edge of this cover projects the curved arm W, Figs. 1, 5, 8, 11, having an eye, as seen in Fig. 5, and a forked point, *v*, as shown in Figs. 5, 11. The spool *p*, which is an ordinary wooden one, is placed on a rod having a head on either end, one of them being a screw-nut, so that the spool may be held firmly whatever its size, and is then inserted in the case S, as seen in Figs. 1, 3, 11, the ends of the rod

finding bearings in hooks  $s$   $s'$ , Fig. 3,  $s$ , Fig. 10,  $s'$ , Fig. 9. The under thread passes from the spool  $p$  through the eye in  $W$ , and thence through the point  $v$ . A tension-plate,  $w$ , Figs. 1, 5, 8, 11, acts upon this thread, and is regulated by a set-screw, as seen. The forked point  $v$  enters the hole  $z$  in the end of the arm  $X$ , Figs. 3, 4, 15, thus preventing the case  $S$  from revolving with the case  $R$ , and also keeping it in place when the cloth-plate of the machine is removed. The feeding device consists of two small wheels,  $x$   $x'$ , Fig. 14,  $x$ , Fig. 4, having roughened or serrated surfaces, and attached to an arbor, 2, Fig. 14, having its bearings in the cloth-plate 3, Figs. 1, 2, 4, 14, one end of the arbor having a pinion, 4, Fig. 14, gearing with the teeth on the upper face of the wheel 5, Fig. 14, the wheel 5 and the cloth-plate 3, which is made to revolve by the thumb-screw 6, Figs. 1, 2, 3, 4, 19, as in the application hereinbefore referred to, and the wheel 7 are united in the same manner as the same wheels in said application, the union being such that the cloth-plate may be revolved without affecting the plate-wheel 5, which is the feed-wheels driver, and the plate 5, when acting to move the feed-wheels, will not disturb the cloth-plate, this latter being kept securely in the desired position by the thumb-screw 6, the head of which is attached to its body by a screw and spiral spring, as seen clearly in Figs. 4, 19, the head having a stud on the lower edge 8, Fig. 19, which, by drawing out the head, is made to engage or disengage with corresponding slots in the bed-plate. Gearing with the wheel 5 is the wheel 9, Figs. 4, 14, on a cylindrical shaft, 10, having on its other end the plate 11, Figs. 1, 4, 13, the latter figure showing a bottom plan of the plate, which has two rings upon its face, with a channel, 12, between them. Inside of the cylindrical shaft 10 is another cylindrical shaft, 13, having attached to its upper end the lever 11, Figs. 1, 2, 4, and 18, while to its lower end is attached the gear 15, Figs. 4, 12, which works between the arms of the slotted lever 16, one arm of which is a rack, as seen in Fig. 12. A rod, 17, Figs. 1, 4, passes through this last shaft, and is secured by a screw, 18, passing through the plate 19, Figs. 1, 4, the one pin or rod thus holding all the several parts together. In the slot 20 of the lever 16 is the pin 21 of the dog 22, Figs. 4, 13, while on the other end of the dog is a stud, 23, which works in the channel 12 of the plate 11, while attached to the plate 19 is a dog, 24, also working in the same channel, as seen clearly in Fig. 13. To each of these dogs is attached a spring, as seen in Fig. 13, the free ends of which play in opposite directions, so that the dogs may bite alternately, as will be seen. On the end of the lever 16 is a slotted vertical arm, 25, Figs. 1, 4, 12, in which plays the ball of the diagonal crank-pin 26, Figs. 1, 4, on the end of the driving-shaft  $G$ , which, as the shaft  $G$  revolves, gives a reciprocating lateral motion to the le-

ver 16. and through it gives an intermittent motion to the feed-wheels, the dog 22 being arranged to bite the plate 11, causing it to move with the lever in its forward stroke, while the dog 24 prevents the return stroke of the lever from affecting the plate, its spring, as stated, being arranged to hold the plate for the second bite of dog 22. By means of the lever 14 the gear 15 is made to act upon the slotted lever 16, giving it a longitudinal movement in the line of the machine, causing the pin of the dog 22 to move in the opposite direction in the slot 20 of the lever, thus increasing or diminishing the length of the stitch, which, as has been explained, is made by the action of the dogs on the plate 11. The under side of the lever 14 has a tooth which engages with a rack, 27, as seen in Fig. 1. Attached to the fixed arm  $B$  are two cylinders, 28 and 29, Fig. 1. In the cylinder 28 is the piston of the presser-foot 30, while in the other is the piston 31, Figs. 1, 20, 21, carrying the straight-grooved eye-pointed needle 32, the piston being connected, by a rod, 33, to the vibrating arm. The presser-foot piston is arranged and operates as in the application hereinbefore referred to, having a spiral spring in the cylinder and a thumb-screw, 34, by which it is operated. The needle 32 is made with a hooked head, as seen in Fig. 20, while the inner faces of the jaws on the end of the piston are made to slightly approach each other at the point 35, Fig. 20, while the inner faces of the points have a channel to receive the needle.

To insert the needle, pass it between the jaws above the pin 36, Figs. 20, 21, in the manner shown in the former figure, with the point of the hook down; then draw it through till the hook and pin engage, the head being too large to pass through; then draw the piston up into the cylinder, and the needle is set as soon as it is sprung into the channel between the points of the jaws. The article to be sewed being now placed on the cloth-plate in the usual manner, and power applied to the machine, the downward thrust of the needle carries the upper thread through the cloth and into the depression 37, Fig. 8, in the case  $S$  directly behind the arm  $W$ , when the hook  $o$ , as the needle rises, catches the upper thread, the case being so adjusted on its shaft that just before the eye of the needle is with drawn from the depression 37 the hook shall pass above the eye between the needle and thread, and catch and carry the thread with it. As the thread is carried along by the hook the case  $S$  divides the thread, one part of the loop passing outside of the oval cover  $V$ , while the other passes between the cases  $S$  and  $R$ , there being sufficient space between the two cases to admit of this; and the flange on the face of  $S$  being partially cut out, (from the point 38 to 39, Fig. 5,) so as to leave a space between the edge of the ring  $T$  and the case  $S$  during the whole revolution of  $R$ , and there being also a space between the ends of the ring  $T$ , as seen, as the case  $R$  revolves the under side of the loop

assumes, successively, the positions indicated by the dotted lines 40 and 41 in Fig. 5, the position indicated by 41 being that at which the take-up begins to act, and the position of the hook at the top of the figure being that at which the thread is drawn up to complete the loop. A stitch is made at every alternate revolution of the hook, as the gearing is such that the hook makes two revolutions to each revolution of the driving-shaft of the needle-arm.

The action of the hook and take-up being, in this device, positive throughout, there is a minimum amount of strain upon the upper thread, much less than in the devices shown in many other machines. Though it requires two revolutions of the hook to each stitch, yet each stitch is completed before another is begun, the take-up being arranged to draw the stitch tight before the needle again reaches the cloth in the downward thrust.

As in my other machines, above referred to, the direction of the feed may be changed as desired by means of the thumb-screw 6, and the small feed-wheels are, as in that machine, arranged on either side of and in such a manner as to draw the cloth from the needle.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The holder R having a hook, *o*, on its periphery, spool-case S having a hinged cover, V, tension-plate W, and hooks *s s'*, for supporting an ordinary wooden spool, the spool and its case S being held stationary by an arm, X, while the holder revolves, in combination with a vertical eye-pointed needle carrying the threads of an ordinary spool and a take-up device, arranged as shown and described on the vibrating and fixed arm, and all arranged in combination with suitable operating mechanism to make stitches, substantially as shown and described.

2. The combination of the holder R having hook *o*, stationary case S having oval cover

V, tension-plate W, vertically-vibrating needle, and take-up device, together with operating gearing connections, all said parts being constructed and arranged substantially as described, so that the hook makes two revolutions to each descent of the needle, and so that each stitch is completed before another is commenced, as set forth.

3. The combination of the gears 9 and 11, plate 19, lever 16, dogs 23 24 and their springs, slotted arm 25, diagonal crank-pin 26 arranged on a revolving shaft, and fastening-rod 17, substantially as and for the purpose set forth.

4. The combination of the gears 9 and 11, plate 19, lever 16, dogs 23 24 and their springs, slotted arm 25, diagonal crank-pin 26 arranged on a revolving shaft, fastening-rod 17, lever 14, rack 27, and gear 15, substantially as and for the purpose shown and specified.

5. The combination of the gears 9 and 11, plate 19, lever 16, dogs 23 24 and their springs, slotted arm 25, diagonal crank-pin 26 arranged on a revolving shaft, fastening-rod 17, lever 14, rack 27, gears 15 and 5, the latter communicating an intermittent motion to the feed-wheels *x x'* through the pinion 4, substantially as and for the purpose shown and specified.

6. The take-up device, consisting of the perforated plate *d*, plate K, and its eyelets *c c' c''*, vibrating arm C, and the eyelets *h h*, &c., and *y*, all combined and operating substantially as and for the purpose shown and specified.

7. A needle-holder for a sewing-machine, consisting of a cylinder, 29, piston 31 having jaws 35 and a pin, 36, when constructed and operating substantially as set forth.

8. The combination of the needle-holder above described with a hook-headed needle, 32, substantially as shown and specified.

S. W. WARDWELL, JR.

Witnesses:

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JOHN W. COLLINS.