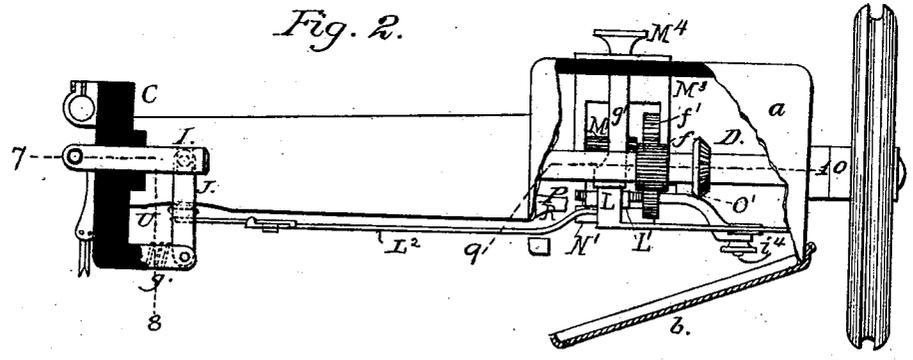
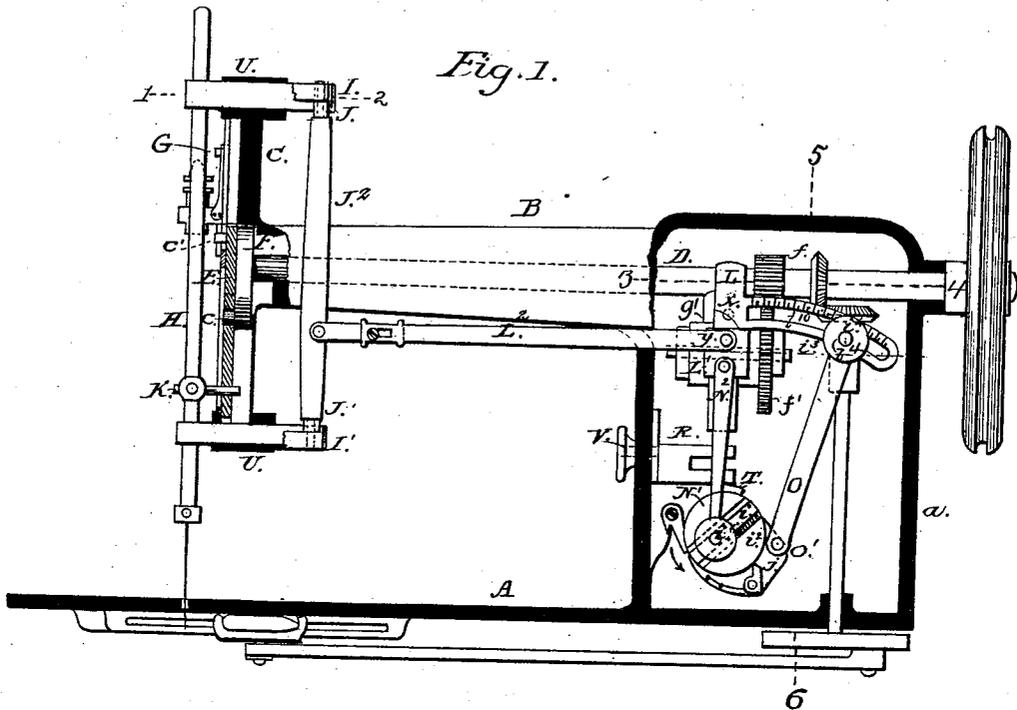


J. B. SECOR.
SEWING MACHINE.

No. 253,772.

Patented Feb. 14, 1882.



Witnesses:
 Courtney A. Cooper.
 William Paxton.

Inventor:
 Jerome B. Secor
 By his attorney
 Charles E. Foster

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SEWING MACHINE.

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Fig. 2.^a

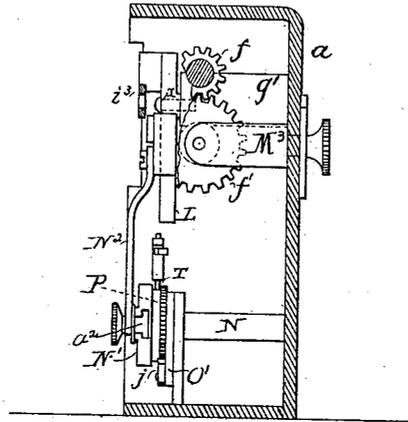
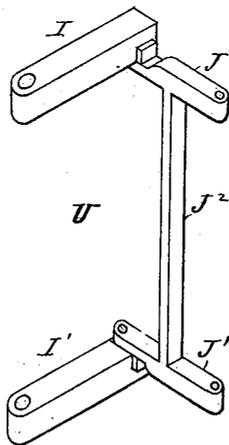


Fig. 2.^b



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SEWING MACHINE.

4 Sheets—Sheet 3.

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Fig. 3.

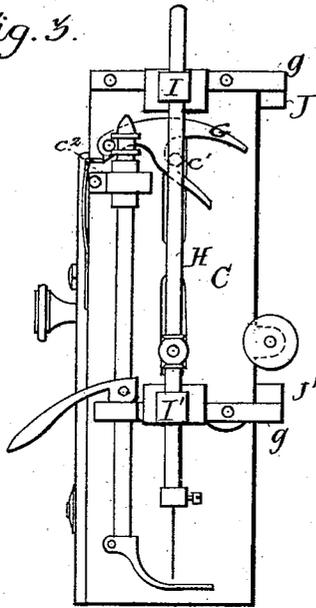


Fig. 4.

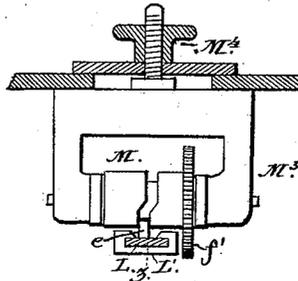


Fig. 6.

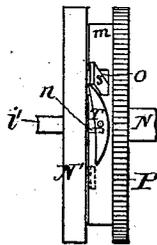
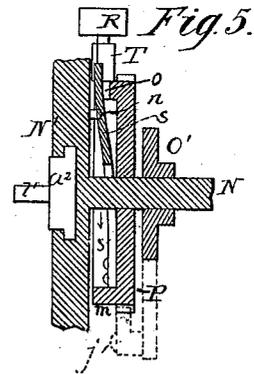
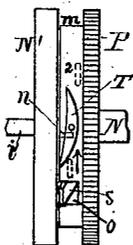


Fig. 7.



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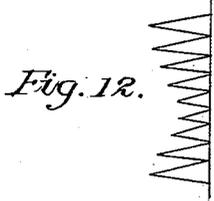
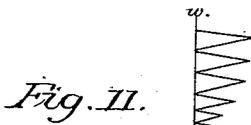
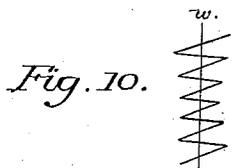
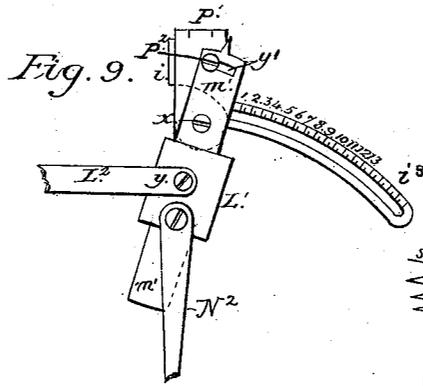
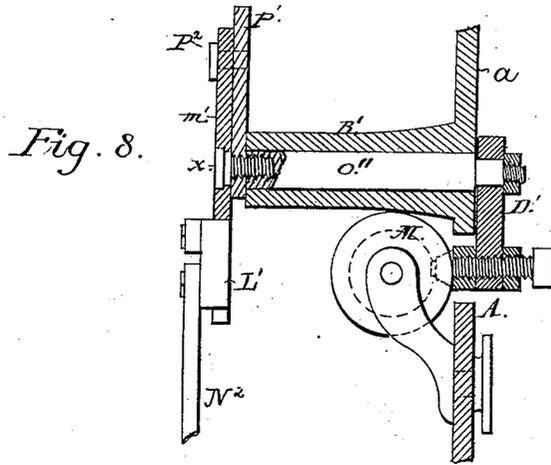
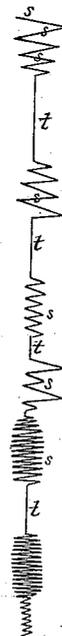


Fig. 13.



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UNITED STATES PATENT OFFICE.

JEROME B. SECOR, OF BRIDGEPORT, CONNECTICUT.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 253,772, dated February 14, 1882.

Application filed August 29, 1879.

To all whom it may concern:

Be it known that I, JEROME B. SECOR, of Bridgeport, Fairfield county, Connecticut, have invented Improvements in Sewing-Machines, of which the following is the specification.

My invention relates to that class of sewing-machines in which the needle reciprocates both vertically and horizontally, so as to produce zigzag stitches, the width of which depends on the extent of the horizontal movement of the needle; and my invention consists in certain details of a machine, constructed as fully described hereinafter, whereby the stitches may be thrown to either side or on both sides of an imaginary central line, may be automatically varied in their character, or may be of uniform character, at the will of the operator.

The invention further consists in certain details of construction having for their objects to simplify the character and increase the capacity of the machine and to effect readily the adjustment requisite to vary the stitching.

In the drawings forming part of this specification, Figure 1 is an elevation of my improved sewing-machine, showing the frame or casing in part section on the lines 7 8, 9 10, Fig. 2; Fig. 2, a plan showing the frame or casing partly in section on the lines 1 2, 3 4, Fig. 1; Fig. 2^a, a sectional elevation on the line 5 6, Fig. 1; Fig. 2^b, a perspective view, showing the needle-bar-carrying frame; Fig. 3, a front elevation of the head of the machine; Fig. 4, an enlarged detached section, showing the operating devices of the lever L; Fig. 5, a section, and Figs. 6 and 7 plan views, illustrating parts of the automatic stitch-changing mechanism; Fig. 8, a cross-section of a modified device for altering the working position of the needle-bar; Fig. 9, a front view of parts of the devices shown by Fig. 8; Figs. 10, 11, 12, 13, diagrams illustrating various stitches.

My invention may be embodied in different sewing-machines, the general construction of which varies greatly. I have illustrated it in a machine similar in its general character to the Singer machine, having a shuttle reciprocating in a fixed race.

A is the base, and B the overhanging arm, of the machine, the said arm terminating in a head, C, the vertical portion of said arm be-

ing in the form of an oblong hollow box or case, *a*, to one side of which is hinged a door, *b*, to permit ready access to the parts within.

The upper thread may be secured by means of a lower shuttle-thread, or in any other suitable manner.

The driving-shaft D has its bearings in the arm B and imparts a vertical reciprocating motion to a slide, E, into a slot in which extends a stud, *c'*, from a disk, F, on the end of the shaft D. A pin, *c'*, projects from the front of the slide E and extends between the arms of a forked take-up lever, G, pivoted to the head C and raised by a spring, *c*².

The needle-bar H reciprocates in slides of a frame, U, Fig. 2^a, movable upon the head C, the said frame in the present instance consisting of two slides, I I', and arms J J', the latter being pivoted to brackets *g* on the head and connected by a bar, J².

A pin, K, connected to the needle-bar, extends into an opening in the slide E, so that the needle-bar may move forward and back without losing connection with the slide.

To a bracket, *g'*, in the case *a* is pivoted, at *x*, a lever, L, carrying a slide, L', to which is jointed, at *y*, a connecting-rod, L², attached at its outer end to the bar J², and from the rear of the lever L a stud, *e*, (shown in Fig. 4,) extends into a cam-groove in the cam-cylinder M, turning between brackets within the case *a* and driven by gears *f f'* from the shaft D, which makes two revolutions to one of the cam-cylinder M.

A transverse shaft, N, turning in bearings at the lower part of the case *a*, carries a crank-wheel, N', having a transverse slot, *i*, for receiving the slide *a*² of an adjustable wrist-pin, *i'*, to which is attached a connecting-rod, N², secured at its upper end to the slide L'. The slide L' is capable of such adjustment upon the lever L that it may be elevated (by the action of the crank-wheel N' and connecting-rod N², as before described) until the pivotal point *y* of the connecting-rod L² coincides with the pivotal point *x* of the lever L, in which case the vibration of the lever will impart no longitudinal movement to the connecting-rod, while as the slide L' is lowered and the points *y* and *x* are separated the vibration of the lever will

throw the connecting-rod with a gradually-increasing stroke.

From the lever L extends an arm, i^3 , having a slot, i^{10} , in which a pin, i^4 , is adjustable, said pin being provided with a nut for securing it after adjustment. With this pin is connected, by the connecting-rod O, an arm, O', rocking on the shaft N, and provided with a spring-pawl, j , adapted to the teeth of a ratchet-wheel, P, secured to the shaft N. (See Fig. 5.) With the machine thus constructed the rotation of the shaft D and cam-cylinder M will, when the parts are in the position shown in Fig. 1, vibrate the lever L on its pivot x and carry the connecting-rod L² and needle-bar frame back and forth, and will also revolve the crank-wheel N' intermittingly in the direction of its arrow, carrying the slide L' and the pivot y of the connecting-rod L² toward and from the center x of the lever L, so that the horizontal reciprocating movement of the needle-bar frame and needle-bar is varied automatically, producing stitches in regular order but of varying width, as shown in Fig. 10. It will be apparent that the extent of this varying movement may be regulated by adjusting the wrist-pin i' in its slot i . By the adjustment of the pin i^4 on the arm i^3 the successive stitches may be abruptly or gradually varied in width. Thus when the pin i^4 is at the extremity of the said arm the ratchet-wheel P and crank-wheel N' are moved to a greater extent at each vibration of the lever, the slide L' is raised and lowered oftener, and the variation in the width of the stitches is considerable. When the pin i^4 is moved near the center x the crank-wheel N' is rotated very slightly at each vibration of the lever, and the slide L' approaches and recedes from the center x by a series of slight steps, and the stitches only gradually increase or decrease in their width. When the pin i^4 is brought close to the center x , by adjusting it in the slot i^{10} the connecting-rod O will not be moved sufficiently far to turn the crank-wheel N' and the stitches will not vary in their width, while by so adjusting the pin i' as to bring the points y and x to coincide the lever L will vibrate without moving the rod L², and the stitching will be made the same as in an ordinary sewing-machine. In order that various characters of work may be reproduced with exactness, the face of the crank-wheel N' is graduated adjacent to the slot i , and the arm i^3 is also graduated, so that the adjustment of the pins i^4 i' may be made with any required degree of exactness. When the lever L vibrates so that the point y is carried uniformly across and to the same extent on each side of a vertical line drawn through the pivot x of the lever, the stitches will extend to opposite sides of an imaginary line, w , extending parallel with the feed, Fig. 10; but when the lever is adjusted so that the point y vibrates wholly at one side or the other of said vertical line the stitches will lie wholly on one side or the other of the said line w . (See Figs. 11 and 12.) In order to secure this change in the position of the

needle, the cam-cylinder M may be made longitudinally adjustable in any suitable manner. For instance, it may turn in bearings of a bracket, M³, laterally adjustable in the case a , and secured by a nut, M⁴, as shown, the gear f being of such width as to permit said adjustment without becoming disconnected from the gear f' .

It is obvious that by adjusting the cam the pivotal point y may be carried to a greater or less extent to either side of the point x , on which the lever vibrates, so that the horizontal working position of the needle-bar is changed without thereby altering the extent of its horizontal motion. Thus the position, but not the width of the stitch, may be changed.

Instead of altering the position of the cam-cylinder, the pivot of the lever L may be adjustable horizontally in any suitable manner, as by providing the bracket g' with holes side by side and putting the pin in any one of said holes; or the pin e of said lever may be adjustable in a slot in the lever, the horizontal adjustment of either producing the same effect as the adjustment of the cam-cylinder.

As the change in the vibrating position of the lever would with a continuous connecting-rod, L², alter the working position of the needle-bar, the said rod is made in sections connected adjustably together, so as to vary the length of the rod in accordance with the working position of the lever, as may be desired. By imparting one revolution of the cam-cylinder M to two revolutions of the shaft D the needle is caused to penetrate the cloth alternately in different lateral positions.

It is sometimes necessary to alternate stitches of uniform character with those of a varied character—as, for instance, to make stitches similar to those shown in Fig. 13, where the stitches s s are varied in length by the operations before described, and alternate with plain straight lines of ordinary stitching, t . I effect this by providing for the occasional automatic stopping of the crank-wheel N' or other device used for automatically adjusting the throw of the needle-bar frame. This stoppage may be effected by various appliances. Those which I have found most effective are shown in Figs. 5, 6, 7, which I will now describe. One side of the ratchet-wheel P is provided with a flange, m , having a notch, o , and a flat spring, s , is secured to the inner face of the ratchet-wheel, so as to extend opposite the notch o , but to tend to spring out of the latter to a position to strike a pin, n , at the back of the crank-wheel N', which must then be carried around with the ratchet-wheel when the latter revolves.

From a bracket, R, above and between the ratchet-wheel P and the crank-wheel N' is suspended a curved pivoted switch, T, against which the end of the spring s may be brought, as shown in Fig. 7, when the switch will deflect the spring from the crank-wheel N' and back into the notch o , away from the pin n , so that the ratchet-wheel can turn without the crank-wheel N'. As the spring passes from

the switch it bears upon the latter, turning the switch to the position indicated in Fig. 6, so that when the spring approaches the switch from the opposite side, as shown in dotted lines, Fig. 6, said spring will remain in a position to strike against the pin *n* to carry the crank-wheel with the ratchet-wheel. As the spring *s* then passes the switch *T* it will throw the latter back to the position shown in Fig. 7, so that at the next revolution the spring will strike the switch, as shown in dotted lines, Fig. 7, and will ride over the latter, tilting it as it passes the pivotal point to the position shown in Fig. 6. The crank-wheel is thus alternately stationary and movable. When the crank-wheel is stationary the stitches are uniform in width, which width depends on the position of the pivot *y* at the moment when the ratchet-wheel stops.

The switch mechanism may be thrown in and out of action by using an adjustable bracket, *R*, provided with a set-nut, *V*, or other appliance for securing it after adjustment.

As other appliances may be used for automatically varying the throw of the needle-bar frame, the position of the slide *L'*, and for operating the crank-wheel *N'*, I do not desire to limit myself to the particular devices shown and described. In practice, however, I have found such devices most effective, as the movements are easily regulated and the appliances simple in character and not liable to get out of order.

A modified device for varying the operating position of the needle-bar is illustrated in Figs. 8 and 9, in which *O''* is a rock-shaft turning in a bearing, *B'*, extending from the side of the case *a*, and carrying at the ends crank-arms *D' P'*.

The arm *D'* is provided with a stud, which enters the groove of the cam-cylinder *M*, and from the arm *P'* extends the slotted arm *i'*.

To the end of the shaft *O''* is pivoted, at *x*, a bar, *m'*, through a slot, *y'*, in which a screw-pin, *P²*, extends into the arm *P'*.

On the bar *m'* is carried the slide *L'*, operated as before described, and attached to the connecting-rod *L²*.

By means of the screw *P²* the bar *m'* may be secured in a position with the point *y* to one side or other of the center *x*, with the same result as if the cam-cylinder were moved longitudinally, as before described.

It will be apparent that the machine may be used for overseaming or binding, in working button-holes, &c.; that two or more needles may be used with corresponding tensions and take-ups, so as to sew with several threads at once.

I do not claim broadly the combination, with the vertically-reciprocating needle, of appliances for reciprocating said needle horizontally and devices for changing the horizontal position of the needle without altering the extent of its horizontal movement.

I claim—

1. The combination of the needle-bar-carrying frame, vibrating lever *L*, pin *e*, connecting-rod *L²* and pivot *y*, cam-cylinder *M* and its operating appliances, and adjusting devices, whereby movement of the connecting-pivot *y* may be thrown to a greater or less extent to either side of a vertical line drawn through the lever-fulcrum *x*, substantially as set forth.

2. The combination, with the lever *L* and pin *e*, of the operating cam-cylinder *M* and devices for adjusting the latter longitudinally, as specified.

3. The combination of the lever *L*, devices for vibrating the same, slide *L'*, carried by said lever, the needle-bar-carrying frame *U*, connecting-rod *L²*, and devices for automatically moving the slide on the lever, substantially as set forth.

4. The combination of the lever *L*, frame *U*, needle-bar *H*, slide *L'*, connecting-rod *N²*, crank-wheel *N'*, its adjustable pin *i'*, connecting-rod *L²*, and appliances whereby to turn the wheel, substantially as set forth.

5. The combination of the lever *L*, slide *L'*, connecting-rod *N²*, crank-wheel *N'*, and devices for turning the said crank-wheel *N'*, constructed to automatically vary the speed with which it is turned, and appliances to automatically throw said crank-wheel in and out of operation, substantially as specified.

6. The combination of the lever *L*, provided with arm *i²*, and operating devices, pin *i⁴*, crank-wheel *N'*, ratchet-wheel *P*, secured to the wheel-shaft, vibrating arm *O'*, carrying a spring-pawl, and connecting-rod *O*, attached to the pin *i⁴*, substantially as set forth.

7. The lever *L*, provided with the graduated arm *i²*, and adjustable pin *i⁴*, connecting-rod *O*, and slide *L'*, in combination with the graduated crank-wheel *N'*, pin *i'*, connecting-rod *N²*, and devices constructed to rotate the crank-wheel from the movement of the connecting-rod *O*, substantially as set forth.

8. The combination of the crank-wheel *N'* and needle-bar-adjusting devices arranged to be operated thereby, and the ratchet-wheel *P*, arranged to turn independently of the crank-wheel, and intermediate devices for automatically connecting and disconnecting the crank and ratchet wheels, substantially as specified.

9. The combination of the crank-wheel *N'*, having a pin, *n*, ratchet-wheel *P*, having a spring, *s*, and notched flange *m*, switch *T*, and devices for supporting said switch above and between the crank and ratchet wheels, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JEROME B. SECOR.

Witnesses:

GEORGE F. WILDMAN,
ALFRED B. BEERS.