

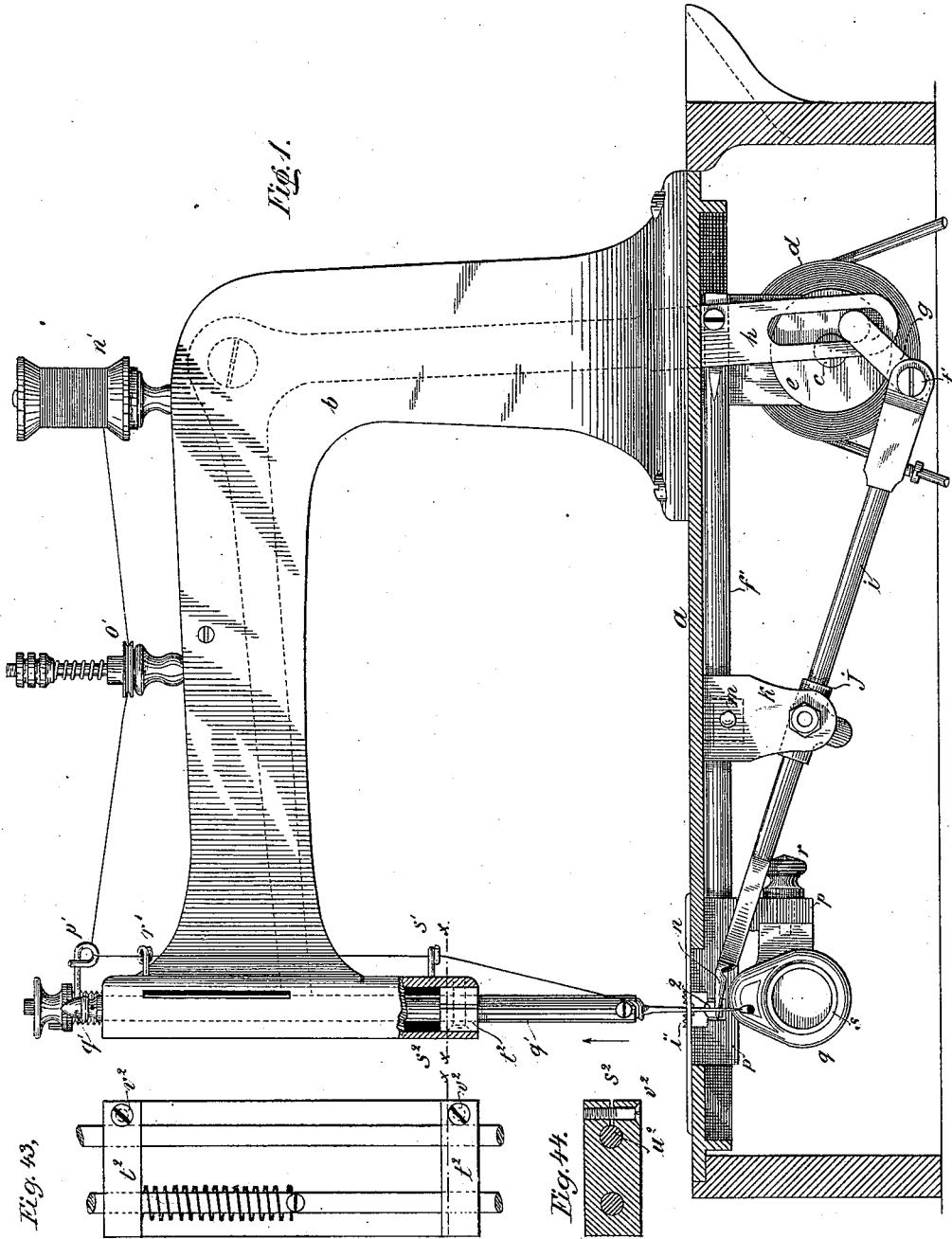
(No Model.)

7 Sheets—Sheet 1.

J. W. POST.
SEWING MACHINE.

No. 250,966.

Patented Dec. 13, 1881.



WITNESSES
Geo. M. Finckel
Ernest Abshagen

INVENTOR
John W. Post
 By his Attorney
Wm. A. Finckel

(No Model.)

7 Sheets—Sheet 2.

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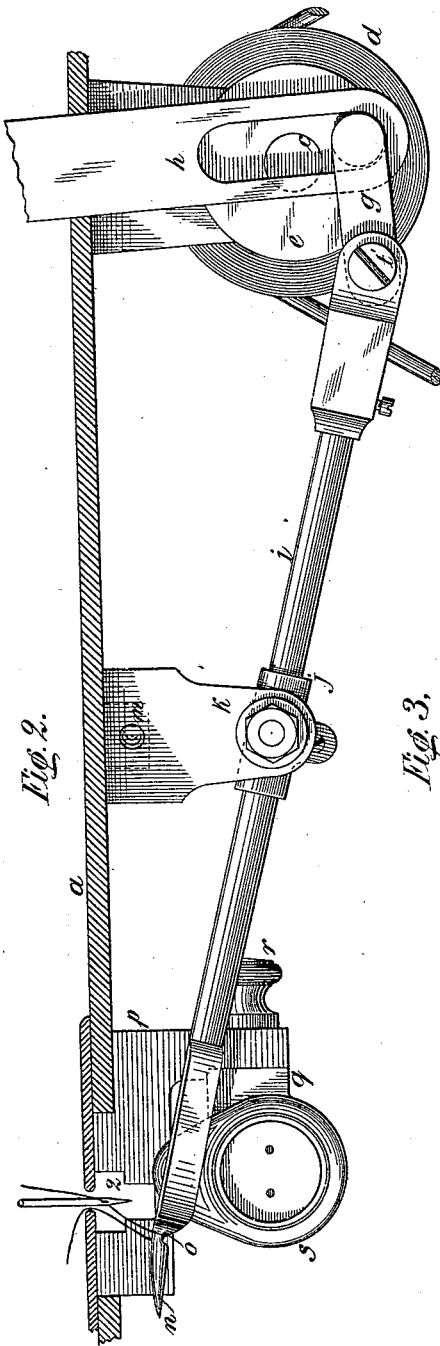


Fig. 2.

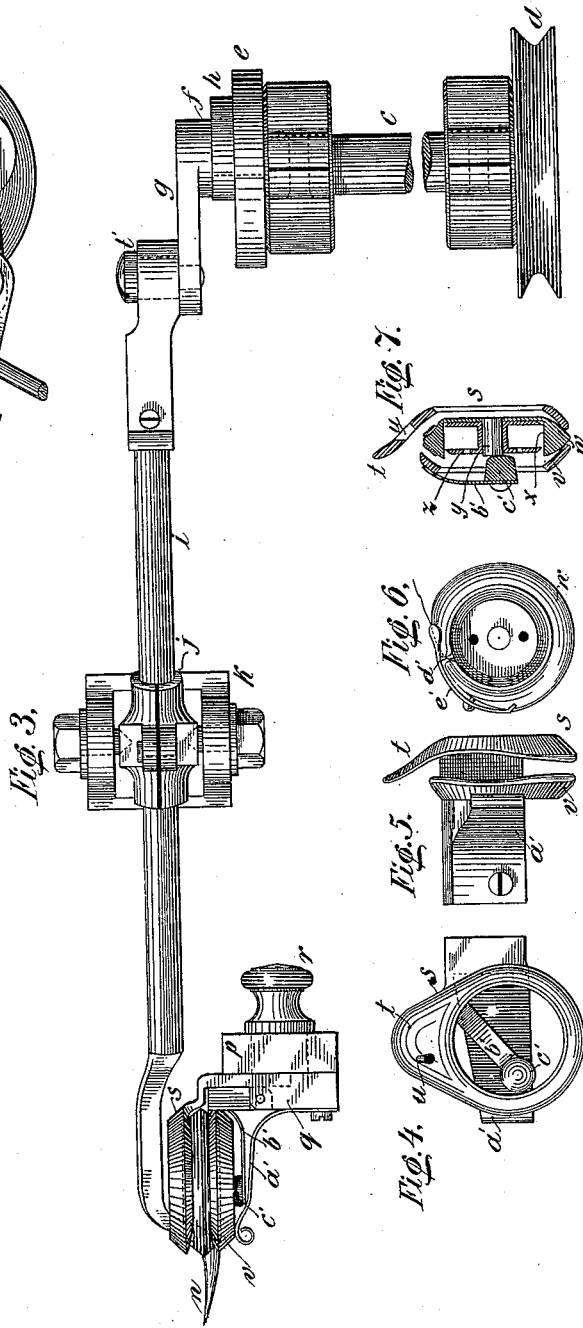


Fig. 3.

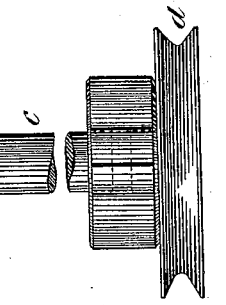


Fig. 4.

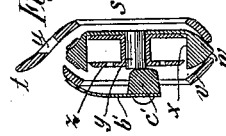


Fig. 5.

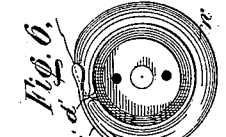


Fig. 6.



Fig. 7.

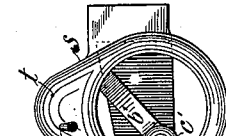


Fig. 8.

WITNESSES

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By *his Attorney*

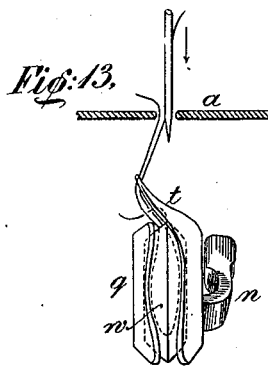
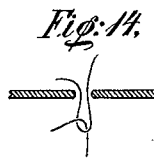
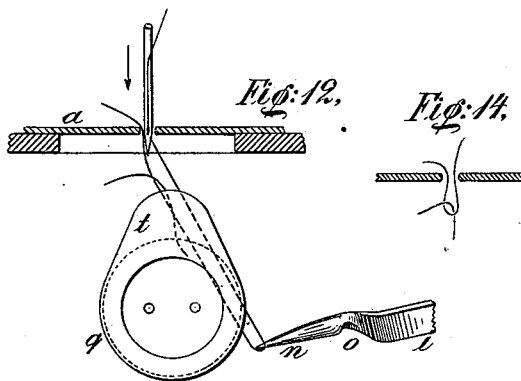
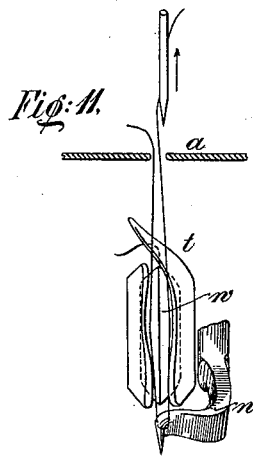
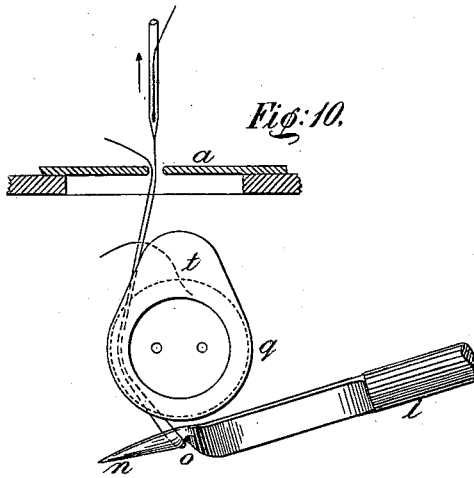
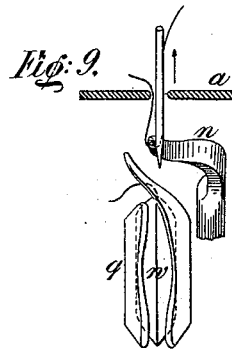
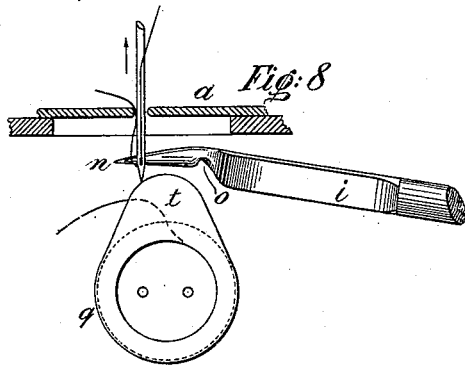
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WITNESSES

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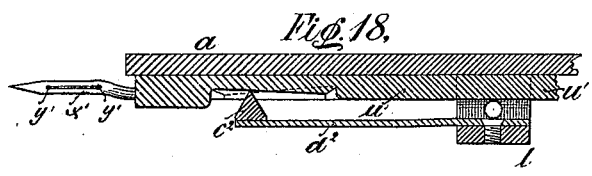
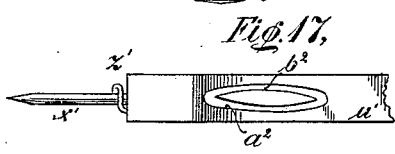
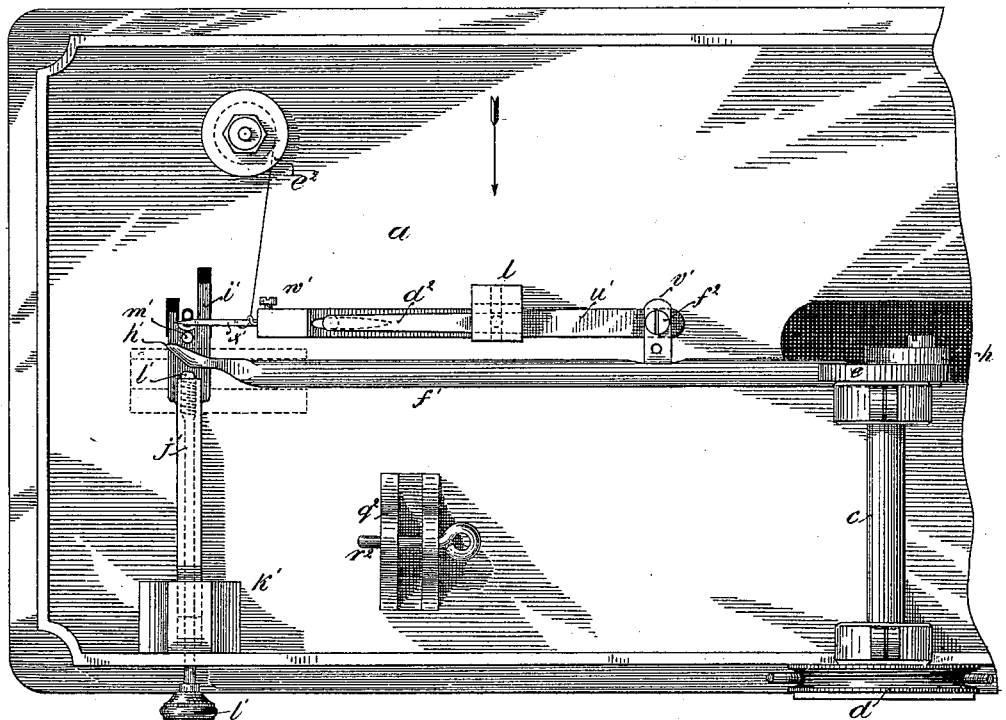
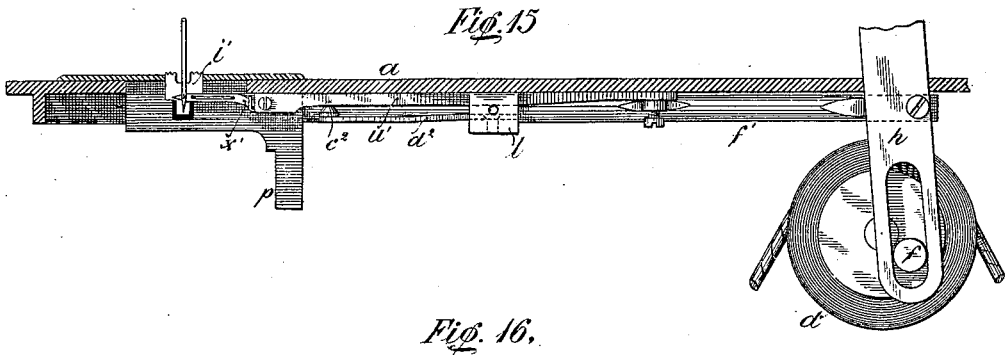
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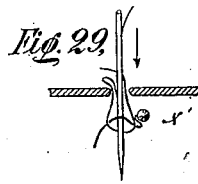
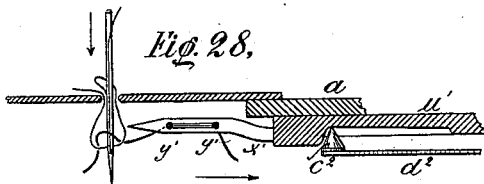
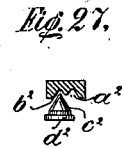
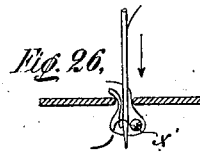
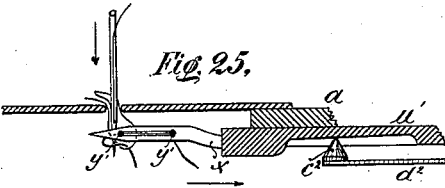
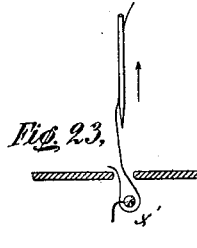
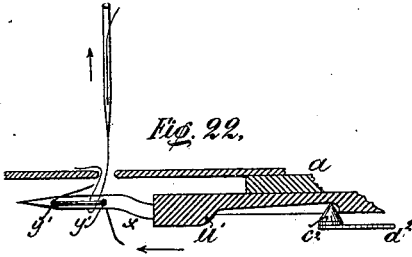
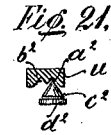
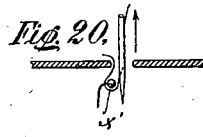
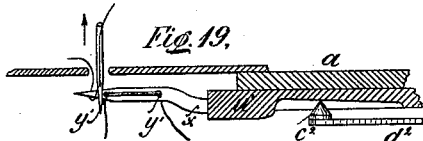
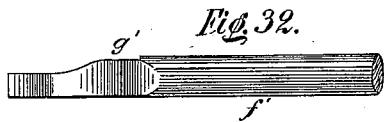


Fig. 31.



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Fig. 34.

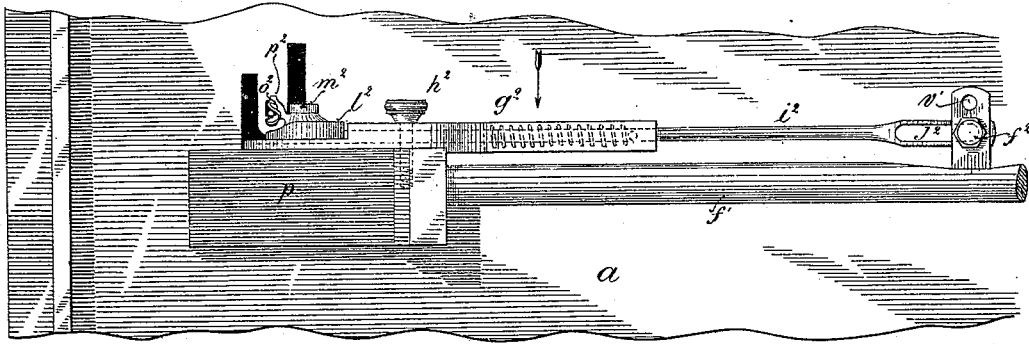


Fig. 35.

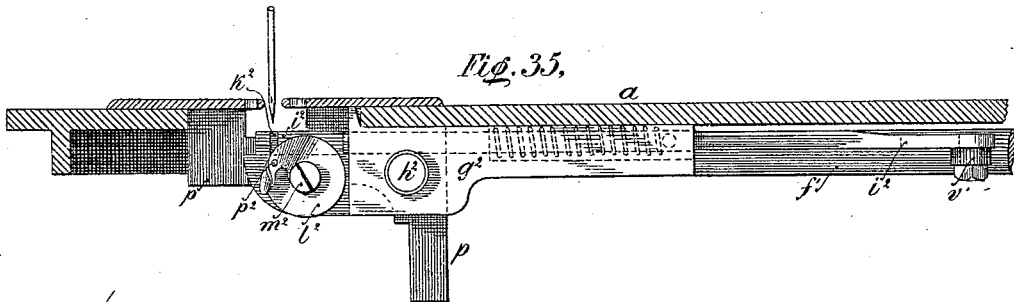


Fig. 36.

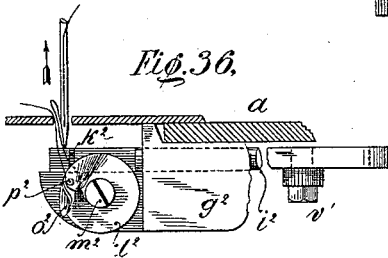


Fig. 37.

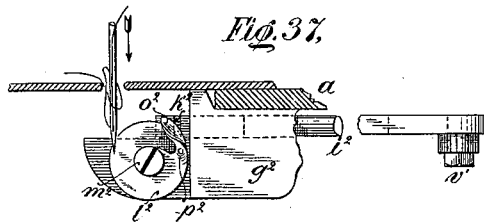


Fig. 38.

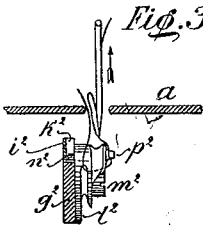


Fig. 39.

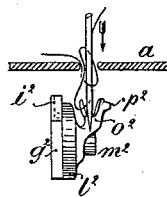


Fig. 40.

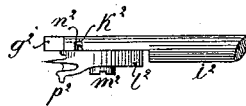


Fig. 41.



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UNITED STATES PATENT OFFICE.

JOHN W. POST, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 250,966, dated December 13, 1881.

Application filed October 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. POST, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The object of this invention is to provide a sewing-machine for family or manufacturing purposes which, by a few simple and readily-made adjustments of mechanism, is rendered capable of making different kinds of stitches. Such a machine, to be practicable, must not greatly, if at all, exceed the cost of an ordinary machine, nor should its range of usefulness in connection with the ordinary ruffling and other attachments be contracted.

The invention, broadly stated, consists in a sewing-machine having driving, needle-operating, and feed mechanisms combined with mechanism for making the ordinary lock-stitch, independent mechanism for making the embroidery-stitch, and other independent mechanism for making the chain-stitch, these several stitch-forming mechanisms being separately combinable with the driving, needle, and feed mechanisms, but all deriving motion from a common shaft. In my invention I make the looper take the place of a take-up. I provide for the lock-stitch mechanism, as a substitute for a shuttle, a rotary spool in a case which is stationary or non-rotating, and I give to the looper a motion that will bring the thread from the needle, spread it over the bobbin or spool, drop it, and progress for the next loop while the first is being drawn tight. For the embroidery-stitch I employ a longitudinally-reciprocating looper having a lateral vibration to carry its thread around the needle and through the needle-thread. For the single-thread chain-stitch I provide a peculiar oscillating looper, which takes the needle-thread, spreads it for the entrance of the next loop,

casts off the first loop, takes the second, and draws up the first, all substantially as herein-after specified and claimed.

In the accompanying drawings, illustrating my invention, and forming part hereof, in the several figures of which like parts are similarly designated, Figures 1 to 14, both inclusive, illustrate in detail the lock-stitch mechanism, Fig. 1 being a side elevation of my machine, with the cloth-plate in section and the head-cap partly broken away, the parts being in position when the needle is ascending and the looper just entering the loop; Fig. 2, a side elevation of the same, the arm being removed and the looper advancing with the loop to spread it over the spool-holder; Fig. 3, a bottom plan view of the mechanism shown in Fig. 2, the driving-shaft being broken to save space on the sheet; Fig. 4, a side elevation, and Fig. 5 a front edge elevation, of the spool-holder; Fig. 6, a side elevation of the spool and its shell; Fig. 7, a central vertical cross-section of the spool, its shell and holder; and Figs. 8 to 14, both inclusive, details showing progressively the steps to form the stitch. Figs. 15 to 30 show the details of the embroidering mechanism, Fig. 15 being a side elevation, looking in the direction of the arrow, Fig. 16, the cloth-plate being in section. Fig. 16 is a bottom plan view; Fig. 17, a bottom plan view, on a larger scale, of the looper-bar, showing its cam-groove. Fig. 18 is a longitudinal section, on the same scale, of said bar and its shipper. Figs. 19 to 31, both inclusive, show details of the stitch. Fig. 32 shows a side elevation, and Fig. 33 a top plan view, of the feed-operating bar. Figs. 34 to 41, both inclusive, show details of the chain-stitch mechanism. Fig. 34 is a bottom plan view; Fig. 35, a side elevation, looking in the direction of the arrow, Fig. 34, with the bed-plate in section; Figs. 36, 37, 38, 39, and 41, details of the progressive formation of the stitch; and Fig. 40, a top plan view of the looper and its operating-lever. Fig. 42 is a perspective view of my machine applied to a lathe, as in the combination claimed in my Patent No. 220,496, granted October 14, 1879. Fig. 43 is a front elevation of the head of the arm with the face-plate removed; and Fig. 44 is a section on line *x x*, Figs. 1 and 43.

A suitable table or stand being provided, I prefer to pivot the head of my machine there-to transversely, so that it may be turned back as upon a transverse instead of the usual longitudinal axis. This head is composed of the cloth-plate *a* and arm or neck *b*, with stitch-forming mechanisms, hereinafter specified. *c* is the driving-shaft, having the driving band-pulley *d*, and not necessarily having, but in fact dispensing with, the usual hand-wheel. *e* is a disk or crank on the opposite end of this shaft *c*. This disk has an eccentric-pin, *f*, from which extends tangentially a rigidly-affixed crank or arm, *g*. *h* is an elbow-lever pivoted in the bend of the neck, and connected with the needle-bar by a link or by any other suitable joint. This lever derives a rocking motion from the driving-shaft by means of the pin *f* engaging the lever through a slot in its end. The shaft *c* is driven by a belt or band connected with suitable motive power.

i is a rod pivoted to the crank *g* and sliding through a tubular bearing, *j*, which bearing is pivoted so as to oscillate in a forked bracket, *k*, removably attached to a lug, *l*, Fig. 16, and dotted lines, Figs. 1 and 2, on the under side of the bed or cloth plate. A removable pin, *m*, is used to connect the bracket to the lug. The forward end of the rod *i* is curved laterally, and terminates in a curved bayonet-shaped hook, *n*, having the notch *o*.

p is a block attached to the under side of the bed-plate, and *q* is a spool-holder attached to the block by a screw, *r*. This spool-holder consists of a rigid annular arm, *s*, having an upwardly-projecting laterally-curved finger, *t*, in which is the needle-hole *u*, and a hinged annular arm, *v*, of substantially equal diameter and corresponding shape with the annular portion of the arm *s*. These arms lie parallel and somewhat separated. Their adjacent edges are dressed smoothly and their adjacent faces are concaved, as clearly indicated in the section, Fig. 7, to form a cavity to receive a spool-holding shell or case, *w*, Figs. 6 and 7. This shell or case has a V-shaped or double-beveled edge or periphery, so as to lie snugly in between the meeting edges of the arms *s* *v*. A cavity, *x*, is formed in the side of the shell, and within this cavity is fixed a post or arbor, *y*, whereby a spool, *z*, can be supported within the shell. This spool and its receiving-shell are placed in the holder *q* by slipping it in between the arms *s* *v* edgewise, the hinged arm *v* yielding to permit such insertion. A spring, *a'*, acting against the hinged arm *v*, keeps it in place, and permits it to yield under the insertion and removal of the spool and its shell. A spring, *b'*, beneath the spring *a'*, having a button, *c'*, resting against the spool, serves to keep it within its shell.

The spool-case *w* has an opening, *d'*, through which the spool-thread is led to and under a tension-spring, *e'*, adjustably attached to said case, and designed to furnish the proper and a regulated tension to the under thread.

f' is a bar pivoted to the needle-operating

elbow-lever *h*, and deriving a horizontal reciprocating motion therefrom. This bar is held beneath the bed-plate in a bearing in the block *p*. Its front end has an incline or cam, *g'*, on top and a lateral wedge or cam, *h'*, just beyond it.

i' is the feed-dog. It is arranged to slide in a transverse slot, *2*, in the block *p*, and has an arm, *j'*, extending backwardly and supported in a block, *k'*, on the bed-plate.

l' is an adjusting-screw extending through the arm *j'*, and projecting more or less beyond the front end of the said arm, to limit the forward throw of the feed-dog. As the arm *j'* is thrown forward synchronously with the rise of the needle, the back of the cam *h'* will come in contact with the projecting end of the screw *l'* and advance the feed-dog, the cam *g'* acting synchronously to give said feed-dog the proper rise. Upon the return of the arm *j'* on the descending motion of the needle the cam *g'* will leave the feed-dog, and the face of the cam *h'* will strike a pin, *m'*, on said feed-dog and retract it. The feed-dog is thus positively moved in all directions, except that gravity and the pressure of the spring of the presser-foot effect its fall. The needle-thread is carried from the spool *n'* on the neck *b* about a tension device, *o'*, thence through an eye, *p'*, projecting from the needle-bar *q'*, and thence through eyes *r'* *s'* at the rear upper and lower ends of the head to the needle. These eyes, as will be understood, form guides for the thread. The needle has only a vertical reciprocation. The spool *z* (carrying the under thread) and its shell and holder form a substitute for the usual shuttle. The holder and shell are stationary, and the spool has only so much rotation as is necessary to pay out the thread.

The operation of this part of my invention is as follows: When the needle has completed its descent the rotation of the disk *c* advances the looper, so that when the needle begins its ascent the hook *n* will enter the loop of thread carried by the needle, (see Figs. 1, 8, and 9,) and, continuing to advance, said thread-loop will be caught by the notch *o*. The end of the looper is so curved as to clear the spool-holder *q*, and its bayonet end is bent around, so that its hook will move in a plane parallel with the apex of the V-shaped periphery of the spool-shell. This end of the looper is sufficiently thick that when the thread is in its notch the loop of thread will be spread open, so that as the looper, having attained its extreme advance, begins to fall and retreat the loop of thread will be spread open over the spool-shell, between it and the arms of its holder, (see Figs. 10 and 11,) and the spool-thread will fall within this loop. The motion of the looper about the spool-holder is described in an elliptical curve somewhat resembling the outline of a top or a sharp-pointed egg, the larger curve being in front of the holder. Hence as the looper retreats it will carry the loop rearwardly with it, Fig. 10, and beyond the binding portions of the holder and shell, (see Fig. 12,) when, the

looper being raised and reaching its rearward movement, the thread will be freed from the notch, and upon the descent of the needle co-incident with this position of the looper said looper will advance and take the last loop from the needle, and, drawing from the previous loop, this first loop will be drawn up, Fig. 14, and a stitch formed. I by this operation dispense with a take-up and make the looper serve its purpose. The looper holds the thread taut during the ascent of the needle, taking up the slack and drawing from the needle-thread spool enough thread for the succeeding stitch. This saves the wear and strain upon the thread incident to its repeated and rapid running through the eye of the needle in a take-up machine and its constant whipping by the rapid vibration of the take-up. The peculiar elliptical motion of my looper is obtained by the rotary movement of its pivotal end being converted through the oscillating bearing in which its fulcrum is constantly changing. The finger *t* of the arm *s* overhangs the shell of the spool and serves to separate the ascending and descending loops.

In operating my machine as an embroidering-machine, I disconnect the bracket *k* by taking out its pin *m* and removing the pivot *t'*, used to connect the rod *i* and crank *g*. The under-thread holder *q* may also be removed by taking out the screw *r*; but this removal is not necessary, save as a matter of convenience. The lug *l*, to which the bracket *k* is attachable, has a slot parallel with the rod *f'*, and through this slot is passed, so as to work as in a guide, a bar, *u'*. This bar is pivoted to a projection, *v'*, of the rod *f'*, whereby it obtains a rectilinear reciprocation through the block *l*. This bar has secured to its forward end, as by a set-screw, *w'*, a looper, *x'*. This looper *x'* somewhat resembles a needle, and has two eyes, *y'* and *z'*, and a thread-guide, *z'*, through which, in reverse order, the thread is passed. The bar *u'* has in its under face elliptical grooves *a²* *b²*, merging into each other at their meeting ends, and a pin, *c²*, on a spring-arm, *d²*, secured to the block *l*, works in said grooves, it passing from one groove into the other as the bar is reciprocated, and imparting a lateral vibratory movement to such bar, which has the effect of passing the looper's thread through the needle-thread on one side of the needle, and permitting the needle, on its return descent, to pass through the looper's thread on the opposite side of the looper, as indicated in Figs. 19 to 29. The looper gets its thread (which may be silk, silk floss, or other thread) from the spool *e²*, suitably sustained, as by a tension device on the under side of the bed-plate, and it forms with the needle-thread an embroidery-stitch, as indicated in Fig. 31.

The same needle and its operating mechanism, the same feed, and the same driving-shaft are employed with this embroidery-looper as are used with the lock-stitch mechanism; and in its operation the looper carries its thread through the needle-thread on one side of the needle, Figs. 19 and 20, the needle rising and

the looper completing its advance, Figs. 22, 23; the pin *c²* then enters the opposite groove in the looper-bar, the needle begins its descent and the looper its retreat, but on the other side of the vertical path of the needle, Figs. 25, 26, thus encircling the needle with its loop; the needle completes its descent and the looper its retreat, Figs. 28, 29, when the looper-shifting pin enters the first groove; the looper begins its advance and the needle its ascent, after the stitch has been formed. The looper-thread appears boldly as embroidery and the needle-thread as the sewing, the looper-thread having been passed around each thread of the needle-loop and back again, thus being laid in three lines, as clearly indicated in Fig. 31.

The looper-arm *u'* may remain in its bearing-block *l* at all times. It is rendered inoperative by removing the screw *f²*, which attaches it to the projection *v'* of the feed-operator *f'*, and pushing it back in the slotted block *l*, the spring *d²* holding it therein against accidental displacement. When thus removed, which is the work of but a moment, the chain-stitch mechanism or the lock-stitch mechanism may be applied, which is also easily accomplished.

The chain-stitch mechanism is composed of a bracket, *g²*, adapted to be removably attached to the block *p* longitudinally by a thumb-screw, *h²*, Figs. 34, 35. The bracket *g²* is perforated longitudinally to form a sheath or bearing and guide for a rod, *i²*, which is slotted at its rear end, and connected by said slot and a bolt or screw, *f²*, (the one used for connecting the embroidery-looper,) to the projection *v'* of the rod *f'*, that operates the feed-dog. The forward end of the rod *i²* is flattened vertically, and has a vertical groove, *k²*, in its face. *l²* is a disk, pivoted at *m²* to the bracket *g²*, and having a pin, *n²*, Fig. 38, which enters the groove *k²* of the bar *i²*, by which the rectilinear reciprocating motion of the bar derived from its connection with the feed-dog operator is communicated to the disk *l²*; but said disk being arranged upon a fixed pivot, *m²*, this motion is converted in the disk to an oscillating or rotary reciprocating motion thereof, and the bar *i²* being connected to its motor through a slot, there occur periods of rest in the reciprocation of the said bar, so that the movement of the disk is intermittent.

The forward throw of the disk may be automatically accomplished by a spring, Figs. 34, 35, coiled about the rod *i²* in its bearing *g²*; or said spring may be utilized to take up the lost motion of the slot *j²*.

The disk is provided with a curved tangential hook, *o²*, extending laterally therefrom, and having a pointed end somewhat U-shaped in cross-section, as indicated in Fig. 39. A pin, *p²*, projects laterally from the hook near its forward end. In operation the hook *o²* takes the loop of thread from the needle and draws it taut by its forward rotation. While the needle rises for the next loop the thread is spread over the sides of the hook, and is held in proper position thereon by the pin *p²* to admit into it

the next descending loop. The needle completing its second descent, the looper or hook disk returns with the first loop spread and the second within it. Continuing its backward movement, the hook casts off the first loop, Figs. 38, 39, and, beginning its forward movement, takes the second loop from the ascending needle, and so on, chaining one loop within the other to form the chain-stitch.

In both the embroidery and chain stitch mechanisms their loopers, as in the lock-stitch mechanism, take the place of a take-up. In the chain-stitch the needle-bar thread-guide p' need not be employed.

For combining this combination sewing-machine with my lathe, Fig. 42, I employ a forked joint, q^2 , and pin r^2 . (See Fig. 16.) In making the changes from one stitch to another no more time is consumed and no greater adjustments or manipulations are required than in applying many of the ordinary sewing-machine attachments to other machines.

In Figs. 1, 43, and 44 I have shown in detail means for taking up the wear of the bearings of the needle-bar, and these means consist in vertically slotting or splitting the ends of the head. These slots s^2 extend from the outer faces of these ends t^2 inwardly to the bore u^2 for the needle-bar. Screws v^2 , passing transversely through the ends t^2 , serve as means to tighten up the needle-bar bore, to compensate for wear, and to hold the bar steady in its bearings therein.

What I claim is—

1. The combination of a driving-shaft, a needle driven thereby, a feed-dog, a rod to transmit motion from said shaft to the dog to operate the feed-dog, a block forming bearings for said feed-dog and rod, and a series of interchangeable loopers adapted to be operated from said shaft, to form, with a suitable thread or threads supplied thereto, a series of lock, chain, or embroidery stitches, substantially as described.

2. In a lock-stitch sewing-machine, a looper-rod, a rotary shaft, with which it is connected, and an oscillating bearing, in which the looper-rod slides, and thus constantly but uniformly shifts its bearings, so as to convert the rotary motion at one end into an elliptical motion at the other end, in combination with devices for supplying upper and under threads and a feed mechanism, substantially as described.

3. In an under-thread-spool holder, a spring, b' , having a button, c' , to retain the spool in its shell, and an auxiliary overlying spring, a' , to hold the shell in its holder, substantially as described.

4. In a sewing-machine, the combination, with the needle and its operating mechanism, the feed-dog, and a reciprocating bar to actu-

ate the same, adapted for use with mechanism for forming a lock or chain stitch, of a looper-bar deriving a rectilinear reciprocating motion from said reciprocating bar and a laterally-vibrating motion from a guiding device working in an elliptical groove in said looper-bar to form embroidery-stitching, substantially as described.

5. A looper actuated from the feed-operating bar, combined with a spring-finger, to give to said bar lateral vibrations and to hold it in place when not in use, substantially as described.

6. The reciprocating looper-bar having an elliptical groove in its face, combined with a fixed pin, which enters said groove from opposite sides at the completion of the advance and retreat of the bar, to give to it a lateral vibratory movement to carry the thread about the needle to interloop it and the needle-thread, substantially as described.

7. The looper-bar and a slotted block in which it is received, combined with a spring-arm to hold it in place when not in use, substantially as described.

8. A looper-bar having a rectilinear reciprocating motion, and a continuous elliptical or elongated oval groove, combined with a fixed pin extended in said groove to vibrate said looper laterally, substantially as described.

9. In a sewing-machine adapted for conversion into a lock-stitch, embroidery-stitch, or chain-stitch machine, a block to support the feed-dog-operating mechanism, combined with a bracket removably attached thereto, a looper pivoted to said bracket, and a rod deriving a rectilinear reciprocating motion from the feed-dog operator and imparting an oscillating or intermittent semi-rotary reciprocating movement to the looper, substantially as described.

10. A chain-stitch looper composed of a pivotal disk, a thread taking and spreading hook thereon, and a lateral thread-guard pin, substantially as described.

11. The combination of a rod grooved at one end and connected by a slip-joint to its motive power, a bracket in which said rod slides, and a looper provided with a pin working in the groove in the rod, substantially as described.

12. A feed-dog operator driven from the main shaft, provided with a lateral projection adapted to impart motion to an embroidering or chain stitch looper, substantially as described.

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

JOHN W. POST.

Witnesses:

WM. H. FINCKEL,
H. B. ZEVELY.