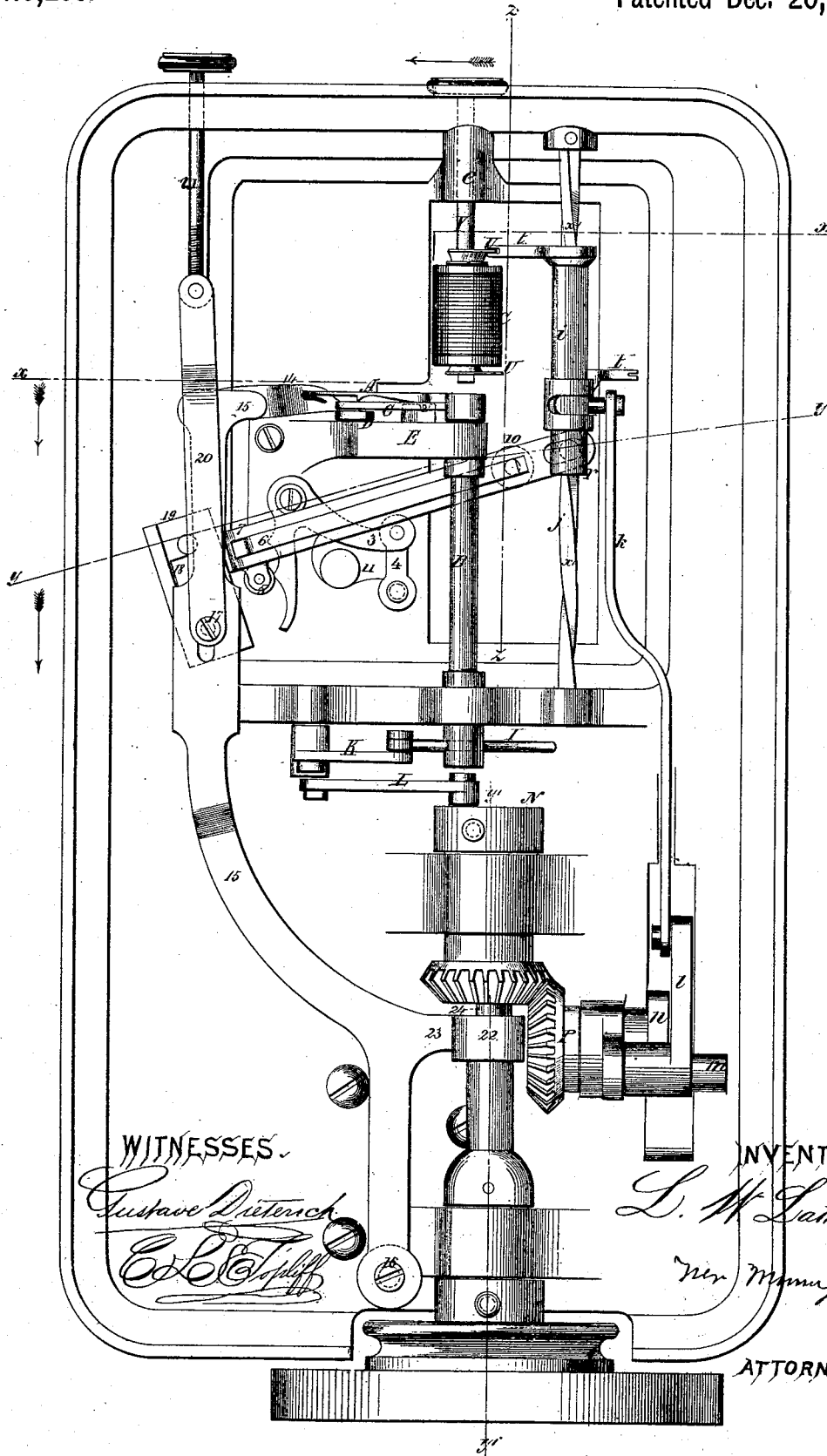


L. W. LATHROP.

Sewing Machine.

No. 110,250.

Patented Dec. 20, 1870.



WITNESSES.

Gustave Dietrich
E. L. T. J. J.

INVENTOR.

L. W. Lathrop
per M. M. L.

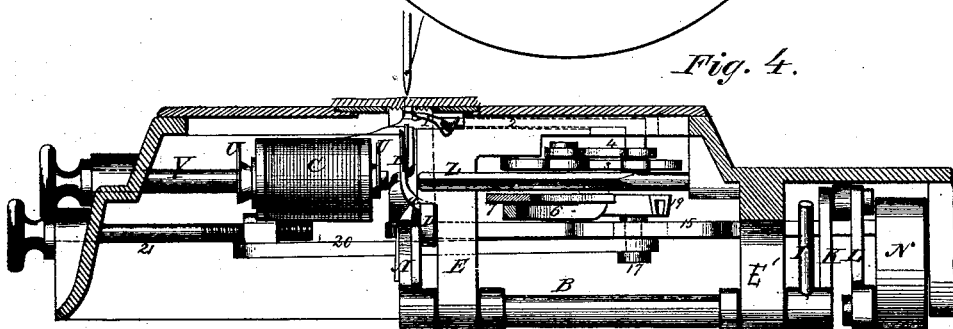
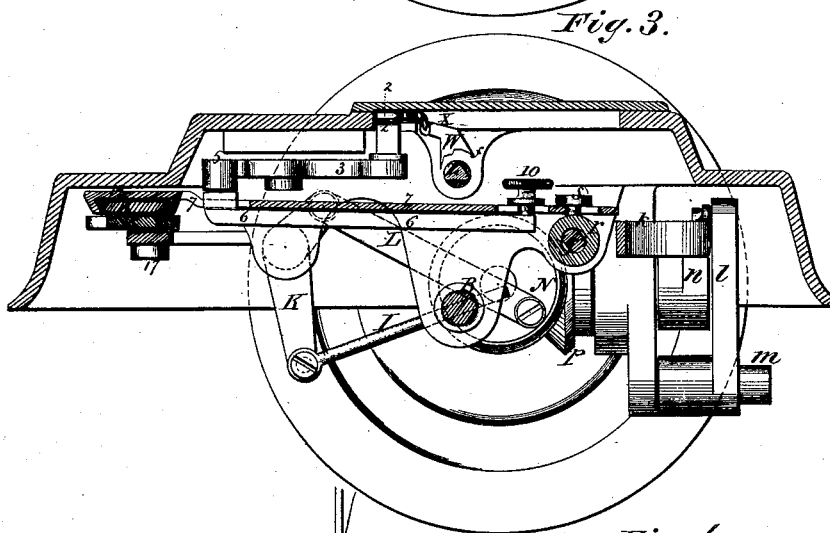
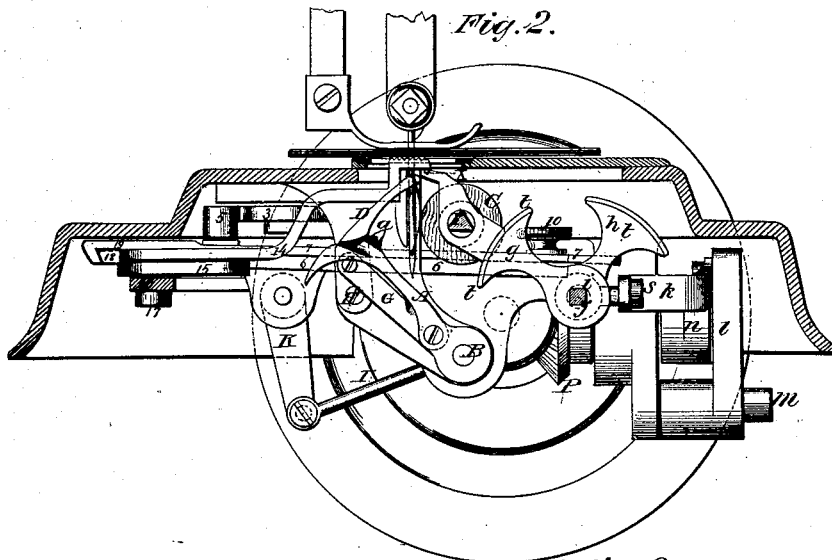
ATTORNEYS.

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Gustave D. Smith
E. L. C. T. J. P. L.

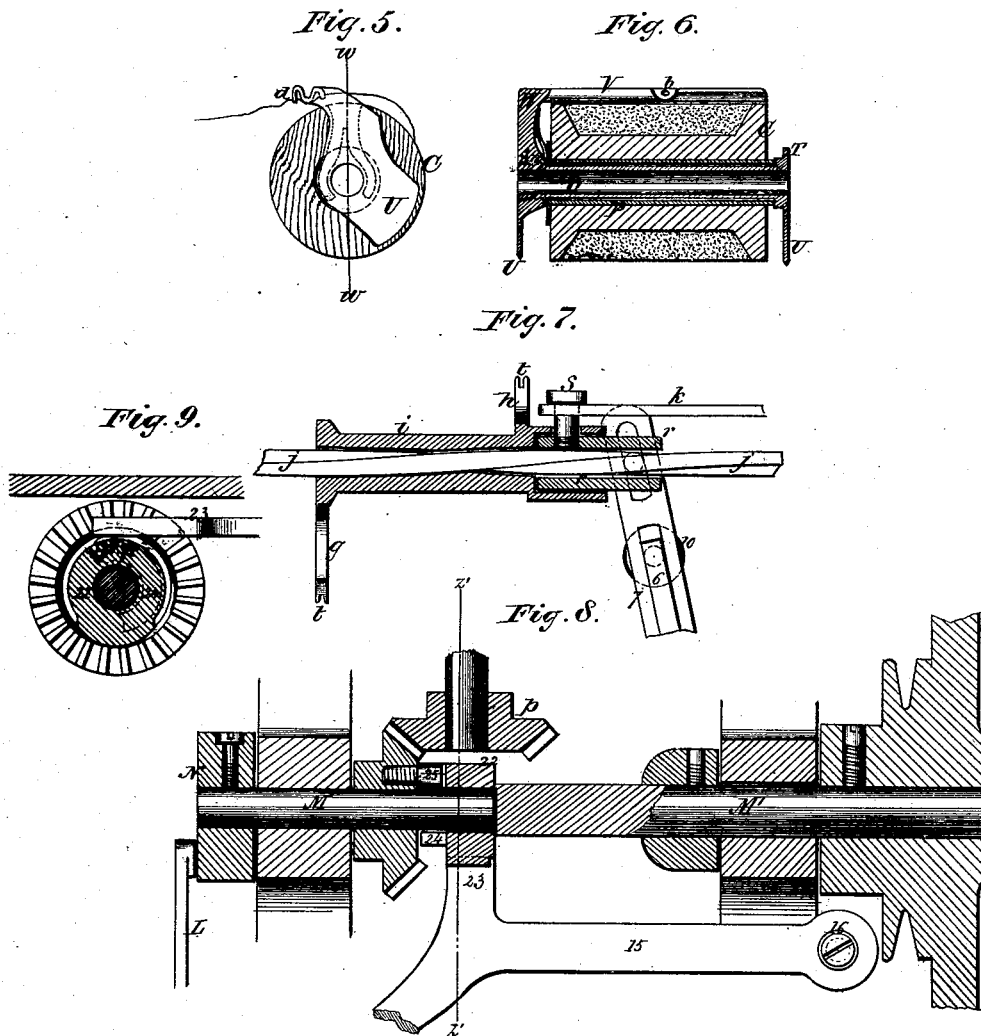
INVENTOR.
L. W. Lathrop
per M. M. L. & Co. Attorneys

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Gustave Dietrich
 E. L. Topliff

INVENTOR.

L. W. Lathrop
 per Munn & Co
 Attorneys

UNITED STATES PATENT OFFICE.

LEBBEUS W. LATHROP, OF POUGHKEEPSIE, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 110,250, dated December 20, 1870.

To all whom it may concern:

Be it known that I, LEBBEUS W. LATHROP, of Poughkeepsie, in the county of Dutchess and State of New York, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to sewing-machines; and it consists in an arrangement of devices more fully described hereinafter, and by which the combined lock, shuttle, and chain stitch, or the single chain-stitch may be made at the will of the operator, while the thread for these stitches is taken from common spools.

The invention also consists in devices by which the operator may change the direction of the feed by changing the direction of the movement of the driving-wheel.

The invention also consists in a combination, with the needle and a principal loop-spreader, of an auxiliary loop-spreader for opening the loop widely for the more readily passing a common spool of thread through for locking the loop.

It also consists in an improved combination and arrangement of means for passing the spool through the loop.

The invention also consists in a combination, with the needle and the said loop-spreader, of a looper and operating devices therefor for forming a chain-stitch with one thread (the lower one not being used) under such an arrangement that the said looper may also be used in conjunction with the devices for making a lock-stitch, and thereby produce a compound lock and chain stitch.

The invention also consists in a novel arrangement of the driving-gear for operating the lower spool and the looper for shifting the same relatively to the needle-driving gear, whereby the machine may be worked by turning the driving-gear either way, and the feed changed to either direction, by simply changing the direction of the motion of the driving-gear.

The invention also consists in certain other improved combinations and arrangements of operating devices, all as hereinafter described.

Figure 1 is a plan of the bottom of my im-

proved machine. Fig. 2 is a section on the line *xx* of Fig. 1. Fig. 3 is a section on the line *yy* of Fig. 1. Fig. 4 is a section on the line *zz* of Fig. 1. Fig. 5 is an end elevation of the spool-carriage. Fig. 6 is a section of Fig. 5 on the line *ww*. Fig. 7 is a sectional elevation of the spool-driving apparatus. Fig. 8 is a section of a part of the driving-gear for the loop-spreaders, the spool, and the feed. Fig. 9 is a section of Fig. 8 on the line *z' z'*.

Similar letters of reference indicate corresponding parts.

The needle-thread is carried by the ordinary movements of the needle to the lower side of the plate and a loop formed in the thread by an upward movement of the needle. This loop is to be caught by the point *a* of a principal loop-spreader, A, which is mounted on the oscillating shaft B, and carried back to the right for spreading it for the spool C to pass through.

D is an auxiliary spreader, pivoted at F to the bracket E, which supports the shaft B. It is connected by a link, G, to the shank of the spreader A at H, and so arranged that as the point *a* of spreader A swings toward or beyond the right upper side of the spool it will engage the lower part of the bight of the loop and carry it down below the lower part or under side of the spool, thus making a large opening for the latter and holding the thread so that the spool and its carrier will pass through the loop without contact with it, thereby making it unnecessary for providing a shield or case for the spool, which would be needed to prevent the rough spool from catching the thread of the loop. It will be observed that the auxiliary spreader takes the thread from the needle downward from the point nearly in a direct line with the needle, thereby permitting the use of a short needle. It also economizes in friction, which is greater when the thread is drawn out perpendicularly from it, and thereby lessens the tension on the thread, and it also prevents springing the needle out of the right line. The link G, connecting the two spreaders and imparting motion from one to the other, is connected to each, as will be seen, a short distance from their pivots, and thereby imparts a considerable motion to the spreader D without rising high enough to interfere with the spool C. The shaft B, for operating these loop-spreaders, is mounted in the brackets E E', and is worked by a pin, I,

bell-crank K, and the connecting-rod L, and a crank or a disk, N, with a wrist-pin on the driving shaft M. The said pin I passes radially through the end of the shaft B, and is jointed to the arm of the bell-crank, which, being oscillated, slides the pin forth and back in the said shaft at the same time that it imparts the oscillation thereto.

The spool C for the under thread is mounted on a carrier consisting of the tubes O P, one fitting within the other, and both passing through the hole of the spool and screwing together at R, the tube O having the head S and the other having the head T. Each head has a section of a disk, U, and the one S has a grooved arm, V, supported at the end of the radial arm W in a position parallel with the tubes O P, as shown in Fig. 6, the groove of the arm N being on the outer side for working on a guide, X, attached to the under side of the plate of the machine to hold the carrier in position while it is suspended on the triangular-shaped rods Y and worked back and forth thereon. The said arm has guide-eyes *b d* at about the center for conducting the thread from the spool under the said arm.

The triangular rod *y* is supported in the frame at *e*, where it screws in and out to be removed for putting the carrier in and taking it out for shifting the spools, and it terminates at the inner end near the path of the loop-spreader A, so as to leave a space between it and the end of the rod *z*, which is suspended at one end and in the axial line of the rod *y* by the bracket *f*, and terminates at the other near the termination of rod *y*. The spool-carrier moves across this space in passing through the loops. The rods *y z* are made triangular, for the reason that in case a piece of thread gets in the tube O between it and the rod it will work into the large spaces or one of them provided by thus shaping the rods, and will thereby have room and allow the spool-carrier to work without clogging, as would be the case if the rods were round or of other form fitting the tube snugly. This carrier is moved back and forth by a pair of sliding and oscillating arms, *g h*, mounted on a sleeve, *i*, which is worked back and forth on the spirally-twisted rod *j* by a connecting-rod, *k*, which is worked by the vibrating lever *l*, mounted on a stud pin, *m*, and worked by a crank, *n*, on the shaft of the wheel *p*, which is driven by the wheel *q* on the driving-shaft. The sleeve *i* has a spirally-shaped hole through it corresponding to the spiral form of the rod *j*; so that when it is moved along the said rod it receives its oscillating motion thereby. A short sleeve, *r*, is fitted into a large opening in one end of the sleeve *i* to take the pins *s* for the connection of the rod *k*, which pin passes through a circumferential slot in sleeve *i* in a manner to allow it to oscillate, while it, together with the short sleeve, serves to make the connection with the rod *k*, as will be clearly understood by inspection of the drawings. The arms *g h* are placed as far apart on the sleeve *i* as the

plates or sectional disks U on the spool-carrier are, and they are attached radially nearly perpendicular to each other. Each is formed on a true curve at the periphery, and has a deep groove, *t*, into which the edge of the plate U, corresponding to each arm, is received by the oscillation of the sleeve *i* and retained a part of the time of the movement in each direction for imparting the motion to the spool-carrier while so engaged. The oscillation of the arms *g h* is about a quarter of a circle, and the peripheries of the arm are about an eighth of a circle in length, and they are arranged so that one engages the spool-carrier when the other escapes from it, or slightly before, and they escape from the said carrier or plate U thereon just previous to their passage and the passage of the spool beyond the space between the ends of the rods *y z* when the loop-spreader swings past the end of the spool for either spreading or releasing the loop.

The guide-bar *x*, attached to the under side of the plate and working in the groove of the arm V of the spool-carrier, is notched above the spreader A, and the latter rises high enough to carry the thread up into the notch above the arm V when spreading the loop above the said arm V.

These devices, operating together with the needle, make the lock-stitch; but for making the combination lock and chain stitch I introduce a sliding loop, holding-pin, or hook, 1, the shank 2 of which is arranged in a slot or groove in the under side of the plate of the machine, and is moved forward by the bell-crank 3, which is connected to it by the link 4 and operated by the friction-wheel 5 on the sliding bar 6, arranged in the slotted bar 7, which is pivoted and connected to sleeve *r*, so that it may slide on the pin of the said sleeve, and the sliding bar 6 is confined by the set-screw 10 either in the position to cause the bell-crank to be worked by the vibrating bar 7, or in a position in which the said friction-wheel 5 cannot move the bell-crank. A spring, 11, moves the slide 2 and the looper back. This looper is caused to move forward at the time the loop is being cast off from the spreaders, so as to enter the same, which is drawn up by the take-up around the looper and retained there until the needle comes down again and goes through it, thereby making the chain-stitch, which may either be done at the same time the lock-stitch is made, thereby making the compound chain and lock stitch shown in Fig. 10, or the chain-stitch only can be made.

To make a chain-stitch only, the spool C is removed or the thread thereof so adjusted as to prevent it from locking with the loops, and when the lock-stitch only is to be made the looper 1 is thrown out of action, as above described, by sliding the bar 6 on the bar 7, so that the bell-crank will not be worked by it. The loops 12 of this compound stitch are the same as in other chain-stitches; but the combination therewith of the locking-thread 13 makes a compound stitch, which is desirable for embroidery

and other uses, where it is important to prevent the chain-stitch from ripping. This bar 7 also imparts the horizontal movement to the feed-plate carrying-bar 14, which is attached to the end of the long, bent, or curved bar 15, pivoted to the under side of the plate at 16. The bar 7 is connected by a screw, 17, with a plate, 18, which is fitted in a dovetail or other suitable groove in the the T-head 19 of the bar, the screw 17 passing through a slot in the bar 15 and being connected to the shifting-bar 20, and which is connected with the shifting-screw 21, so arranged that the said screw and the plate 18 may be shifted as to its position on the bar 15 to vary the movement of the bar 15 for lengthening or shortening the stitch, the length of which will be governed by the distance of the screw 17 from the pivot 8. The feed-plate is raised by the action of the cam 22 on the projection 23 of the bar 15, and it falls back by the action of gravity.

In order to be able to run the machine either way and work the feed in opposite directions thereby and the needle in unison with the loop-spreaders and spool-carriers, whether moving forward or backward, the driving-shaft is made in the two sections M M', arranged in the same axial line, the one, M', imparting motion to the other through the medium of the projection 24 on the side of the cam-disk 22 bearing against the stud-pin 25 on the part M. The projection 24 is so arranged that in reversing the motion of the part M' of the shaft it will turn a half-revolution before turning the part M, so that the movement of the needle, which is caused by the part M' through the medium of the usual connection, will be brought into the same relation to the backward movements of the feed, the loop-spreaders, and the spool-carrier that it has to the forward movements when the driving-wheel turns forward, the said loop-spreaders and the spool-carrier being geared with and operated by the part M of the driving-shaft.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the needle, of two loop-spreaders constructed and operated, as described, to spread and hold the loop for the passage of the spool of locking-thread and its carrier, as specified.

2. The combination, with the shafts B and M, of the disk or a crank, N, connecting-rod L, bell-crank K, and pin I, all constructed and arranged substantially as specified.

3. The combination of the tubes O P, radial plates U, and grooved arm V, constituting the spool-carrier, all substantially as specified.

4. The combination, with the spool-carrier, of the fixed rod Z, detachable rod Y, and the guide X, substantially as specified.

5. The combination, with the spool-carrier, of the oscillating and reciprocating arms *g h*, sleeve *i*, and spirally-shaped way *j*, substantially as specified.

6. The combination of the spool-carrier, the oscillating and reciprocating driver, and the loop-spreaders, all substantially as specified.

7. The combination, with the needle and the loop-spreaders, of the looper 1, when constructed, arranged, and operating substantially in the manner described.

8. The combination, with the looper-stock 2 and lever 7, of the sliding bar 6, friction-roller 5, bell-crank 3, connecting-rod 4, and spring, all substantially as specified.

9. The driving-shafts M and M', the one gearing with and driving the loop-spreaders, the spool, and the looper, and the other connected with and driving the needle-operating devices, and both connected together by the stud 25 and projection 24, and operating in the manner described for shifting the motion of the machine for working forward or backward, all the said devices being combined substantially as specified.

The above specification of my invention signed by me this 24th day of June, 1870.

LEBBEUS W. LATHROP.

Witnesses:

GEO. W. MABEE,

ALEX. F. ROBERTS.