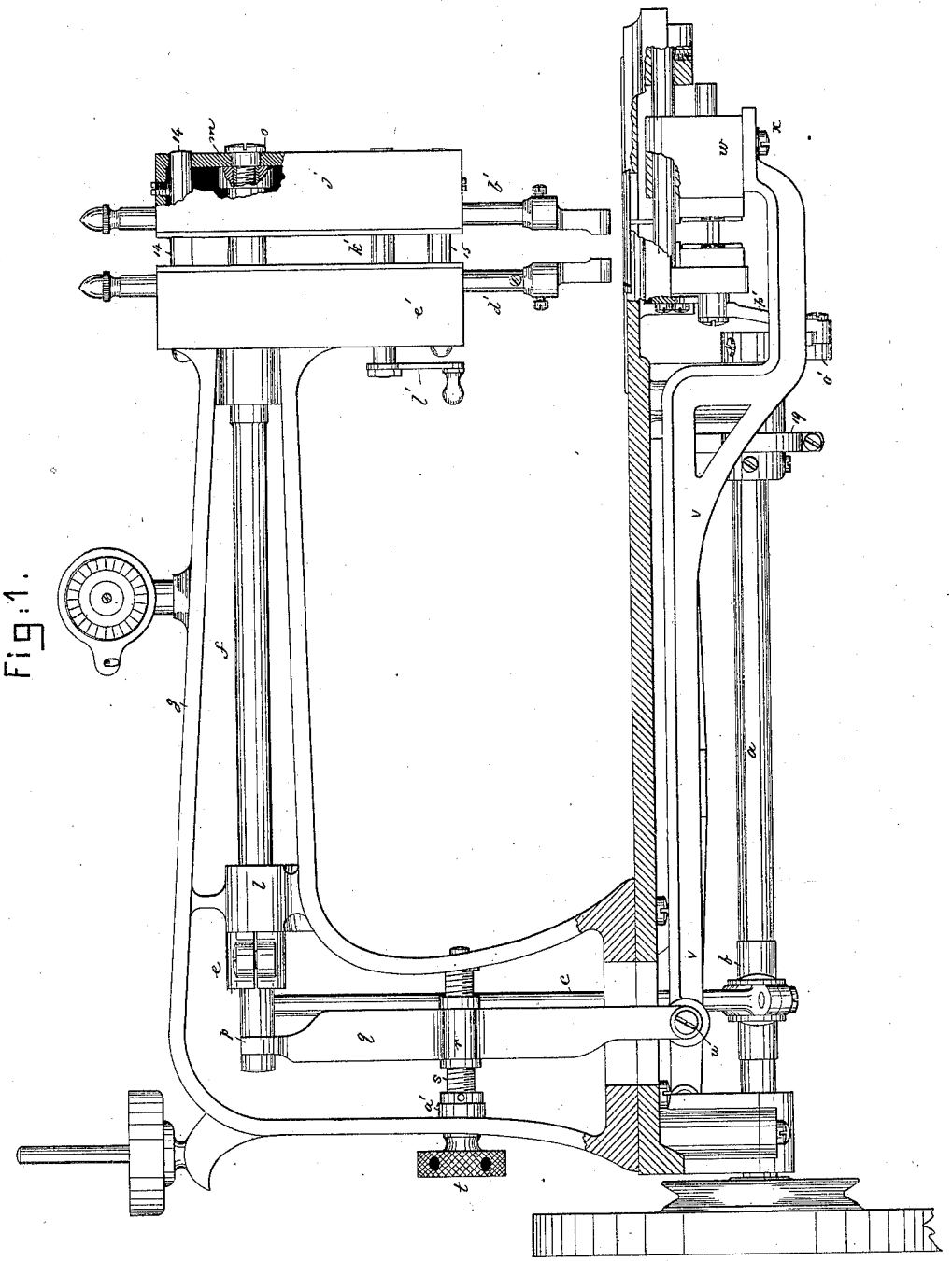
3 Sheets—Sheet 1.

J. H. APPLEGATE.

Sewing-Machine.

No. 212,783. Patented Mar. 4, 1879.

Fig. 1.



Witnesses.

N. O. Whitney.

L. F. Connor.

Inventor.

John H. Applegate,

by Crosby & Gregory Attys

3 Sheets—Sheet 2.

J. H. APPLEGATE.

Sewing-Machine.

No. 212,783. Patented Mar. 4, 1879.

Fig: 2.

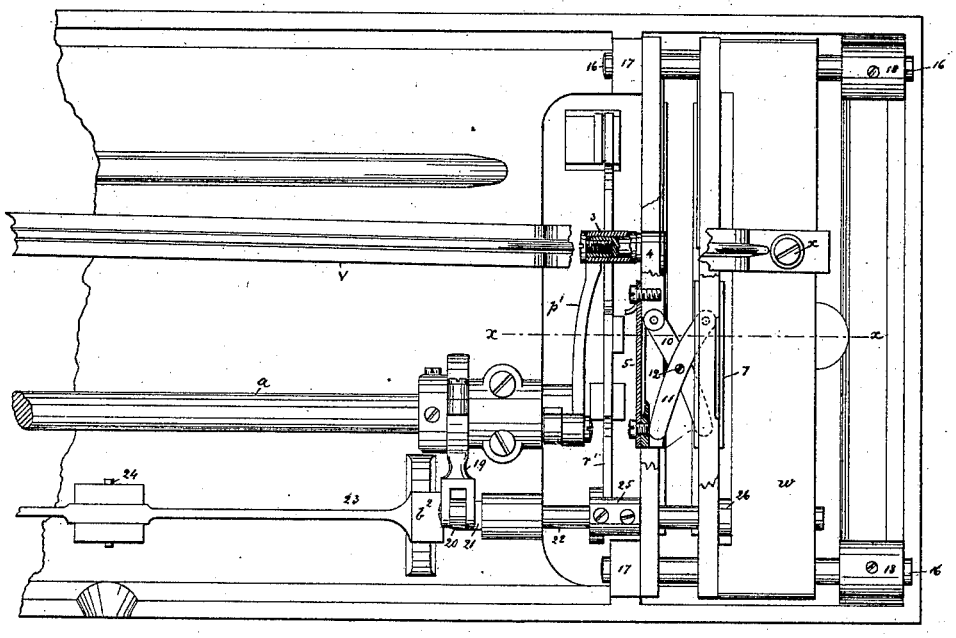


Fig: 3.

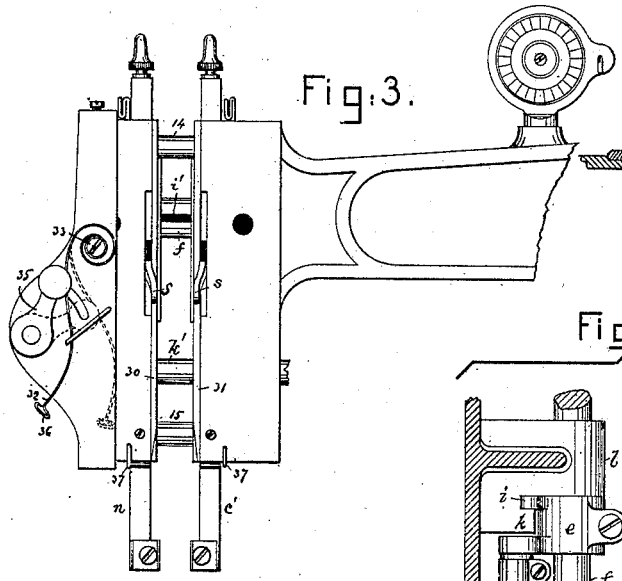


Fig: 4.

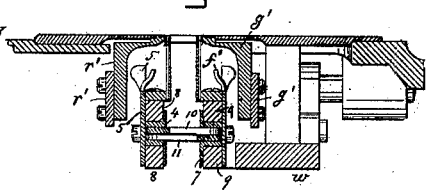
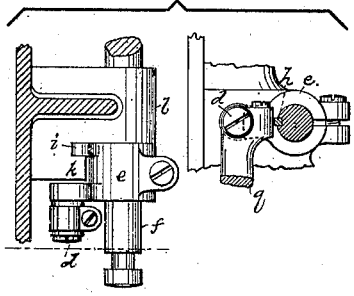


Fig: 12.



Witnesses.

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John H. Applegate.

by Crosby Gregory Attys

3 Sheets—Sheet 3.

J. H. APPLEGATE.

Sewing-Machine.

No. 212,783. Patented Mar. 4, 1879.

Fig:5.

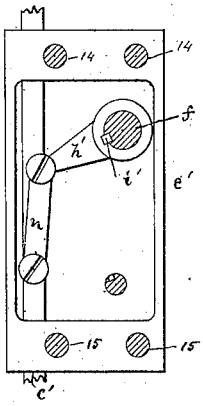


Fig:6.

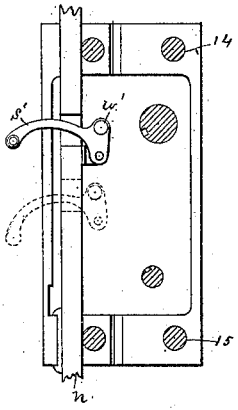


Fig:7.

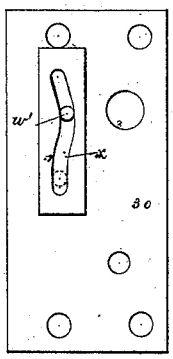


Fig:8.

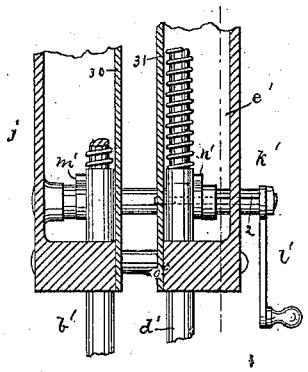


Fig:9.

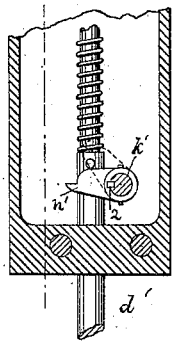


Fig:10.

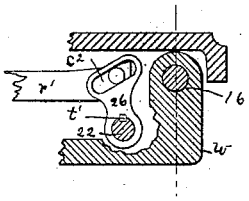
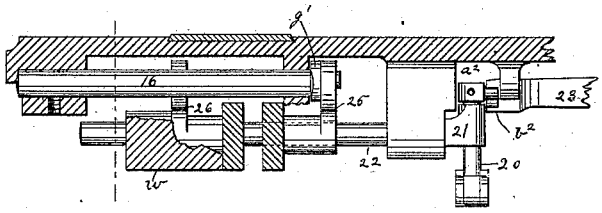


Fig:11.



Witnesses.

N. E. Whitney.

L. F. Connor.

Inventor.

John H. Applegate,

by Crosby & Gregory Attys

UNITED STATES PATENT OFFICE.

JOHN H. APPLEGATE, OF REVERE, ASSIGNOR TO McKAY TWIN SEWING MACHINE ASSOCIATION, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **212,783**, dated March 4, 1879; application filed July 29, 1878.

To all whom it may concern:

Be it known that I, JOHN H. APPLEGATE, of Revere, county of Suffolk, State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the drawings forming a part thereof, is a specification.

This invention relates to sewing-machines employing two needles and shuttles for sewing two independent seams; and the invention consists in the combination, with the needle-operating rock-shaft, the main rotating crank-shaft below the bed, and a crank thereon and link to impart motion to the rock-shaft, of a crank connected with the rock-shaft by a spline, so that the said shaft may be moved longitudinally through the said crank when the auxiliary needle-head and shuttle are adjusted; also, in the combination, with the main and auxiliary shuttle-carriers, of crossed links, pivoted each at each end to each of the carriers, to permit the separation of the carriers and shuttles to sew seams at different distances apart; also, in the combination, with the two needles and mechanism to operate them, of a loop-robbing device, to prevent the needles at desired times from throwing out loops for the entrance of the shuttles, thereby enabling the one needle and its shuttle to continue in operation without forming a stitch, while the other needle and shuttle operate to form a stitch, as usual, this provision enabling angular or square-cornered parallel seams to be sewed, it also permitting one needle to sew while the other operates without forming a stitch, as is necessary when the thread of one needle or shuttle breaks or runs out, and the seam has to be again run over to make perfect that portion in which the stitch was not made or imperfectly made; also, in main and auxiliary feed-bars and a rock-shaft, combined with a crank fixed upon said rock-shaft, and a second crank, connected with the rock-shaft by means of a spline, to permit it to be moved longitudinally along the rock-shaft with the auxiliary shuttle-race, the two carriers operating the two feed-bars, substantially as described.

Figure 1 represents, in side elevation and partial section, a machine provided with my improvements; Fig. 2, an under-side view of the principal portion of the machine; Fig. 3, a side elevation of the overhanging arm and main and auxiliary heads and needle-bars, showing the loop-robbing device only on the auxiliary head, it being omitted from the main head to show the parts more clearly; Fig. 4, a section taken through the main and auxiliary shuttle-races on the line *x x*, Fig. 2; Fig. 5, a view of the crank and links for operating the needle-bar in the main head; Figs. 6 and 7, details, showing the take-up and the manner of operating it; Figs. 8 and 9, details of the main and auxiliary heads and presser-foot-lifting devices; Figs. 10 and 11, details of the feeding devices, and Fig. 12 a detail of the crank on the needle-operating rock-shaft.

The general plan of the bed-plate, overhanging arm, rock-shaft above the table, rotating shaft below the table, needle-bar moving, shuttle-actuating, and feed-operating mechanisms, and take-up lever are those common to the new Weed sewing-machine. The main rotating shaft, *a*, has a crank, *b*, which is connected by a link, *c*, with a pin, *d*, which projects from a cranked sleeve, *e*, on the rocking shaft *f* in the overhanging arm *g*, the said sleeve being connected with the said shaft by means of a spline, *h*, on the shaft, which enters a groove or equivalent in the crank, the crank being thereby so attached to the shaft that the latter may be moved horizontally with the auxiliary head *j* without detaching the crank from it. This cranked sleeve has a retaining-finger, *i*, projecting from it, which co-operates with a stud, *k*, fixed to the overhanging arm at the rear of the bearing *l*, the finger and bearing co-operating as holding devices to prevent the sleeve from being moved horizontally.

The forward end of the rocking shaft *f* has attached to it a crank, *m*, (see Fig. 1,) which, by a link, *n*, such as shown in Fig. 5, is joined with and operates the auxiliary needle-bar c^1.

The end of the shaft *f* is provided with an internal screw-thread, as shown in Fig. 1, to receive a headed screw, *o*, and at its rear end the said shaft is grooved to receive the fork *p* of the tie-bar *q*, which, at or near its center, has a hub, *r*, provided with an internal thread

to receive the threads of the screw *s*, having a milled head, *t*, the lower end of the tie-bar being jointed at *u* to the rear end of the link *v*, which, at its forward end, is connected by a screw, *x*, with the auxiliary shuttle-race *w*.

The inner side of the head of the screw *o* bears upon the outside of the outer plate of the auxiliary head *j*, and the crank *m* against the inner face of the said plate; and as the tie-bar is moved horizontally by the screw *s*, mounted on the standard of the overhanging arm so as to turn, but not to move horizontally, as it is held by the collar a^1, the shaft *f* is moved horizontally, and with it is moved the auxiliary head and needle-bar and the auxiliary presser b^1, thereby adjusting the auxiliary head toward or from the main needle-bar c^1, main presser *d'*, and main head *e'*, to provide for sewing parallel seams at desired distances apart.

During the movement of the auxiliary head and shaft *f* by the tie-bar, the latter, by the link *v*, moves the auxiliary race *w* and auxiliary shuttle-carrier *f'* and the attached auxiliary feeding device *g'* laterally in the same direction, and for a distance exactly equal to the movement of the auxiliary head and its parts, so that the needle and shuttle operate correctly to form a stitch.

The crank *h'* in the main head *e'*, which, by link *n*, is connected with and operates the main needle-bar c^1, is connected with the shaft *f* by means of a groove and key, *i'*, so that the said shaft, as it is moved longitudinally during the adjustment of the auxiliary head, slides through the said crank, but yet operates it so as to reciprocate the main needle-bar and needle in all positions of adjustment of the shaft *f*.

The rod *k'*, provided with a handle, *l'*, has two cams, *m' n'*, to act upon pins projected from the presser-bars to lift the presser-feet.

The cam *m'* is fixed to the rod, while the other one, *n'*, is connected therewith by a groove and spline, as at 2, Figs. 8, 9, so that as the auxiliary head *j* is adjusted laterally, carrying with it the rod *k'*, the said rod will move longitudinally through the cam *n'*.

The rotating lower shaft, *a*, has at its front end a crank, *o'*, which, by a link, *p'*, is connected with the stud 3 of the slide 4 of the main shuttle-carrier 5 in the main raceway, the slide 4 being held between the guideways 8, as is the slide 7 of the auxiliary race between the guideways 9, all as usual.

These main and auxiliary shuttle-carriers and slides are joined together by links 10 11, pivoted together at 12, so that as the main shuttle-carrier is moved positively by the usual crank *o'* and link *p'*, the auxiliary shuttle-carrier will be moved in the same direction at the same speed, and this, notwithstanding the distance between the main and auxiliary races and shuttles, for the links 10 11, being pivoted, provide for movement of the races toward and from each other.

The links 10 11, being pivoted upon the shuttle-carriers, and one upon the other, as shown and described, are prevented from wearing at their points of connection to such a degree as would cause lost motion and fail to move the shuttles at the proper time with relation to the needle.

Rods 14 15, connected with the auxiliary head and extended through openings in the main head, and rods 16, extended between the lugs 17 18 and loosely through the auxiliary shuttle-race *w*, serve as guides for the auxiliary head and shuttle-race as they are moved laterally.

The shaft *a* has an eccentric, over which is placed an eccentric strap and link, 19, connected with a rod, 20, which is extended through a hole in a crank, 21, at the end of the feeding rocker-shaft 22, (see Figs. 2 and 11,) and has at its end a head, a^2, a stud from which is grasped by the forked end b^2 of the feed-regulating lever 23, pivoted at 24, and regulated by a thumb-screw at its other end, all as common in the Weed sewing-machine.

The shaft 22 has two arms, 25 26, (see Figs. 10, 11,) each provided with an inclined slot, c^2, to receive a pin projecting from each feed-bar *g' r'*, the said arms and feed-bars being all as common to the said Weed machine.

The arm 26, which moves the auxiliary feed, is attached to the shaft 22 by a spline and key, as at *t'*, so that as the auxiliary shuttle-race and feeding device are moved laterally the said arm may slide longitudinally over the shaft and continue to actuate the auxiliary feed in all positions of the auxiliary race.

In this way it is seen that the adjustment of the parts for sewing seams at different distances is made positively in both directions by a single screw.

The take-up levers *s'* for the needle-threads of each needle are alike. One of the said levers is shown in Fig. 6 as an elbow-lever pivoted to the needle-bar, so as to rise and fall with it, and the lever has a stud, *w'*, which enters an irregular slot, x^2, in the movable head-plate 30 or 31. The movement of the needle and shuttle and the take-up are, in the formation of the stitch, the same as in the Weed machine.

Attached to the auxiliary head is a loop-robbing device, composed, as shown in this instance of my invention, of a spring, 32, fastened at 33 on a plate, 34, removably attached to the said head. The plate is provided with a finger, 35, so connected therewith as to be turned to occupy the positions shown in full and dotted lines, Fig. 3. When, as in dotted lines, the finger presses the spring 32, its eye 36, through which the needle-thread will be made to pass, will simply act as a guide for the said thread in its passage from the eye of the take-up lever to the usual guide-eye 37, near the bottom of the head; but when in the position in full lines, the spring is permitted to move outward and pull the needle-thread constantly between the take-up and eye of the needle, so that the thread in the needle-eye is

not permitted to form a loop below the material for the passage of the shuttle or other thread-carrier through it, and consequently a stitch is not formed so long as the spring 32 remains in the position shown in full lines.

The main needle-head will, in practice, be provided with a loop-robbing device like that just described for the auxiliary head; but such robbing device is herein omitted, so as not to complicate the drawings.

When, in using two needles, it is desired to turn a square corner and preserve the parallelism of the two lines of stitching, it is necessary that one needle should make a greater number of stitches than the other, to compensate for the difference in the lengths of the seams in such cases; and, also, when, for any reason, one line of stitching is perfect and the other imperfect, it becomes necessary to run back the material to restitch a portion of it. Then the needle which is not to make stitches has its loop robbed or pulled back by the loop-robbing device, so as not to be entered by the shuttle which works with the said needle, and the said needle will then penetrate the material with the other needle, but will not make stitches.

The finger may be shifted so quickly as to prevent the formation of a stitch at any desired thrust of the needle. Each needle will be provided with a loop-robbing device, so as to provide for turning angles to the right or left, or correcting errors in the right or left hand row of stitching.

It is obvious that my invention might be embodied in other forms of lock-stitch sewing devices besides those common to the Weed form.

I claim—

1. The main rotating crank-shaft below the bed and a link extended above the bed, combined with the needle-operating rock-shaft and a crank connected therewith by a spline, and means for holding the same against lateral movement, whereby the said needle-operating rock-shaft may be moved longitudinally through the said crank, which operates it, substantially as described.

2. The main and auxiliary shuttle-carriers and slides, combined with the links 10 11, which connect them, the said links permitting the separation of the shuttle-carriers, and acting to impart motion from one to the other shuttle-carrier, as described.

3. The combination, with the two needles and mechanism to actuate them, of a loop-robbing device, to prevent the needles at desired times from throwing out loops, substantially as and for the purpose described.

4. The loop-robbing spring, adapted to prevent the needles at desired times from throwing out loops, as and for the purpose specified, in combination with the adjustable finger, two needles, and mechanism to operate them, substantially as described.

5. The main and auxiliary feeding-bars, combined with a rocking-shaft provided with a fixed arm, and an arm connected with the shaft by a spline, to permit the shaft to be moved longitudinally through the said arm, substantially as described.

6. The presser-foot-lifting rod *k'*, provided with a cam fixed to it, and combined with a cam connected therewith by a spline, to permit the rod to be moved longitudinally through the said cam, substantially as described.

7. The longitudinally-movable rock-shaft *f*, provided with the screw-thread at its end, combined with the auxiliary head and screw *o*, to draw the said head toward the head *e'* when the shaft is moved longitudinally, substantially as described.

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

JOHN H. APPLEGATE.

Witnesses:
G. W. GREGORY,
N. E. WHITNEY.