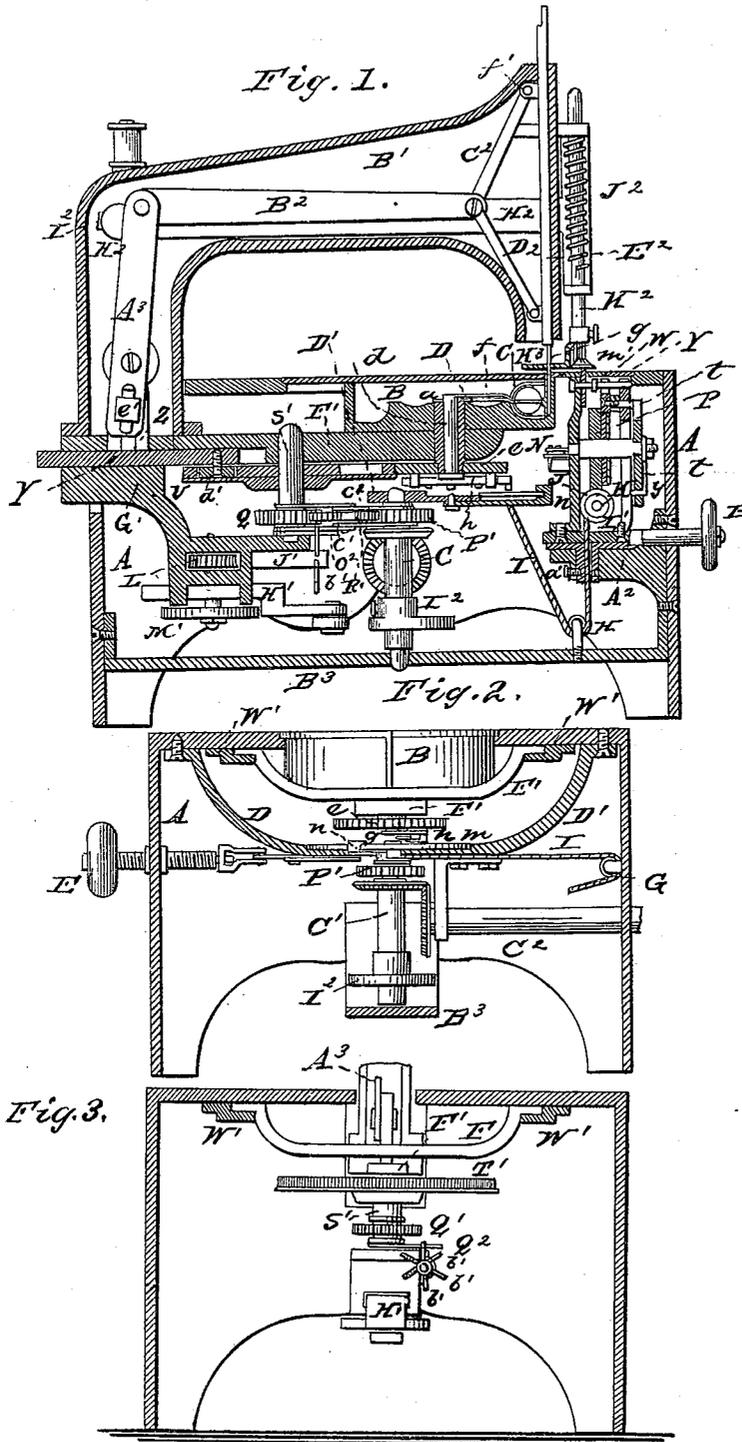


P. L. SLAYTON.
Sewing Machine.

No. 14,022.

Patented Jan. 1, 1856.



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Fig. 4.

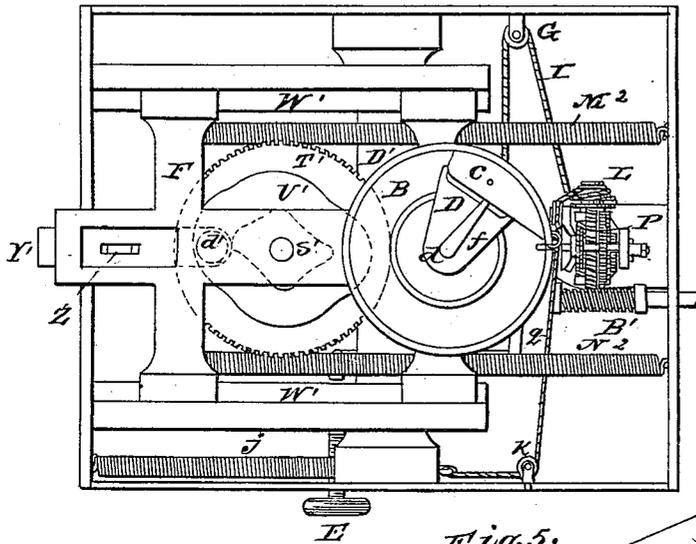
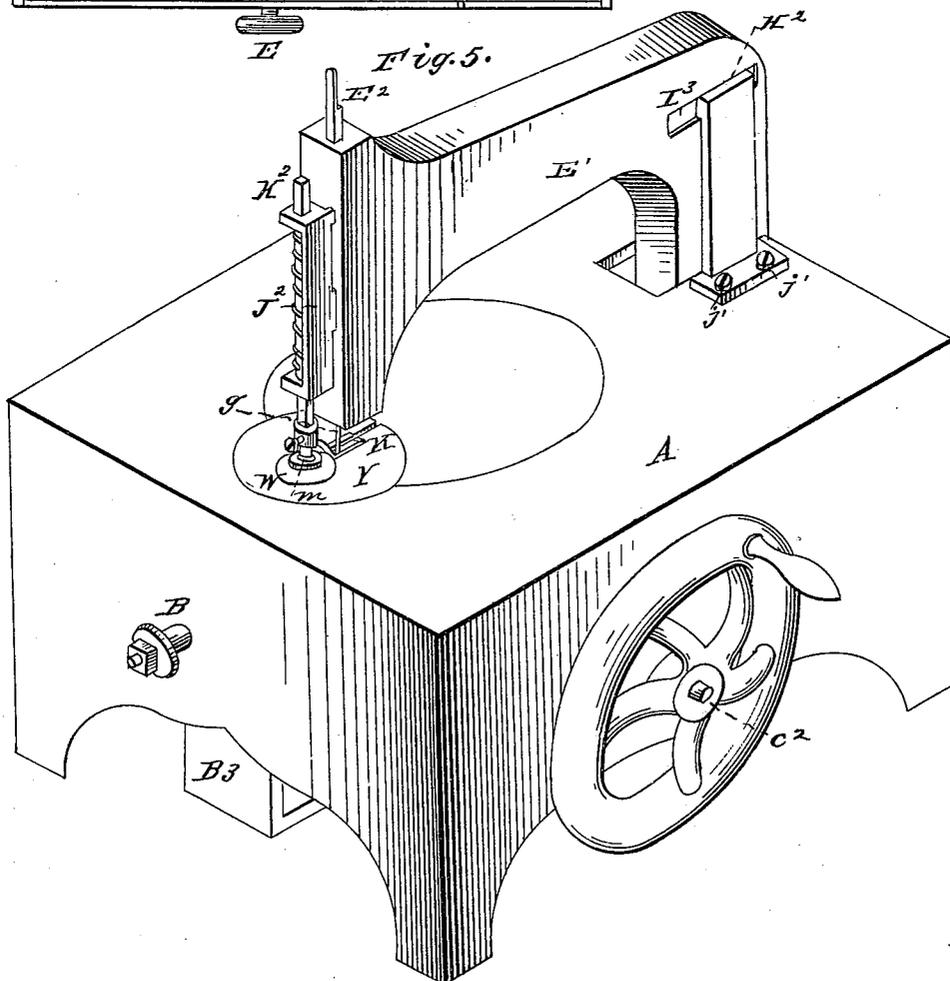


Fig. 5.



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Fig. 9.

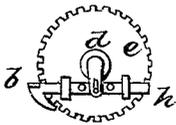


Fig. 10.

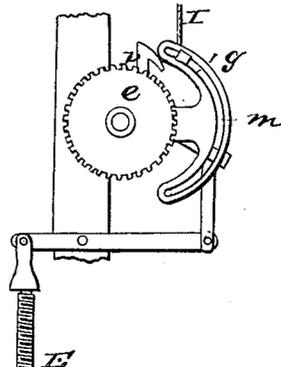


Fig. 13.

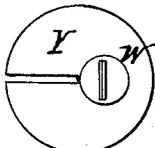


Fig. 13.

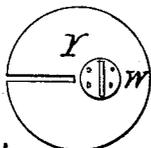


Fig. 14.

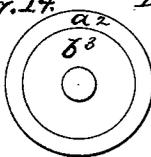


Fig. 14.

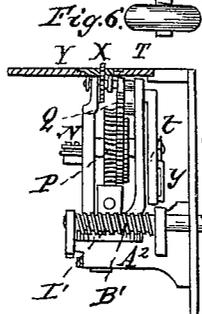
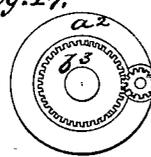


Fig. 7.

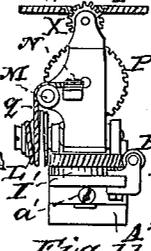


Fig. 8.

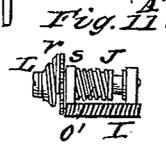
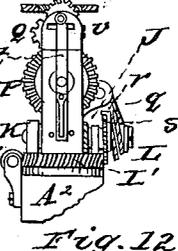


Fig. 15.

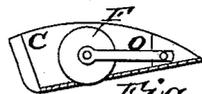


Fig. 18.

Fig. 19.

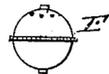


Fig. 16.

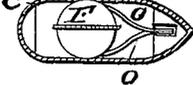


Fig. 17.

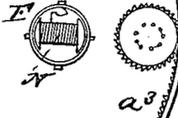


Fig. 20.

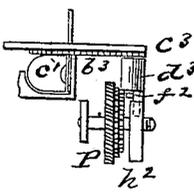


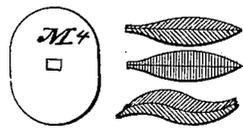
Fig. 21.



Fig. 22.



Fig. 23.



UNITED STATES PATENT OFFICE.

P. L. SLAYTON, OF MADISON, INDIANA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 14,022, dated January 1, 1856.

To all whom it may concern:

Be it known that I, PHINEAS L. SLAYTON, of Madison, in the county of Jefferson and State of Indiana, have invented certain new and useful Improvements in Machines for Sewing and Embroidering Cloth, also for Making Button-Holes; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents a sectional view through the machine lengthwise; Fig. 2, a transverse vertical section through a line in front of the shuttle-box; Fig. 3, a transverse vertical section through a line back of the shuttle-box; Fig. 4, a plan view of the top of the machinery, the cover being removed; Fig. 5, an isometrical view at an angle of thirty degrees. The remaining figures refer to various parts of the machine.

Similar letters of reference indicate corresponding parts in the several figures.

This machine is intended to sew and embroider cloth, also to work button-holes. The principal parts of the said machine may be said to be as follows: first, the machinery for containing and operating the shuttle; secondly, the machinery for feeding the cloth; thirdly, the machinery for giving an irregular lateral motion to the needle and shuttle-box, and, fourthly, the machinery for operating the needle.

The principal frame A, which supports all the machinery, is placed upon a proper stand, and the machine can be propelled either by hand or foot. I will first describe the shuttle and box.

The shuttle-box B is rotary, of sufficient diameter to answer the purpose, and the shuttle C is made to run as near the circumference of the box as possible, (see Fig. 4,) and is propelled forward by means of the plate D, one end operating as a lever on the back end of the shuttle, and the other is secured to the top end of a short perpendicular shaft, *a*, which rotates freely in the center of the shuttle-box, and passing down through the center of the shaft *a* is a smaller one, *d*, which can turn easily in it, and to the upper end is attached a small fly, *f*, which is operated by the thread

as the shuttle passes through the loop. This fly *f* communicates through the shaft *d* with a short sliding bar, *h*, on the underside of the wheel *e*. (See Fig. 9.) On the outer end of the bar *h* is a small hook, *b*, which is made to catch upon a similar hook, *g*, (see Fig. 10,) whenever desired.

The hook *g* is secured to a small block, and through this block is secured the end of a small cord, *l*, the other end being connected with the feeding apparatus. This block moves back and forth in the groove *m* as far as is necessary to regulate the feed. The end of the bar *h* is formed into an inclined plane, and on the outer edge of the plate containing the circular groove *m* is another inclined plane on the end of the swinging bar *n*, which can be placed at any part of the circle required by means of the screw *E*, (see Figs. 2 and 10,) projecting through the side of the frame. This is operated by the thread of the loop as the shuttle passes through. The thread throws the end of the fly *f* back to the rear end of the shuttle. It communicates the motion to the bar *h* and throws it forward, so that the hook *b* will catch onto *g* and carry it along the groove *m* until the end of *h* strikes against the inclined plane on *n*. This pushes the bar in far enough to release the two hooks and permits the block *g* to resume its original place, and also restores the fly *f* to its proper place preparatory to another stitch. Consequently, unless the shuttle passes through the loop, there is no movement of the fly and no possibility of missing a stitch.

It will be seen at once that every time the shuttle makes one revolution the thread which reaches from the cloth will either twist or untwist once, which will cause the thread to have so much twist as to kink and prevent it from working, or make it so slack as to prevent it from having sufficient strength. To overcome this difficulty I have the following arrangement. (See Figs. 15, 16, 17, 18, and 19.) The thread is placed on an ordinary spool and placed inside of a globe, *F*, which opens at the center in two equal parts, having a pivot or center at the top and bottom, upon which it revolves horizontally, and out of the center of the upper pivot the thread passes from the spool *N* in and out of a few holes around the

pivot sufficiently often to give the necessary friction, and lastly through the center of the upper pivot to the cloth. On the outside of this globe is a row of ratchet-teeth, and in one side of the shuttle-box is another set of a corresponding number, a^2 , and as the face of the shuttle is open on the side next to the needle the two sets of teeth are permitted to come in contact. This causes the ball F to revolve once and no more at each revolution or stitch. The globe or ball is secured in its place by the two centers being placed in a pair of steel springs, O, in the form of a pair of calipers, being united at one end, and becomes a hinge, being secured by a pin in its place, and the ball can be swung in and out when desired.

From the block g to the feeding-gear is the cord I, which passes out to one side of the machine around the pulley G, thence back again to the pulley H directly under the feed-gear. Whenever the lateral motion of the shuttle-box and needle is used, the hook b moves with the shuttle-box, and can only feed every other time, (this is quite an object in embroidering to get fine feed; but it may hereafter be found necessary to feed every time for some kinds of work,) and when the lateral motion is not used the feed acts every time, as in other machines.

Figs. 6, 7, and 8 show the arrangement of the feeding apparatus. Fig. 6 is a side view, Fig. 7 a front view toward the shuttle-box, and Fig. 8 a back view of the same. The cord I passes under the pulley H and up through the center of the revolving plate I', and around a small drum, J, (see Figs. 11 and 12,) two or three times. This drum is secured to the shaft K and revolves with it. On the opposite end of K is an inclined plane or fusee, L, which is also secured to it, and around this fusee is the cord q , which passes up over the pulleys M and N, thus bringing it to the center of motion as nearly over the center of I' as it leaves the feeding apparatus, thus permitting the feed-wheel that moves the cloth and its gearing to revolve freely without altering in the least the length of the cords q or I. The cord q then passes out to one side of the machine around the pulley k , (see Fig. 4,) and is attached to the spiral spring j . Around the shaft K is an endless screw, O', and secured to one end is the ratchet-wheel S, and on the fusee L is a ratchet-spring, r , which operates the ratchet S. As the cord I is drawn out it makes J, K, L, S, r , and O' all revolve together, and turns the wheel P the distance of a stitch, and as soon as the cord I is released the cord q is immediately drawn out by the spiral spring at the opposite end. This draws the spring r around the wheel s , draws up the slack of I, and permits the screw O' to remain stationary, ready for another stitch.

The object of the fusee L is to equalize the power required to draw out the spiral spring attached to the end of q . This gives an easy, regular feed, and very fine when wanted.

At the upper side of P are two small pinions, Q and U, which transmit the motion from P to the feed-wheel X. The pinion Q connects the wheels P and T, and causes the feed-wheel X to move in the same direction as P, and the pinion U to revolve entirely clear of both; but when the pinions U and Q are thrown in the opposite direction U will be connected with P and Q with the pinion T and reverse the direction of X. Consequently the feed of the cloth is reversed at pleasure by changing the lever t , which supports the pinions U and Q. This lever is held in its proper place by the spring-hook y . The lever t is divided into two parts, so that the upper part can be removed whenever an eyelet-hole is made and another arrangement substituted for that purpose, as hereinafter explained.

The teeth on the wheel X are brought to a sharp point, so as to take good hold of the cloth, and they project up through the small circular plate W, which revolves with the feed apparatus. This is set in another plate, Y, which is secured to the frame A. This plate has a slot extending nearly to the center, (see Figs. 13 and 13*,) for the passage of the needle during the lateral motion.

The feeding apparatus is supported and revolved by the wheel I'. This extends down through the frame A², and is kept there by the screw a' . In the upper edge of I' works the screw B', the shaft projecting through the outside frame, where it can be readily used at pleasure by either hand, thus constituting a certain, steady, and accurate feed in any degree of a circle both backward and forward.

I will now describe the operation of the running part of the machine.

The perpendicular shaft C' is driven, by either foot or hand, by means of the fly-wheel and shaft C², which are connected together by the bevel-gearing attached. The upper end of C' works in a brace, D', which is secured to the main frame A, and its lower end rests in a cross-brace, B³.

The needle-frame E', with all that is attached to it, the plates F' G' H' and all attached to them, form a separate sliding frame, which moves in a lateral direction to the cloth more or less, as circumstances require, by means of the cam I², which is brought in contact with the end of H' at every revolution of the shaft, and as there are two stitches made at each revolution of the shaft there is a stitch made at each end of the motion carrying the needle-arm and shuttle-box with it. This motion is regulated by a pattern, M', (see Fig. 21,) M², Fig. 22, or M³, Fig. 23, of whatever shape will suit the figure to be worked, which is attached, as shown in Fig. 1, to the lower end of the same shaft on which the screw-wheel L is placed. This is slightly turned at each revolution by means of a little lever, O², on the lower end of the shaft S'. This strikes against one of the pins b' on the screw J', and turns the said screw one-sixth around, and leaves the following pin in

the same position as the first one, which will always continue to feed, whether a pattern is attached or not. The bar H' is thrown back and forth by the pattern, and on the end is a roller which rolls against the cam I^2 .

On the shaft C' is a small wheel, P' , which gives motion to another wheel, Q' , on the shaft S' by an intermediate wheel, R' . The wheel Q' is on the shaft S' in the movable frame. Consequently Q' and P' are constantly placed at different distances, and the intermediate wheel, R' , becomes necessary to transmit the motion and occupy the space between them. This is kept there by the brace-straps $c' c' c'$.

The shaft S' passes up through the cam T' , and is secured to it. This cam works the needle-arm by the roller d' , running in the groove U' . The circumference of the cam is formed into a wheel. This gives motion to the shaft a by means of the wheel e , which is just half the size of T' , and consequently makes two revolutions to one of T' , and as the cam T' is double and two revolutions of the shuttle are made to one of T' , it follows that the shuttle and needle will always correspond.

The plate or frame F' slides in two grooves or ways, $W' W'$, (see Figs. 2, 3, and 4,) very true, and supports all the movable machinery. The roller d' is secured to one end of the bar Y' , and from the center of this bar is secured a stud, Z , with a vertical slot, which permits the pin e' to pass through the groove, also through another in the lower end of A^3 , and screw into a nut on the opposite side, the pin having a shoulder on the inside, which permits it to be secured firmly, and it can be raised or lowered to regulate the throw of the needle. From the upper end of A^3 is attached the bar B^2 , and to the other end of B^2 are attached two small rods, forming a stub-joint, C^2 and D^2 . The lower end of D^2 is attached to the perpendicular sliding rod E^2 , the lower end of which contains the needle and the upper end a small eye, (not drawn,) which draws out the thread from the spool as needed. The upper end of C^2 is secured to the arm-frame E' by the screw f , which permits it to swing on it. The needle g is secured in its place by a small screw.

As the bar B^2 is drawn back it will be evident that E^2 will rise, and when thrown forward it will go down through the cloth far enough to form the necessary loop and cause C^2 and D^2 to be nearly straight with each other as it passes through the cloth or leather, thus acting with great ease and power.

On the back side of the lever A^3 is a bar, H^2 , extending the whole length of the inside of the arm-frame. This is secured firmly to the back end of the stationary part of the machine A by its being connected through to the outside of the arm-frame E' at the slot I^3 , (see Fig. 5,) and thence passing down, and is secured to the bed-plate by the screws $j' j'$. The opposite end passes out through the front end of the arm-frame and slides back and forth in a square

mortise, and secured to the front end of H^2 is a short frame down the front J^2 . This contains or supports a perpendicular rod, K^2 , which has a spiral spring around it, the lower end being secured to it and the upper end pressing against the upper flange of J^2 . Consequently it will always have a tendency to press it down on the cloth, for which it is intended. Upon the lower end of the rod is a little pad, m' , made adjustable, and resting upon the feed-wheel with sufficient force to hold the cloth firmly between them. Extending down from the inside of this rod is a long pad or foot, K^3 , having a slot lengthwise through it as far back as the greatest lateral movement requires for the free passage of the needle. This pad does not touch the cloth, but is merely to keep the cloth from being drawn by the needle at any time. Thus by means of the stationary bar H^2 the pad m' is always kept directly over the feed-wheel X and permits the arm-frame E' to move back and forth at pleasure without interfering in the least with the motion of the cloth.

I will here mention that in using the lateral motion a stitch is taken at each end and feeds only at one end, or every other time. Consequently only one revolution of the cam I^2 becomes necessary to two revolutions of the shuttle. The two spiral springs M^2 and N^2 are intended to draw back the movable parts of the machine to their original position as soon as the cam I^2 will permit.

In addition to this description are several smaller parts for doing different kinds of work. Thus the pattern- M' (see Fig. 21) will give the proper lateral motion for a button or an eyelet hole. M^3 (see Fig. 22) will form a pear-shaped leaf opposite. M' will produce a leaf, as represented, straight or crooked. The stitch is made angular by turning the feeding apparatus to the angle required, and the flower can be crooked, as desired, by giving the center line the proper direction of whatever is being made. By changing the pattern almost any form of flower or leaf may be made.

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

1. The horizontal motion of the needle and shuttle-box combined at at any required distance from the cloth.

2. The combination of mechanism by which the pattern receives motion and operates to control the movements of the needle and shuttle, consisting of the worm-wheel L and screw J' , or their equivalents, of which the screw or other first mover is furnished with arms $b' b'$, operated upon by a lever, O^2 , on a shaft, S' , which receives a continuous rotary motion, substantially as herein described.

3. Though I do not claim a circular shuttle-box or raceway and revolving shuttle, I claim furnishing the revolving shuttle with a revolving bobbin or ball, F , containing the thread and spool N , by which the twist of the

thread remains unchanged, or their equivalents.

4. The manner of connecting the fly *f* with the feeding-hook *h* as it is operated upon by the thread as the shuttle passes through the loop to prevent missing stitches.

5. The feeding apparatus attached to the

revolving turn-table *I*, and otherwise arranged and combined, substantially as herein described.

PHINEAS L. SLAYTON.

Witnesses:

A. B. SLAYTON,
G. W. SPENCER.