

J. M. CLEMENTS.

Sewing Machine for Stitching Button Holes.

No. 57,451.

Patented Aug. 21, 1866.

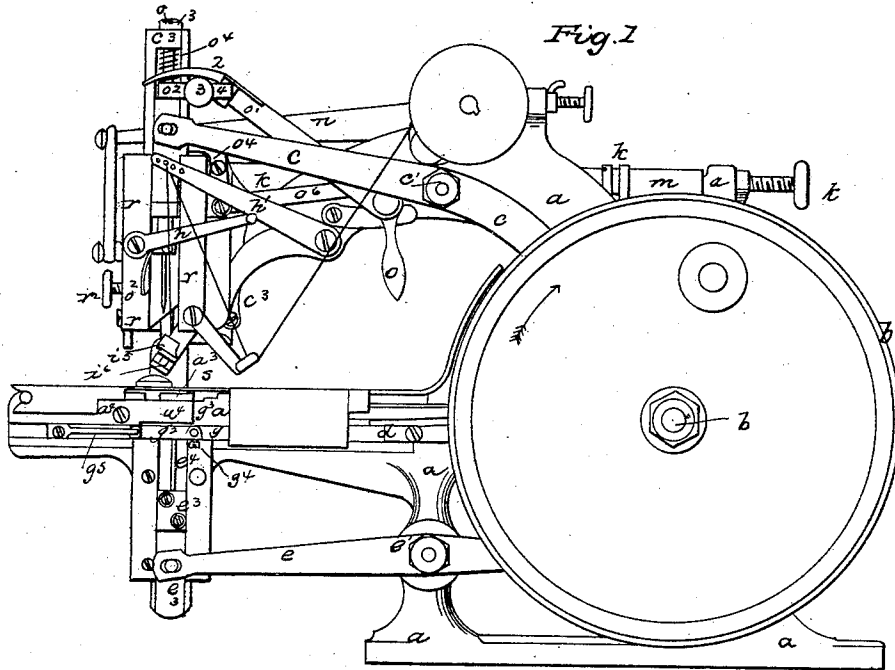


Fig. 1

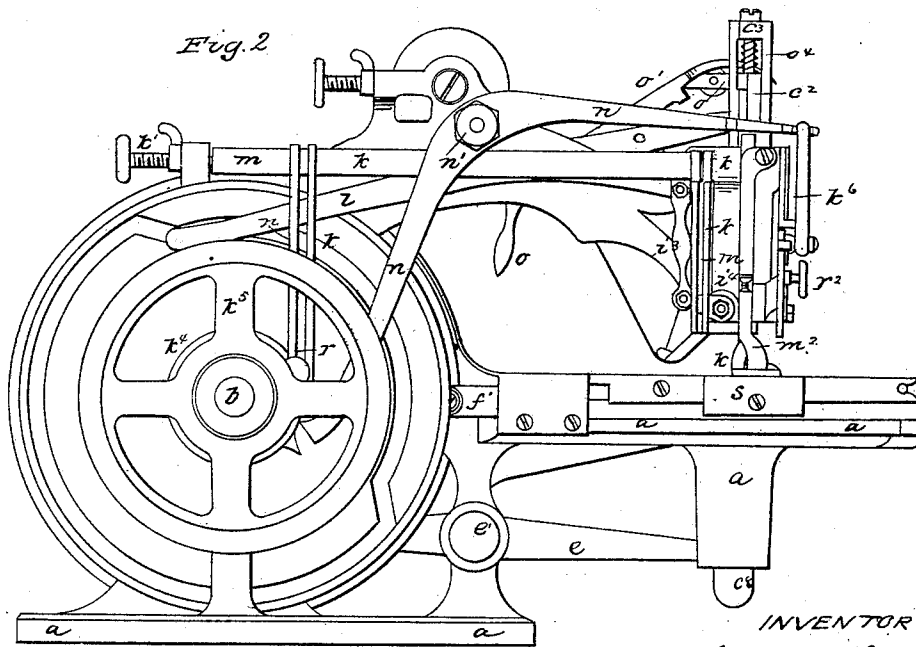


Fig. 2

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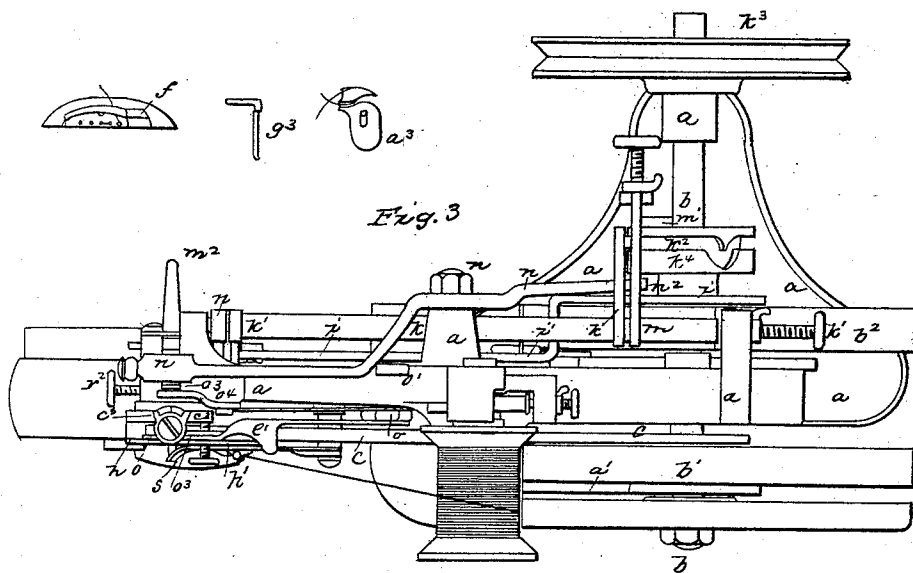


Fig. 3

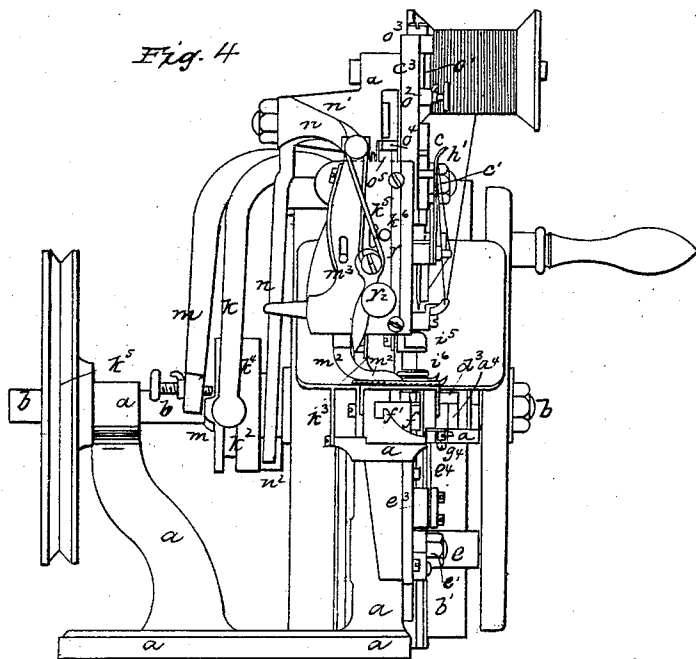


Fig. 4

WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES MOORE CLEMENTS, OF BIRMINGHAM, ENGLAND.

IMPROVEMENT IN SEWING-MACHINES FOR STITCHING BUTTON-HOLES.

Specification forming part of Letters Patent No. 57,451, dated August 21, 1866.

To all whom it may concern:

Be it known that I, JAMES MOORE CLEMENTS, of Birmingham, in the county of Warwick and Kingdom of England, tailor, a subject of Her Britannic Majesty, have invented an Improvement in Sewing-Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, which are made a part of this specification, and in which—

Figure 1 is a front elevation of the machine. Fig. 2 is a back elevation. Fig. 3 is a plan. Fig. 4 is an end elevation.

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

This invention has reference mainly to machines of the class employed for working or stitching button and eyelet holes, as well as for embroidery and other like work, though parts of these improvements are capable also of being applied to ordinary sewing-machines, its peculiar adaptability for working button-holes, eyelet-holes, and for embroidery being obtained by an arrangement of mechanical appliances constituted to turn the fabric automatically as the needle is required to work the eyelet or the circular head of a button-hole, instead of requiring the fabric to be turned by hand, and also to make the stitches with a purl upon the edges of each side of the material by a lock-stitch.

I will now proceed to describe the parts of the machine and its several motions.

a is the casting or frame, carrying a shaft, *b*, upon which are keyed the cam-wheels *b'* *b''*, and a smaller one, *k'*, and a pulley, *k''*, by which the shaft *b* receives its motion. These cam-wheels actuate all the moving parts of the machine.

c is the needle-lever, working on a fulcrum, *e'*, and actuated by a cam-groove on the inner side of the wheel *b'*. This lever gives motion to the vertical slide *e''*, which carries the needle.

d is a slide, which receives motion from a cam-groove in the inner face of the wheel *b'*, and actuates a circular hook, *d''*, working upon a center, *d'*.

e is a lever, called the "barbed-hook lever," working on its fulcrum *e'*, and receiving its motion from a cam-groove on the outer face of

wheel *b'*, and actuating the vertical slide *e''* and barbed hook *e'''*.

f is the shuttle, driven by the shuttle-driver *f'*, sliding in a groove parallel with and at the back of the slide *d*, and receiving its motion from a cam-groove in the wheel *b''*.

g is the slide for actuating the detaching-hook *g''*. This slide works in a groove just below the slide *d*, and receives its motion from a cam-groove on the wheel *b'*. This slide carries the lever *g''*, centered on a pin, *g'''*, which lever *g''* has a curved detaching-hook, (shown as detached from the machine and much larger than its usual size at *g''''*), which is held in position by a set-screw, *g'''''*, and a spring, *g''''''*. These parts are all carried on the slide *g*.

h and *h'* are the pivoted arms by which the slack silk is taken up. *i* is a lever working upon a pin, *i'*, and receiving its motion from the cam-groove *i''* on the wheel *b''*, and actuating, through the connecting-link *i'''*, the bell-crank *i''''* and the double hook *i''''''*. The arm or shank of the hook *i''''''* is attached directly to the bell-crank *i''''*, the rocking motion of which imparts a vibratory movement to said hook *i''''''*. The arm of the latter is slotted longitudinally and embraces a pin on the arm of the hook *i''''''*, the last-mentioned arm being pivoted to the back of the needle-frame. Being thus connected by the slot and pin and hung on different centers, the hooks *i''''''* *i''''''''* recede from each other as they are moved toward the driving-wheels, and approach each other as they are moved in the opposite direction. By the first movement the hooks *i''''''* *i''''''''* are adapted to draw a sufficient amount of silk through the eye of the needle to supply the barbed hook *e'''*, and they place the silk in a position nearly at right angles to the needle and across the hole in which the needle works, to enable it to be caught and drawn down by the barbed hook; and by the second movement the hooks are carried to the opposite side of the needle-hole in the bed-plate, where they stand ready to again draw the thread from the needle to supply the barbed hook. The action of the hooks *i''''''* *i''''''''* occurs just after the ascent of the needle.

k and *m* are two shafts having pendent arms at both ends, the one marked *m* working within that marked *k*, and both hung on common centers *k'*. These two shafts are called "rocking

levers," the rocking lever k receiving its motion from the cam-groove k^2 on the cam k^4 , and actuating the pendulous hooked bar k^3 hanging from the center k^5 in the slot k^{5*} . The rocking lever m takes its motion from the cam m' on the wheel k^4 and actuates the feeding-foot m^2 on its center m^3 .

n is a lifting-lever working on a pin, n' , and receiving its motion from a cam, n^2 , on the wheel k^4 , and bearing on the top of the feeding-foot m^2 , to hold the foot in position on the cloth.

o is a hand-lever hanging on a center, as shown. This lever is attached to a second lever, o' , which actuates the circularly-feeding device o^2 , o^3 being the centers upon which o^2 works. The loose extremity of the lever o' projects under a lug at the top of the needle-carrier o^3 , and is depressed by the descent of the needle-carrier. At the moment the feeding device o^2 comes in contact with the cloth the shoulder 2 on the lever o' forces outward the pin 3, and thereby vibrates the arm 4, which moves the feeding device o^2 in the arc of a circle. The feeding device o^2 descends simultaneously with the needle, and the latter constitutes a center, upon which the cloth is turned as the work of sewing the button-hole progresses.

o^{14} is a spring, affording the requisite yielding character to the pressure which is applied to the material by the circular feeding device o^2 , and producing the return or ineffective movement of the latter.

o^4 is a bell-crank lever, connected by a link, o^6 , to the lever o and actuating the slide o^5 , which works between the shank of the feeding-foot m^2 and the end of the rocking shaft m , as seen in Fig. 4, to regulate the forward feed.

r is a plate, in which the needle-slide c^3 and its cheeks move. This plate is pivoted to the side of the projecting arm a , and is adjustable by means of a set-screw, r^2 . The needle is in this manner moved away from or toward the barbed hook e^4 , for the purpose of regulating the width of the material covered by the stitching.

s is the bed-plate, pierced with an oblong hole, one end of which is turned up into a flange, to support the foot of the pendulous bar k^3 .

I will now proceed to describe the operation of the machine, and for this purpose I shall take, as an example, the working of a button-hole, which, by this machine, is worked with a purl-edge on both sides of the material, the same description applying to embroidery or the working of eyelets.

The parts of the machine are represented in the position shown at the highest elevation of the needle. The cam-wheels revolving in the direction of the arrow, the needle enters the material, leaving a small loop on the under side, within the shuttle-race, through which loop the shuttle passes, and which loop is then taken hold of by the circular hook d^3 and carried into a horizontal position. The

barbed hook e^4 enters the loop from below, and, passing through it and through the button-hole, descends and takes hold of the silk held by the double hook $i^5 i^6$, and the barbed hook is closed by the pendulous bar k^3 , with which the barb of the hook comes in contact during its descent. When the barbed hook is in its highest position, the silk, having already been made to assume a horizontal, or nearly horizontal, position by the hooks $i^5 i^6$, is acted upon by the pendulous notched bar k^3 , which throws the silk at such an angle to the barbed hook that the barbed hook must catch the silk in its descent. The barbed hook then descends through the preceding loop and forms the silk into a new loop, through which the shuttle passes. The detaching-hook g^3 passes over and around the top of the barbed hook and releases the silk. The silk is drawn tight by the thread-lifters $h h'$ bringing the shuttle-silk to the surface of the button-hole. The hooks $i^5 i^6$ carry the silk into a horizontal position to be taken hold of by the barbed hook in the same way as before. The barbed hook, the shuttle, the detaching-hook, and the thread-lifters repeat their operations, the circular hook is withdrawn from its loop, the double hook $i^5 i^6$ draws up tightly the silk that was held round the circular hook, and the stitch is now complete.

To bring the circular-feed motion into action it is merely necessary to press the lever o to the left and to withdraw it when the head of the button-hole is complete, and both these operations can be performed without stopping the machine, the object being to give a revolving motion to the material while held by the needle and an increased traverse to the feed round the head of the button-hole. There are four traverses of the shuttle to one up-and-down stroke of the needle.

I would remark that the several mechanical parts herein described and illustrated may be used separately or collectively with sewing-machines of the ordinary kind, requiring merely in their adaptations such slight modifications as would occur to the makers or users of such machines.

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

1. The vibrating hooks $i^5 i^6$, arranged and operating substantially as described, and employed for the purpose of drawing the needle-silk into a horizontal position in order to supply the barbed hook, as and for the object set forth.

2. The combination of the eye-pointed needle, the circular-grooved hook d^3 , and the barbed hook e^4 , constructed and operating as and for the purpose set forth.

3. In combination with the above, the detaching-hook g^3 , arranged and operating substantially as described.

4. The pendulous bar k^3 , employed, in conjunction with the hooks $i^5 i^6$, to feed the needle-silk to the barbed hook, as set forth.

5. The arrangement of the circularly-feeding device o^2 , spring o^{14} , arm 4, pin 3, shouldered lever o' , and hand-lever o , as and for the purpose specified.

6. The plate r , which carries the needle-slide, pivoted to the frame and adjustable by means of a set-screw, r^2 , in combination with the barbed hook, as and for the purpose described.

7. The combination and arrangement of the

several mechanical parts herein described and represented, and mentioned in the preceding claims, or the mere equivalents thereof, forming improved machinery to be employed for sewing, stitching, or embroidering, substantially as herein set forth and specified.

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Witnesses:

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I. FRANCIS BRAME.