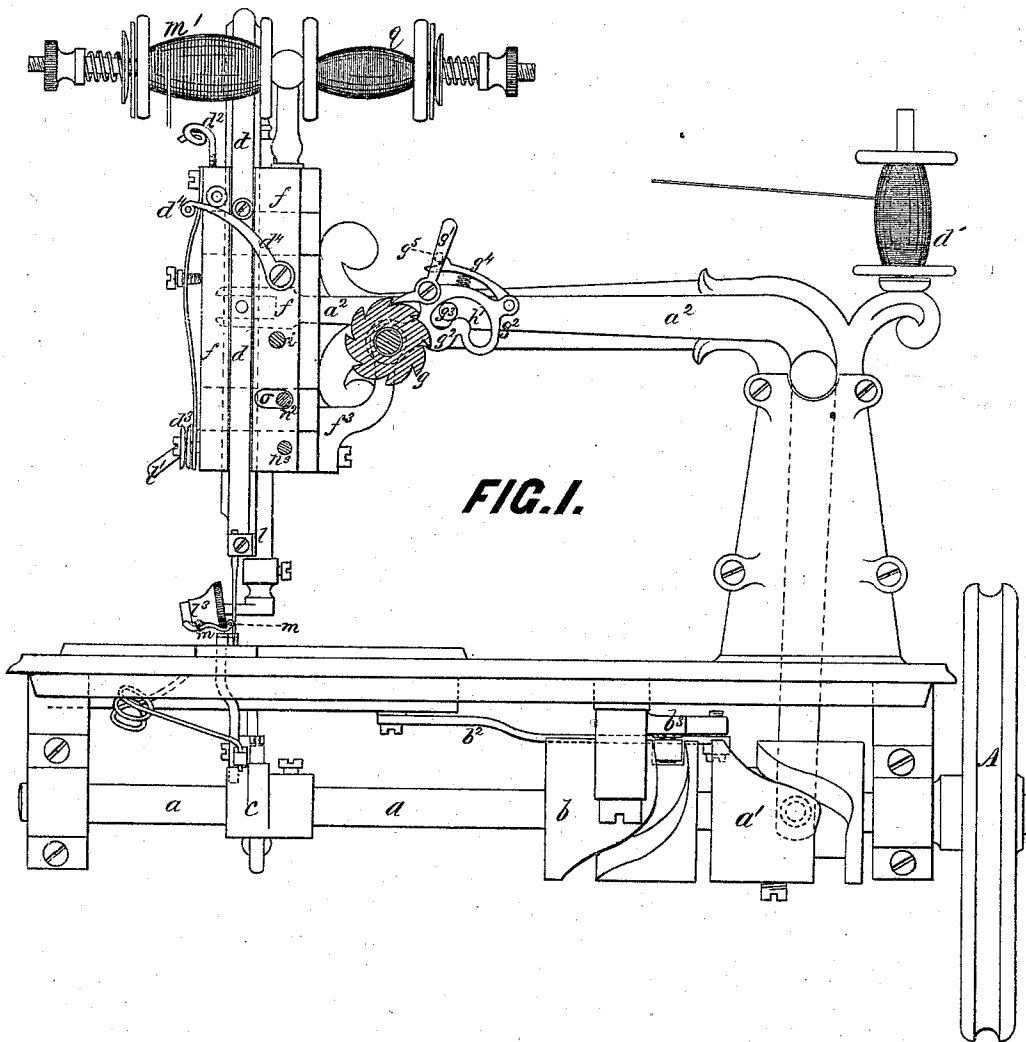


G. KALLMEYER.
Button-Hole Sewing-Machines.

No. 137,689.

Patented April 8, 1873.



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FIG. 2.

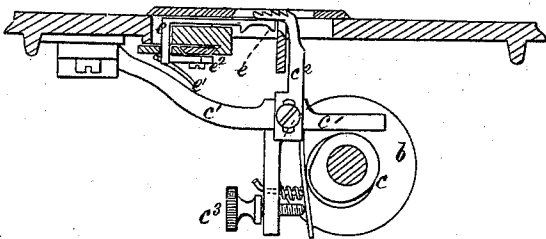


FIG. 3.

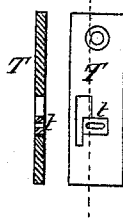


FIG. 4.

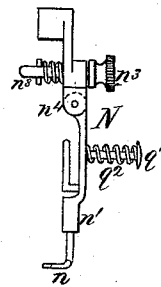


FIG. 5.

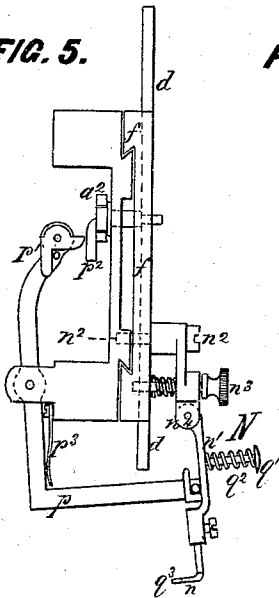


FIG. 6.

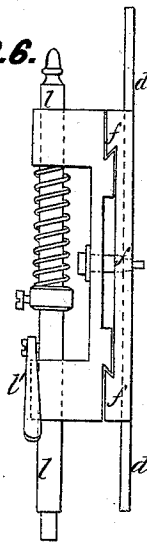
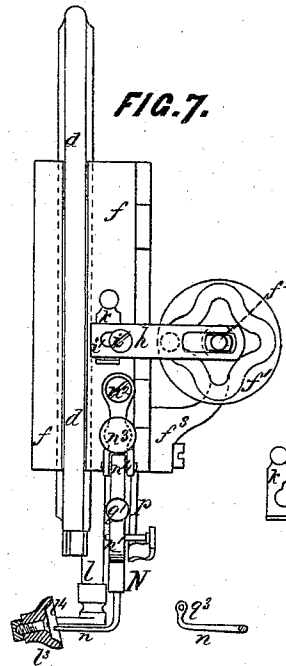


FIG. 7.



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FIG. 8.

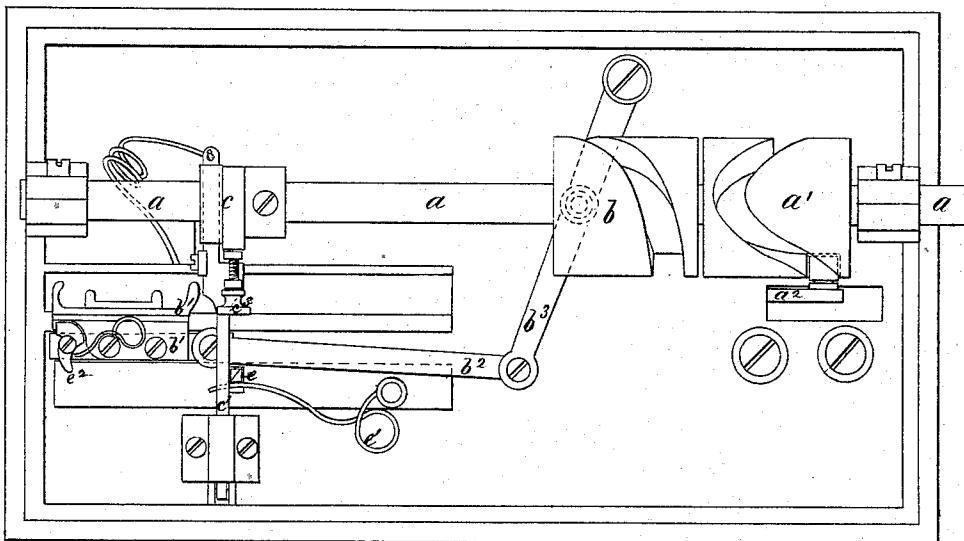


FIG. 9.

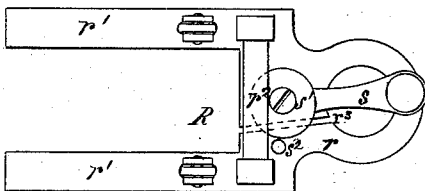


FIG. 10.

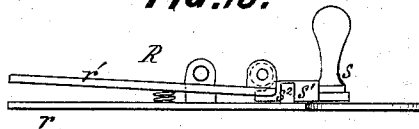


FIG. 11.

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UNITED STATES PATENT OFFICE.

GUSTAV KALLMEYER, OF BREMEN, GERMANY.

IMPROVEMENT IN BUTTON-HOLE SEWING-MACHINES.

Specification forming part of Letters Patent No. **137,689**, dated April 8, 1873; application filed February 25, 1873.

To all whom it may concern:

Be it known that I, GUSTAV KALLMEYER, of the free city of Bremen, in Germany, have invented a certain Improvement in Machines for Sewing Button-Holes, of which the following is a specification:

My invention embraces certain improvements in the organization and construction of lock-stitch sewing-machines, by means of which they are made capable, at the pleasure of the operator, of working and finishing button-holes, with or without gimp, with two threads, forming the ordinary lock-stitch, or with three threads, forming a new and peculiar stitch. These improvements are as follows, viz.: First, the device for imparting reciprocating, horizontal, or lateral motions to the plate in which the needle-bar slides; secondly, the devices for introducing a third thread, so as to form the peculiar stitch described; and thirdly, the forked gripping-jaws, constructed as described, for holding the fabric on both sides of the slit or button-hole, and distending it so as to open the slit sufficiently to allow the needle to pass through without touching the cloth on either side.

In the accompanying drawings the same parts appearing in different figures are indicated by like letters of reference.

Figure 1 is an elevation, partly sectional, exhibiting, partly in dotted lines, the principal working parts of the machine. Fig. 2 is a vertical cross-section, exhibiting details of the feed mechanism, &c.; Fig. 3, a longitudinal section and top view of the stitching-plate; Fig. 4, a side view of the filling-thread carrier or guide; Fig. 5, the same attached to the shifting (needle-bar) plate, showing lever for imparting reciprocating motion to the guide at a right angle to the motion of the shifting-plate; Fig. 6, a cross-section of the head of the machine, showing presser-bar and needle-bar; Fig. 7, a front view of the shifting-plate, showing cam, &c., for imparting lateral motion thereto, and also the rolling cloth-presser and gimp-guide; Fig. 8, a view of the under side of the machine, showing main shaft, shuttle-ways, and tension device; Fig. 9, a top view of forked gripping-jaws; Fig. 10, a side view of the same; Fig. 11, a view of the rela-

tive positions of the needle-thread and filling-thread.

The pulley A drives the main shaft *a*, carrying the needle-cam *a*¹, the shuttle-cam *b*, and the feed-cams *c*. The needle-cam gives motion to the bent needle-lever *a*², and the latter terminates in a fork which engages a pin on the needle-bar *d*, and imparts reciprocating vertical motion thereto. The shuttle-cam imparts reciprocating motion to the shuttle-carrier *b*¹ through the link *b*² and lever *b*³. The feed-cams operate on the feed-lever *c*¹, which carries the feeder *c*² by elevating it and thrusting it forward, and the extent of the thrust, and thereby the length of the stitches, is governed by means of the thumb-screw *c*³, Fig. 2. The needle-thread runs from the spool *d*¹ through the eye or guide *d*², down between the tension-plates *d*³; thence upward and through the eye of the thread-lever *d*⁴; thence downward and through the eye of the needle. The shuttle-thread, in addition to its usual tension derived from the shuttle, is held rigidly against the side of the shuttle-ways by the thread-presser *e*, operated by the spring *e*¹, Figs. 2 and 8. At the instant when it is necessary to unwind from the shuttle the thread required for a new stitch, the thread-presser *e* is pushed back by the tripping-toe *e*² on the shuttle-carrier *b*¹, and the thread is thus released. The thread-presser *e* is for the especial purpose of holding down the shuttle-thread when, in working button-holes, the threads are interlocked over the edge of the slit; without it the shuttle-thread would be drawn upward with more or less irregularity, owing to the continued tension of the upper or needle thread.

For the purpose of adjusting the machine to work button-holes, the shifting-plate *f*, in which the needle-bar *d* slides, is submitted to the action of the cam *f*¹, which revolves upon the pin *f*² affixed to the arm *f*³, the latter being bolted to the head of the machine. To the cam *f*¹ is affixed a ratchet-wheel, *g*, which is driven by a pawl, *g*¹, attached to the rocking lever *g*², the latter deriving its motion through the stud *g*³ affixed to the needle-lever. When it is desired that the needle-plate shall remain stationary, so that the needle will have only its ordinary relation to the shuttle, the

pawl g^1 is disengaged from the ratchet-wheel g , and thus ceases to rotate the cam f^1 . The pawl g^1 has an elbow projecting upward, and provided with the small stud g^2 , which engages with the spring-catch g^4 . This elbow serves as a lever for conveniently moving the pawl against or away from the ratchet-wheel, and the spring-catch g^4 maintains it in either position, as required. The ratchet-wheel g has eight teeth, and the cam-groove four equal convolutions, Fig. 7. Fig. 1 shows the ratchet-wheel in section, the cam being removed. With the movement of one tooth by the pawl g^1 , the cam-pin, attached to the link h , which moves the needle-bar plate, Fig. 7, is forced away from the center of the cam, and the movement of the pawl upon the next tooth brings the link back again. While the needle-bar d is making its downward movement the cam g is stationary, and the cam does not revolve until the needle in its upward movement has left the fabric. The movement of the cam is effected by the stud g^3 , which enters the irregular slot h^1 in the rocking-lever g^2 . Lateral motion is transmitted from the cam to the shifting-plate f through the sliding link h , Fig. 7. The link h has a slotted hole, i^1 , which engages the stud i affixed to the shifting-plate, and a chock, k , is arranged so as to slide across the slotted hole i^2 , and when fully depressed to make a close connection between the link h and the stud i . This chock k is slotted on the side toward the stud i , and hence when elevated so as to bring this slot opposite the stud i only one-half of the motion of the link h is imparted to the shifting-plate, and the machine is then adapted to stitch the sides of button-holes.

In finishing button-holes the motion of the shifting-plate requires to be doubled in extent, and accordingly the chock k is then fully depressed.

The presser-bar l is controlled by the lever l^1 and carries a rolling cloth-presser, l^2 , and also a guide, m , for the gimp or cord fed thereto from the spool m^1 . The face of the rolling cloth-presser is recessed, (see l^4 in the sectional view of it exhibited in Fig. 7,) for the purpose of making room for the end of the filling-thread guide n , which reaches into this recess in making one of its motions. The guide m lays the gimp or cord on the fabric, so that it is over-stitched by the needle-thread. The gimp may be dispensed with, if desired; and my machine finishes a light button-hole perfectly, whether the gimp be present or not.

My arrangement for introducing a third thread, around which the needle-thread is looped in working button-holes, consists of the adjustable guide n attached to the jointed arm N , which is made to rock upon the stud n^2 in a vertical plane parallel to the motion of the shifting-plate f by the stud n^3 , which is affixed to the shifting-plate f . By reference to Fig. 1 it will be seen that the shifting-plate is slotted transversely at o to admit the stud n^2 , the

latter being shown in cross-section. The guide n receives motion at a right angle from the motion just described by the rocking of the lower arm n^1 upon the joint n^4 . This motion is effected by the action of the rectangular rocking link p , the upper end of which has a tripping-toe, p^1 , which is caught by a projecting lug, p^2 , on the side of the needle-lever a^2 in its upward movement, so as to push out the upper end of the link p . The link is brought back to its former position by the spring p^3 . In the downward movement of the needle-lever a^2 the lug p^2 trips or rocks the tripping-toe p^1 , and thus no effect is produced upon the link p . Fig. 4 shows the jointed arm N , &c., and Fig. 5 shows its connections and its position when thrown forward by the rocking link p . The filling-thread is supplied from the spool q , from which it passes through the slotted pin q^1 , wherein it is subjected to tension by the pressure of the spiral spring q^2 , and is fed or guided to the fabric through the eye q^3 , in which the guide n terminates. By the compound motions of the arm N the guide n carries the filling-thread back and forth alternately, placing it so that it is over-stitched every time the needle passes through the fabric, and holding it away from the button-hole in the opposite direction during the interlocking of the needle and shuttle threads over the edge of the button-hole. By thus alternately reversing the position of the filling-thread the needle-thread is looped or wound around it at every stitch, as shown in Fig. 11, and thus an ornamental bar is formed around the edge of the button-hole, and the button-hole stitch is made more substantial. The forked gripping-jaws R , Figs. 9 and 10, consist of the forked plate r , slotted at r^3 and provided with the pivoted jaws r^1 , the latter connected by the bar r^2 . A lever, s , has an eccentric hub, s^1 , chamfered on one side, so as to act as a wedge when forced under the bar r^2 . Having placed the fabric under the jaws they are closed down on the cloth-plate by a partial turn of the lever s , and the button-hole is cut. A further turn of the lever s brings the eccentric periphery of the hub against the stud s^2 attached to the plate and forces the jaws apart laterally, and opens the slit in the fabric. The stitching-plate T , Fig. 3, has a slotted needle-hole, which is formed in a piece of lead or other soft metal, t , inserted in the plate.

I claim as my invention—

1. The combination of a needle moving alternately in parallel vertical planes, substantially as described, and a shuttle moving substantially in a horizontal plane with the thread-guide having the compound motions described, for the purpose of introducing a third thread into the stitch formed by the interlocking of the needle and shuttle threads, substantially in the manner described.

2. The combination of the slotted link h and the stud i , with the adjustable chock or wedge k , for regulating the lateral movement of the

shifting-plate and the width of the button-hole stitch, substantially as described.

3. The combination of the stud g^3 on the needle-lever a^2 , with the slotted rocking lever g^2 , spring-catch g^4 , and the adjustable pawl g^1 , substantially as described.

4. The combination of the reciprocating plate f with the jointed thread-carrying arm N , by means of the stud n^3 , whereby the jointed arm n^1 is swung in a plane parallel to the plane of motion of the shifting-plate f .

5. The combination of the jointed thread-carrying arm N , by means of the rectangular lever p provided with the tripping-toe p^1 with the needle-lever a^2 , whereby the jointed arm N , carrying the thread-guide n , is swung in a plane at a right angle from the plane of motion of the shifting-plate.

6. The pivoted jointed thread-carrying arm N , operated in one direction by the pin n^3 , and in the other by the lever p , the needle-bar, the toe p^1 , and spring p^3 , substantially as described.

7. The thread-presser e , constructed as described, and adapted to hold the shuttle-thread against the race-face, for the purpose set forth.

8. The jaws R , provided with the slot r^2 and stud s^2 , in combination with the lever s with its eccentric hub s^1 , whereby the jaws may be laterally distended while holding the fabric, substantially as and for the purpose set forth.

Bremen, January 11, 1873.

GUST. KALLMEYER.

Witnesses:

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CHS. E. BORSBORFF.