

J. A. & H. A. HOUSE.

Sewing Machine.

No. 39,445.

Patented Aug. 4, 1863.

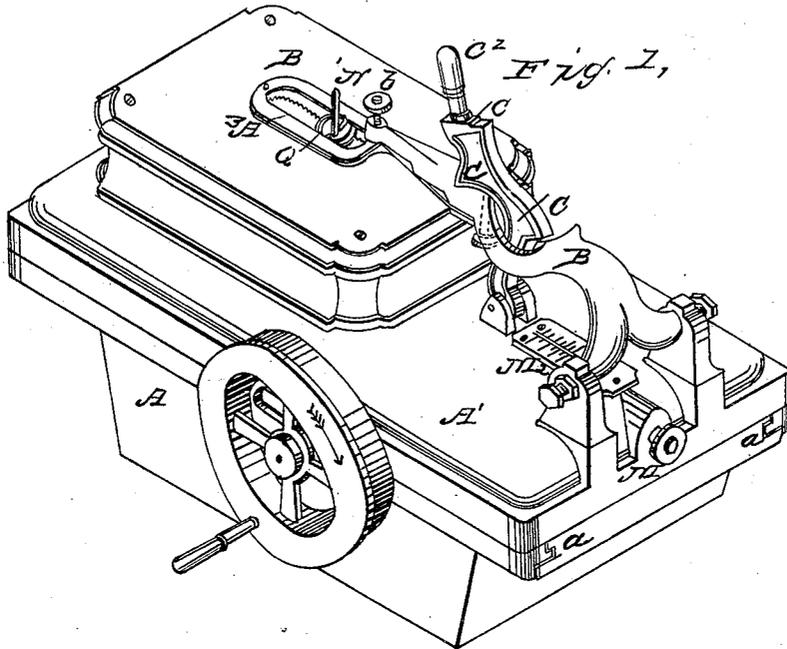
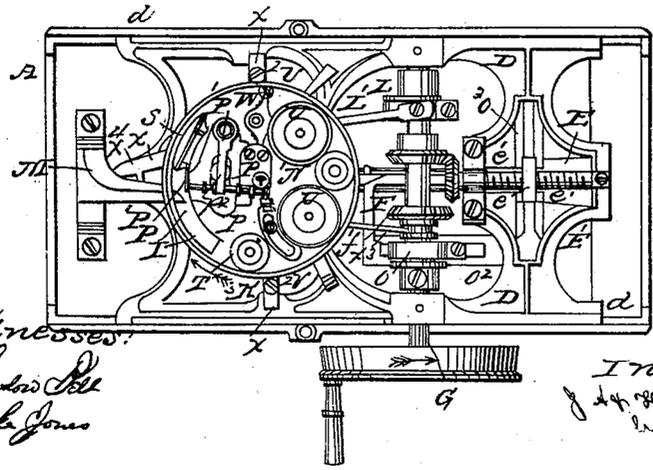


Fig. 2,



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Fig. 3,

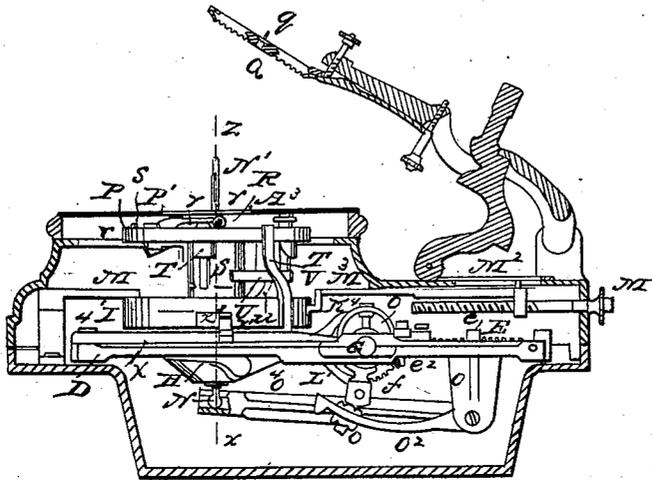


Fig. 6,

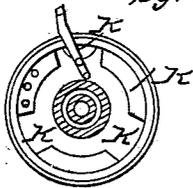


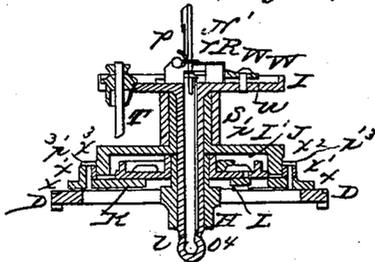
Fig. 5,



Fig. 7,



Fig. 4,



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UNITED STATES PATENT OFFICE.

JAMES A. HOUSE AND HENRY A. HOUSE, OF BROOKLYN, ASSIGNORS TO THEMSELVES AND AUGUSTUS G. SEAMAN, OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 39,445, dated August 4, 1863.

To all whom it may concern:

Be it known that we, JAMES A. HOUSE and HENRY A. HOUSE, both of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a view in perspective of a machine for working button-holes, embracing our improvements, with its parts in position for operation; and Fig. 2 represents a plan or top view of the same with its upper casing removed. Fig. 3 represents a view in elevation of one side of the same, the casing and a portion of the mechanism being shown in section, and the presser-lever raised in order to permit the removal or adjustment of the work. Fig. 4 represents a vertical transverse section through the same at the line *xx* of Fig. 3. Fig. 5 represents a detached view of the cam and collar by which motion is communicated from the needle-mandrel to the looper or thread-carrier. Fig. 6 represents a view partly in plan and partly in section, showing the details of the frog and gripping-lever by which the stitching mechanism is rotated at proper intervals; and Fig. 7 represents a view in perspective of the gripping-lever detached and inverted.

The improvements claimed under this patent consist, first, in forming a slot or groove in the needle bar or shank in order that the looper or thread-carrier may play into it, whereby compactness is secured and accuracy of work insured; second, in mounting the shaft of the looper or thread-carrier in adjustable bearings in order that its distance from the reciprocating needle may be varied to accommodate loopers of various sizes; third, in combining an eye-pointed needle which pierces the fabric with a looper working within a slot in the needle-bar; fourth, in mounting an adjustable thread-guide upon the rotary disk in such manner that its point (in which the eye for the passage of the thread is situated) shall project into a slot in the needle-mandrel or occupy a position in close proximity thereto, as hereinafter described, whereby we are enabled to take up

more or less of the slack of the needle-thread and thus to alter the position of the pearl on the button-hole as occasion requires; fifth, in combining a series of plate-springs with the rotary disk in such manner as to prevent it from turning too freely and yet permit them to be readily turned out of the way when it is desired to remove the disk; sixth, in combining, substantially in the manner hereinafter described, a forked shifting-lever carrying friction-rollers on its prongs with the rotary disk which carries the stitching mechanism in such manner that the rotation of the disk shall automatically start, stop, or reverse the movements of the mechanism; seventh, in mounting the spool-cases upon a bar or bracket on the lower disk in such manner as to leave room for the passage of the guides which regulate the length of seam sewed.

In the accompanying drawings, which exemplify one way of carrying out the objects of our invention, the stitching mechanism and gearing of the machine are represented as mounted in a strong frame, *D*, traversing on guides or ways in the casing. The stitching mechanism proper is mounted on two disks or frames *I I'*, connected so as to move together on one frame, the greater portion being on the upper disk.

The needle-mandrel *N* is driven by an eccentric, *O*, on the driving-shaft *G*, which actuates an adjustable arm or connecting-link, *O'*. This link is attached to a slotted arm, *O²*, by means of a nut and set-screw, *o*, in order to vary the length of stroke of the needle-mandrel. This slotted arm is connected to a rock-shaft, *O³*, pivoted to a bracket, *O⁵*, underneath the frame *D*. The needle-mandrel is driven from the pitman *O⁴* on this rock-shaft, as shown in Figs. 2 and 3.

The needle bar or shank *N'*, which is mounted on the mandrel, is made with a projection on its upper end, in which the needle is inserted, and a groove or slot is made in it for the thread-carrier *P* to work in. Both the needle and thread carriers play through a slot in the stitching-plate *R*, which is made sufficiently firm not to yield or spring under the pressure of stitching.

Two small standards, *r*, are erected upon the stitching-plate. They serve both as guides to

steady the needle-bar, which plays between them, and to maintain in its proper relation the button Q, through a hole in which the needle-bar also plays.

The looper or thread-carrier p is fastened by a screw upon one end of the rock-shaft P, which is mounted in suitable bearings on the upper disk. By loosening the screw the looper can be removed and a new one substituted, or it can be adjusted relatively to the rock-shaft, needle, and stitching-plate, so as to vary the distance through which it penetrates the slot in the latter, which removal or adjustment could not be effected were it rigidly secured on the shaft. The shaft P is rocked by means of a bent arm or crank, p' , on it, which plays in a heart-shaped cam, s , mounted on an arm projecting from an oscillating collar, S, which encircles the spindles of the disks. As shown in Fig. 3, the bearings of the rock-shaft P form part of a sliding plate, P^2 , which rests upon the upper disk, and can be adjusted relatively to the needle-mandrel by means of a slot and set-screw p^2 , as shown in Fig. 2. This adjustment is necessary to accommodate a change in the size of the looper employed. The stitching-plate R may likewise be rendered adjustable or removable, if desired. A view of the collar, arm, and cam detached is given in Fig. 5. The collar S is connected with the needle-mandrel by means of a pin or screw, which is inserted into the mandrel and plays freely up and down in a curved slot, S' , in the collar, being provided with friction rings or rollers that it may run easily. By this means the vertical movements of the needle-mandrel communicate the requisite movements to the looper, the movements of which are thus rendered isochronous with those of the needle.

The tension-posts T, instead of being secured to the frame, as heretofore, are made to fit tightly, but are so arranged that they can readily be removed when required, which arrangement affords great facilities for adjusting them.

The spool-cases U are mounted on a bar, u , one end of which only is fastened to the disk. The bar is then bent up and again bent, so that the portion on which the spool-cases are mounted is above but parallel to the disk. The object of this arrangement is to permit the guides M M³ to pass over the disk, which they could not do were the spool-cases mounted directly upon the lower disk. The retaining-spring V has an eye in it, through which the thread of the bent finger passes. It is adjusted by means of a curved slot and set-screw, so as to vary its position relative to the finger, and thus to vary the position of the pearl on the button. An adjustable thread-guide, W, is also arranged upon this disk. This tension consists of a lever, the outer end of which is pivoted to the disk, so as to play vertically in its bearings. It is prevented from rising above a certain point by a set-screw, w , and is held

up against the screw by a spiral spring, w' . The inner end of this lever may be curved inward, so as to enter a slot, n , in the needle-arm, or at least to lie in close proximity to the needle-arm, and has an eye near its point, through which the thread which supplies the needle passes. By raising or lowering the eye of this guide the amount of slack thread between the eye and the needle is varied, which we have found to be very useful in varying the position of the pearl on the button-hole. In our former patent, heretofore referred to, the tension and position of the needle-thread was regulated by a post or standard which projected above the stitching-plate and obstructed the view and movements of the operator, and was otherwise inconvenient. By this device we are enabled to locate the tension apparatus of both needles beneath the table instead of having at least one of them above it, as in all previous machines of which we have any knowledge, which arrangement is a great convenience to the operator, as it leaves the table entirely unobstructed when the presser-foot is raised. The disk is prevented from turning too freely by friction-springs v^2 , the lower ends of which are inserted into the frame D in such manner as to turn freely in their pivots, that they may be removed out of the way when it is desired to separate the disk from the frame.

The shifting-lever X is arranged and operates in a manner similar to the one described in our former patent. It turns upon a pivot, x^1 , at one end of the sliding frame D, and is made of a U shape in order to encompass the cylinder H, upon which the disk is mounted. Upon each of its arms x is mounted a small friction-roller, x' , which bears against the edge of the lower disk, I'. There is a small cam or projection, x^2 , on one side of this disk, and a corresponding concavity or depression, x^2 , on the other, so that when, during the rotation of the disk, the cam x^2 strikes one of the friction-rollers the other enters the concavity and the shifting-lever is moved, and as a prolongation, x^3 , of one of its arms fits into the sliding collar F, the bevel half-gears $f f'$ are alternately thrown into and out of gear with the traversing screw E.

The operation of the machine is as follows: In Figs. 1 and 2 the parts are represented in the position they occupy when commencing to work a button-hole. The arrows show the direction of the movement of the several parts. As the driving-shaft G is rotated the bevel half-gears $f f'$ impart an intermittent rotating movement to the screw E, which propels the sliding frame D, upon which the gearing and mechanism are mounted, step by step, the distance between the stitches being determined by the length of this step. The needle-mandrel is vibrated by means of the eccentric O and its connections, as heretofore explained, and a corresponding vibratory movement is imparted to the thread-carrier p through the collar S and heart-shaped cam s .

The manner of forming the stitch has been explained in our former patents, and does not require repetition here.

When the stitching mechanism has traversed the distance at which the gage M' has been set the tail k^4 of the gripping-lever slips past the end of the guide M . During this time the flanged ring J has been oscillated round its axis by its cam L and pusher L' without acting upon the disk; but when the gripping-lever is released from the guide it is acted upon by a small spring (not shown in the drawings) in such manner that when moving in one direction it plays loosely, but when moving in the other its key k' locks against the edge of the flanged ring J and turns the disk a distance equal to the length of stroke of the cam L , which also determines the distance between the stitches. When the disk has performed a slow rotation the tail k^4 of the gripping-lever strikes against the guide M , which throws the gripping-lever out of gear or contact with the flanged ring J . At the same moment one of the friction-rollers x' on the shifting-lever strikes the cam x^3 on the disk, while the other drops into its corresponding cavity and moves the shifting-lever sidewise. As one arm, x^5 , of the lever is connected with the sliding collar F , the other bevel half-gear, f' , is engaged with the pinion e^2 on the traversing screw E , the motion of which is reversed and the stitching mechanism is caused to traverse back to the point from which it started.

It is obvious that the arrangements of mechanism above described might be varied in many ways without departing from the spirit of our invention.

We deem it unnecessary here to describe in detail the construction of the entire machine, as such details are shown in three several applications for Letters Patent filed simultaneously with this, and respectively marked Divisions A, B, and C.

The invention claimed under this patent, though applicable to other machines, is mainly designed as an improvement on a sewing-machine for which Letters Patent of the United States were granted November 11, 1862, to

A. G. Seaman and ourselves, as our assignees, to which patent reference is made for a complete understanding of our invention as affected by the improvements herein described.

What we claim under this patent as our invention is—

1. The combination, in a sewing-machine, of a slotted or grooved needle shank or bar with a looper or thread-carrier which plays within the slot, substantially in the manner and for the purpose described.

2. Mounting the looper rock-shaft of a sewing machine in bearings adjustable relative to the needle with which the looper co-operates in forming a stitch, substantially in the manner described, whereby we are enabled to use loopers of different sizes, and thus to vary the stitch, as set forth.

3. The combination, in a sewing-machine, of an eye-pointed needle which works up from beneath the table and penetrates the fabric, with a looper or thread-carrier also working up from under the table, penetrating the fabric, and playing in a slot in the needle-arm, substantially in the manner described.

4. The combination of the adjustable thread-guide with the needle-mandrel, substantially in the manner and for the purpose set forth.

5. The combination of the friction-springs v^2 and rotary disk, as and for the purposes described.

6. The combination of the forked shifting-lever and friction-rollers with the rotary disk, in the manner described, for the purpose set forth.

7. Mounting the spool-cases on a bar or bracket attached to the disk in such manner as to leave a space between the bottom of the spool-cases and the disk for the guides, as set forth.

In testimony whereof we have hereunto subscribed our names.

JAMES A. HOUSE.
HENRY A. HOUSE.

Witnesses:

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