2 Sheets—Sheet 1.

G. REHFUSS.

Sewing Machine.

No. 51,086. Patented Nov. 21, 1865.

Fig. 1

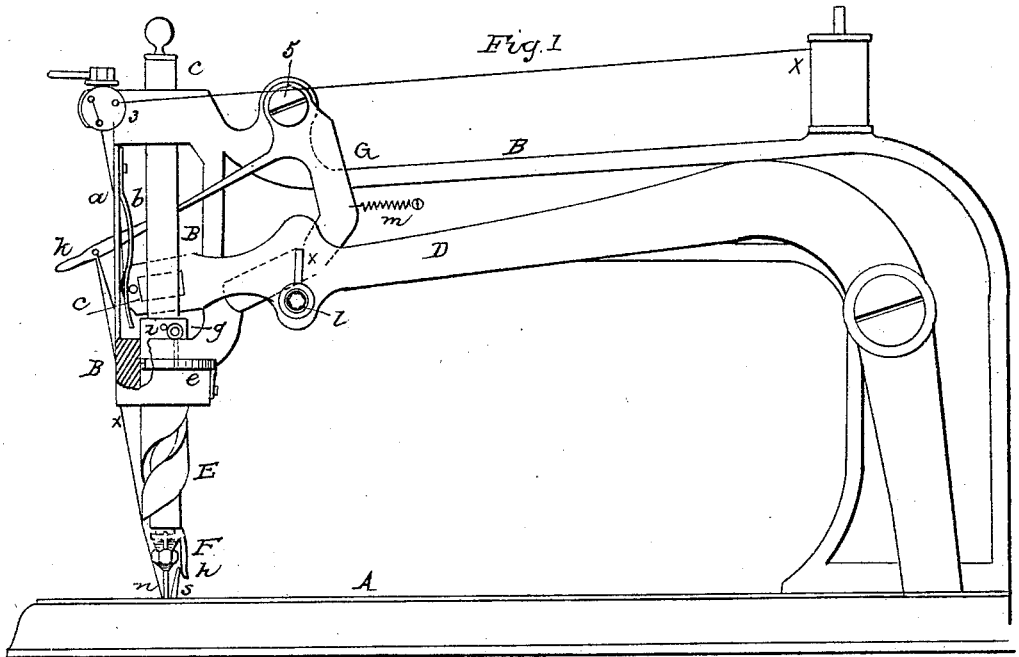
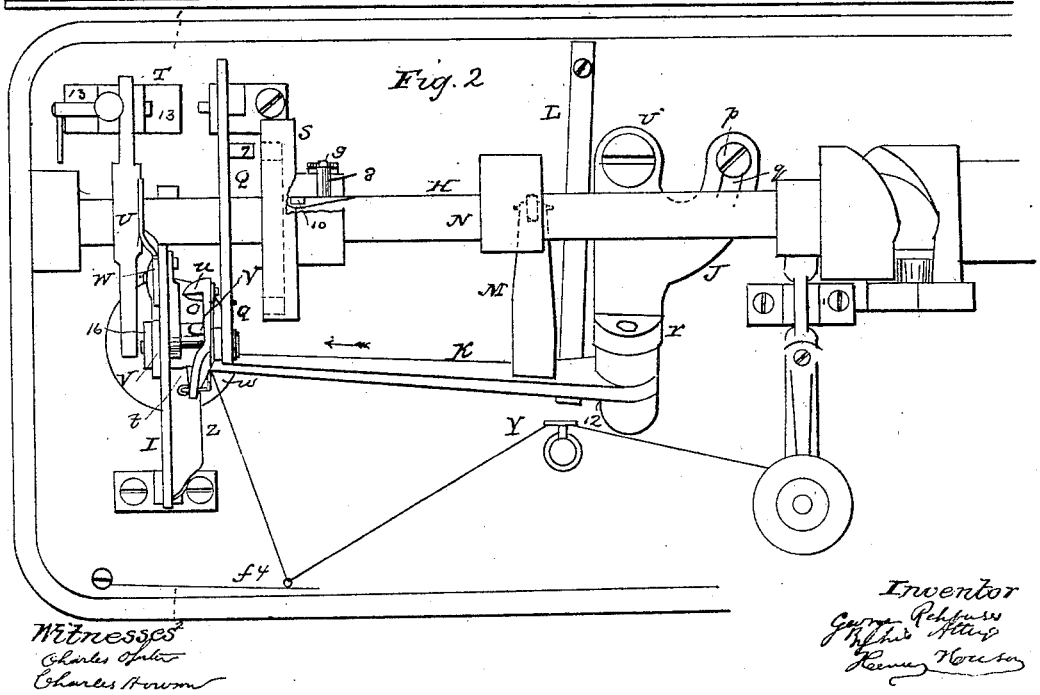


Fig. 2



Witnesses:
Charles Hutz
Charles Brown

Inventor
Geo. Rehfuss
By his Attys
Henry Howson

2 Sheets—Sheet 2.

G. REHFUSS.

Sewing Machine.

No. 51,086. Patented Nov. 21, 1865.

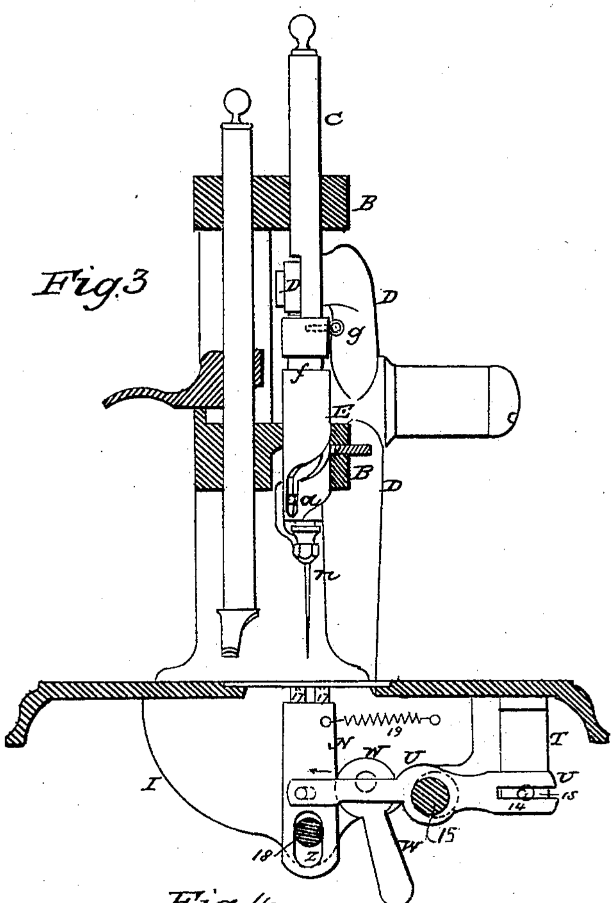


Fig.3

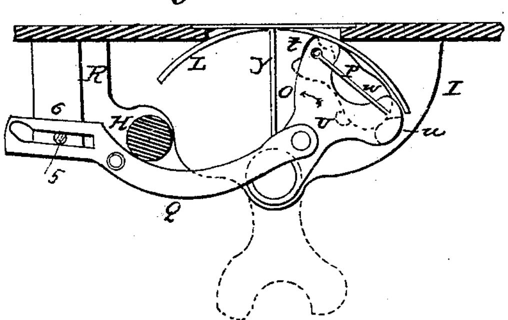


Fig.4

Witnesses
[illegible]
[illegible]

Inventor
G. Rehfuss
by his Attorney
Henry Howson

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE REHFUSS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **51,086**, dated November 21, 1865; antedated November 11, 1865.

To all whom it may concern:

Be it known that I, GEORGE REHFUSS, of Philadelphia, Pennsylvania, have invented certain Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of devices fully de-described hereinafter, designed with the view of readily changing a sewing-machine for forming a button-hole stitch into a machine for making the ordinary lock-stitch.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1, Drawing No. 1, is a side elevation of my improved sewing-machine as arranged for sewing button-holes; Fig. 2, Drawing No. 1, an inverted plan view; Fig. 3, Drawing No. 2, a transverse sectional elevation, the machine being arranged to make the ordinary lock-stitch; and Fig. 4, Drawing No. 2, a transverse section on the line 1 2, Fig. 2, looking in the direction of the arrow, the parts being in a different position.

Similar letters refer to similar parts throughout the several views.

A is the base-plate of the machine, on which is the usual stationary arm, B, and in the front end of the latter slides a needle-bar, C, to which a reciprocating motion is imparted by the lever D.

To the front end of the arm B is secured a perforated plate, *a*, on the inside of which is a spring, *b*, and from the end of the arm D projects a pin, *c*, which, during a portion of the movement of the arm, bears against the spring *b*.

On the lower portion of the needle-bar is a sleeve, E, into a spiral groove in which projects a pin, *a'*, Fig. 3, on the needle-bar, the sleeve being retained in its vertical position by a plate, *e*, which projects into an annular recess, *f*, in the upper end of the sleeve, the said plate being hinged to the arm B, and being, in the present instance, maintained in its position by a pin, *g*, which passes through an opening in the arm B into the plate.

In the upper end of the sleeve E is an opening, *i*, and in the needle-bar is an opening, which, when the bar is in the position shown in Fig. 1, corresponds with the said opening *i*, for a purpose described hereinafter.

To the lower end of the sleeve E is secured an arm, F, at the end of which is a curved projection, *h*.

To a pin, *j*, at the upper side of the arm B, is hung a curved plate or lever, G, from the front edge of which projects an arm, *k*, and in the end of the latter is an opening.

Through a slot, *x*, in the lever D projects an adjustable pin, *l*, which bears against the back edge of the lever G, the latter being maintained in contact with the pin by a spring, *m*.

On the under side of the base plate turns the driving-shaft H, and to the said plate is secured a vertical plate, I, in the rear side of which is a groove, *y*, Fig. 4, adapted for the reception of the needle *n* when it descends below the base-plate.

An adjustable plate, J, is secured to the under side of the base-plate A by a pin, *o'*, the said plate being retained in any position to which it may be adjusted by a pin, *p*, which passes through a curved slot, *q*, in the plate and into the base-plate. On one side of the plate J is an inclined projection, *r*, to which is hung a lever, K, and at the end of the latter is secured a curved loop holder or carrier, *s*, Fig. 1. Against the upper edge of the lever K bears a flat spring, L, Fig. 2, secured to the base-plate, and from the side of the lever K projects an arm, M, a friction-roller on the end of the latter bearing against the upper side of a cam, N, on the driving-shaft.

At the front of the arm B is a tension device, 3, and on the under side of the base-plate is a spring take-up, 4, and a tension device, 12.

To the inside of the plate I is hung a shuttle-carrier, O, from the side of which next the plate project lugs *t*, *u*, and *v*, Fig. 4, and on the latter rests the shuttle P, which is in contact with the plate I, the point *z* of the shuttle being maintained closely against the plate I by a spring, *w*.

From the side of the plate I, above the shuttle, projects a curved plate, Z, Fig. 4.

To the side of the carrier O is jointed one end of an arm, Q, the other end of which is

supported by a pin, 5, projecting from a bracket, R, into a slot, 6, in the arm. (See Fig. 4.)

On the shaft H is a wheel, S, and in the face of the latter is a cam-groove, to which is adapted a pin, 7, on the arm Q, and through the said wheel passes a pin, 8, which is secured to a spring, 9, the said pin projecting into a recess, 10, in the shaft, excepting when the wheel (which can be moved to a limited extent on the shaft) is in the position shown in Fig. 2.

Through a bracket, T, passes a bar, 13, a portion, 14, Fig. 3, of which is made eccentric, the bar passing through a slot in a lever, U, and through the center of the said lever passes an eccentric portion, 15, of the driving-shaft H. A pin, 16, projecting from the inside of the lever U, passes into a slot in a vertical plate, V, which is adjacent to the plate I, and on the upper end of which are the serrated lugs 17 17, a pin, 18, passing through a slot, *z*, in the lower end of the plate V, and retaining the latter in contact with plate I, on the side of which is a handled cam, W, with the edge of which the bar V is maintained in contact by a spiral spring, 19.

When the machine is to be used for sewing button-holes the different parts are adjusted to the position shown in Figs. 1 and 2. The shuttle P being removed and the carrier O turned down to the position shown in dotted lines, Fig. 4, the upper thread, X, is then carried from the spool to the tension device 3, and passed through one or more openings in the latter through one of the openings in the plate *a*, and along the inner side to an opening at the lower part of the same, through the latter to the eye near the end of the arm *k*, and thence to the needle *n*. The under thread, Y, is carried from the spool to the tension device 12, thence to the eye of the spring take-up 4, and thence to the loop-holder *s*, Fig. 1. On operating the machine the under thread will be carried upward across the edge of the fabric by the loop-holder *s*, and then by the arm F over the top of the fabric, to which it is secured by the thread X carried by the needle *n*, the operation of the machine on the threads and the stitch produced being similar to that in a machine for which a patent was allowed to my assignees on the 31st of December, 1864, but not yet issued. As the arm D rises the pin *l* will be brought against the under edge of the plate G, and the latter will be moved forward and the arm *k* consequently raised, the plate being depressed on the downward motion of the arm D by the spring *m*. As the arm D rises the pin *c* will also be brought against the spring *b*, which will thus be forced against the plate *a* until the arm has nearly reached the limit of its upward motion, so that the thread will be held tightly between the spring and plate, while at the same time the slack thread is taken up, and the stitch just formed is drawn close to the cloth by the upward motion of the take-up arm *k*. When the needle again descends the arm *k* will be quickly lowered, so as to furnish a plentiful supply of thread for forming the loop. As the lever V is raised and moved in the direction of the arrow, Fig. 3, by the revolution of the driving-shaft H, the pin 16 will be moved forward in the slot in the plate V until it strikes the end of the same, when the said plate, which has been raised with the end of the lever, will also be carried forward with the same in the direction of the arrow, the serrated projections 17 17 being brought against the under side of the fabric and moving the latter a short distance on the work-plate. As the shaft H continues its revolution the end of the lever and plate V will both be depressed, and will also both be carried back toward their original positions, the backward motion of the plate V being arrested when the same strikes the edge of the cam W, by turning which the extent of the motion of the plate V may be readily regulated.

It will be seen that by turning the rod 13 the eccentric portions 14 of the same within the slot in the lever U may be brought to a position to either raise or depress the end of the lever, and consequently regulate the distance to which the projections 17 17 will be raised above the work-plate.

When the machine is to be employed for ordinary sewing the parts are, in the first instance, brought to the position shown in Figs. 1 and 2, and the pin *g* is removed from its position and passed through the opening *i* in the sleeve E and into the needle-bar C, the plate *e* being turned back so that its edge is removed from the annular groove *f*, and the sleeve E being thus secured to the needle-bar, so as to rise and descend with the latter. The set-screw *p*, Fig. 2, is now loosened and the plate J is turned back so as to remove the end of the arm *k* from the vicinity of the plate I and the outer end of the arm M from contact with the cam N. The shuttle-carrier O is now brought to the position shown in Fig. 4. The shuttle P is inserted in the same, where it is retained between the lugs *t*, *u*, and *v* and the plates I and Z. The wheel S is then moved forward on the shaft H until the pin 7 on the arms Q occupies a position within the cam-groove in the face of the drum, the pin 8 being forced by the spring 9 into the recess 10, thereby securing the wheel in its position. The pin *l* is then raised to the upper end of the slot *x* in the arm D and secured in this position, and the thread X is conducted from the spool to the needle *n*, as in the first instance. The fabric is now placed on the work-plate and the machine set in motion. After the needle *u* has descended through the fabric into the groove *y* and has begun its upward motion a loop of thread, X, will be formed at the side of the same. The shuttle-carrier will then move forward in the direction of the arrow, Fig. 4, and the point of the shuttle will be inserted into the loop of thread X, and as the shuttle passes across the needle the said loop will pass readily over the

shuttle and between it and the lugs *t*, *u*, and *v*, a portion of the thread Y carried by the shuttle being left in the loop, which is drawn close to the cloth as the needle rises, and while the shuttle-carrier moves back to its first position. The take-up arm *k*, the thread-tensions, and the feed device are adjusted and operated in the same manner in this instance as when the machine is adjusted for sewing button-holes, while all the devices which are used only for this latter purpose are secured in such position as not to interfere with the operation of the machine as adjusted for plain sewing.

It will be seen that the changes necessary for adapting the machine for either class of work can be readily and quickly made, that the devices are all simple in construction and such as can be readily understood by those who generally use this class of machines.

If desirable, two work-plates, one adapted to each class of work, may be employed with each machine.

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

1. The lever K, for holding a loop of thread and carrying the same across the edge of the fabric, when the said lever is so connected to a permanent part of the machine as to be adjustable, substantially in the manner and for the purpose specified.

2. The combination of the shuttle-carrier O, the cam-wheel S, and operating-lever Q, the whole being constructed and arranged for adjustment substantially as and for the purpose herein set forth.

3. The sleeve E, adapted to the needle-bar and to the stationary arm B in the manner described, in combination with the devices herein described, or their equivalent, whereby the said sleeve and its projection *h* may be put either in or out of operative action, as desired, for the purpose specified.

4. The take-up motion consisting of the adjustable pin *l* on the needle-arm D, the lever G, and its arm *k*, and tension device 3, the whole being arranged and operating substantially as and for the purpose herein set forth.

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

GEO. REHFUSS.

Witnesses:

CHARLES E. FOSTER,

CHARLES HOWSON.