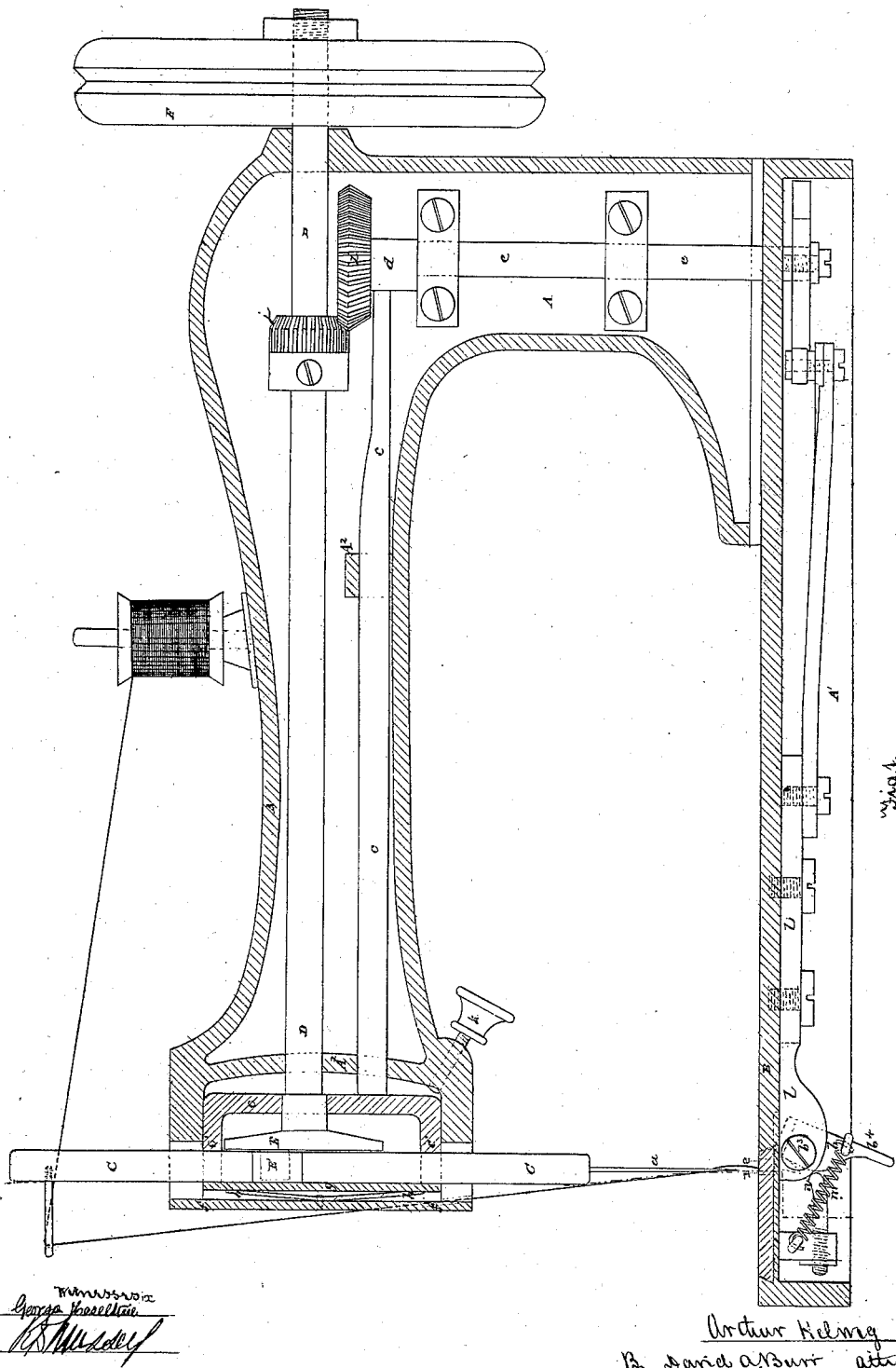


A. HELWIG.
SEWING MACHINE.

No. 111,059.

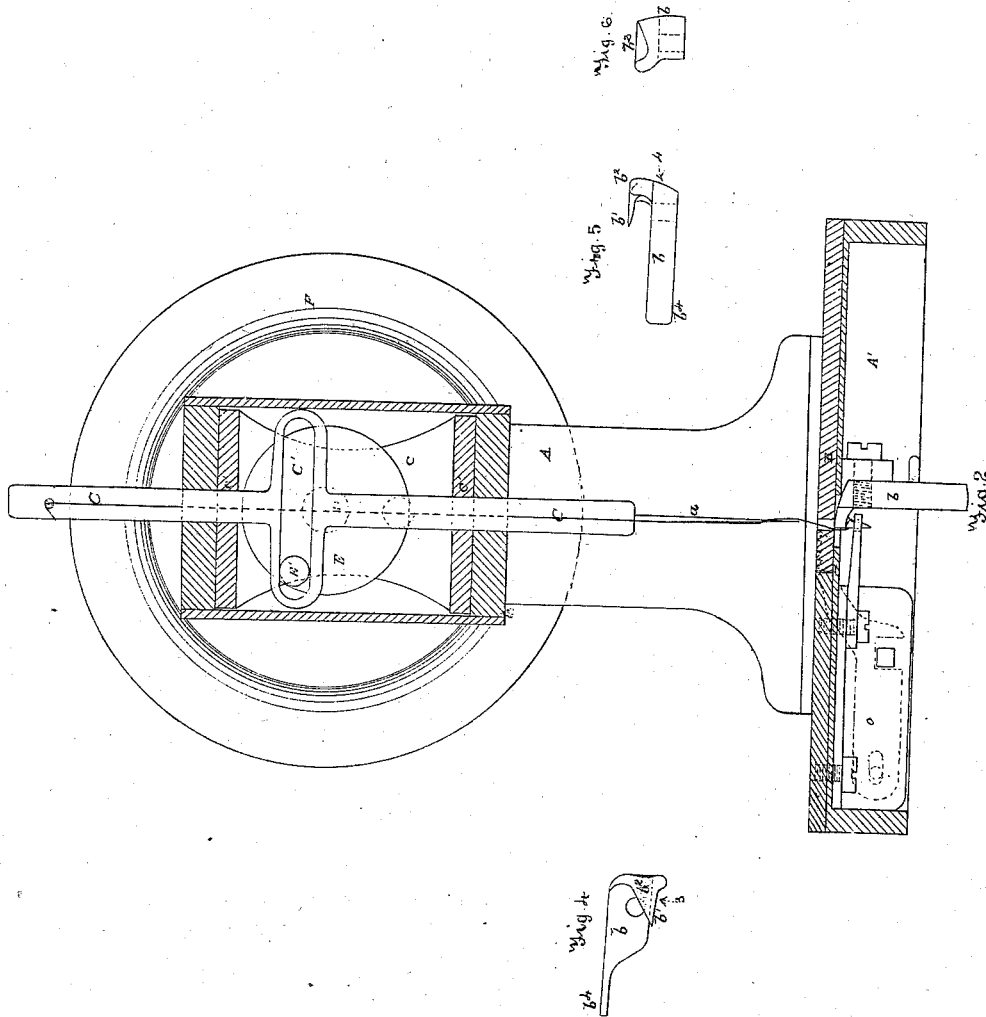
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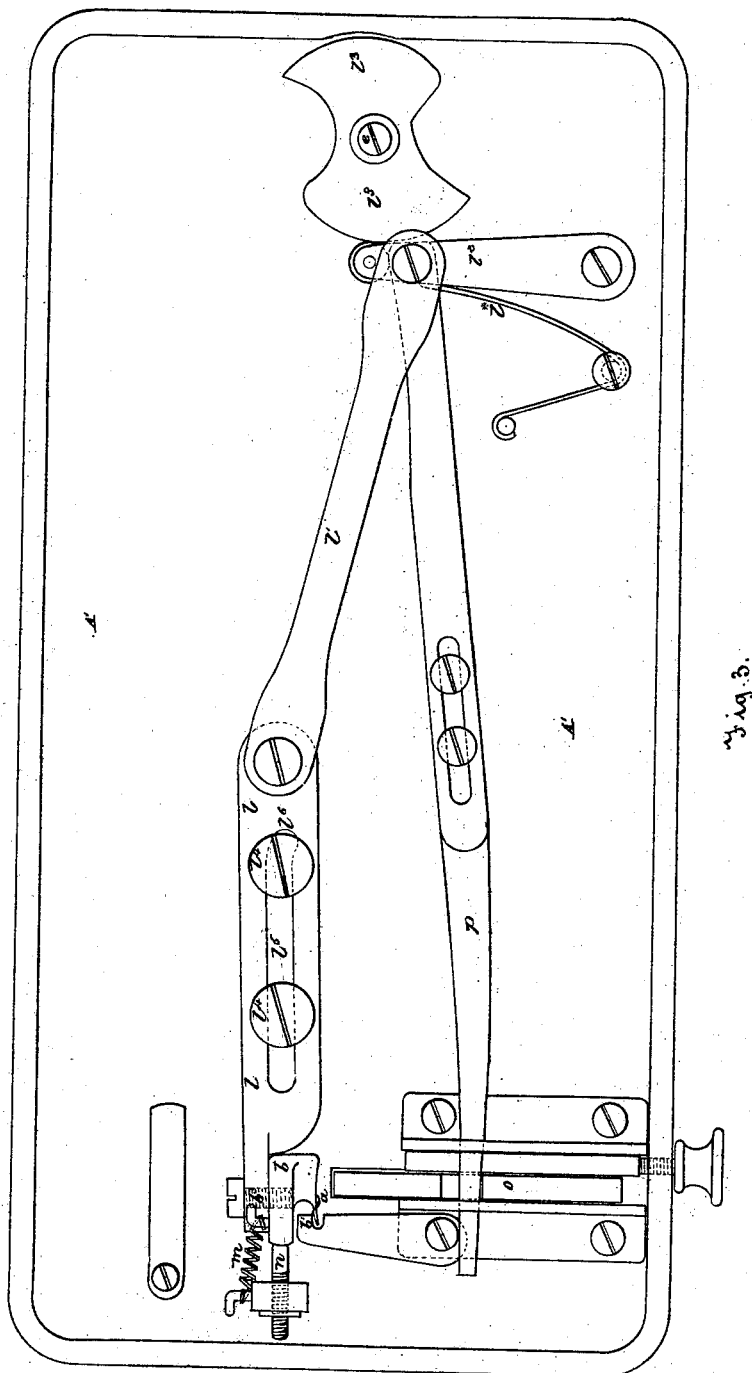
Witnesses
George Haselline
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Arthur Helwig
By D. A. Burr Atty

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ARTHUR HELWIG, OF LONDON, ENGLAND, ASSIGNOR TO HIMSELF AND
SIMON COLLINS, OF SAME PLACE.

Letters Patent No. 111,059, dated January 17, 1871.

IMPROVEMENT IN SEWING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

I, ARTHUR HELWIG, of London, England, have invented "a certain new and improved Stitching and Button-hole Sewing-Machine," of which the following is a specification.

My invention relates to a machine wherein the work is performed with a single thread carried by a needle, and secured by means of a hook or looper.

The main object of my invention is to furnish an efficient and cheap machine for sewing button-holes; and

The nature of the said invention consists in combining with the needle, in a single-thread sewing-machine, having a lateral to-and-fro motion transversely to the direction of the sewing, so that it descends alternately on the inside and outside of the edge of the hole, a vibrating hook or looper, which operates in connection with the needle for looping the thread in such manner as that the looping of the thread is effected continuously without any derangement of its regularity by the lateral variations in the position of the needle.

Description of the Accompanying Drawings.

Figure 1 is a longitudinal vertical section of my improved sewing-machine.

Figure 2 is a section on the line *x x*, fig. 1.

Figure 3 is a plan of the under side of the said machine.

Figures 4, 5, and 6 show the looper detached.

Like letters indicate corresponding parts throughout the drawings.

A is the frame, supported on the base A', and

B is the cloth-plate.

C is the needle-bar, and

D, the crank-shaft, provided with the crank E for operating the said bar, and also provided with a wheel, F, to which the power is applied in any convenient manner.

In my machine, as in ordinary chain-stitch machines, the thread is carried through the work by the needle *a*, and at each descent thereof a loop is taken by the hook or looper *b*, and held while the needle in its succeeding descent carries another loop through the first one, the loops or stitches being tightened as the needle ascends.

In the said machine the reciprocating action of the needle-bar C may be obtained in any convenient and suitable manner which will not prevent or interfere with the additional operation required in applying my invention to the machine. I prefer, however, to form the said needle-bar with a transverse aperture or slot, C', and to operate the same by the rotating crank E, whose pin E' works in the said slot, as shown in fig. 2.

In order that the needle may descend alternately, as hereinbefore specified, on the inside and outside of the edge of the button-hole, it is necessary that the needle-

bar C, while being properly supported and guided in suitable bearings, should be capable of lateral movement to such an extent as will produce the required variations in the position of the needle. For this purpose I support the said bar in bearings in a forked rod, *c*, which is firmly supported upon the frame A, but which is free to slide in its bearings A² in the direction of the length of the machine.

The said rod is extended behind its forked portion to the rear of the frame A, and its end bears against the cam or eccentric *d*, which is formed or fixed on the shaft *e*, and is so arranged that, when properly adjusted, it gives the rod *c* at each revolution a to-and-fro motion.

It will thus be seen that the needle-bar C has two motions, each of which is independent of the other, the said bar working up and down freely in the bearings *c* in the forked rod *c*, while the latter moves to and fro across the work, carrying the needle-bar C with it to and between the lines 1 and 2, fig. 1, so that the needle *a* descends at every alternate stroke on opposite sides of the line of sewing, as required.

In front of the needle-bar C, and within the front plate or cover *f*, I place a plate, *g*, between which and the said front plate is a spring, *h*, and the said spring acts continuously to press the forked rod *c* into contact with the cam *d*.

The said cam is attached to the bevel-wheel *i*, which gears into the pinion *j* fixed on the needle-bar shaft D, or is otherwise connected with the wheel F, which communicates motion to the operative parts of the machine.

When it is desired to throw the cam *d* out of connection with the forked sliding rod *c*, the said rod, by means of the screw *k*, can be held in such a position as not to come in contact with the cam, which will then turn without operating the said rod.

This means of adjustment is provided to allow the machine to be used for ordinary or plain stitching, for which it will be found very efficient.

It is obvious that other devices may be used instead of this screw for adjusting the rod *c*, and also that instead of the spring *h* and plate *g* above described, a spring otherwise arranged may be employed to keep the rod *c* in contact with the cam *d*.

The vibrating hook or looper *b*, which holds the loops of thread while the needle *a* passes through them, is clearly illustrated in figs. 4, 5, and 6. Fig. 4 shows the front of the looping-point *b'*. Fig. 5 is an edge view, looking in the direction of the arrow 3. Fig. 6 is a back view, looking in the direction of the arrow 4.

The said hook is arranged to vibrate in a vertical plane at the side of the needle, as clearly shown in fig. 3.

The point *b'* of this hook, or the portion whereon

the loops are held, is a thin triangular piece, with its face, which lies adjacent to the path of the needle, hollowed out or made concave at b^2 , as shown in figs. 4, 5, and 6.

The hook b is arranged in such a position that this triangular part b^1 works in a plane parallel with that of the lateral motion of the needle, and the side of the said triangular part occupies a portion of this plane.

The loops of thread taken from the needle are stretched over this concave portion, and the needle must descend in this space between the thread and the surface of the hook, as shown in fig. 3.

The concavity of the hook must, therefore, be of a width equal to or greater than the extreme distance between the lines 1 and 2, fig. 1, (that is, the extreme lateral positions of the needles a), so that the latter will at each stroke descend within this concave part b^2 .

As the needle a rises the triangular part b^1 of the hook b stands in a vertical position, or nearly so, with its point downward, as shown in figs. 1 and 2; but in order that the hook shall take the loops from the needle a without being affected by the different positions assumed thereby, the said looper must have a motion in such a direction that the point b^1 of the hook will not fail to enter the loop of thread at each descent of the needle a .

To give the hook b this motion I prefer that the center b^3 , whereon it vibrates, should have a horizontal to-and-fro motion, and that the vibrations of the hook b should be produced by such motion I therefore support the pivot or axis b^3 of the hook in a sliding plate or bar, l , which is moved to and fro by means of levers l^1 l^2 , connected with a cam or eccentric, F , fixed on the shaft e , or by other suitable mechanism.

The said bar is held by screws l' passing through the slot F^2 .

I prefer that the looper b should have a slight lateral vibrating motion as the needle is about to enter the loop, and I impart this motion to the looper by making the slot F^2 slightly curved at the end F^3 , as shown in fig. 3.

The hook b is constructed with an arm, b^4 , to which is attached a spring, n , whereby the said arm is held in such a manner that, as the sliding plate l moves away from the needle a , the triangular part b^1 of the hook b is left in a horizontal position. In this position, as the sliding plate l moves forward the hook b advances toward the needle a , and, by means of a stop, n , is turned over into a vertical position, taking the loop from the needle a as the same rises.

F^4 is the spring for keeping the lever l^1 in contact with the cam F .

In the machine illustrated in the drawings the feed-bar o is operated through the lever p by the cam U , but this arrangement of parts is not essential to my invention.

Claim.

I claim as my invention—

The vibrating looper b , constructed and operated as described, in combination with a needle, a , having vertical and lateral motion, both the looper and needle operating together, substantially as and for the purpose herein set forth.

ARTHUR HELWIG. [L. S.]

Witnesses:

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HARVEY WRIGHT.