



# UNITED STATES PATENT OFFICE.

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AND JOHN GAULT, OF SAME PLACE.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 16,566, dated February 3, 1857.

*To all whom it may concern:*

Be it known that I, JOSHUA GRAY, of Boston, in the county of Suffolk and State of Massachusetts, 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 annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view of my machine; Figs. 2, 3, and 4, details which will be hereinafter described; Fig. 5, a plan upon the line X X of Fig. 3.

My improvements are applicable to the ordinary chain-stitch machine; and they consist, first, in a peculiar method of operating the hook which forms the loop and of imparting the required motions thereto, and, secondly, a new and peculiar feed, by which improvements I am enabled to simplify the machine and to reduce the cost of its construction without impairing its usefulness.

To enable others skilled in the art to understand my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is the bed or table of the machine; B, the shaft through which motion is communicated to the operating parts. The needle-bar C is set in motion by a crank, *a*, upon the driving-shaft, which plays in a slot, *m*, in the bent lever D. This lever, which is pivoted at E, is connected at one end with the needle-bar C, and serves also to give motion to the hook *e*, Fig. 2, by which the loop is formed. This operation will now be described.

Attached to the under surface of the bed of the machine is a plate, F, upon which slides another plate, G, which is held thereto by the screws *f*. These screws pass through slots *b* in the plate G and enter the plate F.

H is a bar, which slides in a recess in the plate F, and is set in motion by the bent lever D, with which it is connected at *d*. The bar H carries a pin, *g*, that plays in a slot, *h*, in the plate G, and thus the required motions are imparted to the hook to enable it to form the loop, as will now be more fully described.

Starting with the parts in the position represented in Fig. 4, the pin *a* being at 1 and

the pin *g* at the point 5 of the slot *h*, the needle, having passed through the cloth, is at its lowest point, and the plate G and hook *e* are in the position seen in dotted lines in Fig. 2. As the shaft revolves, the pin *a* passes from 1 to 2, Fig. 4, and the needle is partially elevated, forming a loop beneath the cloth. At the same time the pin *g*, moving in the diagonal portion 5 to 6 of the slot *h*, carries the plate G and hook *e* in the direction of the arrow *y* toward and into the loop just formed by the retraction of the needle. So soon as the plate G has advanced sufficiently far in this direction for the pins *f f* to enter the diagonal branches *b'* of their slots, this plate commences to move in the direction of the arrow *z*, and the hook *e* carries the loop into a position ready to receive the needle the next time it descends. This takes place while the pin *a* is passing the point 2, Fig. 4, and as this pin continues round to the point 3 the needle is retracted, leaving its loop in the hook beneath the cloth. While this is taking place, the pin *g* is passing through the portion 6 to 7 of the slot *h*, and the hook remains stationary until the needle is again caused to pierce the cloth, by the motion of the pin *a* from 3 to 4, and enter the loop held by the cloth. While this is taking place, the pin *g* passes from 7 to 6, and as the pin *a* passes from 4 to 1 the needle continues its descent, and the hook is retracted by the passage of the pin *g* from 6 to 5 of its slot. These motions of the hook are all performed at the required instant by the plate G and the parts immediately connected therewith with the utmost precision and exactness.

I will now describe the manner in which the goods are fed as the sewing proceeds.

C, Fig. 3, is the needle-bar.

I is a spring-pressure rod, the foot *o* of which exerts a uniform pressure upon the cloth. This foot is slotted, Fig. 5, and in this slot plays the feed-arm K, the foot of which is roughened or serrated in the ordinary manner. The arm K is pivoted at *l* to the rod I, and at its upper extremity has a slot, P, in which plays the pin L, projecting from the needle-bar C. This slot is so formed at its upper end that as the pin L rises and falls it shall give motion to the foot S of the feed-arm. The pin L may be made adjustable in position, by which

means the length of the stitches may be regulated.

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

The combination and arrangement of the plate G and slide H with their slots and pins, operating in the manner substantially as de-

scribed, for the purpose of giving the required motions to the hook, as set forth.

JOSHUA GRAY.

Witnesses:

SAM. COOPER,

P. E. TESCHEMACHER.