

(No Model.)

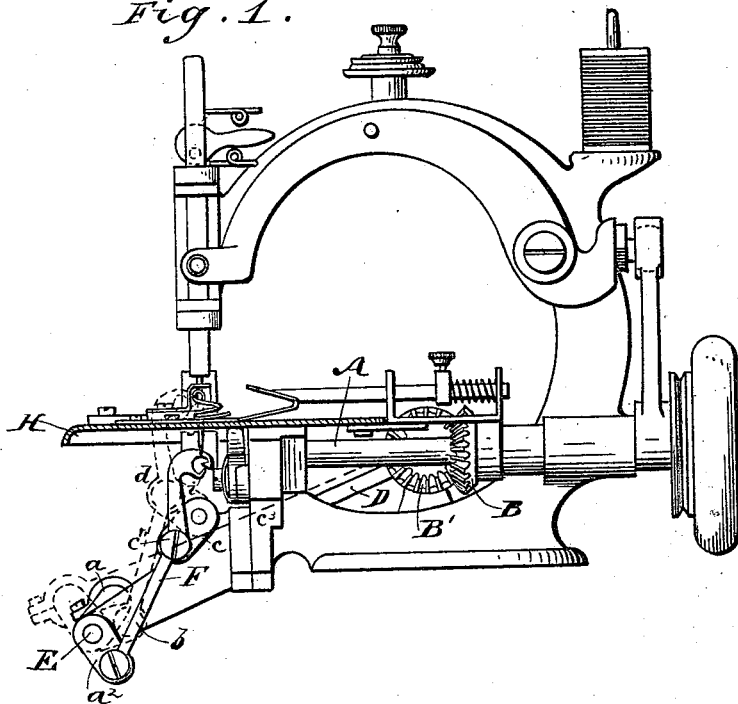
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H. H. FEFEL.  
SEWING MACHINE.

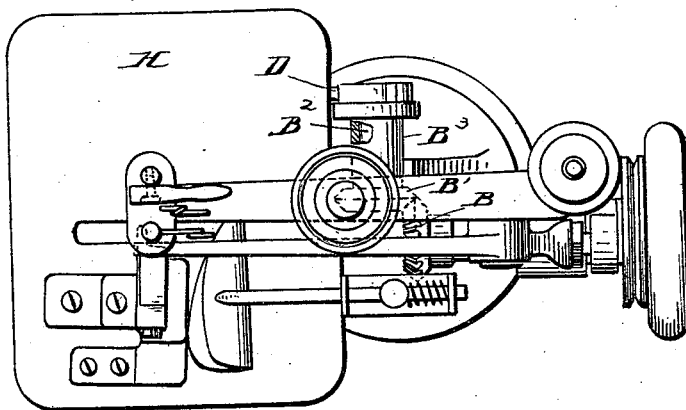
No. 455,190.

Patented June 30, 1891.

*Fig. 1.*



*Fig. 2.*



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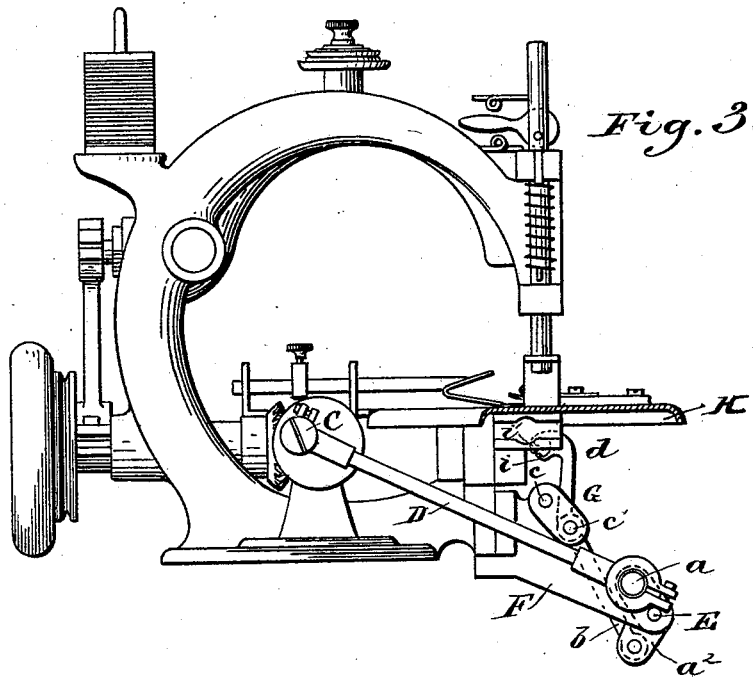
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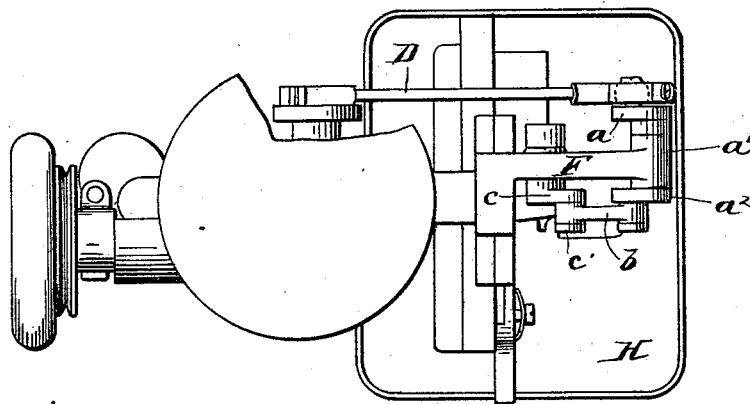
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*Fig. 4.*



*Fig. 5.*

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Fig. 6.

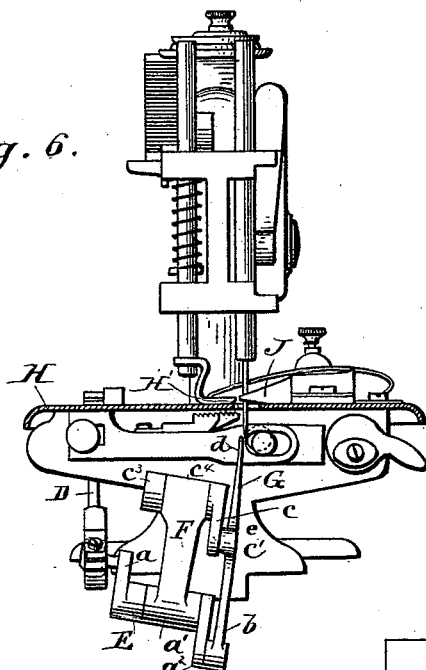


Fig. 9.

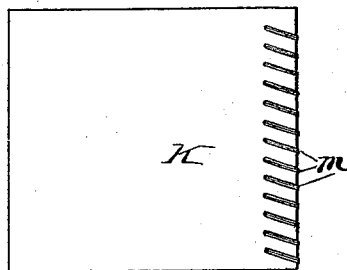


Fig. 8.

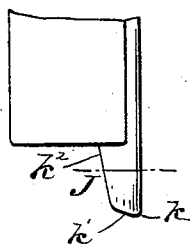


Fig. 7.

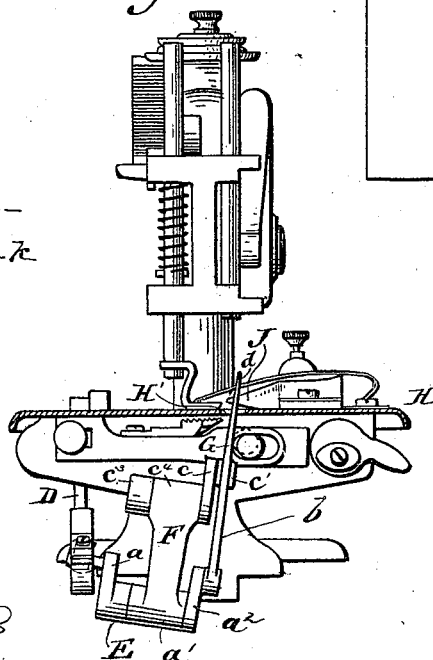


Fig. 10.



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# UNITED STATES PATENT OFFICE.

HENRY H. FEFEL, OF NEW YORK, N. Y., ASSIGNOR TO MARI A. CUMING,  
OF SAME PLACE.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 455,190, dated June 30, 1891.

Application filed December 21, 1889. Serial No. 334,508. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY H. FEFEL, of the city, county, and State of New York, have invented a new and Improved Sewing-Machine, of which the following is a full, clear, and exact description.

My invention relates to a sewing-machine for making the so-called "overstitch;" and my object, besides that of producing a machine of improved structure, capable of high speed, simple, and durable, is to lay the threads of each stitch close together and at the proper angle to give the work the appearance of hand-stitching.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved sewing-machine, a part of the cloth-plate being broken away to show the relation of the hook to the needle. Fig. 2 is a plan view of the machine. Fig. 3 is a side elevation opposite to the side shown in Fig. 1. Fig. 4 is a broken plan view of the machine inverted. Fig. 5 is a detailed perspective view of the stitch-bridge, a part of the cloth-plate, the guide, needle, a piece of fabric, and the hook, showing its relation to the needle at the time the needle pierces the fabric. Fig. 6 is a front elevation of the machine, the cloth-plate being in section, the hook and needle being at their lowest position. Fig. 7 is a similar view showing the hook and needle at their highest position. Fig. 8 is an enlarged view of the point of the stitch-bridge. Fig. 9 is an enlarged view of the stitch, and Fig. 10 is an enlarged sectional perspective view of the stitch-bridge.

On the main shaft A is secured the beveled gear-wheel B, which meshes with the beveled gear B' on a short counter-shaft B<sup>2</sup>, held in a sleeve-bearing B<sup>3</sup>. To the outer end of this counter-shaft is attached a crank-pin C, which reciprocates the pitman D, attached at its lower or outer end to one of the cranks  $\alpha$  of the double-crank shaft E, journaled in the sleeve  $\alpha'$  of the arm F. The other crank  $\alpha^2$  of the said double-crank shaft E is arranged at right angles, or nearly so, to the crank  $\alpha$ , as shown in Fig. 1, and is attached to the lower

end or stem  $b$  of the stitch-forming hook G. The said hook is poised at or about its center on the pivot  $c'$  at the end of the crank  $c$ , whose shaft  $c^3$  is journaled in the bearing  $c^4$ , 55 formed as a part of the arm F. The said arm F is set at a slight angle to the needle, as shown in Figs. 6 and 7. Hence the shafts E and  $c^3$ , the cranks  $\alpha$   $\alpha^2$   $c$ , and the stitch-forming hook G are held at a slight angle, so that 60 the upper end of the hook when in its highest position will stand in front of the needle and when at its lowest position will stand back of the needle, as illustrated in these figures. The upper end  $d$  of the stitch-forming 65 hook is curved forward and constructed with the lower bill  $i$ , whose point is upturned, and with the upper curved bill  $i'$ , whose point  $i^2$  is turned inward and stands a short distance above the bill  $i$ . 70

When the machine is in motion and the hook is in its lowermost position, the upper bill  $i'$  drops through the loop formed in the thread, back of the needle, which loop is retained by the point  $i^2$ . When the lower end 75 of the crank  $\alpha^2$  starts upward, the crank  $c$  swings the hook outward, and as it progresses upward the loop shifts from the upper bill  $i'$  to the lower bill  $i$ . The movement of the crank  $\alpha^2$  is such as to lift the upper end of the 80 hook up through the slot H' in the cloth-plate H, as shown in Fig. 5. In this position the crank  $c$  carries the hook forward toward the needle, carrying the loop over the stitch-bridge J and holding it close to the needle, so 85 that as the needle descends it passes through the loop and forms the stitch. The hook now moves backward and downward in the curved path by which it ascended to take the loop 90 again and repeat the operation, in the meantime casting off the first loop from the lower bill  $i$  through the space between it and the upper bill. While the hook is ascending the lower part of the loop is retained by the projection or retainer  $j$ , formed as a part of the 95 cloth-plate, as shown in Fig. 5.

The stitch-bridge J is hollow to receive the edge of the fabric K to serve as a guide thereto, and is sloping, coming to a small curved point  $k$ . From this point proceeds the curved 100 point  $k'$ , which merges into the diagonal side edge  $k^2$ , as shown in Fig. 8. The edge  $k'$

gives the desired slant to the stitches *m*, which in this respect are in exact imitation of hand whip-stitch. The slope of the bridge shifts the upper part of the loop when it slips  
5 off from the bridge into close contact with its mate, so that while the stitch is composed of two strands of the same threads they lie so close together and so regularly are they applied that the stitch appears as though composed  
10 of only a single thread.

The feed and needle-arm motion, the tension, and guides and other accessories of the machine may be of any approved construction and need no detailed description.

15 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the needle, feed, and main shaft of a sewing-machine, and a  
20 stitch-hook formed with an upper and lower bill and poised in the center on a pivoted crank, of a double-crank shaft and means for rotarily reciprocating the same, the stitch-hook being attached to one of the cranks, substantially as described.  
25

2. The stitch-bridge J, made hollow and sloping at the point, combined with the feed, the presser-foot, the needle-bar, and the hook for carrying the stitch from beneath the plate  
30 over the point of the sloping bridge for laying the two threads composing the stitch close together, said stitch-bridge being separate from the presser-foot of the machine, substantially as described.

3. The stitch-bridge J, made hollow and sloping and having the diagonal point *k'*, combined with the feed, the needle-bar, and the hook for carrying the stitch from beneath the plate over the point of the sloping stitch-bridge, substantially as described.  
40

4. The stitch-bridge J, sloping at its upper surface and formed with the diagonal point *k'*, in combination with the needle, feed, the work-plate having the projection *j*, and the stitch-hook G, poised at the center on a crank  
45 and reciprocated by another crank, substantially as described.

5. In a sewing-machine, the combination, with the needle-bar, feed, and work-plate, of a vertically-reciprocating and centrally-pivoted stitch-hook held at an angle to the longitudinal axis of the needle for taking the loop at the back of the needle and carrying it up through a slot in the work-plate to a position in front of the needle, substantially as  
55 described.

6. The main shaft provided with a gear-wheel, and a counter-shaft geared therewith and provided with a crank, in combination with a pitman, a double-crank shaft, and a  
60 stitch-hook attached to one of the cranks of the double-crank shaft and poised in the center on another crank, substantially as described.

HENRY H. FEFEL.

Witnesses:

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