(No Model.) 4 Sheets—Sheet 1.

E. & R. CORNELY.

EMBROIDERING MACHINE.

No. 566,061. Patented Aug. 18, 1896.

Fig. 1.

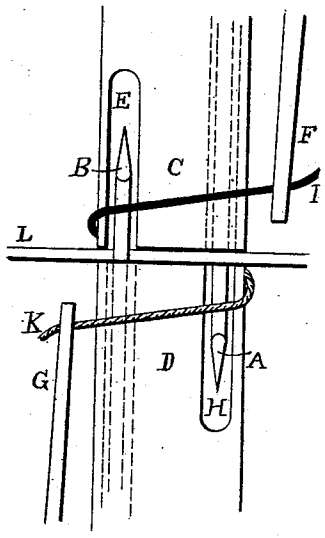


Fig. 2.

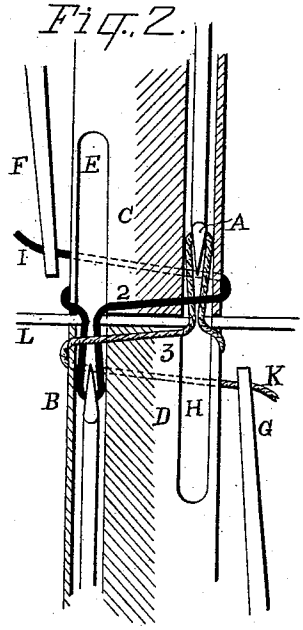


Fig. 3.

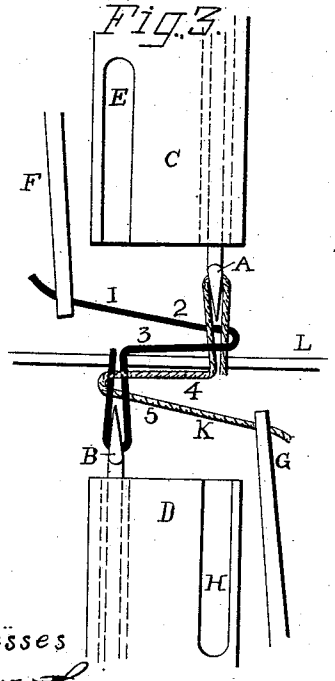
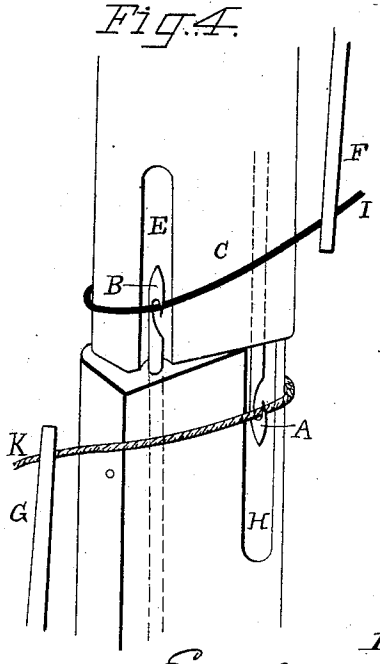


Fig. 4.



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E. & R. CORNELY.

EMBROIDERING MACHINE.

No. 566,061. Patented Aug. 18, 1896.

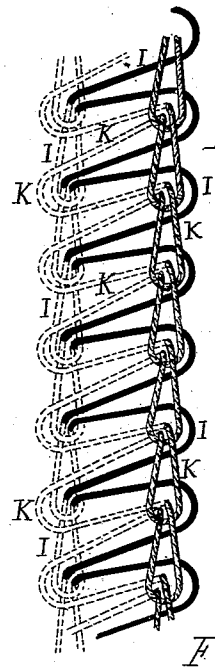


Fig. 6.

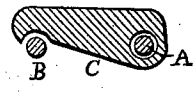


Fig. 5.

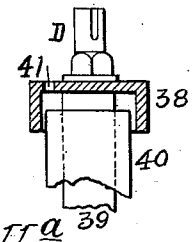


Fig. 11.

Fig. 11a

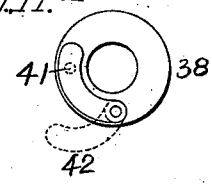


Fig. 9.

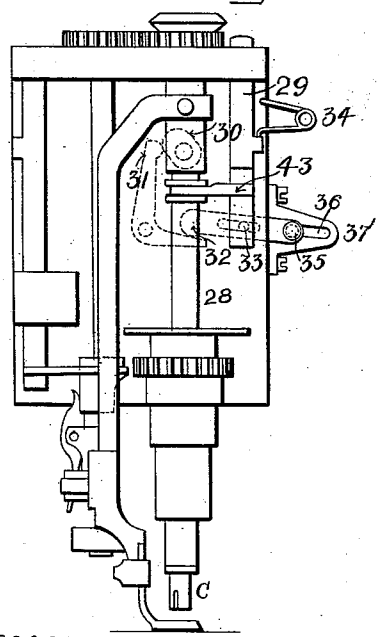
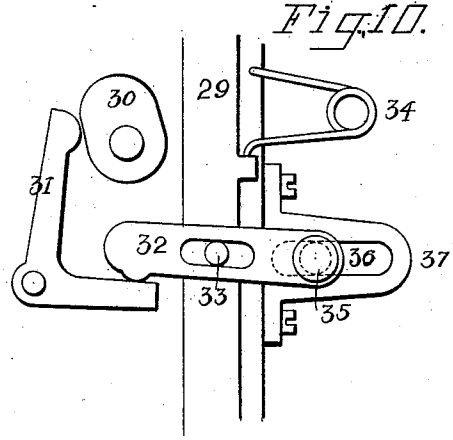


Fig. 10.



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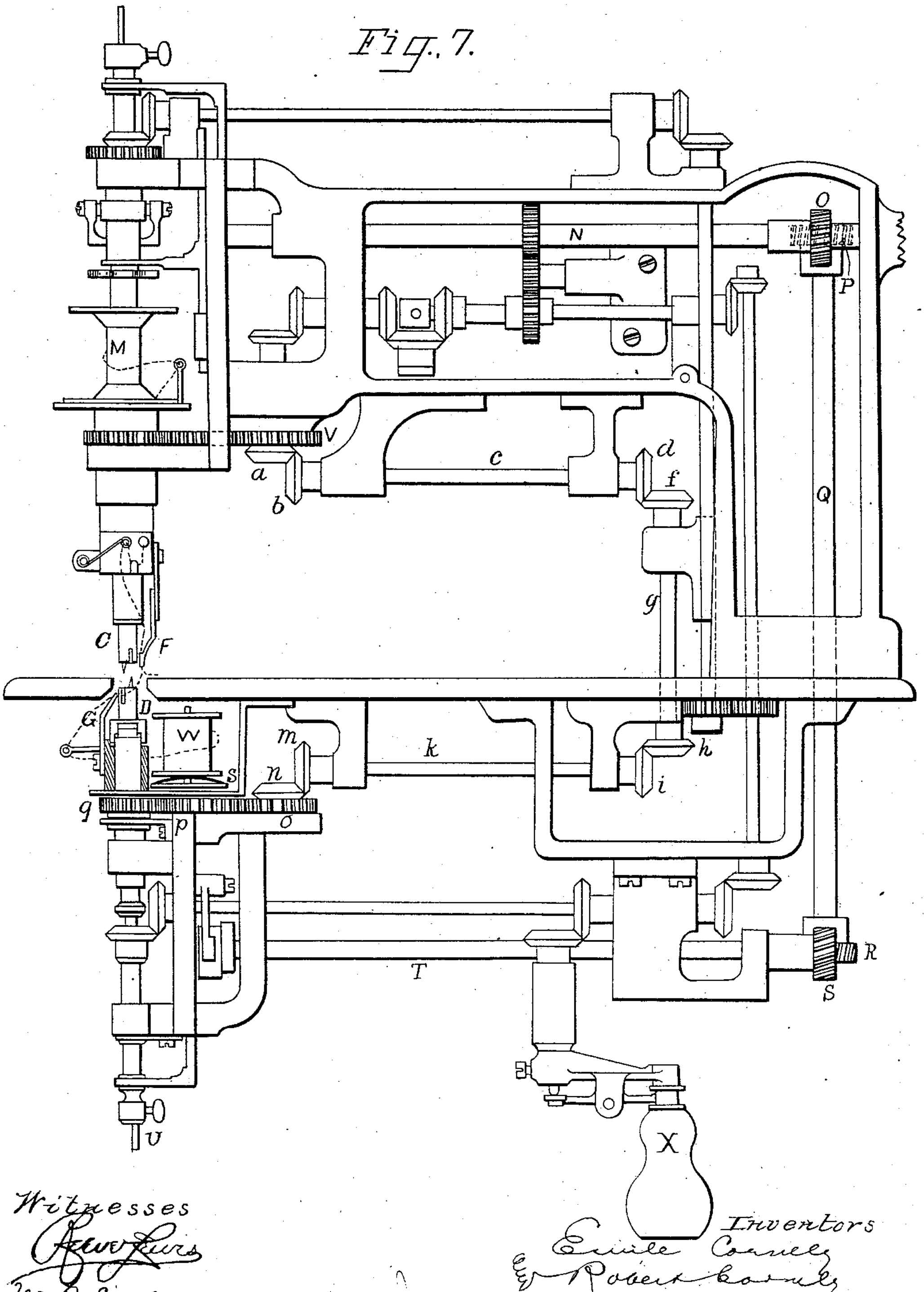
E. & R. CORNELY.

EMBROIDERING MACHINE.

No. 566,061. Patented Aug. 18, 1896.

Fig. 7.



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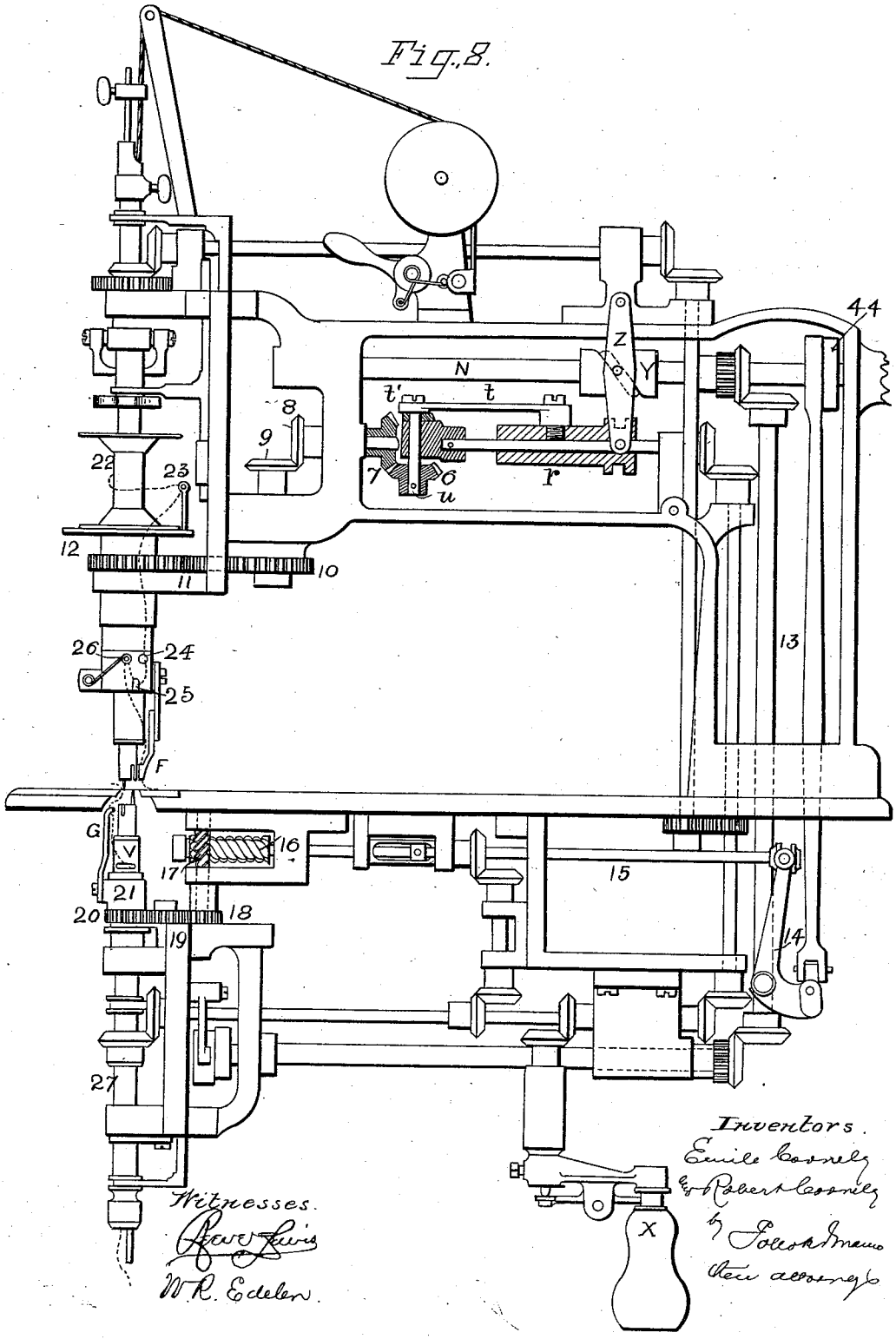
E. & R. CORNELY.

EMBROIDERING MACHINE.

No. 566,061. Patented Aug. 18, 1896.

Fig. 8.



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their attorneys

UNITED STATES PATENT OFFICE.

EMILE CORNELY AND ROBERT CORNELY, OF PARIS, FRANCE.

EMBROIDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 566,061, dated August 18, 1896.

Application filed May 8, 1896. Serial No. 590,748. (No model.)

To all whom it may concern:

Be it known that we, EMILE CORNELY and ROBERT CORNELY, residents of Paris, France, have invented new and useful Improvements in Embroidering and Edging Machines, which are fully set forth in the following specification.

The object of the present invention is the production of a novel ornamental seam for embroidering or edging fabrics, and comprises the improved machine and novel parts or arrangements thereof whereby the seam is produced. In its general features the machine resembles the well-known universal embroidering-machine described in numerous patents heretofore granted to us, and the following specification will be confined mainly to the features wherein the improved machine differs from those heretofore patented.

The improved machine is characterized mainly by the employment of two reciprocatory hook-needles, one actuated from above and the other from beneath the cloth-plate, the needles being arranged to move the one in opposition to the other—that is, the upper needle descends as the lower needle ascends, and vice versa. Combined with these two needles are auxiliary stitch-forming devices whereby the threads of the two needles are interlaced, the upper thread being wound around a loop of the lower thread, and vice versa. These auxiliary devices comprise thread carriers or loopers, one above and the other beneath the cloth-plate. The thread-carriers may have a continuous rotary movement in one direction, or an oscillatory movement, or one of the thread-carriers may have an oscillatory and the other a continuous rotary movement.

Each needle is preferably provided with what may be termed a "double nipple," the chief characteristic of this device being that, in addition to the ordinary passage for its own needle, the nipple has an additional groove or open-sided recess for the admission of the other needle in order to facilitate the winding of the thread around both needles.

The invention embraces certain specific constructions, combinations, and arrangements of parts, as hereinafter described.

In the accompanying drawings, forming part of this specification, Figures 1, 2, and 3 are enlarged elevations illustrating the stitch-forming devices in several positions. Fig. 4 is a perspective view of the same devices in a position corresponding to Fig. 1. Fig. 5 is a cross-section of the upper nipple. Fig. 6 is a diagram illustrating the seam. Fig. 7 is an elevation of one form of machine constructed in accordance with the invention. Fig. 8 is similar view of another form of machine. Fig. 9 is a partial front elevation. Fig. 10 is a detail on an enlarged scale of parts shown in Fig. 9. Figs. 11 and 11ª are details of the lower nipple and adjacent parts.

The principal elements employed in making the seam shown in Fig. 6 are:

First. Two needle-hooks A and B, Figs. 1, 2, 3, 4, and 5, working vertically in opposite directions, one against the other, the needle A being above and the needle B being below the cloth-plate.

Second. Two double nipples C and D, in which the two needle-hooks A and B operate. The nipple C works above and the nipple D below the cloth-plate. In each of these two double nipples one of the two needle-holes E and H, respectively, is opened sidewise, forming thus a groove or recess. The under needle B enters into groove E of the upper nipple C, and the upper needle A enters into groove H of the under nipple D.

Third. Two thread-carriers F and G, the first being above, the latter underneath, the table. Thread-carrier F winds its thread I around the upper nipple C, while the thread-carrier G winds its thread K around the under nipple D. The motions of these two thread-carriers around each of their nipples can be either an oscillating motion or a continuous rotating motion.

The operations of the above-described elements in the formation of the stitch are as follows:

In Fig. 1 the two nipples C and D are shown as pressing against the material L, and needle-hook B has reached its highest position, while needle-hook A has reached its lowest position. Needle-hook B on its return movement engages thread I, and needle-hook A in its return movement engages thread K, these threads being wound around nipples C and D by means of thread-carriers F and G, respectively. Then hook B draws the loop

which it has caught into the needle-hole of nipple D, while at the same time the hook A draws in the same manner its loop into the needle-hole of nipple G, as represented in Fig. 2. At this moment nipple C makes its upward movement, while nipple D descends. These motions cause the loops 2, 3, 4, and 5 of the threads I and K to slip off from the nipples around which they were wound and form thus the interlacement of threads represented in Fig. 3. At this moment the feed takes place, after which the two needle-hooks A and B begin their motions toward each other, depositing each its chain-stitch on the respective upper and under side of the material L, piercing the material and coming again with its respective nipple and thread-carrier back to the positions represented at Figs. 1 and 4 for the formation of the next-following stitch, so as to produce the embroidering or edging seam represented on a large scale in Fig. 6. In this figure the threads represented in full lines are above the material and the threads represented in dotted lines are below the material, and are designated by their respective letters I and K. They form a chain-stitch above and one beneath the material, the transversal threads of which are interlaced in the manner represented in Fig. 6.

Fig. 7 represents a machine in which both thread-carriers F and G have a continuously-rotating motion around their double nipples C and D. The upper thread-carrier F is operated in the manner described in Letters Patent No. 461,737, of October 20, 1891, and its thread passes from spool M through suitable guides into the thread-carrier F. Main shaft N of the machine is provided with a gear-wheel O, which operates wheel P, shaft Q, wheels R and S, and shaft T. The latter shaft T operates needle-bar U and nipple D in the well-known manner. The under thread-carrier G receives its rotating motion from wheel V through bevel-gears *a b*, shaft *c*, wheels *d f*, shaft *g*, wheels *h i*, shaft *k*, and wheels *m*, *n*, *o*, *p*, and *q*. This latter wheel *q* is provided with a sleeve on which are secured the thread-carrier G and the spool-holder *s*, which carries the spool W, from which the thread is supplied to the thread-carrier G.

All the elements for the production of the stitch are governed by the crank-handle X in conformity with the direction of the feed, either for a complete rotation of the handle or only for a limited rotation, as well understood, and as described in former patents.

Fig. 8 represents an elevation of the machine, in which both thread-carriers F and G perform an oscillating motion around their nipples C and D. The oscillating motion of the upper thread-carrier F is obtained by means of a grooved cam Y, which is secured upon main shaft N. This grooved cam Y operates lever Z, sleeve *r*, pitman *t*, crank *t'*, shaft *u*, and pinions 6, 7, 8, 9, 10, 11, and 12 in the manner described in English Patent No. 14,358, of August 25, 1891, which need not be here described in detail. The oscillating motion of the under thread-carrier G is obtained by means of an eccentric 44, which is secured upon shaft N. This eccentric operates pitman 13, lever 14, and rod 15, upon which is secured the screw-gear 16, which thus receives a to-and-fro motion. This screw-gear 16 operates a similar screw-gear 17 (like that employed in our well-known universal-feed embroidering-machine) and the gears 18, 19, 20, which thus all receive an oscillatory motion which is communicated to sleeve 21, upon which the thread-carrier G is secured. The two thread-carriers F and G are governed by the crank-handle X of the machine in the well-known manner.

It is well understood that the rotating and oscillating motions of the thread-carriers F and G can be combined in such a manner in the same machine that the upper thread-carrier F may have a rotating motion and the under thread-carrier G an oscillating motion, or vice versa.

The thread of the upper thread-carrier F is shown in Fig. 8 in dotted lines. It comes from spool 22, passes through guide 23, and from there it goes through the inner passage of cog-wheel 12, from which it comes out through opening 24. Then it passes through guide 25 and tension-spring 26, and at last through thread-carrier F. The thread of the under thread-carrier G comes from a spool placed below the table, passes through central tube 27, from which it comes out through opening *v*, and goes then to the thread-carrier G.

In order to obtain a regular working of the elements which produce the stitch, it is necessary that the distance from the nipples to the material should be regulated according to the thickness of the materials. Such regulating means are illustrated in Figs. 9 and 10. The up-and-down motion of nipple C, which is secured to the lower part of nipple-tube 28, Fig. 9 is obtained in the following way: The eccentric 30, which is secured upon main shaft N, vibrates lever 31 upon its fulcrum, Figs. 9 and 10. The horizontal arm of this lever 31 works against lever 32, which is provided with a slot in which projects a pin 33, which is secured upon the nipple-tube slide 29. This nipple-tube slide 29 is provided with a fork 43, which operates nipple-tube 28. The downward motion of the slide 29 is obtained by the action of spring 34. The length of the stroke of the slide 29 and of its nipple-tube 28 is regulated by shifting the fulcrum 25 of lever 32 in slot 36 of bracket 37, so that the bearing-point of lever 31 being equally shifted, the stroke of the nipple-tube slide is increased or diminished.

Figs. 11 and 11[a] represent the under nipple D, provided with a cup-shaped shield 38 to protect the under nipple-tube 39 from any fibers, dust, or other impurities which may prevent the proper working of the nipple-

tube 39 in its bearings in hub 40. The said protecting-shield 38 is provided with a hinged cover 42 for opening and closing a hole 41 for lubricating the nipple-tube 39.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an embroidering-machine, the combination of two hook-needles, one above and the other beneath the cloth-plate, a thread-carrier for winding a thread around the needles above the cloth-plate, a thread-carrier for winding a second thread about the needles beneath the cloth-plate, and actuating mechanism for said needles and thread-carriers, substantially as described.

2. In an embroidering-machine, the combination with cloth-feeding mechanism, of two hook-needles, one above the cloth-plate for drawing a loop of thread upwardly through the fabric, and the other beneath the cloth-plate for drawing a loop of thread downwardly through the fabric, mechanism for reciprocating said needles in opposite directions, and means for laying a thread around the loop carried through the fabric by one of the needles, substantially as described.

3. In an embroidering-machine, the combination with cloth-feeding mechanism, of two hook-needles, one above the cloth-plate for drawing a loop of thread upwardly through the fabric, and the other beneath the cloth-plate for drawing a loop of thread downwardly through the fabric, mechanism for reciprocating said needles in opposite directions, means above the cloth-plate for laying a thread about the loop drawn through the fabric by the upper needle, and means below the cloth-plate for laying a thread about the loop drawn through the fabric by the lower needle, substantially as described.

4. In an embroidering-machine for making a chain-stitch on both sides of the material by means of two threads, the combination of two hook-needles, one above and the other beneath the cloth-plate, an upper nipple and a lower nipple having each two needle-holes one being open at the side, an upper thread-carrier and a lower thread-carrier, actuating mechanism for said needles, nipples, thread-carriers, and cloth-feeding mechanism, substantially as described.

5. The combination of the upper and lower hook-needles, the upper and lower nipples having each two needle-holes, and upper and lower thread-carriers, actuating mechanism for reciprocating said needles and nipples, and means for regulating the extent of movement of one of the said nipples, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

EMILE CORNELY.
ROBERT CORNELY.

Witnesses:
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D. T. S. FULLER.