

A. BONNAZ.

Sewing Machine for Embroidering.

No. 83,909.

Patented Nov. 10, 1868.

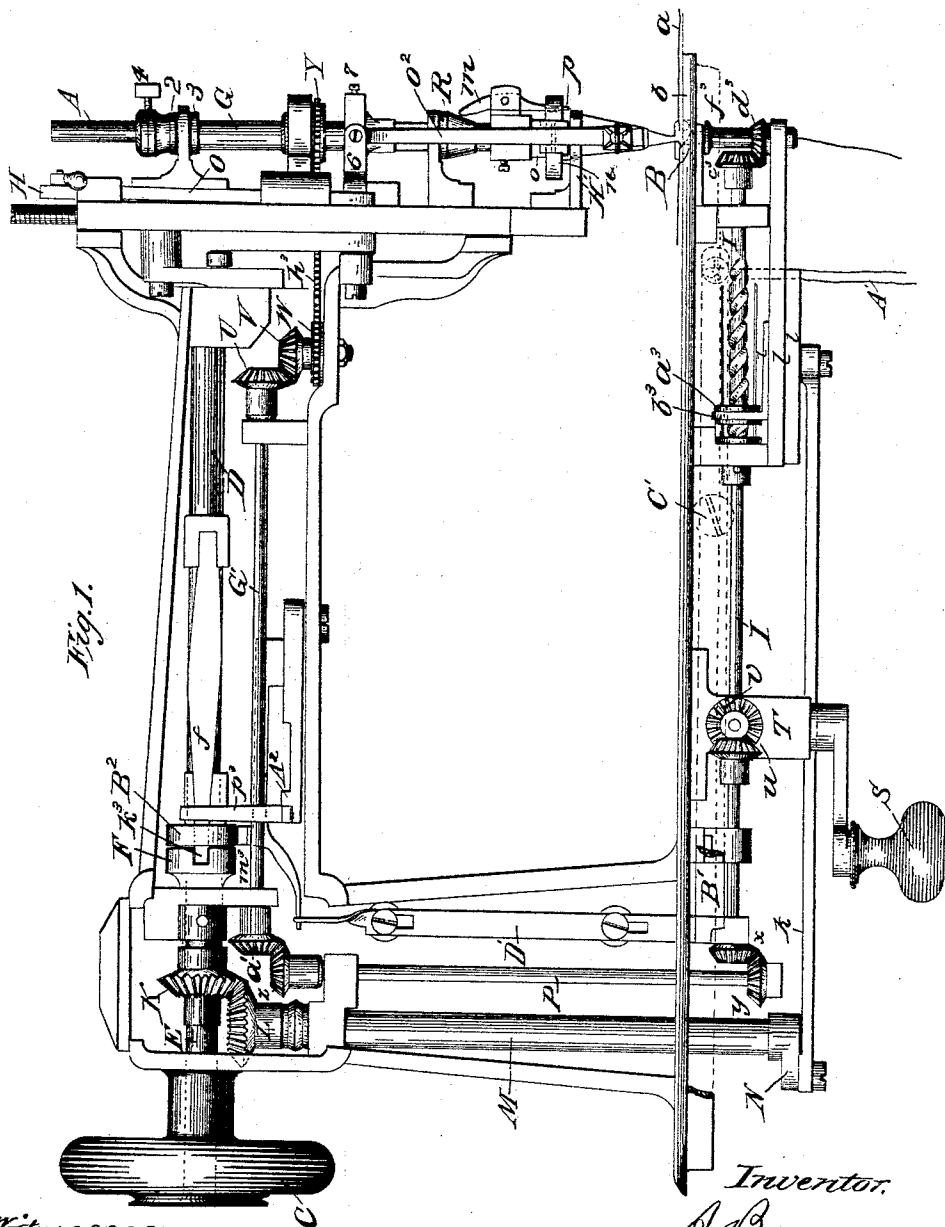


Fig. 1.

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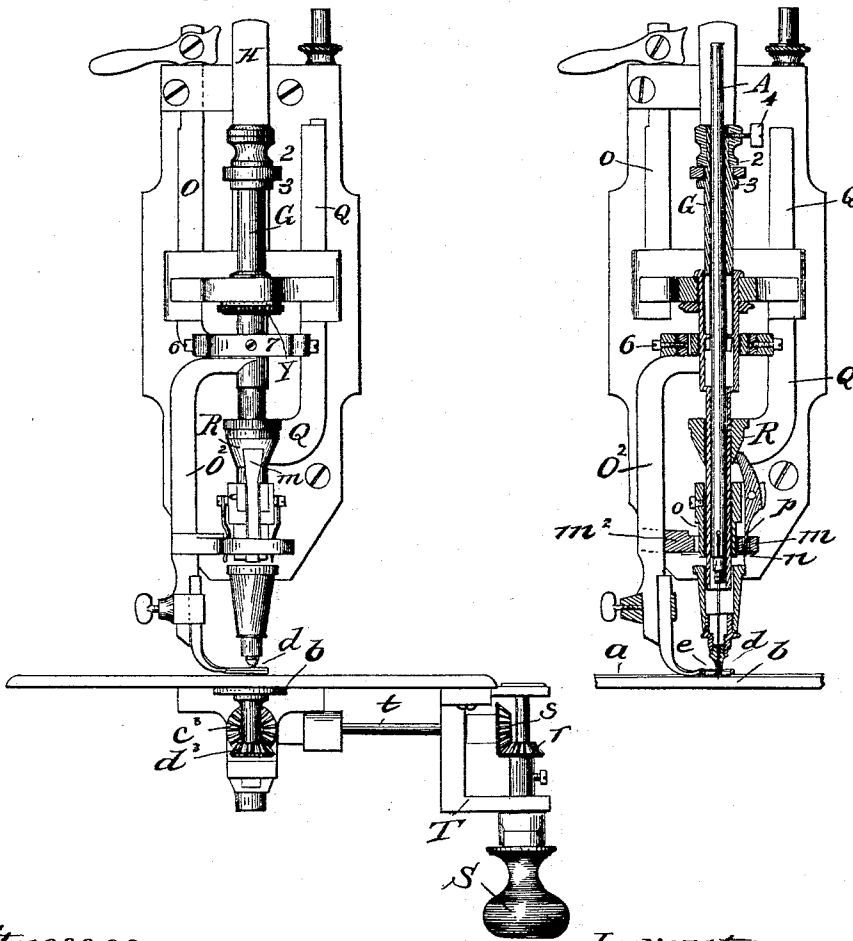
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Fig. 2.

Fig. 4.



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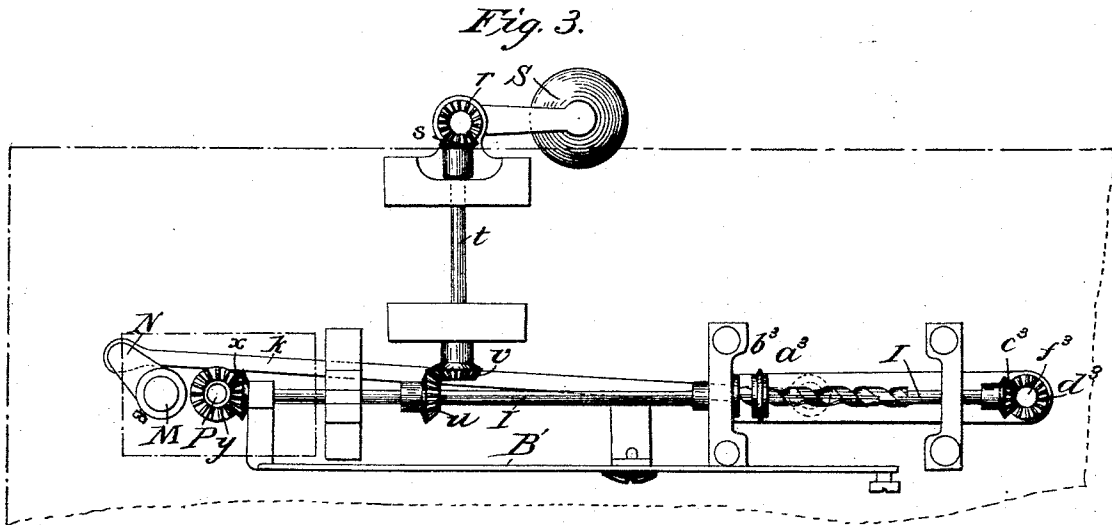


Fig. 10.

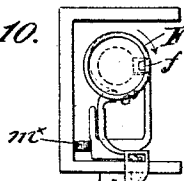


Fig. 9.

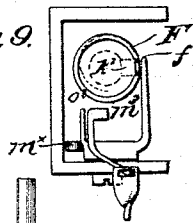


Fig. 5.

Fig. 6.

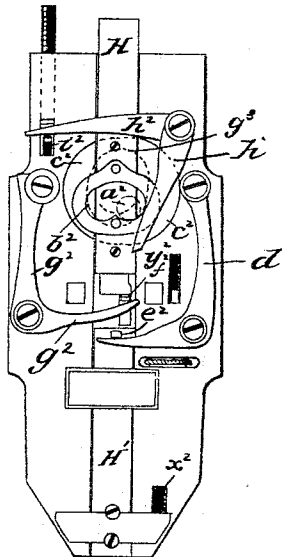
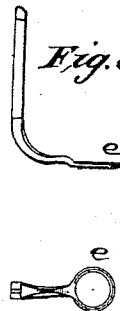


Fig. 7.



Fig. 8.



Witnesses

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ANTOINE BONNAZ, OF PARIS, FRANCE, ASSIGNOR TO EMILE CORNELLY, OF THE SAME PLACE.

Letters Patent No. 83,909, dated November 10, 1868.

IMPROVEMENT IN SEWING-MACHINE FOR EMBROIDERING.

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

To all whom it may concern :

Be it known that I, ANTOINE BONNAZ, of the city of Paris, in the Empire of France, have invented certain new and useful Improvements in Embroidery-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a side view of the machine.

Figure 2 represents an end view thereof.

Figure 3 represents a plan of those parts of the machine which are below its platform.

Figures 4, 5, 6, 7, 8, 9 and 10 represent detached views, hereafter to be referred to.

The like parts of the machine are denoted on the several figures by similar letters.

In making embroidery-work on a sewing or embroidery-machine, the great difficulty occurs that, on making rounds or other intricate design, the entire cloth has to be turned constantly, in conformity with the design to be made, and for this reason that description of embroidery-work is not only difficult to be executed, but can be made with a very moderate degree of speed only. To avoid this difficulty, I have combined the several working-parts of an embroidery-machine in such a manner that a universal-feed motion causes the cloth to move in any direction desired, and that the hooks or needles which make the stitch move in combination with said feed-motion, so as not to change their relative position to each other, and thus embroidery-work of the most intricate design can be made at any desired speed, and without turning the cloth.

To the better understanding of the machine, I will first explain the manner in which the stitch is made. I employ a hooked needle, *c*, represented at fig. 6, such as is employed in making crochet-work, and said hook is secured to the needle-bar *A*, and has a vertical reciprocating motion imparted to it in piercing the cloth *a*, which is supported by the cloth-plate *b*. The needle-hook *c* takes the thread (marked in red) beneath the cloth-plate, draws it up through the cloth, holds the thread while the feed-motion takes place, and then returns downward to make the succeeding stitch.

To accomplish this operation, it is necessary that the thread below the cloth-plate should, at each descending motion of the needle-hook *c*, be presented to the latter in such a manner that it can pull said thread upward, or else the machine will make drop-stitches. This operation of presenting the thread to the hook *c* is effected by means of an oscillating looper, *B*, which, by means of a projection, *l*, takes hold of the thread, and when the needle has arrived at its lowest position, the looper *B* makes a turn of about two hundred and seventy degrees of a circle, and lays the thread around the needle, which, on rising, takes infallibly hold of the thread.

It is further necessary that, when the needle-hook *c* rises, the cloth should be held firmly down upon the

cloth-plate, so as to prevent the hook *c* from pulling it upward. This is effected by means of a nipple, *d*, which surrounds the needle. While the needle rises, the nipple *d* remains stationary until the needle *c* has cleared the cloth, after which the nipple *d* rises, so that the feed of the cloth can take place.

The feed is effected by means of the feed-surface *e*, which has a ring-shape, and which surrounds the needle and its nipple. The feed-surface has a vibratory horizontal as well as vertical motion, like that of an ordinary sewing-machine, besides its universal-feed motion, hereafter to be described.

To enable an easier and better understanding of my invention, I will describe the *modus operandi* of the above elements, when the machine works on straight lines only, and add to it afterward the operation of said parts when the machine runs on curved lines, and for producing angular work.

C represents the driving-wheel of the machine. It is secured to a shaft, *E*, which is provided with a coupling-disk, *F*, which, by means of the coupling-spring *f*, drives the shaft *D*. The latter turns an eccentric, whose pin *a*² (fig. 5) enters into the cam-groove *b*² of the needle-bar driver *H*, which, holding the needle-bar carrier *G* between two collars, 2 3, imparts to it the desired vertical reciprocating motion. The needle-bar *A* itself is secured to the needle-bar carrier by means of the pressure-screw 4.

The movement of the nipple *d* is effected by means of a cam, *c*², which acts upon the lever *d*², and which operates the pin *e*² of the nipple-carrier *H*¹, to raise the nipple *d*, which, in its turn, is pressed downward upon the cloth-plate, by the action of a spring, *x*², when the cam *c*² releases the lever *d*².

The bevel-pinion *K* is secured to the horizontal shaft *B*, and gears into a similar pinion, *L*, secured to the vertical shaft *M*, that, at its lower end, is provided with a crank, *N*, which, on turning, imparts a vibratory motion to the rod *k* and to the slide *l*, which, by the action of the spiral nut *a*², which turns in the ring *b*², and the reciprocations of which impart to the spirally-cut shaft *I* an oscillating motion, which, by the action of the bevel-gears *c*² and *d*², is transmitted to the vertical shaft *f*² of the looper *B*. Thus, at each motion of the needle-hook *c*, the looper *B* is turned the amount necessary to throw the thread into the path of the rising needle-hook.

The vertical motion of the feed-surface *e* is effected by means of the cam *c*², which, acting upon the lever *g*², the latter raises the bar *O* by acting upon pin *f*². The feed-bar *O*² is connected to the bar *O* by a universal joint, 6 7, on which said feed-bar can swing freely in all directions. When the action of the cam *c*² ceases, the spring *y*² causes the bars *O* and *O*², and consequently the feed-surface *e*, to descend upon the cloth-plate.

The horizontal action of the feed-surface is effected in the following manner:

The cam g^3 of the shaft D acts upon the lever h^2 , and the latter upon the pin i^2 of the rod Q, which is provided with a conical sleeve, R, over which the end of a small lever, m , slides. When the conical sleeve R descends, it acts upon the upper end of the small lever m , and the lower end, p , of said lever imparts a horizontal movement to the nut m^2 , which is adjusted within the circular collar n , and which latter is secured to the feed-bar O². It thus imparts to the latter and to the feed-surface e the horizontal-feed motion.

As the nut m^2 is adjusted upon the square part o of the piece to which the lever m is pivoted, it will forcibly turn therewith, and within its collar n , as the piece o is turned, and thus the direction of the feed is changed according to the position which is given to the piece o .

Having thus described the operation of the several parts of the machine for making straight lines, it is to be shown in what manner any design of curved lines can be executed without turning the cloth, and which is the essential feature of the machine.

S represents a crank, beneath the platform of the machine, whose shaft is supported by a bracket, T.

A bevel-pinion, r , transmits motion to a pinion, s , and to the transverse shaft t , whose other end is geared to the pinion u by means of the pinion v .

Motion is transmitted from the horizontal shaft I to the vertical shaft P, by means of the bevel-pinions x and y , and from shaft P to shaft G' by the pinions z and a' .

A pinion, U, is secured to the end of the shaft G', and turns the pinion V, whose shaft is rigidly secured to the frame of the machine.

A cogged wheel, W, is secured to pinion V, and, by means of an endless chain, h^3 , it is connected to a cogged wheel, Y, secured on the needle-bar carrier G.

By turning the crank S, a combined turning-movement is given to the looper B, to the needle-bar carrier G, and to the piece o , which controls the direction of the feed-motion, and thus any design, no matter how complicated, can be embroidered without turning the cloth, but by simply directing its motion by turning the crank S.

In making complicated embroidery-work, and chiefly in embroidering letters, it frequently occurs that sharp angles have to be produced. This can only be done by arresting the motion of the machine instantaneously, and by suddenly turning the crank S the desired angle, and by again starting the machine.

To accomplish this in an easy and effective manner, I have organized the following coupling-device:

On working the machine, two treadles are applied to its stand, one for each foot. By means of the right-hand treadle, the fly-wheel is turned, whose strap passes

in and around the groove of the wheel C, and said wheel thus rotates constantly. The left-hand treadle is connected, by means of a rod, A¹, to the lever B¹, which is pivoted to the screw C'. The end of the lever B¹ is connected with the vertical slide D'. By pressing upon the treadle connected with rod A¹, the slide D' is depressed, as represented in figs. 1 and 9.

The shaft D is provided with a spring-clutch, f , whose end springs into the notch k^3 of the coupling-disk F, (figs. 1 and 9,) and, when the parts are in the positions represented at figs. 1 and 9, the shafts E and D are coupled together, but, upon the treadle connected with rod A¹ being released, the slide D' is raised by the action of the spring m^x , and the projection m^3 of the clutch-lever A² is gripped by the tooth O³ on the circumference of disk B², as the latter turns, forcing the arm p^3 of clutch-lever A² against the spring f , whereby the latter is forced out of the recess k^3 , as represented at fig. 10, instantaneously uncoupling the shaft D from shaft E, thus arresting the motion of the machine, although the driving-wheel C continues its motion. When the machine is thus uncoupled, the crank S is suddenly turned, to change or to reverse the feed-motion, and a sharp angle is produced on the design, without arresting the motive-power of the machine.

Having thus fully described the nature of my invention,

What I claim herein as new, and desire to secure by Letters Patent, is—

1. The combination of a hook or needle with an oscillating looper B, and the universal-jointed feed-bar e , when said three elements are connected to each other by a mechanism, substantially such as described, which permits of turning one or the other of said devices, without changing the relative positions of said parts to each other, for the purposes described.

2. The universal-jointed feed-bar O², in combination with the collar n , sleeve R, and the operating-parts which constitute the universal-feed motion above described, constructed and arranged substantially as and for the purposes set forth.

3. The combination and arrangement of parts, by which the needle-bar carrier G is connected with the feed-bar O², the looper B, and the crank S, for imparting the movements to the several parts of the machine.

4. The coupling and uncoupling-device, substantially as herein described, for the purpose of disconnecting the parts and suddenly changing the feed, when used in combination with an embroidery-machine, as described.

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Witnesses:

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