(No Model.) 2 Sheets—Sheet 1.

J. E. BERTRAND.

WAX THREAD SEWING MACHINE.

No. 589,403. Patented Sept. 7, 1897.

Fig. 1.

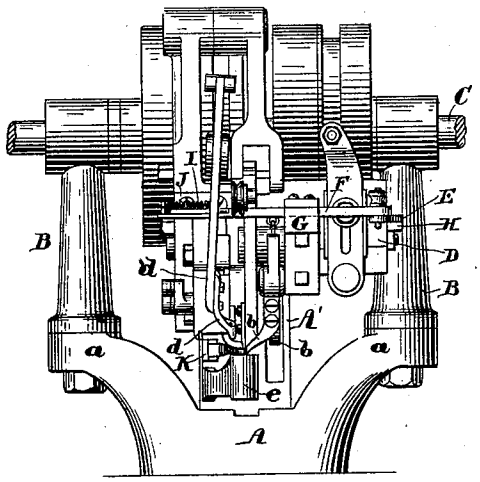


Fig. 2.

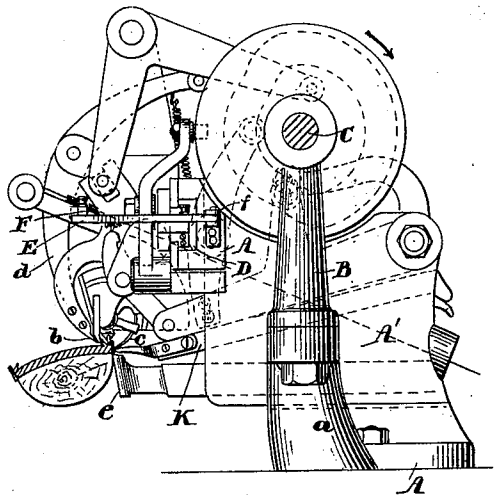


Fig. 7.

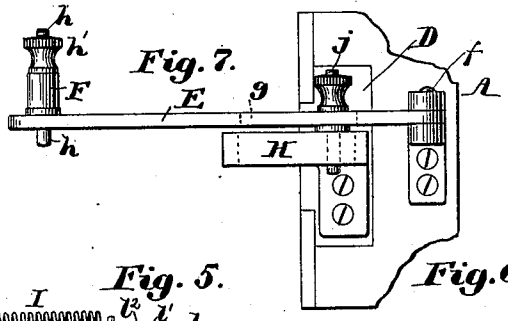


Fig. 5.

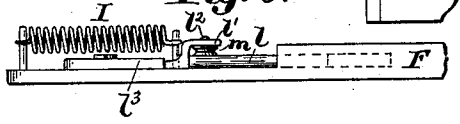
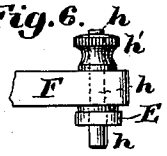


Fig. 6.



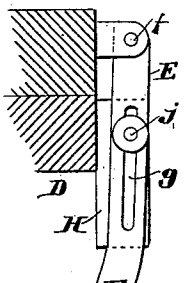
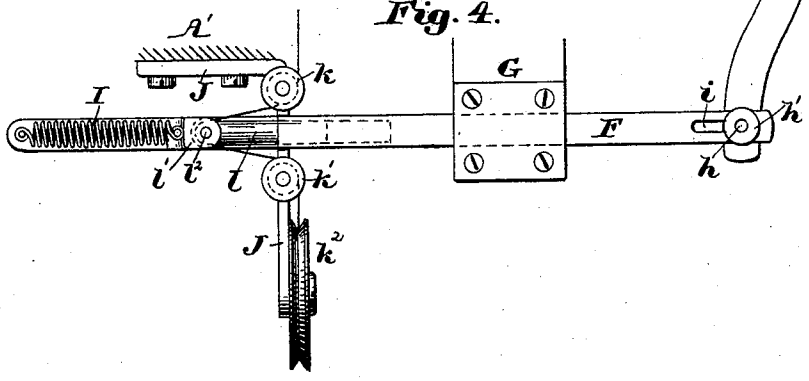


Fig. 4.



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Geo. A. Sewall

Inventor:

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(No Model.)

2 Sheets—Sheet 2.

J. E. BERTRAND.

WAX THREAD SEWING MACHINE.

No. 589,403. Patented Sept. 7, 1897.

Fig. 3.

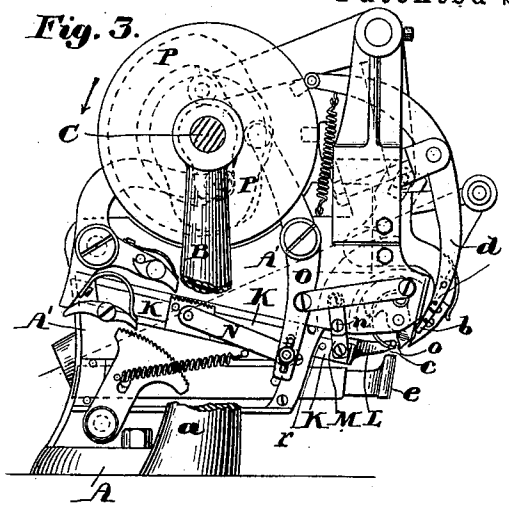


Fig. 8.

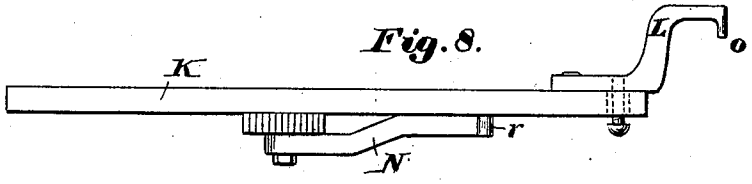


Fig. 10.



Fig. 9.

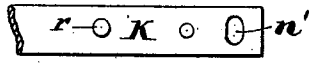


Fig. 11.



Fig. 12.

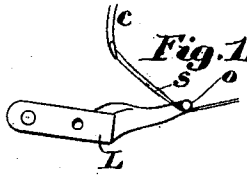
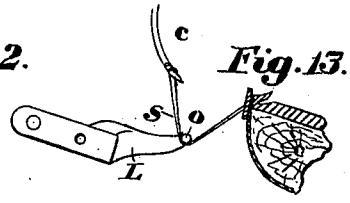


Fig. 13.



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UNITED STATES PATENT OFFICE.

JOSEPH E. BERTRAND, OF BOSTON, MASSACHUSETTS.

WAX-THREAD SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 589,403, dated September 7, 1897.

Application filed January 14, 1897. Serial No. 619,206. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ELI BERTRAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Chain-Stitch Wax-Thread Sewing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to chain-stitch wax-thread sewing-machines, and is an improvement upon the invention described in the Letters Patent No. 190,709, granted to Christian Dancel May 15, 1877; and it consists in certain novel features of construction, arrangement, and combination of parts relating especially to the thread pull-off and measuring devices and the stitch-setting mechanism, which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended and in which my invention is clearly pointed out.

Figure 1 of the drawings is a front elevation of the head of a chain-stitch wax-thread sewing-machine embodying my invention. Fig. 2 is a side elevation of the same, looking toward the left of Fig. 1. Fig. 3 is an elevation of the opposite side of said machine with a portion of the frame broken away. Fig. 4 is a plan of the thread pull-off and measuring mechanism drawn to an enlarged scale. Fig. 5 is an elevation of a portion of the thread-pull-off mechanism. Fig. 6 is an elevation of a portion of the pull-off bar and an end view of the lever for operating the same. Fig. 7 represents an end elevation of the feed-slide and pull-off bar and a side elevation of the bar-operating lever. Fig. 8 is a plan of the back-gage, its slide, and the slide-operating link. Fig. 9 is an elevation of a portion of the front end of the back-gage slide. Fig. 10 is a longitudinal section of the radius-arm for imparting an up-and-down movement to the front end of the back-gage. Fig. 11 is an elevation of the back-gage removed from its carrier-slide. Figs. 12 and 13 are two diagrams illustrating the operation of the back-gage for setting the stitch.

In the drawings, A is the base of the head of the machine, which in practice is mounted upon a suitable supporting column or bench (not shown) and has formed in one piece therewith or secured thereto in any suitable manner the centrally-arranged and upwardly-projecting frame-section A′, as shown.

The base A has formed thereon the two outwardly and upwardly projecting arms *a a* to receive and support the columns B B, having suitable bearings formed on their upper ends, in which is mounted the driving-shaft C, upon which are mounted the several actuating-cams for operating the various moving parts of the machine.

The parts above mentioned, together with the feed-slide D, its feed point or awl *b*, the needle *c* and its carrier, the looper *d*, the shoe-supporting gage *e*, and all other parts of the machine not more particularly referred to or described herein, are constructed, arranged, and operate substantially as described in said before-cited Letters Patent and are not of my invention.

E is a lever fulcrumed at *f* to a fixed part of the frame of the head, is provided between its two ends with the longitudinal slot *g*, and is adjustably pivoted by means of the stud *h* and clamping-nut *h′* and the slot *i* to the pull-off bar F, mounted and movable endwise in a bearing in the stand G, as shown in Fig. 4.

The feed-slide D has firmly secured to its end the stand H, in the flange of which is formed a slot corresponding to the slot *g* in the lever E, said stand H being connected to the lever E by means of the stud *j*, adjustably secured in said slot *g* and projecting into the slot in said stand, so that a greater or less vibration may be imparted to said lever E and a consequently greater or less movement of the pull-off bar F, according as the stud *j* is set at a greater or less distance from the fulcrum of said lever.

The pull-off bar F extends from the stand G toward the left of Fig. 1 and between the two thread-guiding pulleys or sheaves *k* and *k′* and has mounted in a suitable longitudinal bearing therein the rod *l*, which has formed integral therewith, at its outer end, the ear *l′*, through which and said rod is set the pin *l²*, upon which is mounted the thread-guiding sheave *m*.

The rod *l* and sheave *m* are normally held in the positions shown in Figs. 4 and 5 by the tension of the spring I, connecting said rod and a fixed pin set in the bar F, as shown in Figs. 4 and 5.

A stop-plate b^3 is secured to the bar F beneath the spring I to limit the movement of the rod l and sheave m toward the left of Fig. 5.

The thread-guiding sheaves k, k', and k^2 are mounted upon studs upon or set in the bracket J, firmly secured to a fixed portion of the head-frame, as shown in Fig. 4.

K is the back-gage slide, mounted in a guideway in the frame-section A' in a well-known manner.

L is the back-gage, pivoted at its rear end to the slide K instead of being firmly secured thereto in a fixed position, as heretofore, and is pivoted intermediate of its ends to the lower end of the radius-arm M, made in two parts adjustably secured together by the clamping-screw n, (see Fig. 9,) and is pivoted at its upper end to the frame-section A', as shown in Fig. 3, in such a position that when the slide K is moved to the extreme of its rearward movement the front end of the back-gage L will be depressed by the action thereon of the radius-arm M, the pin connecting the lower end of said arm to said back-gage passing through the slot n', formed in the forward end of the slide K, to permit said depression of the front end of the back-gage.

The back-gage L presents about the usual breadth at the front to bear against the work, but is cut away immediately in the rear of its bearing-surface and upon its left side to form the laterally-projecting and rounded finger o, beneath which the needle c passes to enter the work and which engages the loop drawn out by the needle when said needle is retracted and draws said loop downward to set the stitch after the needle has completed its rearward movement.

The back-gage slide K has pivoted thereto one end of the link N, the opposite end of which is pivoted to the lower end of the lever O, to which a vibratory motion is imparted by the cam-path P. (Shown in dotted lines in Fig. 3.)

The slide K has set therein a stop-pin r to limit the forward movement of said slide and the back-gage by engaging a fixed portion of the machine.

The operation of my invention is as follows: The several parts being in the position indicated in the drawings, with the point of the needle having just been withdrawn from the work with a loop of thread engaging the barb of the needle, if the cam-shaft be revolved in the direction indicated by the arrows on Figs. 2 and 3 the needle will be moved to the extreme of its rearward stroke, drawing the loop s of thread into the position indicated in Fig. 12. When this is accomplished, the back-gage slide K is moved back to the extreme end of its rearward movement by the action of the cam-path P upon the lever O, thereby causing the front end of the back-gage L to be depressed, thereby drawing the loop s into the position shown in Fig. 13 and firmly setting the stitch while said loop is still engaged by the barb of the needle. The needle and back-gage then commence to move forward, and as soon as the strain of the loop upon the needle is removed the feed-slide is moved toward the left of Fig. 1 to feed the work, which is completed before the point of the needle reaches the work, and as the pull-off bar derives its motion directly from the feed-slide through the medium of the lever E it follows that the thread is pulled off the tension-wheel after the needle has commenced its forward movement and while the loop is not held under tension by said needle. When the needle commences to move forward, the back-gage also moves forward and its front end is raised before the point of the needle reaches the work, so that the needle passes below the finger o of said gage, the cams for operating the needle, the back-gage, and the feed-slide being so constructed and arranged relative to each other and to the levers upon which they act as to cause the several movements of said parts to take place in the order and time above described. As the needle moves forward to pierce the work for the second stitch the loop of thread just previously engaging the barb of the needle remains on the shank of the needle, but is released from the barb by the needle advancing through it, the work is pierced by the needle, the looper carries the thread around the needle to engage it with the barb, the needle is withdrawn from the work with the new loop engaging the barb thereof in such a manner that the new loop is drawn through the next previous loop without said previous loop being engaged by the barb of the needle, and when the needle has reached the extreme of its backward movement the back-gage slide is moved to the rear, the back-gage is depressed, engaging the new loop between the work and the barb of the needle, depressing it into the position shown in Fig. 13, and setting the stitch as before. The tension of the spring I tends to move the sheave m toward the left of Figs. 1, 4, and 5, and serves to take up the slack of the thread and keep it taut at all times without danger of breaking the same.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a chain-stitch wax-thread sewing-machine the combination of the feed-point-operating slide; a stand formed upon or secured to said slide and provided with a slot extending at an angle to the line of movement of said slide; a thread-pull-off bar arranged parallel or nearly so to said slide; a lever pivoted at one end to a fixed portion of the machine and at its other end to said thread-pull-off bar; means for adjustably connecting said lever to said stand; two thread-guiding pulleys or sheaves mounted upon fixed journals on opposite sides of said pull-off bar; and a thread-guiding sheave mounted upon said pull-off bar and movable therewith.

2. In a chain-stitch wax-thread sewing-machine the combination of the reciprocating

feed-slide D; the slotted stand H; the lever E; the bar F; means for adjustably connecting said lever E to said bar F and stand H; the thread-guiding sheave movably attached to said bar F; the spring I; and the two thread-guiding sheaves *k* and *k'* all constructed arranged and operating substantially as described.

3. In a chain-stitch wax-thread sewing-machine the combination with a curved barbed needle and a reciprocating back-gage slide, of a back-gage pivotally connected to said slide and provided with the laterally-projecting finger *o* arranged to engage the loop of thread drawn through the work by the needle; and a radius-arm connecting said back-gage to a fixed part of the machine whereby the front end of said gage is depressed to set the stitch as it is moved toward the rear by the action of its carrying-slide after the needle has completed its rearward movement.

4. In a chain-stitch wax-thread sewing-machine the combination with a curved barbed needle, means for reciprocating said needle in a curved path, and a reciprocating back-gage slide, of a back-gage pivotally connected to said slide and provided with a laterally-projecting finger at its front end; and means for moving said back-gage about its pivotal connection to said slide as said slide is reciprocated.

5. In a chain-stitch wax-thread sewing-machine the combination of a reciprocating bar or slide arranged to be moved toward and from the front of the machine; a back-gage pivotally attached to said slide and provided with a stitch-setting finger; a link or radius-arm pivoted at one end to said back-gage and at its other end to a normally stationary pivot; and means for adjusting the front end of said back-gage to a higher or lower level when in its forward position.

6. In a chain-stitch wax-thread sewing-machine the combination with a curved barbed needle and its carrier, of a back-gage provided with a laterally-projecting stitch-setting finger at its front end; means for moving said gage to and from the work; and means for imparting to the front end of said gage an up-and-down movement and causing said stitch-setting finger to engage the thread drawn from the work by the needle between the needle and work and thus set the stitch.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 11th day of January, A. D. 1897.

JOSEPH E. BERTRAND.

Witnesses:
N. C. LOMBARD,
GEORGE W. PROUTY.