

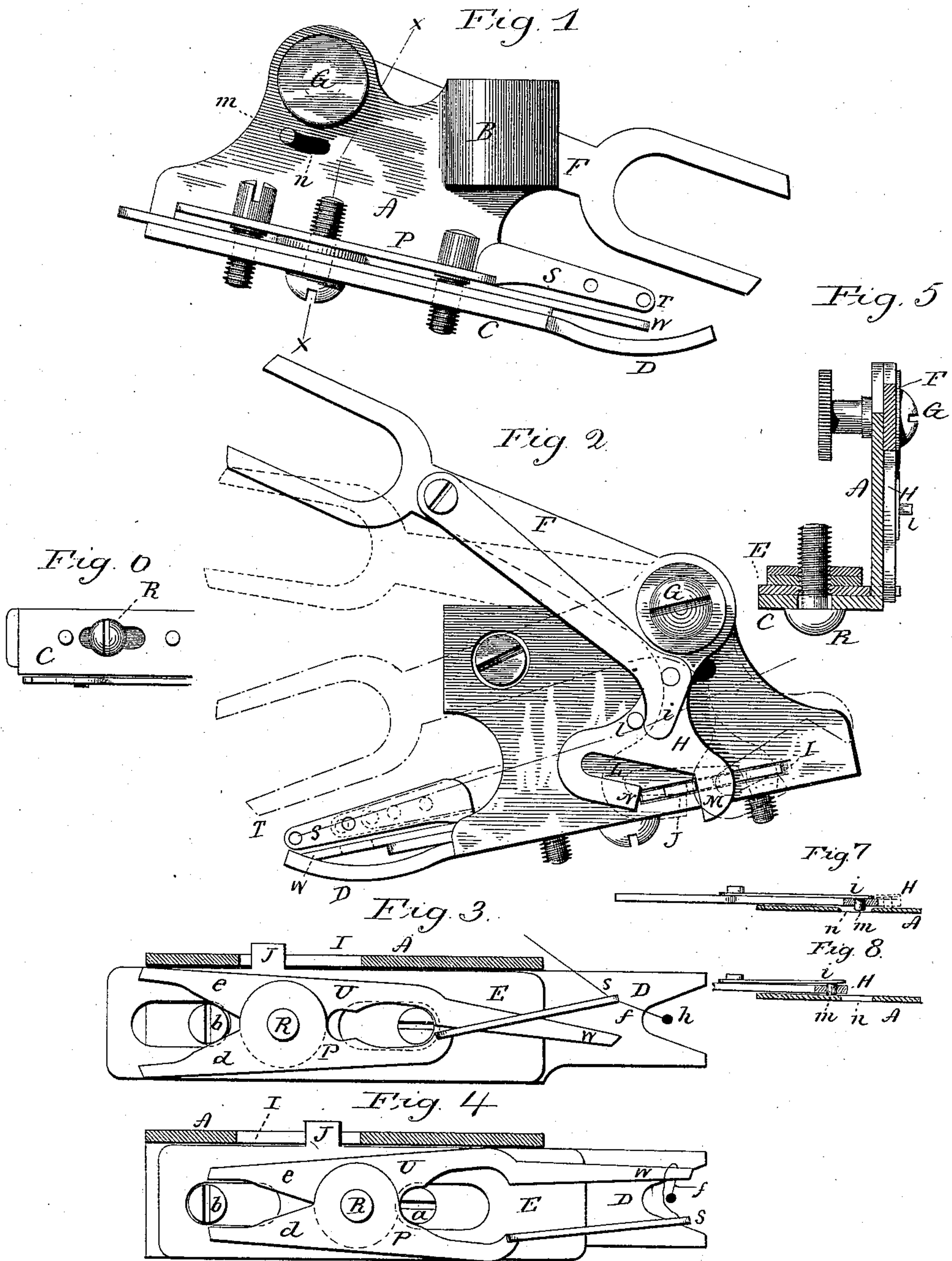
(No Model.)

J. P. LAVIGNE.

EMBROIDERING ATTACHMENT FOR SEWING MACHINES.

No. 324,124.

Patented Aug. 11, 1885.



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# UNITED STATES PATENT OFFICE.

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## EMBROIDERING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 324,124, dated August 11, 1885.

Application filed May 18, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH P. LAVIGNE, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Embroidering Attachments for Sewing-Machines; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view looking from the right; Fig. 2, a side view looking from the left; Figs. 3 and 4, longitudinal sections cutting through the body at the slot I and over the levers P U, to illustrate the operation of the said levers; Fig. 5, a vertical section through the pivot on which the levers are hung; Fig. 6, an under side view showing the pivot and the slot in the base through which it works; Figs. 7 and 8, longitudinal sections through the slot *n*, in which the stud *m* works, to show the operation of the thread-clamp.

This invention relates to an improvement in that class of embroidering attachments for sewing-machines in which the embroidery-thread is carried by a finger back and forth across the path of the needle, so that one stitch is laid upon one side of the embroidery-thread and the other on the opposite side, the embroidery-thread being laid in the form of loops upon the surface of the work, the extent of the loop depending upon the amount of embroidery-thread delivered; and the invention consists in the construction, as hereinafter described, and particularly recited in the claims.

A represents the body of the attachment, on which is a socket, B, by which the attachment may be applied to the presser-foot spindle in place of the usual presser-foot of the machine. The lower edge of the body is turned at right angles in the form of a flange, C, to form the base. This base inclines downward and toward the needle, where it terminates in the presser-foot D. On the flange C a slide, E, is arranged to be moved back and forth toward the needle. To this slide a longitudinal intermittent reciprocating movement is imparted by means of a lever, F, hung to the base up-

on a fulcrum, G, one arm extending toward the needle and there forked to embrace a stud on the needle-bar in the usual manner for this class of machine attachments, and so that the up-and-down movement of the needle imparts a corresponding vibratory movement in a vertical plane to the said lever. The second arm, H, of the lever extends downward outside the body A, as seen in Fig. 2. Through a slot, I, in the body, parallel with the plane of the slide E, a projection, J, extends from said slide E, as seen in Fig. 3.

The arm H of the actuating-lever is constructed with a longitudinal slot, L, from which an opening downward is made to form a shoulder, M, at the rear end of the slot, and a shoulder, N, about midway of the length of the slot. The slot L, opening, and the shoulders M N are such with relation to the stud J, projecting from the slide E, that when the needle-bar is in its up position and has carried the arm F of the lever to that position, as seen in Fig. 2, the rear shoulder, M, is bearing against the rear edge of the stud J, and has carried the slide to its extreme forward or advance position. Then as the needle begins its descent and takes with it the arm F the arm H is thrown to the rear. The shoulder N, striking the forward edge of the stud J, forces the slide rearward until the shoulder N may escape from the stud, and as indicated in the first broken lines downward in Fig. 2. Then the slot L passes onto the stud, leaving the stud and slide stationary, while the needle-bar descends until the forward end of the slot reaches the stud. Then the slide will be given a still further and extreme rear movement by the contact of the forward end of the slot with the forward edge of the stud. Then, in returning, the ascent of the needle takes the arm F upward, carrying the arm H forward, the slot permitting it to pass freely over the stud J until the shoulder M reaches the rear end of the stud. Then the slide will move to its extreme forward position under the force brought to bear through the shoulder M. Thus an advance and retreating movement is imparted to the slide E under the corresponding ascent and descent of the needle. On the slide E the embroidery-thread-carrying lever P is hung



upon a pivot, R, and so as to swing thereon in a horizontal plane. The lever terminates in the thread-carrying finger S, which has an eye, T, in its extreme forward end, through which the embroidery-thread passes. Beneath the lever P, and on the same pivot, a lever, U, is hung, which extends forward and terminates in the looper-finger W, the finger being adapted to swing in a plane parallel with that of the thread-carrying finger S. On the base D, and forward of the pivot, is a stud, *a*, which extends up through a slot in the slide E and between the two levers forward of the pivot. At the rear of the pivot is a similar stud, *b*, extending up from the base through a like slot in the slide, and between the tail of the levers in rear of the pivot the tail *d* of the lever P extends to the right of the rear stud, *b*, and the tail *e* of the lever U extends to the opposite side of the same pivot. The adjacent edges of the tails are both inclined outward and rearward, and so that as the slide E is drawn rearward the inclined edges of the tails *d* *e*, striking the stud *b*, will throw the tails outward and correspondingly turn the forward ends or fingers inward, so that they cross each other in their extreme rear movement, as indicated in Fig. 3. In the reverse or advance movement the forward arm of the levers, having a corresponding cam-like edge, strikes the stud *a*, and the fingers are correspondingly opened, as seen in Fig. 4, so that under the reciprocating movement of the slide, under the ascent of the needle to give advance to the slide, the fingers are thrown forward from the position seen in Fig. 3 to that seen in Fig. 4, and at the same time separate, and on the descent of the needle in the extreme rear movement of the slide E the fingers retreat and are thrown across each other, as seen in Fig. 3. The operation of the fingers under this movement is as follows: The line *f*, Figs. 2 and 3, represents the embroidery-thread as it stands through the eye in the embroidery-thread carrier and drawn from the needle-hole *h*. At this time, it will be observed, the embroidery-thread stands at one side of the line of the needle, while the looper stands upon the opposite side. The two now advance, the looper strikes the embroidery-thread below the thread-carrier, the thread-carrier passing to the opposite side of the needle from which it started, and the looper to the opposite side from which it started, as seen in Fig. 4, so that a loop is formed around the looper W, and through which the needle in its next descent will pass. Then as the needle descends and enters the fabric through the embroidery-thread loop, formed as aforesaid, the shoulder N of the arm H strikes the stud J and throws the slide rearward, to partially draw up the embroidery-thread, but yet leave freedom for the passage of the needle. Then the shoulder N, escaping from the stud J, leaves the slide and the fingers free until the needle approaches its ex-

treme down position, when the forward end of the slot L in its turn strikes the stud and forces the slide to its extreme rear position, and brings the fingers again to their crossed position, as seen in that figure, ready for the next operation, and so that, continuing, each ascent of the needle will cause the fingers to advance and pass to opposite sides, the thread-carrier taking the embroidery-thread over the looper to form the loop, then, returning, will carry the thread to its first position, and return the looper to the position to commence the formation of the next loop. As a tension, and whereby only a predetermined amount of thread may be fed to the embroidery-thread carrier, I arrange a spring-clamp, *i*, on the outside of the arm F. This clamp is in the form of a finger and bears upon the outer surface of the arm H, as seen in Figs. 7 and 8. Forward of the finger is a stud, *l*, under which the thread passes, the broken line, Fig. 2, indicating the thread as it comes from the tension, passes under the clamp *i* beneath the pin *l*, thence to the embroidery-thread-carrier finger. On the inside of the finger *i* is a stud, *m*, of a little greater length than the thickness of the arm H, and in the body A, I make a slot, *n*, concentric to the bearing of the lever F, and in the path of which the stud *m* may work; but the slot *n* is less in extent than the movement of the stud *m*, and so that in the extreme upward movement of the arm F the stud will be drawn onto the surface of the body A, as indicated in Fig. 8, and thereby turn the clamp outward from the arm H. On the descent of the needle the stud at the proper time falls into the slot *n*, and so as to clamp upon the surface of the arm H, and then as the lever approaches its extreme rear position the stud strikes the rear end of the slot *n* and rides up onto the surface of the body A to again raise the clamp, as indicated in broken lines, Fig. 7. Therefore, during the time that the clamp is raised, the thread is free from its engagement, but while the clamp is down the thread will be clamped between it and the arm H, so as to prevent feeding of the thread or compel it to move with the arm. The result of this is, that as the arm H commences its forward movement it runs free of the embroidery-thread until the stud *m* drops into the slot *n*. Then the thread will be engaged by the clamp, and will be drawn from the tension device or spool, as the case may be, until such time as the stud *m* reaches the forward end of the slot. Then the clamp will be raised and relieve the thread from such draft. The thread taken, therefore, will be to the extent of the time in which the clamp is engaged. On the return of the arm H with the embroidery-finger the thread is left free during the first part of the rear movement of the arm H. Then as the stud *m* re-enters the slot *n* the thread is again clamped, and will be drawn up by the continued rear movement of the arm H until it approaches its extreme rear position, when the thread will be again re-



leased. This clamping device therefore tends to feed the requisite amount of thread, and also to draw up the loop of the embroidery-thread to its proper position, and so that the loops will be uniform in size.

The stud *l* may be an eye through which the thread passes, it being employed to hold the thread in the proper relation to the clamping device.

From the foregoing it will be understood that I do not claim, broadly, an embroidery-thread-carrying finger and a corresponding looper arranged to swing in planes across the path of the needle and in opposite directions, as such, I am aware, is not new; but

What I do claim is—

1. The combination of the body A, having the base C formed thereon, terminating in a presser-foot and constructed for attachment to the presser-foot bar, a slide, E, arranged on said base, free for longitudinal reciprocating movement toward and from the needle, a lever, one arm of which is adapted to engage the needle-bar, the other arm extending downward, and constructed with a longitudinal slot, L, and with shoulders M N opening from said slot, the said slide constructed with a stud adapted to be engaged by the shoulders and slot of the said arm H, levers P U, hung upon said slide and so as to swing in horizontal planes, the one lever, P, extended to form a thread-carrying finger, S, the other extended to form a looper, W, the adjacent faces of the said levers constructed with cam-shaped edges in front and in rear of the pivot, and stationary studs *a b*, the one in front and the other in rear of the pivot on which the levers are hung, substantially as and for the purpose described.

2. The combination of the base C, terminating in a presser-foot, D, and constructed for attachment to the presser-foot bar, slide E, arranged on said base for longitudinal reciprocating movement toward and from the needle, a lever, one arm of which is adapted to engage the needle-arm and to partake of its up-and-down movement, a second arm extending downward and adapted to engage said slide, and whereby, through the up-and-down movement of the needle-bar, a corresponding advance and retreating movement is imparted to said slide, a pair of levers hung upon

a pivot on said slide, and so as to move therewith and swing on said pivot in planes parallel with said slide, the one of said levers extending forward and terminating in an embroidery-thread-carrying finger, S, the other extending forward and terminating in a corresponding looper, W, the adjacent faces of said levers constructed of cam shape both forward of and in rear of the pivot upon which they are hung, and stationary studs between the said levers, one forward of and the other in rear of the pivot, substantially as described, and whereby, under the reciprocating movement of said slide, a corresponding horizontal vibratory movement is imparted to said fingers across each other and across the path of the needle.

3. The combination of the base C, terminating in a presser-foot, D, and constructed for attachment to the presser-foot bar, slide E, arranged on said base for longitudinal reciprocating movement toward and from the needle, a lever, one arm of which is adapted to engage the needle-arm and to partake of its up-and-down movement, a second arm extending downward and adapted to engage said slide, and whereby, through the up-and-down movement of the needle-bar, a corresponding advance and retreating movement is imparted to said slide, a pair of levers hung upon a pivot on said slide and so as to move therewith and swing on said pivot in planes parallel with said slide, the one of said levers extending forward and terminating in an embroidery-thread-carrying finger, S, the other extending forward and terminating in a corresponding looper, W, the adjacent faces of said levers constructed of cam shape both forward of and in rear of the pivot upon which they are hung, and stationary studs between the said levers, one forward of and the other in rear of the pivot, the spring thread-clamp *i*, arranged upon the lever, a stud, *m*, extending from said clamp through the lever, and a slot, *n*, inside the lever, into which said stud may enter in the swinging movement of the lever, substantially as and for the purpose described.

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