(No Model.) 3 Sheets—Sheet 1.

S. W. WARDWELL, Jr.

WAX THREAD SEWING MACHINE.

No. 262,160. Patented Aug. 1, 1882.

Fig. 4.

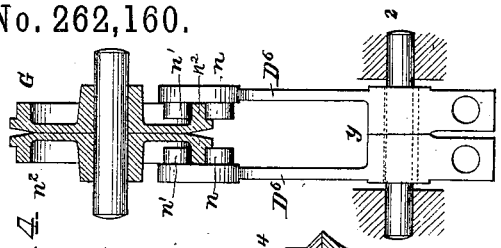
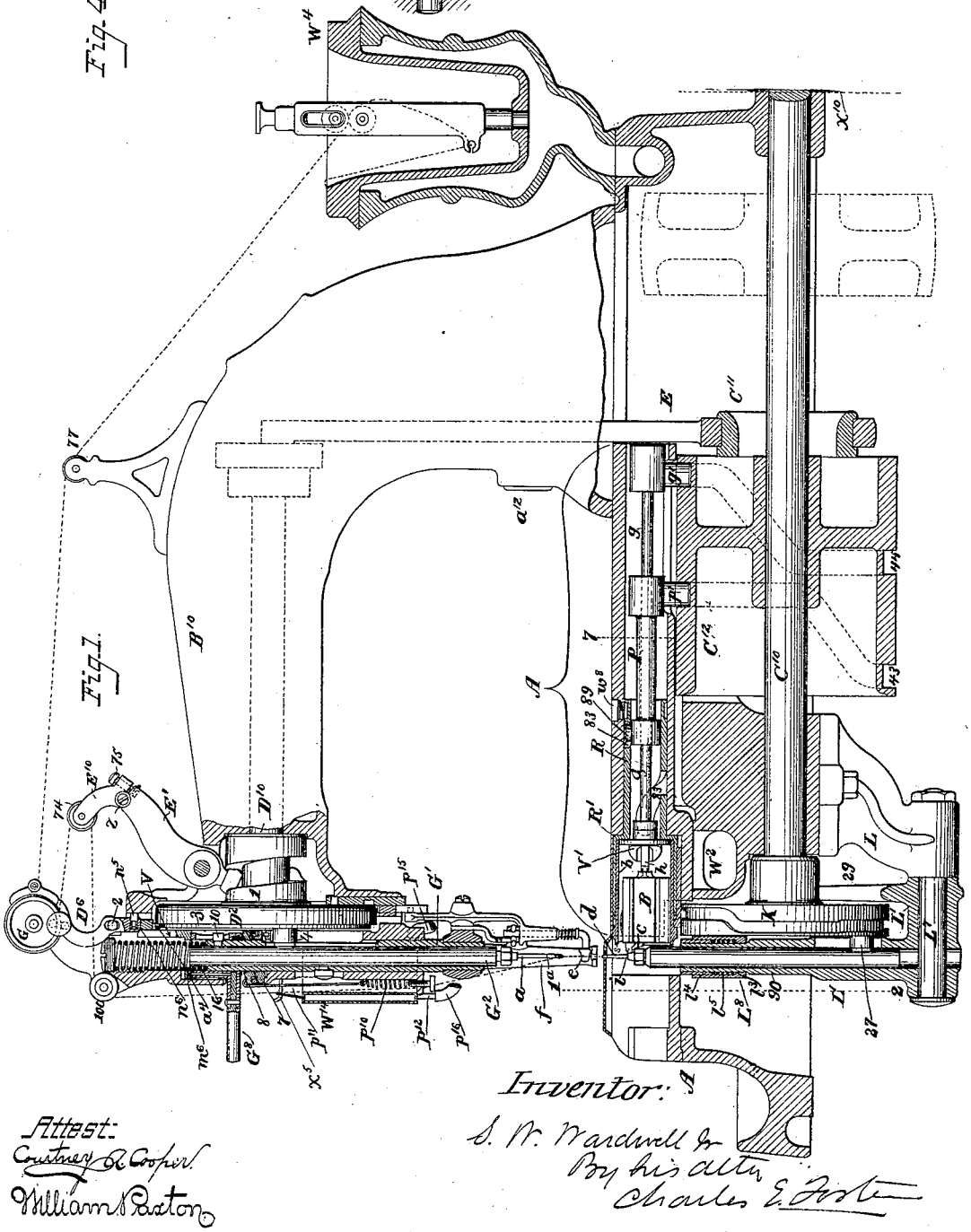


Fig. 1.



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S. W. WARDWELL, Jr.

WAX THREAD SEWING MACHINE.

No. 262,160. Patented Aug. 1, 1882.

Fig. 3.

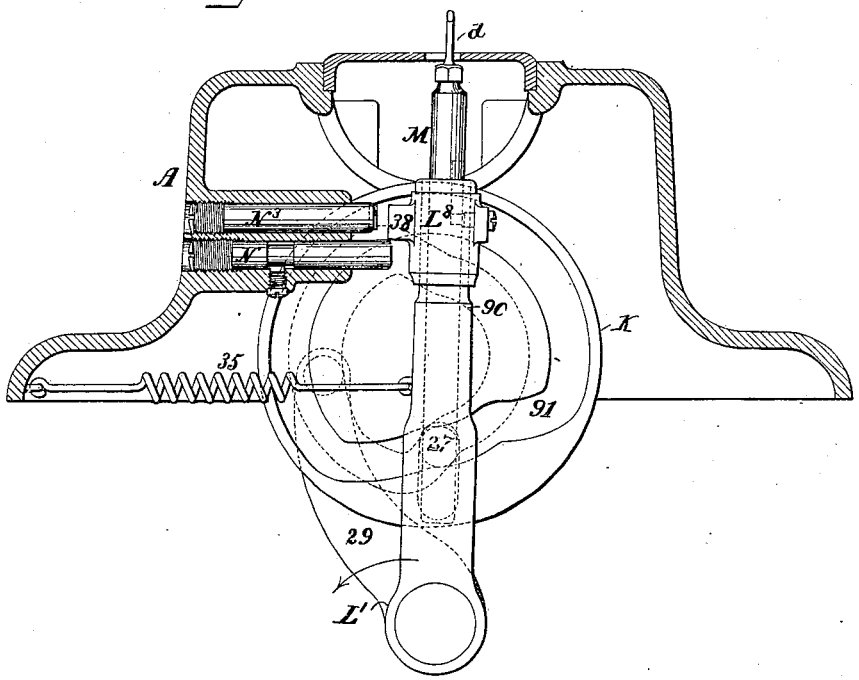


Fig. 2.

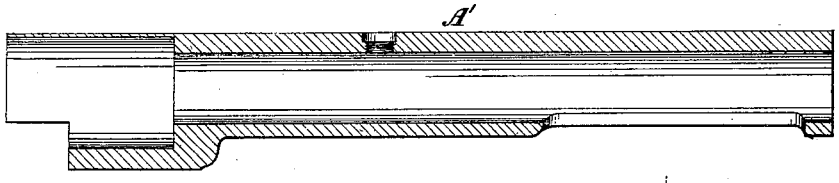


Fig. 5.

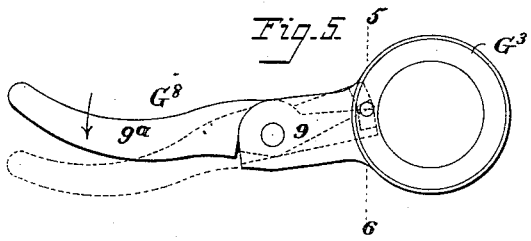
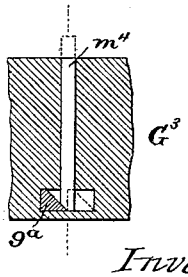


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

S. W. WARDWELL, Jr.

WAX THREAD SEWING MACHINE.

No. 262,160. Patented Aug. 1, 1882

Fig. 7.

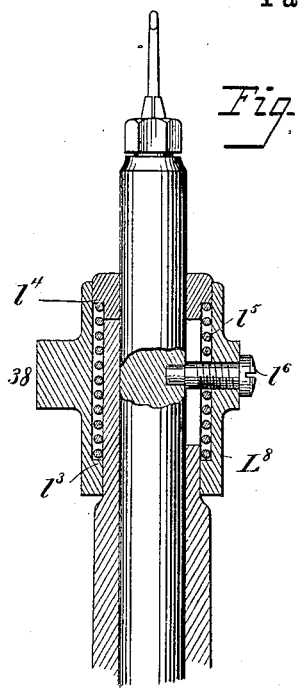


Fig. 9.

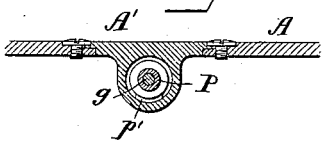
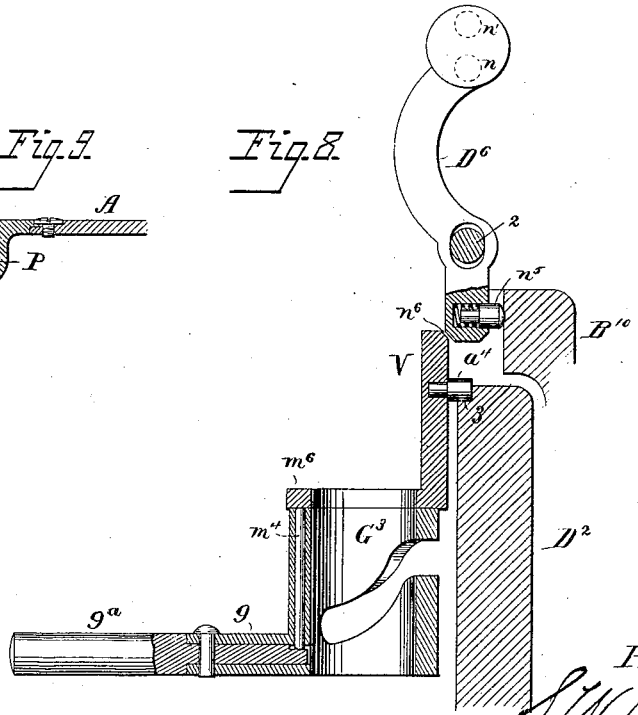


Fig. 8.



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Charles E. Foster

UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, JR., OF WOONSOCKET, RHODE ISLAND.

WAX-THREAD SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,160, dated August 1, 1882.

Application filed February 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, SIMON W. WARDWELL, Jr., of Woonsocket, Providence county, Rhode Island, have invented certain new and useful Improvements in Wax-Thread Sewing-Machines, of which the following is a specification.

My invention relates to that class of sewing-machines employed for sewing with two waxed threads; and it consists in certain improved details of construction, more especially adapted to the machine for which Letters Patent of the United States were issued to me on the 12th day of August, 1879, as fully described hereinafter, the objects being to secure more effective working and adjustment and simplify the construction of the machine.

In the drawings, Figure 1 is a longitudinal sectional elevation of a sewing-machine illustrating my improvements. Fig. 2 is a longitudinal sectional view of part of the bed of the machine; Fig. 3, a cross-section on line 1 2, Fig. 1; Fig. 4, a part transverse section of the thread-pulley and gripping-lever; Fig. 5, a plan view of the ring for elevating the presser-foot; Fig. 6, a section on the line 5 6, Fig. 7. Fig. 7 is an enlarged transverse section through the awl-bar-operating appliances. Fig. 8 is an enlarged transverse section of part of the presser-foot and thread-clamping appliances. Fig. 9 is a section on the line 7, Fig. 1.

In its main features the machine is similar to the machine patented to me as aforesaid, the sewing operations, comprising the perforating and feeding of the material by the awl *d*, the bringing of the needle *a* into position by a gage, *i*, for the thread to be seized by a looper, *c*, the spreading of the loops on the shoulder *s* of a carrier, *b*, the carrying of a part of the thread between the shuttle B and its driving-rod *g* in the recess of an oscillating segment, *h*, and the controlling of the thread by a vibrating shaft carrying a roller, *e*, being all precisely the same as in the said machine, and the parts named being the same in construction. I will not therefore minutely describe the construction and operation of these and other parts identical with those in the machine patented as aforesaid, but will refer to them by the same letters which designate them in the prior patent.

A is the bed-piece, provided with bearings for the driving-shaft C^{10}, and with a bracket, L, carrying a pin, L^7, on which oscillates the feed-lever L′. The bed of the machine is provided with a detachable block, A′, of the form shown in Fig. 2, having bearings adapted to the cylindrical case R′ of the carrier *b* and to the sleeve R of said case.

By removing the block A′ the case R′ and its attachments and contents may be withdrawn together without necessarily disturbing their relative positions, permitting ready access to the parts carried by the block and those within the base-plate. The mode in which the block A′ is supported and retained in the recess in the bed-plate is shown in Fig. 9.

The rotary motion of the case R′ and of the carrier *b* within the same, which carrier rotates the cam V′ that oscillates the segment *h*, is imparted by the longitudinal reciprocation of a hollow shaft, P, provided with a stud, 89, which enters a spiral slot, 83, of the sleeve R, a stud, W^3, adapted to an annular groove of said sleeve, preventing any longitudinal play of the latter. A longitudinal movement is imparted to the shuttle by the rod *g*, which carries the cam V′ and segment *h* and passes through the shaft P. The rod *g* and shaft P are both reciprocated by a cylindrical double-grooved cam, C^{12}, on the shaft C^{10}, a stud, *p*′, on an enlargement of the shaft P, fitting the groove 43 of said cam, and a stud, *g*′, on an enlargement of the rod *g*, fitting a groove, 44, which grooves are so formed as to impart to the rod and shaft their proper relative movements, thus dispensing with a number of complicated appliances used to secure a like result in the aforesaid machine.

The lever L′, which has arms 90 29, Figs. 1 and 3, is oscillated by the cam-wheel K, and the awl-bar M is provided with a stud, 27, which enters a groove, 91, in the said wheel, constructed to impart the desired vertical reciprocating motion to the bar. On the arm 90 of the lever L′ is a sleeve, L^8, between a lip, l^3, of which and a shoulder, l^4, of the arm intervenes a spiral spring, l^5, that tends to depress

the sleeve, a pin, l^6, extending from the sleeve through a slot in the arm and into the awl-bar and preventing the turning of the sleeve on the arm and insuring the lifting of the sleeve as the awl-bar rises. From one side of the sleeve extends a lug, 38, and in the base A, adjacent to the lug, as shown, are two bars, N N^3, the latter being so adjusted that when the lug 38 bears upon the same the awl will be directly in line with the needle.

Attached to the bed and to the arm 90, below the bar N, is a spring, 35, the purpose of which is to carry the arm forward and hold the lug on the sleeve against the horizontal adjusting-bar N during the ascent of the awl until the lug is above the bar N, when the spring will carry the lever in the direction of its arrow, Fig. 3, until the lug strikes the end of the bar N^3, the fabric being thus fed forward. As the awl-bar descends the lug 38, striking on the top of the bar N, will hold the sleeve L^8 stationary until the awl passes from the material, when the lever L′ is swung back by the action of the cam-wheel until the lug 38 is free from contact with the bar N, when the spring l^5 will throw the sleeve down to a position with its lug opposite the bar N. The stitch may be lengthened or shortened by setting the bar N to vary the distance between the end of the same and the end of the bar N^3. The bars N N^3 are shown as threaded and adapted to threaded sockets in the bed-plate, so that each may be adjusted longitudinally by turning the same; but other means of adjustment may be used.

The overhanging arm B^{10} carries the shaft D^{10}, which is driven by the eccentric C^{11} on the shaft C^{10} through the medium of the slotted connecting-lever E, sliding and vibrating on the stud a^{12}. The eccentric may be cast with and form a part of the cam cylinder C^{12}, thereby preventing either from slipping and getting out of time with the other and reducing the cost of adjustment.

The needle-bar G^2 slides in a sleeve, G′, carrying the presser-foot *f*, and is operated from a cam-wheel, D^2, which has a cam-groove receiving a stud, 4, on the needle-bar. The needle-thread is carried from the wax-pot W^4 over a pulley, 77, round a grooved thread-pulley, G, round a pulley, 74, carried by a take-up lever, E′, round a pulley, 100, downward in front of the head of the arm B^{10} to the needle. When the thread is to be drawn upward the pulley G is held tightly and the take-up lever E′ is thrown back by the action of a cam, *l*, on the shaft D^{10}, into the groove in which the short end of the lever enters. The extent of the draft upon the thread is regulated by the adjustment of the end section, E^{10}, of the take-up lever, which section is pivoted at Z to the main section of the lever, a screw, 75, turning in the main section and adapted to threads in the section E^{10}, serving as a means of setting the latter. I do not here claim this feature.

The pulley G, instead of being clamped as described in my aforesaid patent, is secured and released by the action of the gripping-lever D^6, which is slotted to receive a fulcrum-pin, 2, on which the lever can vibrate and slide. The lever is forked (see Fig. 4) to receive the pulley G, and from the inner face of each prong project two pins, *n n′*, between which extend the annular side flanges, n^2, of the pulley G. These pins are so disposed relatively to the pulley and pivot of the lever D^6 that when the latter is thrown forward the lugs will occupy a position nearly vertical one above the other, and the pulley can turn freely; but when the lever is thrown back the lugs will bite against the opposite sides of the flanges n^2 and hold the pulley immovable. The pulley may thus be gripped absolutely fast and released with but a very slight motion of the lever D^6. Different modes of operating the lever may be adopted. For instance, it may carry a spring-seated pin, n^5, bearing against a part of the arm B^{10}, so as to swing the upper end of the lever inward and insure the gripping of the pulley, and the outward movement may be effected by a beveled-ended slide, V, rising and bearing against a beveled face, n^6, of the lever. The movement of the slide during the making of each stitch is effected by a cam-edge, 3, of the wheel D^2, which operates upon a stud, a^4, of the slide to reciprocate the latter vertically. If desired, the lever may be divided on the line *y*, Fig. 4.

The presser-foot is operated by the cam-ring G^3, having an inclined or spiral groove receiving the stud 10 of the presser-sleeve G′, which is raised and lowered by turning the ring, a spring, 16, bearing on the sleeve G′ and maintaining the desired downward pressure of the foot upon the work, as in my aforesaid patented machine. The handle G^8 of the ring G^3 consists of a fixed shank, 9, and a pivoted lever, 9^a, the inner end of which is beveled and constitutes the bearing of a rod, m^4, extending vertically through the ring. By moving the lever the rod is forced upward against a ring, m^6, connected to and forming part of the slide V, and the lever is so arranged, as shown, that this will result on seizing the lever in turning the ring in the direction of the arrow, Fig. 5, as required to lift the presser-foot, so that the same movement that raises the foot will also simultaneously result in raising the slide V and in releasing the grip upon the thread-pulley G, thus permitting the drawing out of the upper thread as the work is removed from the machine. When the material is fed by the action of the awl the presser-foot is automatically raised by the tilting and lifting of two gripping-rings, 7 8, which are lifted at the rear by the action of a slide operated by the wheel D^2, as described in my aforesaid patent; and to insure the depression of the front sides of said rings and the instant biting of the same on the sleeve when tilted, I use a spring, p^{10}, connected by a rod, p^{11}, to a lug on the upper ring, and an adjusting-screw, p^{12}, whereby the

spring may be set to exert any desired pressure. A flat spring or spiral spring bearing on the upper ring may be substituted for that shown.

I have found that with extremely hard wax, or when the weather is cold, the waxed thread is liable to become stiff and wiry before it reaches the needle, to prevent which I hang detachably a steam-box, W^{14}, at a point adjacent to the lower end of the needle-bar and carry the thread in proximity to said box, whereby the wax is warmed, so as to entirely obviate the difficulty referred to. This box may be permanent; but a convenient construction is shown in Fig. 1, consisting of a hollow curved casing adapted to the front of the head of the arm B^{10}, secured in any suitable manner. For instance, it may be hung to a pin, x^5, projecting from the head. Said box is provided with inlet and outlet tubes, to which are connected a flexible steam-pipe, p^{15}, and drip-pipe p^{16}.

The shuttle and operating appliances are heated, as heretofore, by the steam in the surrounding steam-chamber W^2, formed in the base A, but open at one side, so as to be closed by the insertion of the block A′ in its place, the removal of the block thus permitting access to the chamber. In some cases the steam-chest is wholly in a block independent of the block A′.

I claim—

1. The bed-piece A, carrying the driving-shaft, in combination with a detachable block, A′, adapted to the bed, and with shuttle-operating and loop-spreading mechanism having its bearings in and carried by said block, substantially as set forth.

2. The detachable block A′, in combination with the frame having a steam-chamber formed therein below said block and closed thereby, as set forth.

3. The combination, with the case R′, having a spirally-slotted sleeve, R, and with the shuttle and driving-rod *g*, of a shaft, P, carrying a stud, 89, adapted to the slot of said sleeve, and a cam-cylinder, C^{12}, having grooves 43 44, adapted to receive studs p' g' on the shaft P and rod *g*, substantially as set forth.

4. The combination, with the lever L′, of the awl-bar M, provided with a sleeve, L^8, having a lug, 38, a spring bearing said sleeve downward, bar N, and bar N^3, substantially as set forth.

5. The combination of the lever L′, the awl-bar M, sliding thereon, sleeve L^8, sliding on the lever connected to the bar, and having a stud, 38, and spring l^5, substantially as set forth.

6. The combination, with the thread-pulley G, provided with flanges n^2, of a lever, D^6, provided with biting-lugs *n n′*, and with devices for vibrating the lever to grip and release the pulley, substantially as set forth.

7. The combination, with the presser-foot bar and elevating devices, and with the thread-pulley G and lever D^6, constructed and arranged, as set forth, to clamp and unclamp the same, of appliances constructed to swing the lever and unclamp the pulley as the foot is elevated, substantially as set forth.

8. The cam-ring G^3, provided with a fixed shank, 9, pivoted beveled-ended handle 9^a, and rod m^4, bearing on the end of said handle, in combination with the presser-foot bar, pulley G, clamp-lever, ring m^6, and slide V, constructed to vibrate said lever, substantially as set forth.

9. The combination, with the presser-foot sleeve, gripping-rings 7 8, and operating mechanism, of the spring p^{10}, arranged, as specified, to depress the front sides of said rings.

10. The combination, with the rings 7 8 and spring p^{10}, of an adjusting device for varying the force of said spring, as set forth.

11. The detachable steam-casing W^{14}, adapted to the arm and communicating with pipes p^{15} p^{16}, as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL, JR.

Witnesses:
EDWIN J. PEIRCE, Jr.,
FRED H. BISHOP.