(No Model.) 5 Sheets—Sheet 1.

L. GODDU.

SOLE SEWING MACHINE.

No. 545,484. Patented Sept. 3, 1895.

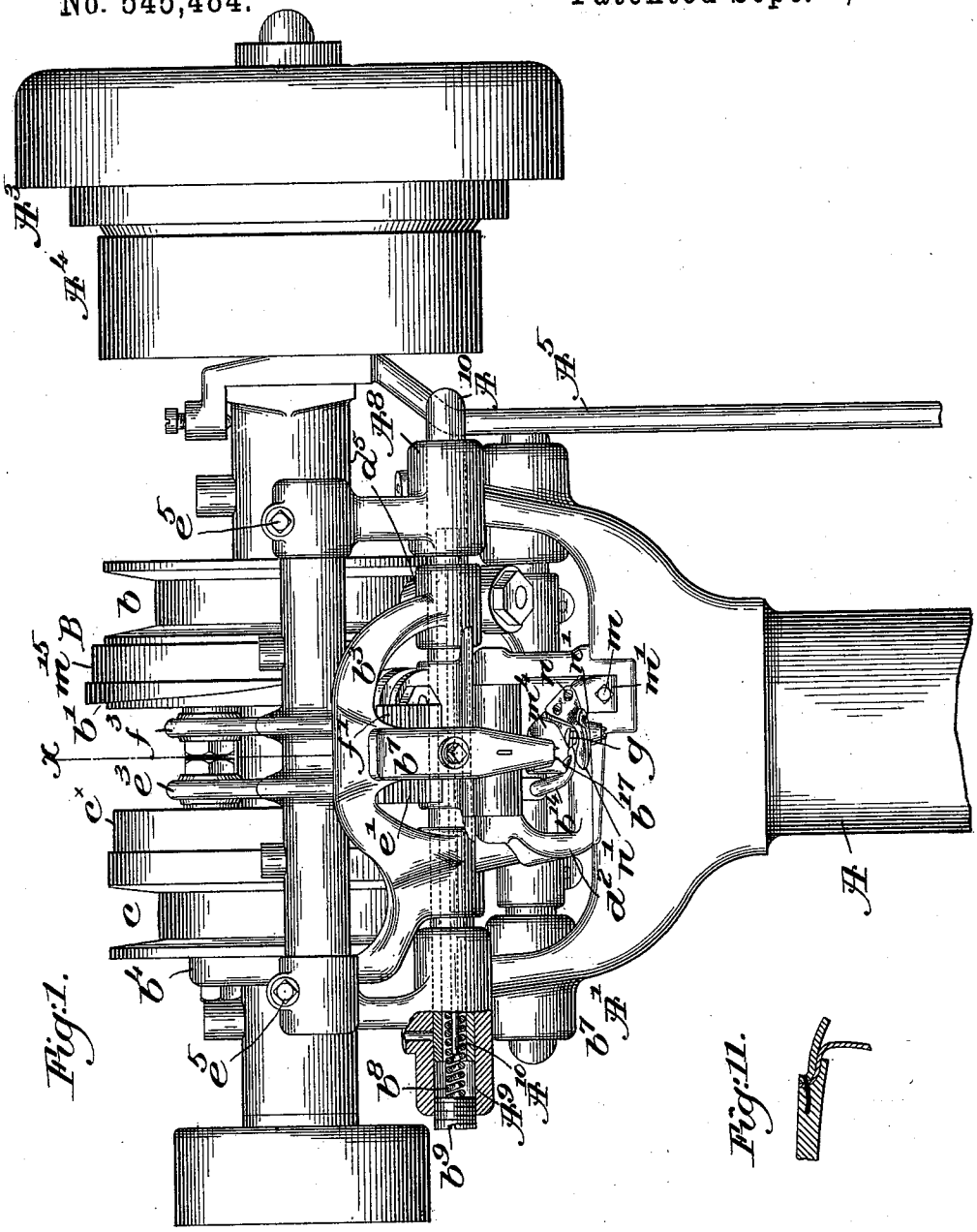

Fig. 1.

Fig. 11.

Fig. 10.

Witnesses.
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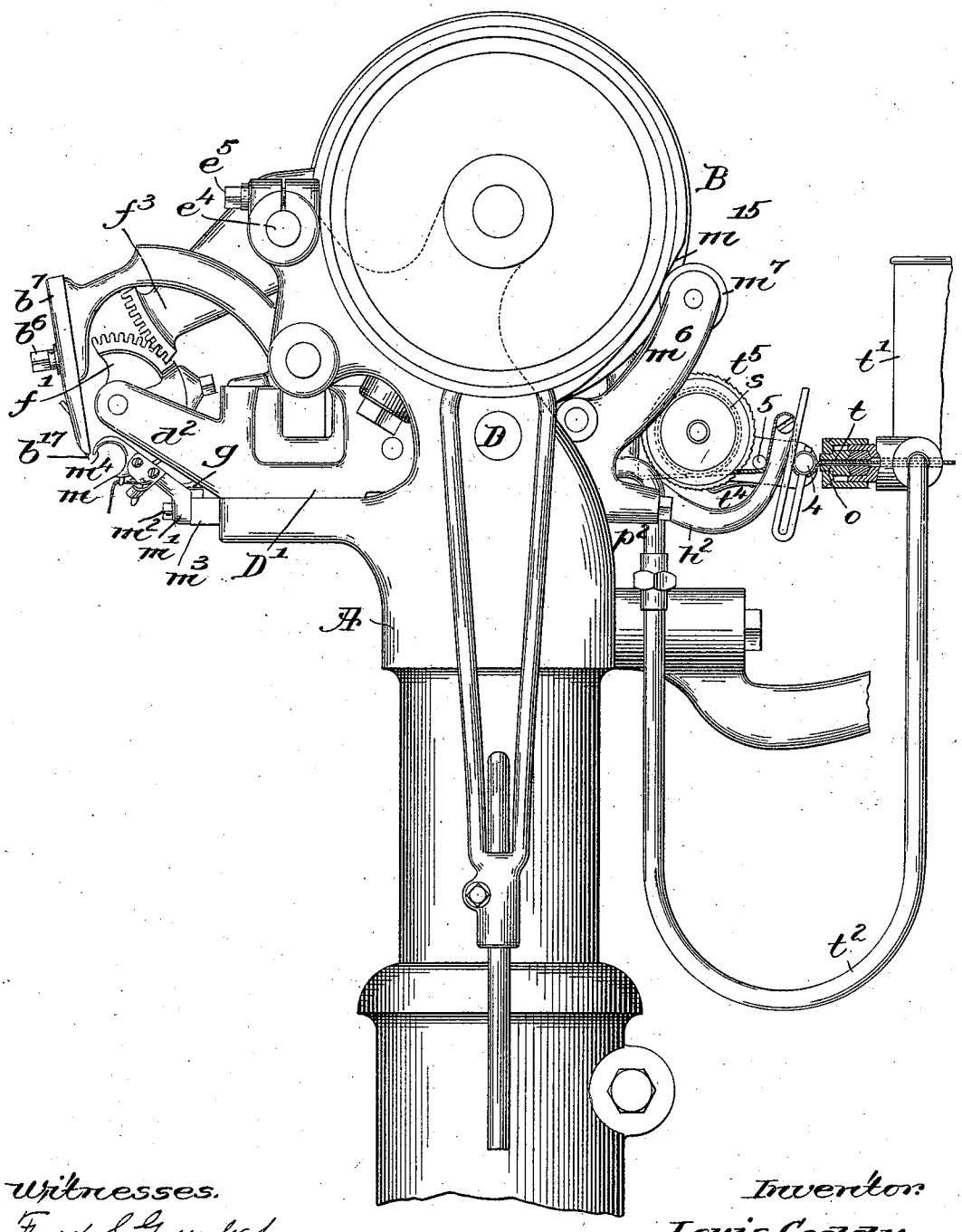
(No Model.) 5 Sheets—Sheet 2.

L. GODDU.

SOLE SEWING MACHINE.

No. 545,484. Patented Sept. 3, 1895.

Fig: 2.



Witnesses.
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(No Model.) 5 Sheets—Sheet 3.

L. GODDU.

SOLE SEWING MACHINE.

No. 545,484. Patented Sept. 3, 1895.

Fig: 3b.

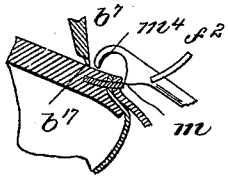


Fig: 3.

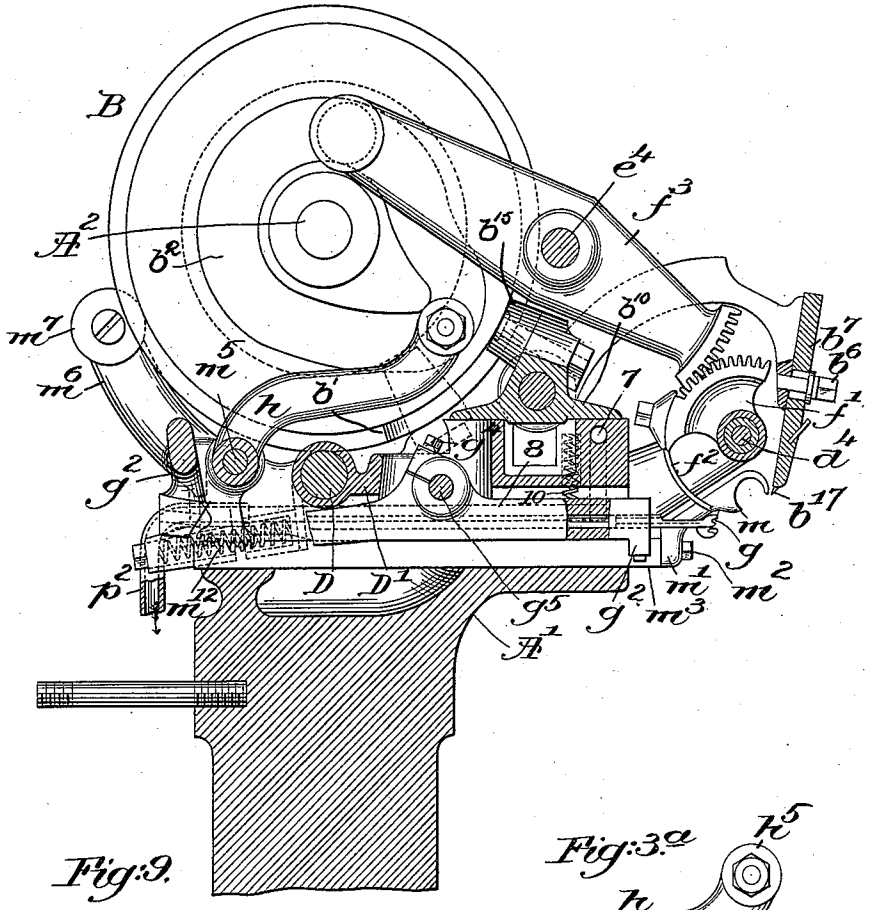


Fig: 3a.

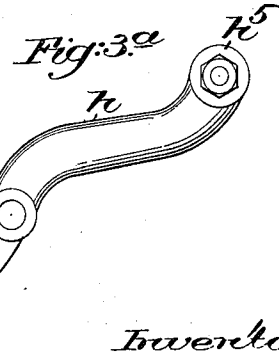
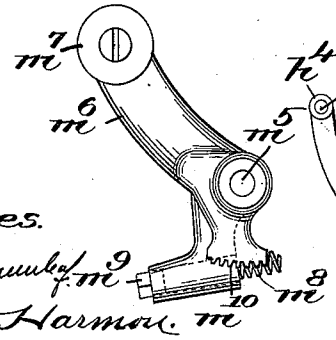


Fig: 3.



Witnesses.
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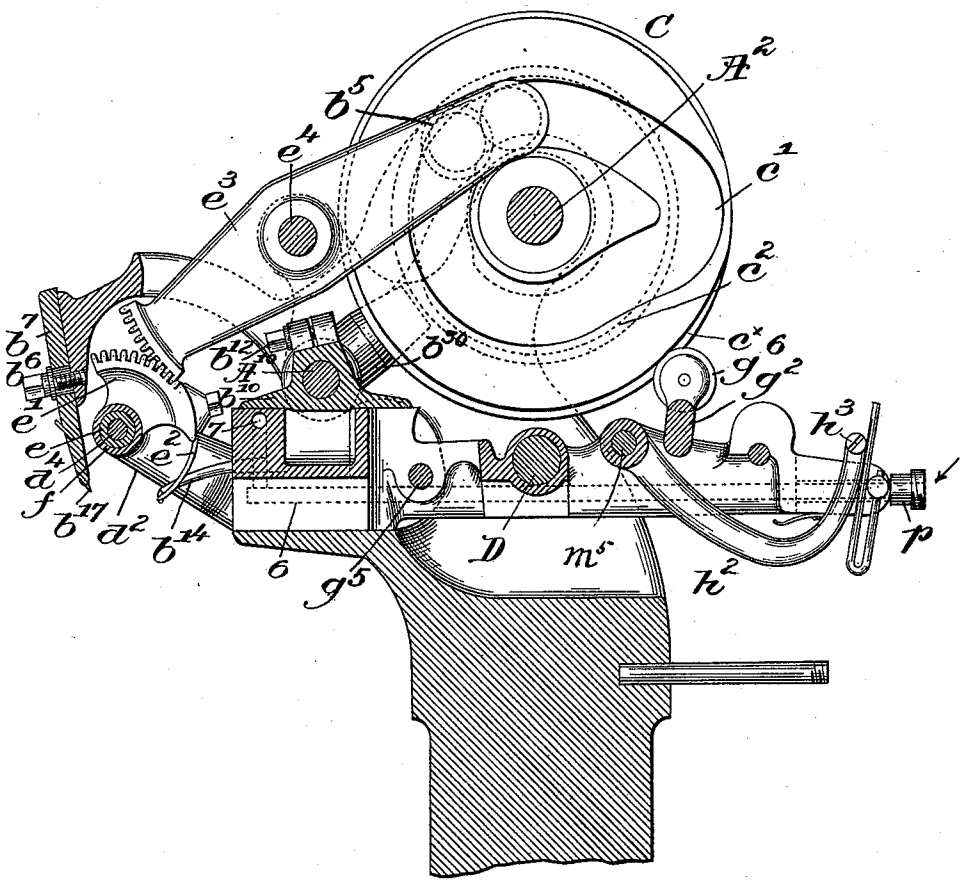
(No Model.) 5 Sheets—Sheet 4.

L. GODDU.

SOLE SEWING MACHINE.

No. 545,484. Patented Sept. 3, 1895.

Fig. 4.



Witnesses.
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(No Model.) 5 Sheets—Sheet 5.

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SOLE SEWING MACHINE.

No. 545,484. Patented Sept. 3, 1895.

Fig: 5.

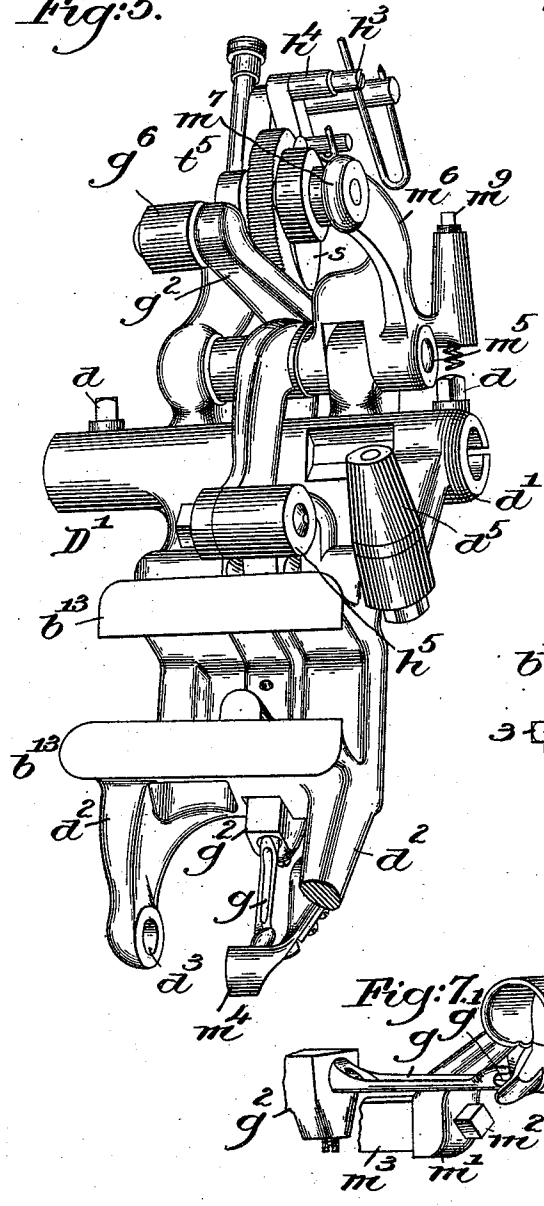


Fig: 8.

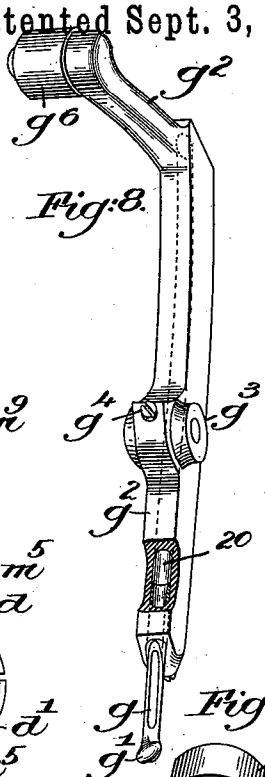


Fig: 6.

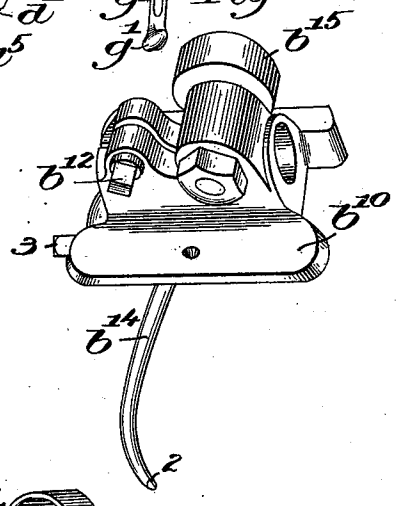
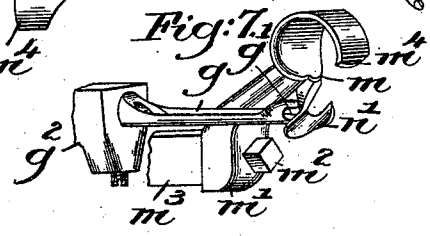


Fig: 7.



Witnesses.
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UNITED STATES PATENT OFFICE.

LOUIS GODDU, OF WINCHESTER, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE, OF PETERSHAM, MASSACHUSETTS.

SOLE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 545,484, dated September 3, 1895.

Application filed January 22, 1894. Serial No. 497,697. (No model.)

To all whom it may concern:

Be it known that I, LOUIS GODDU, of Winchester, county of Middlesex, State of Massachusetts, have invented an Improvement in Sole-Sewing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to provide a novel sole-sewing machine adapted either to stitch the upper to a sole for turned work or a welt and upper to a sole for welted work.

My improved machine contains a narrow work-rest, a curved awl, a curved thread pusher or inserter, a thread-guide, and a thread-measuring hook to pull off from the tension device a quantity of thread for the next stitch to be made, and a suitable feeding device. In another application made by me, Serial No. 497,696, filed January 22, 1894, I have shown and described a machine for making a like stitch, the awl and thread pusher or inserter being, however, illustrated as straight and as attached to carriers adapted to be slid in a guide-box movable at right angles to the direction of the feed of the material, the awl being adapted to be thrust into the material and to be retracted, leaving a hole for the thread, and then the said frame is tipped, as referred to, to place the forked part of the thread pusher or inserter in line with the awl-hole to meet the thread held distended between a stationary thread-delivery and the hook of the measuring device.

In this my present invention I have mounted the carriers for the curved awl and thread pusher or inserter side by side, so that they may be oscillated about a common center of motion, the awl being actuated to enter the work, after which it is retracted and the awl and thread pusher or inserter are moved laterally, the feeding device holding the material until the thread pusher or inserter is put in position opposite the awl-hole. In order, however, to make the stitch referred to and employ a curved awl and pusher side by side, I have been obliged to impart to the thread-guide a slight movement substantially at right angles to the direction of the length of the feed, a thread-measuring device engaging the thread at one side, co-operating with said thread-guide, stretching and laying the thread in the path of movement of the thread pusher or inserter as it approaches the awl-hole.

One feature, therefore, of this present invention may be said to be a sole-sewing machine including the following instrumentalities: a work-rest, an awl-sector, an attached curved awl, a thread-pusher and the sector carrying it, devices to move said sectors laterally in unison and to rock them alternately, a thread-guide, and a thread-measuring device to draw the thread therefrom and to move it into the path of the thread pusher or inserter, substantially as will be described.

Figure 1 in front elevation represents a sufficient portion of a sole-sewing machine containing my present improvements to enable my invention to be understood. Fig. 2 is a right-hand end elevation thereof, the fast member of the clutch-pulley represented at the right hand in Fig. 1 being omitted. Fig. 3 is a sectional detail in the line *x*, Fig. 1, looking to the right; Fig. 3^a, a detail of the thread pull-off. Fig. 3^b is a view showing the work-rest and pitch-gage, together with the pointed feeding device, engaging the sole and part of the thread-inserter. Fig. 4 is a section in the line *x*, Fig. 1, looking to the left. Fig. 5 is a perspective view of a movable frame, to be described, which supports numerous parts. Fig. 6 is a detail of the thread-measuring device and the slide to which it is attached. Fig. 7 is a detail showing the end of the thread-guide and part of the work-rest, pitch-gage, and welt-guide. Fig. 8 is a detail showing the thread-guide and its carrier detached; Fig. 9, a detail of the lever for moving the work-rest. Fig. 10 shows part of a turned shoe, and Fig. 11 shows part of a welt stitched to an upper and sole as it may be in the machine herein to be described.

The column A, adapted in practice to rest upon the floor, has at its upper end a suitable head A′, which constitutes the rigid framework of the machine, parts of the head serving as bearings for a main shaft A^2, and other parts to be hereinafter described. The main shaft has, as herein represented, at its right-

hand end, viewing Fig. 1, suitable fast and loose pulleys A^3 A^4 of the clutch variety under the control of a moving device or actuator A^5, connected with a suitable treadle, (not shown,) so that the constantly-moving member A^4 of the clutch may be made to engage at suitable intervals the fast member A^3 of the clutch and rotate the shaft when desired. Such devices are old and common in United States Patent No. 265,227, and need not therefore be herein further described.

The main shaft a^2 has fast upon it two hubs B C, the hub B having at its periphery a cam-groove b and a cam-face m^{15}, (see Fig. 2,) and near its edge a cam b', and at its inner side the hub B has a cam-groove b^2. (See Fig. 3.) The hub C has in its periphery a cam-groove c and a cam-face $c^\times$, and at its inner side an awl cam-groove c', (see Fig. 4,) and at its outer left-hand side it has a second cam-groove c^2, the outline of which is represented by dotted lines in Fig. 4.

The framework has suitable openings or bearings for the reception of a rod or shaft D, upon which is clamped, by suitable set-screws d, (see Fig. 5,) a movable hollow frame D′, said set-screws entering threaded lugs of, as herein shown, a split sleeve or hub d', the said hub being clamped firmly to said rod, the ends of the rod, as herein provided for, being therefore free to slide back and forth in the bearings in the frame.

The frame D′ is of peculiar shape, and, as herein represented, it has projections d^2, one of which is broken off in Fig. 5, said projections having suitable holes, as d^3, to receive a pin or stud d^4, which constitutes the fulcrum on which is mounted the hub e of the awl-sector e', (see Fig. 4,) to which is attached in suitable manner the awl e^2.

The hub e of the awl-sector serves as a bearing for the hub f of the sector f', to which is secured the segmental thread pusher or inserter f^2, adapted to act upon a measured thread and push it into a hole made by the awl, as will be hereinafter described. The awl-sector derives its oscillating movement from a toothed sector-lever e^3, mounted on a rod e^4, confined in suitable bearings of the head A′ by set-screws e^5, the bearings being split so as to be pinched upon the rod, as best represented in Fig. 2, the rear end of said lever e^3 having a roller or other stud to enter the cam-groove c', before referred to. The sector f' derives its movement of oscillation from a toothed sector-lever f^3, having also at its pivot the rod e^4, said lever having a suitable roller or other stud which enters the cam-groove b^2 at the inner side of the cam B.

The movable frame D′ has a roller or other stud d^5, which enters the cam-groove b at the periphery of the hub B, said cam-groove reciprocating said frame D′ laterally back and forth, as will be described.

The framework has bearing at A^8 A^9 on or forming a part of the head A′, for a shaft A^{10}, upon which is mounted to rock and slide longitudinally thereon the feed-frame b^3, having an arm b^4, provided with a suitable roller or other stud b^5, (see dotted lines, Fig. 4,) to enter the cam-groove c^2 in cam C, to rock the frame on the shaft A^{10}, said frame having adjustably attached to it by screw b^6 the feeder b^7, having one or more penetrating points b^{17}. The roll b^5 is kept pressed into the groove c^2 by a spring b^8, (see Fig. 1,) placed within a hollow part of the shaft A^{10}, the outer end of said spring being acted upon by a screw b^9, screwed into a threaded hub of the bearing A^9.

The feeding-frame is provided with a roller or other stud b^{30}, (shown in full and dotted lines, Fig. 4,) which enters the cam-groove c at the periphery of the hub C, said cam-groove reciprocating the feeding-frame laterally.

The shaft A^{10}, between the hubs of the feeding-frame, is shown as provided with a slide-block b^{10}, clamped on said shaft by a set-screw b^{12} in ears of the split hub of said block, flanges or feet of said block resting and sliding on tracks b^{13} of the movable frame D′, said block preventing any rocking movement of the said shaft. The block b^{10} serves as a carrier for the thread-measuring device b^{14}, the shape of which is best shown in Fig. 6, it having near one end a hook 2, a set-screw 3 holding the thread-measuring device in place. The block b^{10} has a roller or other stud b^{15}, (see Figs. 3 and 6,) which is kept normally against the cam b' by the spring b^8, before referred to, and said block and thread-measuring device have given to them a to-and-fro motion with relation to the thread-guide g.

The thread-guide g, shown as a hollow rod with a notched or bifurcated end g', is attached to a carrier g^2, having a thread-passage 20 therethrough, and shown as having a split hub g^3 attached by screw g^4 (see Fig. 3) to a rocking stud g^5, mounted in the frame D′, the carrier being located in such manner with relation to the said frame as to be adjacent thereto throughout the length of the thread-passage 20, for a purpose to be described, the rear end of the carrier having a roller or other stud g^6, which is acted upon by the peripheral cam $c^\times$ of the cam-hub C, (see Figs. 1 and 4,) a spring 10 (see Fig. 3) keeping the roll g^6 against said cam, the latter causing the front end of the thread-guide to be raised and lowered, so as to put the thread issuing from said guide and held by the thread-measuring device in the path of movement of the thread pusher or inserter as it approaches the awl-hole, the thread-measuring device having drawn off enough thread for the next stitch and holding the said thread so that the said thread-pusher will meet it at a point distant from the last stitch equal to the distance of one awl-hole from another plus one-half the length of the loop of thread to be left in the awl-hole.

The thread t is taken from a suitable wax-box t', in which the wax is heated by steam

from a pipe t^2, steam entering the frame D′ at p (see Fig. 4) from a suitable source of supply, which may be a steam-chamber.

The pull-off consists of a lever h h^2, pivoted at m^5, and having (see Figs. 3ª and 4) a finger h^3, on which is a roller h^4. (See Fig. 5.) The lever h has a roller or other stud h^5, which also enters the cam-groove b^2. The thread is led from the stripper o, under the studs or thread-guides 4 5, as in Fig. 2, and over the roller h^4 of the pull-off, so that when the said roller is raised, as in Fig. 2, the pull-off draws thread from the stripper and wax-box. The thread-tension device s—a suitable wheel or device about which the thread is given a turn on its way into the thread-guide—is prevented from rotating during the action of the pull-off by the detent t^4 in engagement with teeth t^5, connected to a part of the tension device, the latter being carried by the frame D′. When the pull-off is moved, the pawl t^4 prevents retrograde movement of the tension device s and causes to be pulled from the wax-box enough thread for a new stitch, so that there is always left slack thread behind the tension device, so that the thread-measuring device (it having engaged the thread) will, in drawing the thread from the thread-guide, have only to overcome the friction of the tension device, which is usually slight. The work-rest m consists of a narrow thin edge connected to an arm m', attached adjustably by a set-screw m^2 to a carrier-bar m^3, placed in guideways in the head A′, so that it can slide only longitudinally. The work-rest has, as shown, a pitch-gage m^4, combined with it, which bears on the bottom of the sole while the upper or welt is pushed against the work-rest, that depending on whether a turned or a welted shoe is being stitched. I desire to hold the work-rest forward firmly while the stitch is being made and to relax such pressure while the feed is acting to feed the shoe. To provide for this, I have mounted on the frame D′, at m^5, a lever m^6, provided with a roller-stud m^7, which is normally kept against the peripheral cam m^{15} of the cam-hub B by a spring m^8 (see Fig. 9) in a little tube at the lower end of said lever, an adjusting-screw m^9 being applied thereto to control the force of the spring, the inner end of said spring entering a pocket (shown by dotted lines, Fig. 3) connected to the frame D′.

The lever m^6 has at its lower end teeth m^{10}, which engage teeth m^{12} of the shank of the work-rest. (See Fig. 3.)

The arm m^3 of the work-rest, when a welt is to be attached, has secured to it by screws n a welt-guide n', which is of such shape and depth as to let one edge of the welt come between the work-rest and upper when the latter contacts with a shoulder formed at the edge of the sole, as in the sectional detail, Fig. 11.

Fig. 10 shows part of a sole and upper adapted for a turn-shoe.

Having described the construction of the parts, I will now describe the operation of the same. First assuming that the frame D′ is in its position farthest to the right, viewing Fig. 1; that the work-rest is way forward; that the feed device has been moved to the left, has acted to feed the material, and that it is yet down with its points in the material and acting to aid the operator in keeping the upper and sole clamped closely together against the narrow work-rest; that the thread-guide g stands with its notched delivery end in its uppermost position, and that the awl and thread pusher or inserter are both out of the material, now the thread-measuring device will be made to engage the thread of the lifted thread-guide, preparatory to pulling therefrom and the tension device beyond it enough thread for the next stitch.

About as the measuring device engages the thread the thread-guide will be lowered to remove the thread to be drawn out by the measuring device from the path of the awl and the measuring device will be started to pull off the thread, and as soon as the measuring device is out of the way of the awl the latter will be started forward to enter the work yet held between the work-rest and the feeding device, and the measuring device will continue its movement to draw off thread and will complete its backward movement as or about as the awl retires from the work. The awl having been retracted, the frame D′ will be moved to the left sufficiently far to put the end of the thread pusher or inserter f^2 opposite the awl-hole, the feed yet remaining stationary, and at the same time the thread-guide and measuring device will move with the frame, but the work-rest will not move. During this lateral movement of the frame D′ to the left the thread-guide g will be lifted sufficiently to put the thread held between it and the thread measuring device across the hole made by the awl and in the line of movement of the thread pusher or inserter, so that as the latter is moved forward it will engage the thread and put it into the awl-hole.

While the pusher is acting to put the thread into the awl-hole the thread-measuring device will be moved toward the thread-guide, such movement being effected independently of the frame D′ by the spring b^8, the thread-guide then giving up to the pusher the thread held by its hook; but as soon as the thread pusher or inserter is lifted from the material the frame D′ is again started toward the right.

As the thread pusher or inserter starts to come out of the awl-hole, the loop of thread having been put therein, the feed commences to rise, and as the thread pusher or inserter leaves the work, the feed, by means of the stud b^{30} and the co-operating cam-groove c, and with or just after it the frame D′, is started to the right, and as the frame D′ completes its movement to the right the feed engages the work, and just as the points of the feed engage the work and just before the feed

device is again started toward the left to again feed the material the work-rest will be pulled back slightly, so that while the feeding device is acting to feed the material the pressure between the material and the work-rest will be somewhat released; and the feed having been effected, the work-rest will be again pushed forward, this happening, however, before the awl enters the work. The hollow frame D′ (see Fig. 4) receives steam, as stated, at the inlet *p*, the steam following along a channel 6 therein, (see dotted lines, Fig. 4,) at one side of said frame, thence upwardly along a channel 7 below the top of the track b^{13}, and back to the rear end of the frame at its opposite side through a suitable channel 8, (see dotted lines, Fig. 3,) and out at the outlet p^2 into pipe t^2, and thence into the usual hollow casing surrounding the wax-box *t′*, as best shown in Fig. 2, whereby said frame is heated, the thread-carrier g^2 being supported, as described, so that the heated portions of the frame are contiguous or adjacent thereto and heat it throughout the extent of the thread-passage 20.

Heretofore while the operator was removing a finished shoe and replacing it by a shoe to be stitched a considerable portion of the thread was cooled by exposure to the air, and the operator had to draw off and sever such cold portion before he could begin the stitching of the next shoe, the thread being drawn off until the heated portion was brought up to the stitch-forming devices.

By maintaining the thread heated throughout its length from the wax-box to and particularly immediately adjacent to the stitch-forming devices, I obviate the waste occasioned by cutting off a portion of thread for each shoe, and I increase the rapidity of operation of the machine, for the thread is always heated and ready for use at the stitch-forming devices.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sole sewing machine, the following instrumentalities, viz:—a work-rest; a sector, and an attached curved awl; a sector, and an attached curved thread pusher or inserter; devices to move said sectors laterally in unison and to rock them alternately; a thread-guide; and a thread-measuring device to draw the thread therefrom and to move it into the path of the pusher, substantially as described.

2. In a sole sewing machine, the following instrumentalities, viz:—a work-rest; a sector, an attached curved awl; a sector, and an attached curved thread pusher or inserter; devices to move said sectors laterally in unison and to rock them alternately; a thread-guide; a thread-measuring device to draw the thread therefrom and to move it into the path of the thread pusher or inserter, and an independent device having a point to enter the work and keep it against the work-rest during the time that the awl is in the work, substantially as described.

3. In a sole sewing machine, the following instrumentalities, viz:—a work-rest; a sector, an attached curved awl; a sector, and an attached curved thread pusher or inserter; devices to move said sectors laterally in unison and to rock them alternately; a thread-guide; a thread-measuring device to draw the thread therefrom and to move it into the path of the thread pusher or inserter, and a pitch gage, substantially as described.

4. In a sole sewing machine, the following instrumentalities, viz:—a work-rest; a sector, and an attached curved awl; a sector, and an attached curved thread pusher or inserter; devices to move said sectors laterally in unison and to rock them alternately; a thread-guide; a thread-measuring device to draw the thread therefrom and to move it into the path of the thread pusher or inserter; a slide frame in which is mounted a stud on which the said sectors rock; and means to move said frame laterally while the awl and thread pusher or inserter are out of the material, to operate, substantially as described.

5. A sector, and an attached curved awl; a sector, and an attached thread pusher or inserter, said awl and thread pusher pointing in the same direction; means to rock said sectors alternately about their fulcra; and devices to move said sectors in the direction of the length of said fulcra, substantially as described.

6. A work-rest, a movable frame having a fulcrum, sectors mounted thereon and provided with an awl and a stitch-forming device; a thread-guide carried by said frame, and a sliding block and connected thread-measuring device, combined with devices to move said frame, and with devices to move said block on said frame, substantially as described.

7. The movable frame having a fulcrum, two sectors mounted thereon; and a curved awl and a curved thread pusher or inserter attached to said sectors; a thread-guide carried by said frame, a sliding block, and its connected thread-measuring device, and cams to move said frame and said block on said frame, combined with a work-rest and pitch gage mounted on a bar having guides independent of said frame, substantially as described.

8. The movable frame having a fulcrum, an awl sector and a thread-pusher sector; and an awl and thread pusher attached to said sectors respectively, a thread-guide carried by said frame; a sliding block and its connected thread-measuring device, devices to move said frame and said block on said frame; and a work-rest having guides independent of said frame; combined with an independent feeding device, and means to withdraw said

work-rest from said feeding device while the latter is acting to feed the material, substantially as described.

9. In a sole sewing machine, the following instrumentalities, viz: — a work-rest and stitch-forming devices; combined with a feeder to hold the work to be stitched against the work-rest, and a pitch gage rigidly connected to the work-rest, the said pitch gage guiding the outermost surface of the sole while the edge of the sole is held against the upper, the latter lying against said work-rest, substantially as described.

10. In a sole sewing machine, a slide bar, a connected work-rest having an attached pitch gage, and a feeding device having a work-impaling point, combined with a lever, and devices to move it to retract the said work-rest while the feeding device engages and moves the work, substantially as described.

11. In a sole sewing machine, the following instrumentalities, viz:—a work-rest, a pitch gage; a sliding frame; an awl and its sector; a thread pusher or inserter and its sector, and a thread-guide carrier mounted on said frame and provided with a thread-guide; devices to move said awl sector about its fulcrum to force the awl into the work and then retract it, devices to move said sliding frame in the direction of the seam while the awl is out of the work to bring the thread pusher or inserter opposite the awl hole, and devices to turn the thread pusher or inserter about its fulcrum to cause it to put the thread in loop form into the hole made by the awl and then to retract said thread pusher; a thread-guide to supply a thread to said thread pusher; and a feeding device independent of said awl and thread pusher to feed the material over said work-rest, substantially as described.

12. In a sole sewing machine, the following instrumentalities, viz:—a work-rest; a pitch gage; a sliding frame; an awl sector; a thread pusher sector and a thread-guide carrier mounted on said frame; an awl; a thread pusher; a thread-guide; devices to move said awl sector about its fulcrum to force the awl into the work and then retract said awl, devices to move said sliding frame in the direction of the seam while the awl is out of the work to bring the thread pusher opposite the awl hole, and devices to turn the thread pusher about its fulcrum to cause it to put the thread in loop form into the hole made by the awl and to retract said thread pusher; a thread-guide to supply a thread to said thread pusher; and a feeding device independent of said awl and thread pusher, to feed the material over said work-rest; and a welt guide, substantially as described.

13. In a sole sewing machine, the following instrumentalities, viz:—a work-rest; an awl and a thread-pusher or inserter located both on the same side of the work-rest; and devices to move them into and out of the work alternately; a thread-guide; a thread-measuring device to engage the thread and draw it from said guide; and means to actuate the thread-guide to hold the thread out of the path of the awl, and thereafter to move it into the path of the thread pusher or inserter, substantially as described.

14. In a sole sewing machine, a work-support; an intermitting feed device for feeding the work; a curved awl independent of said feeding device, a curved pusher; carriers therefor rotatable alternately about a common axis; and means to move said carriers laterally into position to cause said pusher to rotate in a curved line coincident with the curved path of operation of said awl, substantially as described.

15. A sliding frame, and a sector mounted thereon and provided with a device to engage and put the thread into the stock in the form of a loop, combined with a thread-guide having its carrier mounted on said frame, a thread-measuring device, and means to move said thread-guide to supply the thread-measuring device with thread for the stitch to be made, substantially as described.

16. The sliding frame, the block provided with the thread-measuring device, and devices to slide the frame and block independently, combined with a thread-guide carried by and movable on said frame to present thread to the thread-measuring device, substantially as described.

17. In a wax thread sewing machine, a laterally sliding frame provided with stitch-forming devices, and a thread guide having its carrier pivotally mounted on said frame to rock in a vertical plane, combined with means to move said sliding frame and to rock the thread guide carrier on said frame, substantially as described.

18. In a wax thread sewing machine, a sliding frame provided with stitch-forming devices, and having a sector lever mounted on it, combined with a bar having an attached work-rest, said bar being guided independently of said frame, and devices to move said lever, substantially as described.

19. A laterally sliding frame having stitch-forming and feeding devices, and provided with a tension device, combined with a pull-off lever mounted on said frame, and devices to move said pull-off, substantially as described.

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

LOUIS GODDU.

Witnesses:
FREDERICK L. EMERY,
HADLEY P. FAIRFIELD.