

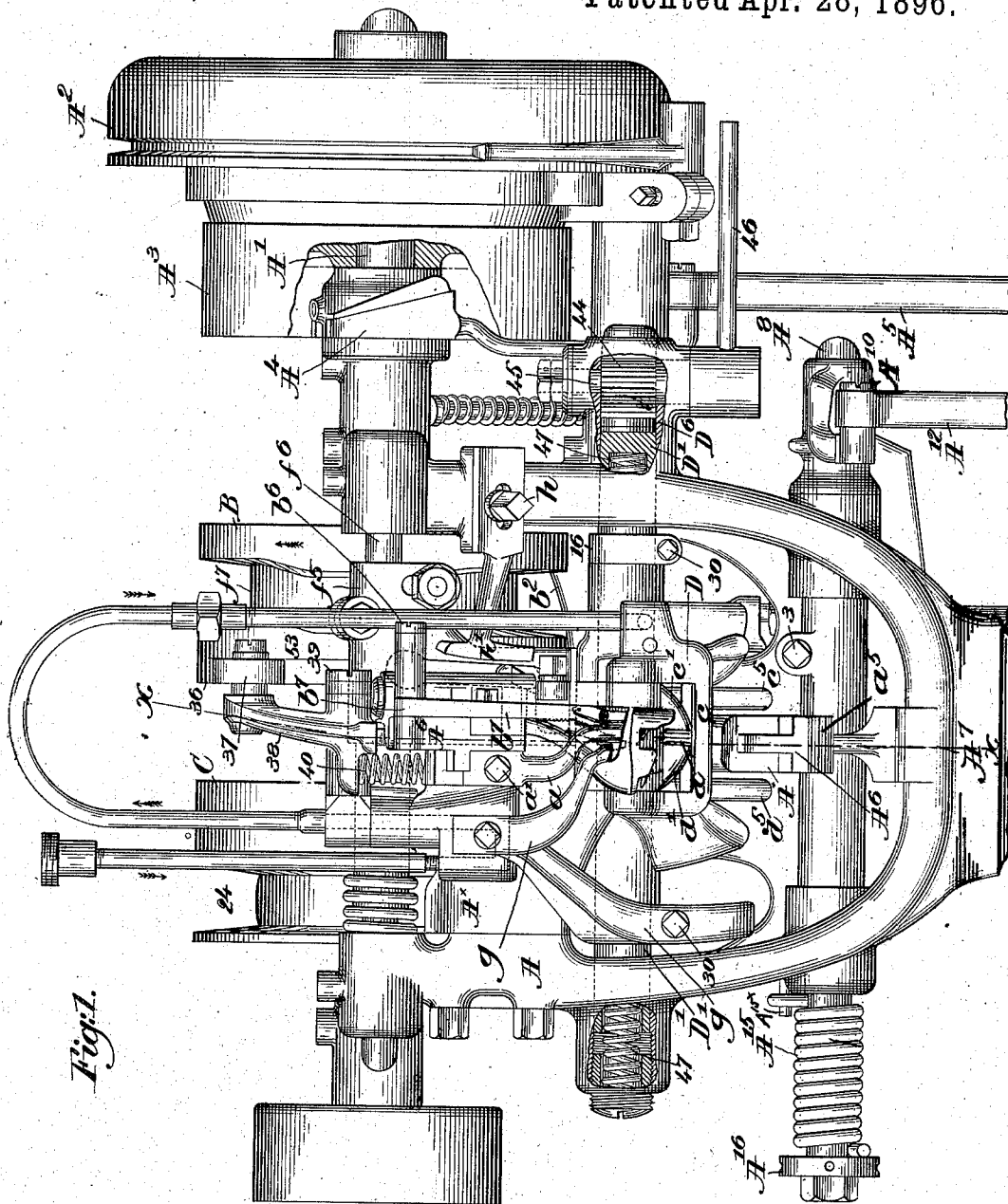
(No Model.)

5 Sheets—Sheet 1.

L. GODDU.
SOLE SEWING MACHINE.

No. 559,129.

Patented Apr. 28, 1896.



Witnesses.

Fred S. Grumbaf.

Thomas Drummond.

Inventor

Louis Goddu

by Crosby & Gregory, attys.

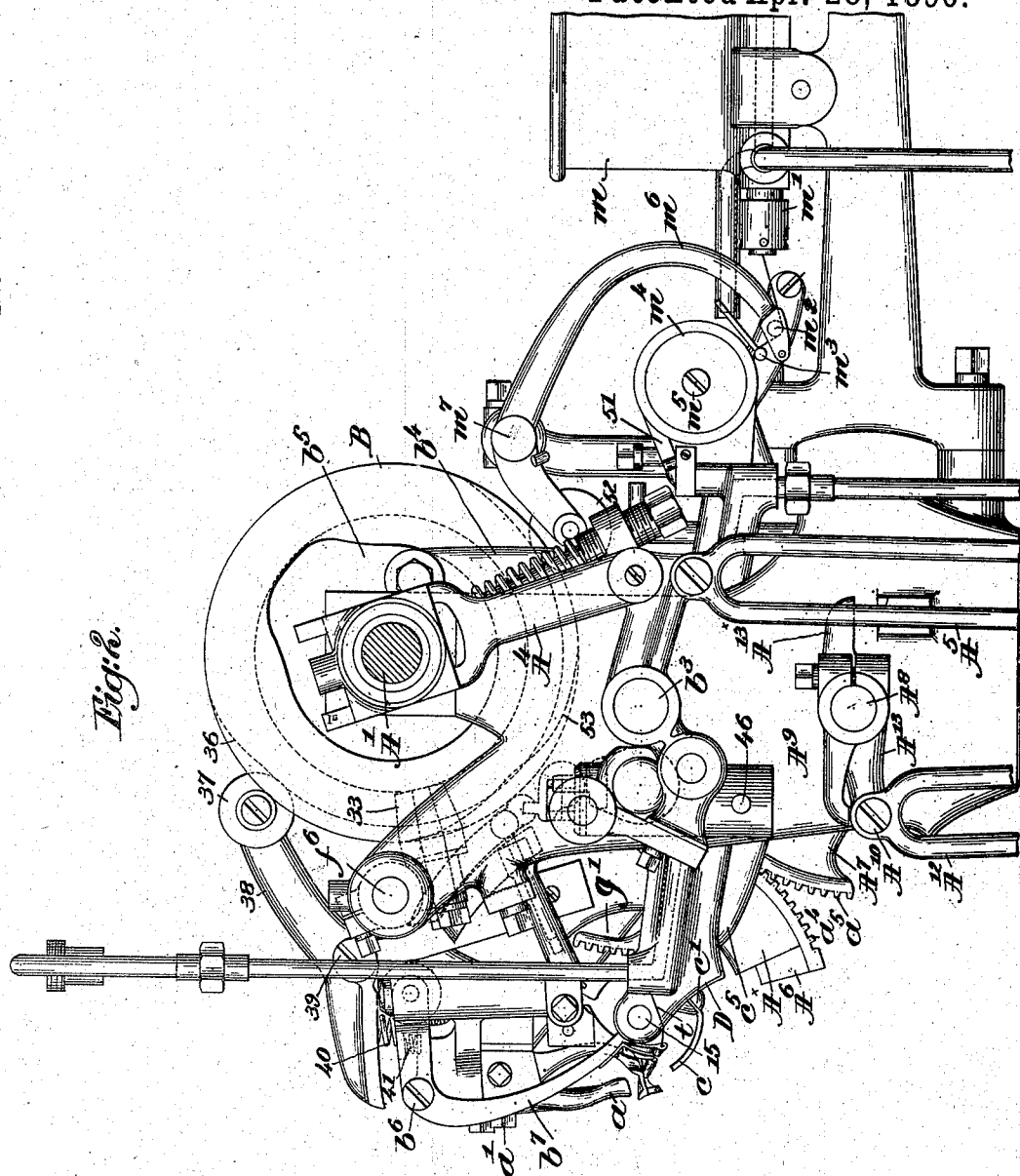
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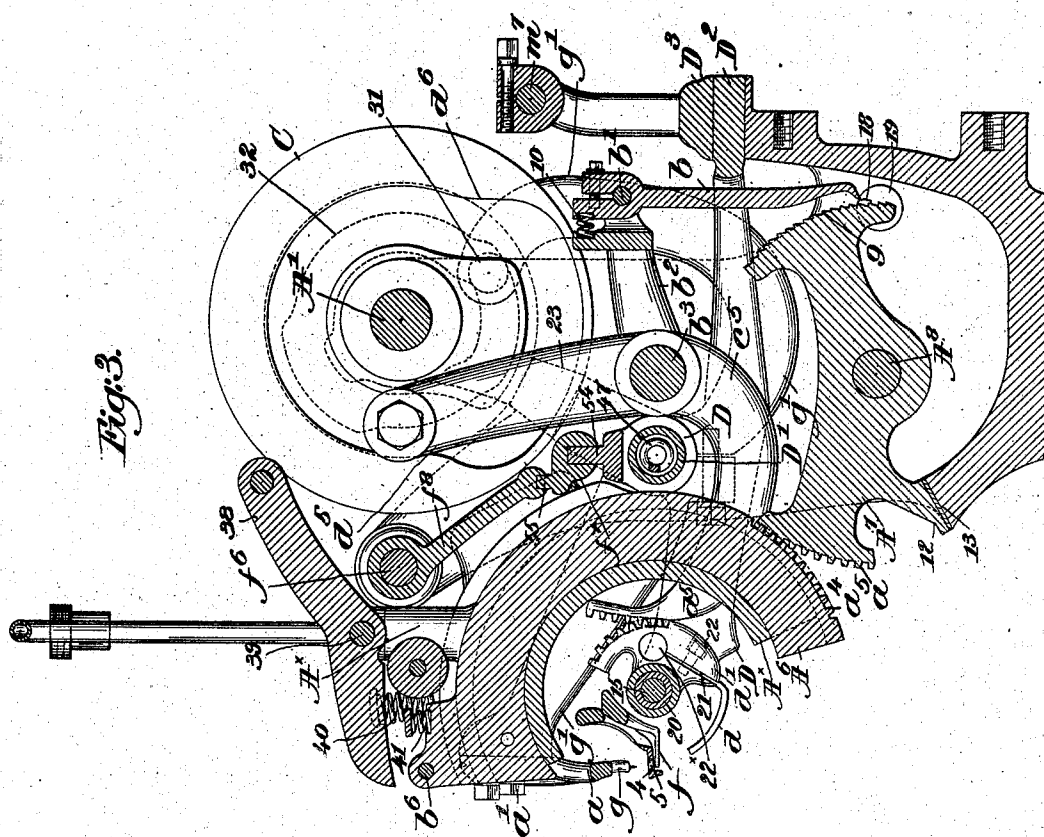
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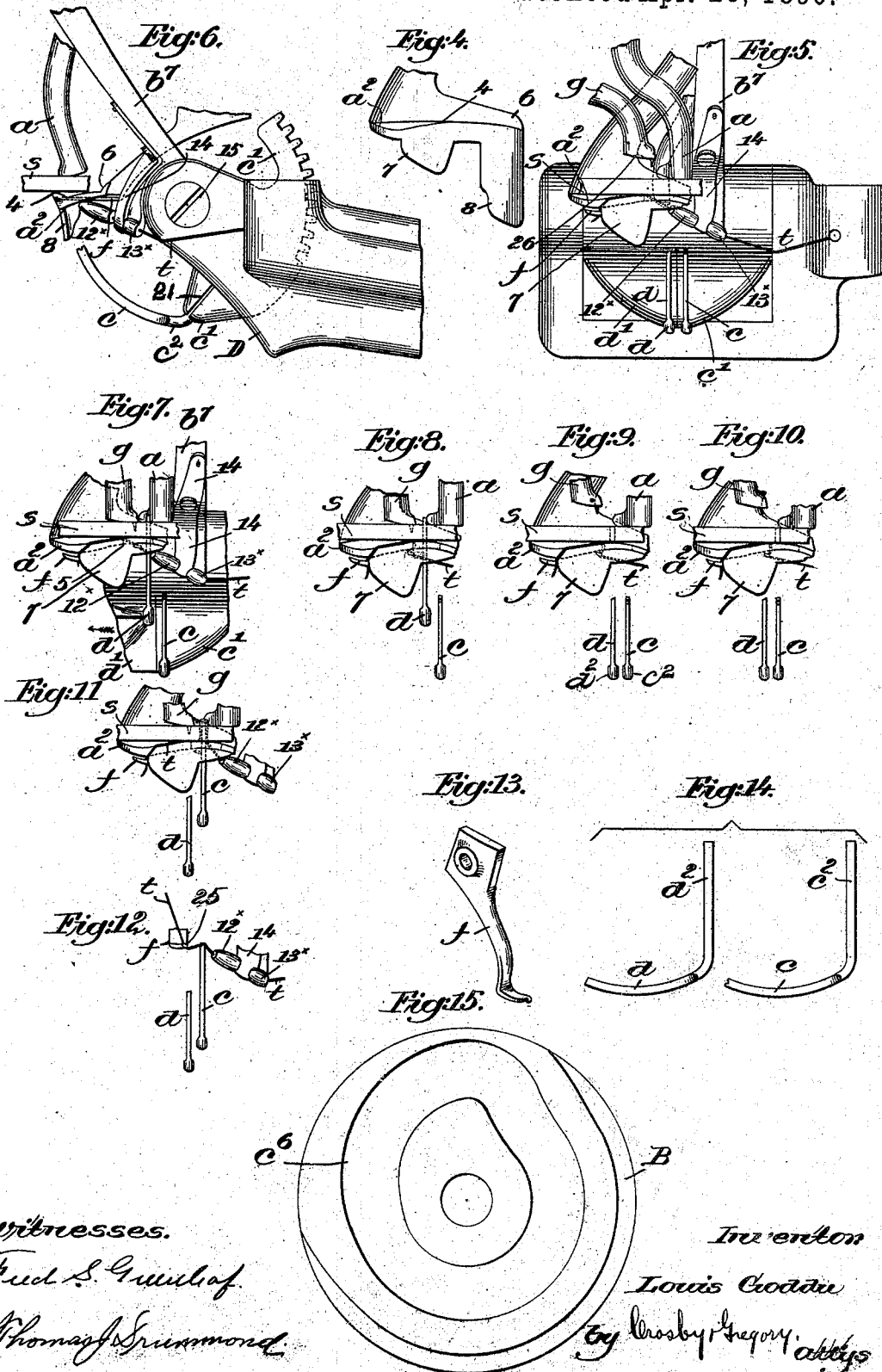
(No Model.)

5 Sheets—Sheet 4.

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No. 559,129.

Patented Apr. 28, 1896.



Witnesses.

Fred S. Guilford

Thomas S. Hammond

Inventor

Louis Goddu

By Crosby & Gregory, attys

(No Model.)

5 Sheets—Sheet 5.

L. GODDU.
SOLE SEWING MACHINE.

No. 659,129.

Patented Apr. 28, 1896.

Fig. 16.

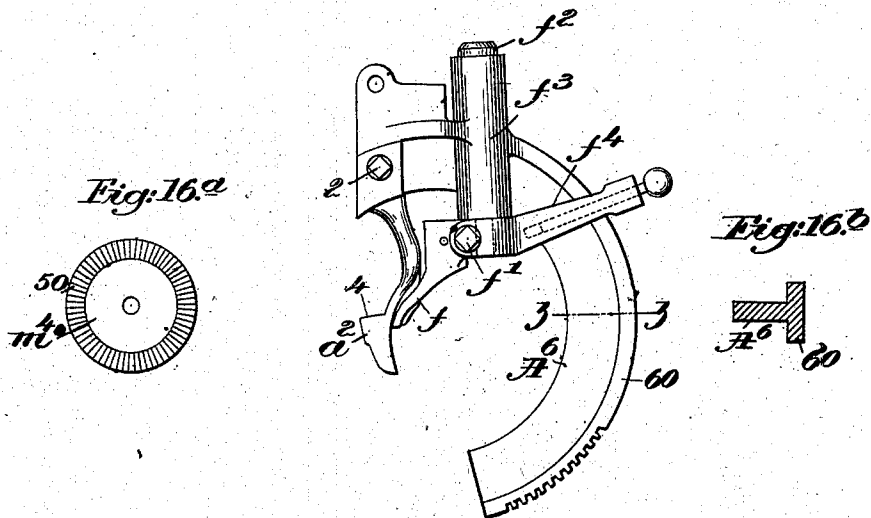
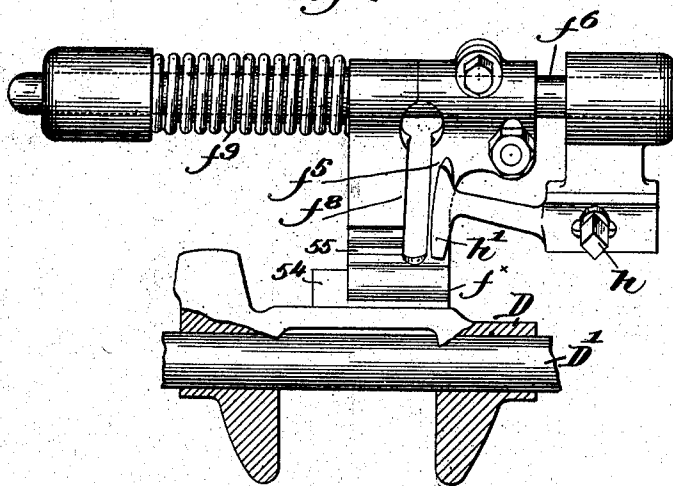


Fig. 17.



Witnesses.

Fred S. Grunleaf.

Thomas J. Drummond.

Inventor.

Louis Goddu

by Crosby & Gregory, attys.

UNITED STATES PATENT OFFICE

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

SOLE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 559,129, dated April 28, 1896.

Application filed December 18, 1894. Serial No. 532,171. (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.

10 The machine to be herein described is of the class more especially devised for sewing outer soles to uppers, and as herein shown a curved awl makes a hole in the sole and then in the welt, and the stock having been fed for the proper distance to bring the awl-hole in position to be filled with thread a thread pusher or inserter located at the same side of the sole rises, meets the thread, and puts the same in loop form into the awl-hole.

20 In this present invention the stock to be sewed together is sustained upon a work-support which is free to rise and fall at proper times in the arc of a circle substantially coincident with the center of motion of the curved awl and toward and from a stationary foot, the work-support being automatically adapted to the varying thickness of the stock, and by moving in the described circle the awl and the pusher or device used to put the thread in the awl-hole are always sure of working together properly, notwithstanding the position of the work-support due to the thickness of the stock. The parts of the machine against which the waxed thread passes in the use of the machine and which are liable to have wax deposited upon them are heated by steam conducted through pipes to said parts. The work-support is connected to a segmental carrier made as a rack-bar running in a curved track; and I have pivotally mounted the thread-guide on the segment carrying said work-support and have combined with the thread-guide devices to move it in such direction as to put the said guide in a particular position with relation to a thread-measuring device which has imparted to it variable movement to draw out for presentation to the thread pusher or inserter more or less thread, according to the thickness of the stock.

50 The particular features in which my invention consists will be hereinafter described, and

indicated in the claims at the end of the specification.

Figure 1 in front elevation shows the upper part of a sole-sewing machine embodying my invention; Fig. 2, a right-hand side elevation of the parts shown in Fig. 1 with the driving-wheel removed; Fig. 3, a section in the line *x*, Fig. 1. Fig. 4, on an enlarged scale, shows the movable work-support, in subsequent figures it being partially omitted to better show parts behind; Fig. 5, an enlarged detail in front elevation of parts of the stitch-forming devices, work-support, feed device, and thread-measuring device, the awl and pusher being in their lowest position preparatory to commencing a stitch. Fig. 6 is a right side elevation of some of the parts shown in Fig. 5. Figs. 7 to 11 show details representing the positions of the stitch-forming devices during the formation of a stitch, the thread-guide being omitted in Figs. 8 to 10 to avoid confusion. Fig. 12 shows some of the parts represented in Fig. 11, the work-support being removed to show the thread-measuring device and thread-guide in the position occupied by them when the thread pusher or inserter is about engaging the thread. Fig. 13 shows the thread-measuring device itself. Fig. 14 shows the thread pusher or inserter and awl detached; Fig. 15, a detail of the inner side of the cam-hub B; Fig. 16, a detail showing the work-support, the segment or carrier on which it is mounted, and the thread-measuring device, also carried by said segment, the thread-guide being omitted; Fig. 16^a, a detail showing the sides of a tension-wheel; Fig. 16^b, a section on the line *z*, Fig. 16; and Fig. 17 shows a detail of the rest *f*³, pressing device *f*³, and cam *h*¹, and devices to guide said rest and pressing devices.

The framework or casting forming the head A is and may be of suitable shape to support the working parts to be described. The head sustains the cam-shaft A¹, on which is a fast pulley A², having a convex side which enters a concavity in a loose pulley A³, which may be pressed against the fast pulley by a suitable wedge-fork A⁴ under the control of a link A⁵, attached to a suitable treadle, (not shown,) whenever it is desired to start the machine.

The clutch-pulley mechanism and its controlling devices are all as usual.

The shaft A' has fast to it two hubs B C; which are grooved and otherwise shaped to constitute cams to operate the various working parts.

The stock to be stitched—that is, the welt and outer sole to be united—is placed between the stationary foot *a*, secured to a rigid part A^x of the head A (see Fig. 1) by a suitable bolt *a'*, and the work-support. A portion of the part A^x is made circular in form (see Figs. 2 and 3) and is provided with a circular groove to receive the segmental bar *a*⁶, to the upper outer end of which is attached by bolt 2 the shank of the work-support *a*², (shown best in Fig. 16,) said figure showing it detached and enlarged. The segmental bar A⁶ has for part of its length at one side (see Figs. 16 and 16^b) a flange 60, which enters a segmental groove in the stationary part A^x, the latter being cut away near its lower end to let the teeth *a*⁴ of the segmental bar A⁶ be engaged by the teeth *a*⁵ of a sector-lever A⁷, the hub of which is suitably clamped or attached, as herein shown, by a bolt 3 (see Fig. 1) to a shaft A⁸, having attached to it near one end a finger A⁹, which, as shown in Fig. 2, normally rests against a shoulder of a second arm A¹³, loose on said shaft alongside of it, said arm being joined by a bolt A¹⁰ to a rod A¹², in practice attached to a suitable treadle (not shown) located at the floor, the arm A¹³ having a heel A^{13x}, which is normally borne against a suitable stop or shoulder of the framework by the stress of a spring A¹⁵, surrounding said shaft near its other end, (see Fig. 1,) one end of said spring resting against a fixed stud A¹⁵ (see Fig. 1) of the framework, while its other end is fixed with relation to a nut or collar A¹⁶, suitably secured to the shaft, said spring normally acting to bear or press the work-support toward the stationary foot to clamp between a projection on said support and the lower end of said foot the welt and outer sole, with the sole against the foot.

The work-support is moved automatically to enable it to adapt itself to the varying thicknesses in the material, and to effect this the work-support must be lowered automatically with relation to the foot. The support is lowered just before each feeding movement of the stock over the support, the lowering of the support being just enough to release the stock from pressure, so that it may be fed easily, and the lowering will be just the same in extent from the end of the foot whatever be the thickness of the stock. To effect this lowering of the work-support, it having a sole-sustaining face 4, provided with an awl-slot 5, an edge-guide 6, and an upper guard 7 8, I have provided the lever A⁷ at its rear end with ratchet-teeth 9, which are engaged by a pawl *b*, pivoted (see Fig. 3) at *b'* on a yoke *b*², loose on a shaft *b*³, said yoke having an arm *b*⁴ provided with a roller or other stud (see Fig. 2) which enters a suitable cam-groove *b*⁵

in the hub B, said pawl, pressed normally toward the ratchet-teeth 9 by a spring 10, always having the same amount of throw.

Fig. 3 shows the pawl *b* in its elevated position, and in such position its point is borne against a rest 18, (shown as an eccentric projection from a stud 19,) which may be turned as desired to place the said rest at a greater or less distance from the ratchet-teeth, as may be desired, the greater the distance the less the effective stroke of the pawl, said rest being made adjustable chiefly to facilitate stitching of double soles or soles wherein there is a great difference between the thickness of the sole at the ball and at the shank; but for ordinary work the adjustment referred to is not necessary. As the pawl descends from the position Fig. 3 it will pass below the rest 18 and will contact with the ratchet-teeth next below the rest, and one or another of said teeth will stand just below said rest, according to the thickness of the stock then between the work-support and the presser-foot.

The lever A⁷ has a foot 12, which acts against a suitable shoulder or stop 13 of the framework when material of least thickness is between the work-support and foot.

The center of motion of the segmental bar A⁶, carrying the work-support, is so adapted and arranged with relation to the center of motion of the awl and thread pusher or inserter sectors as to be substantially coincident, this being necessary to thus insure uniformity of distance of the awl-slot in the work-support from the center of motion of the awl and thread pusher or inserter, whatever may be the height of the support due to the thickness of the stock.

The segmental bar A⁶ has near its upper end an ear which receives a stud *b*⁶, on which is mounted loosely the hub of the thread-guide *b*⁷, (shown enlarged in Figs. 6 and 7, and as having tubular portions 12^x 13^x, for the passage of the thread *t*;) a suitable spring 14, connected to said thread-guide close to its delivery end, acting continuously on said thread to prevent any accidental formation of slack thread between the thread-guide and the thread pusher or inserter *c*, the latter having a suitable notch to engage the thread and put it into a hole previously made in the stock by a suitable awl *d*, said thread pusher or inserter and awl being attached, respectively, to the sectors *c'* *d'*, of substantially the same shape and size, mounted loosely on or with relation to the same stud 15, held in suitable ears of a feed-frame D, having hollow bearings to surround loosely a hollow shaft D', it having bearings in the head and being free to be slid horizontally. The feed-frame D is located on said shaft between a collar 16 and the hub of an arm *g'*, the collar being fixed to the shaft by a set-screw 30. The shaft D may be slid with the feed-frame as required while feeding the stock, the face of the stock forming a so-called "base-line,"

and during a part of the stitch-forming operation, as will be described, said feed-frame having a guiding extension D^2 , which is extended backwardly into or through a suitable
 5 guideway D^3 , fixed to the head. The pusher-segment has a tubular hub 20 extended from one side, which, as shown in section, Fig. 3, fits the stud 15, the hub of the awl-sector fitting loosely the hub of the other sector. The
 10 sector d' is vibrated by or through a sector-lever d^5 of elbow-shape, (see Fig. 3,) mounted loosely upon the shaft b^3 and having a roller or other stud which enters a suitable cam-groove d^6 in the hub C.

15 The sector-lever c^5 , partially shown in Figs. 1 and 2, for moving the sector c' , is of the same shape as the sector-lever d^5 just described, and it is mounted loosely on the same shaft b^3 and has a suitable roller or other stud
 20 which enters a suitable cam-groove c^6 (see Fig. 15) at the inner side of the cam-hub B:

The feed-frame D (see Fig. 3) has a suitable roller or other stud 23, (shown by dotted lines, Fig. 3,) which enters a groove 24 in the
 25 periphery of the hub C', said cam-groove 24 and the cam for actuating the sectors c' d' being of such shape, one with relation to the other, as to enable both the awl and the thread pusher or inserter, as shown in Fig.
 30 5, both below the work-support, to be moved for stitching and feeding in the following manner:

Commencing with Fig. 5, where s designates stock, the awl d will be elevated above the
 35 thread pusher or inserter therein shown to pierce the stock, as shown in Fig. 7, and this done the feeding-frame D will be moved far enough to the left (see Fig. 8) to provide for the proper distance between the last stitch
 40 and the next stitch to be made, and then the feeding-frame will be stopped while the awl is retracted into the position Fig. 9, and thereafter the feeding-frame will be farther moved to the left, taking with it the awl and thread
 45 pusher or inserter until the latter comes in line with the hole in the stock just made by the awl, as in Fig. 10, when the feeding frame will be again stopped and the thread pusher or inserter will be elevated to engage the
 50 thread t between the thread-guide and a thread-measuring device f , to be described, said device engaging said thread just below the under side of the work-support and close to the point where said thread is joined to
 55 the stock in the last stitch completed, the measuring device distending and holding the said thread correctly across the awl-hole and in the path of movement of the thread pusher or inserter, so that it will engage said thread
 60 unerringly and put a loop thereof into the said awl-hole, the measuring device f referred to during said operation being moved to give up to the pusher or thread-inserter the thread held by it, the point 25 of the measuring device being slightly turned up, as shown in
 65 Fig. 12, to enable the thread held by it to slip

off said point easily just after the thread has been started into the awl-hole.

To assist in feeding the work I employ, in connection with the awl, a helper g , having a
 70 point to penetrate the sole or the channeled part thereof, if a channel is used, the end of said helper having a shoulder or face at 26 (see Fig. 5) to act as a hammer against the end of a bight of thread pushed through the
 75 sole or exposed above the sole and left by the thread pusher or inserter, said face acting as a hammer to upset or flatten out the exposed end or bight of the loop of waxed thread left exposed, as stated. 80

The helper g is attached to the lever g' , before described, said lever (see Fig. 3) being extended backwardly and upwardly and being provided with a suitable roller or other stud 31, which enters a suitable cam-groove
 85 32, (shown by dotted lines made in the outer side of the hub C',) said point entering the work just before the awl enters the work and remaining in the work during the first portion of the lateral movement of the feeding-
 90 frame to space the stitches, as stated, and then it is elevated sufficiently to clear the work and remains out of engagement therewith while the second part of the lateral movement of the feeding-frame takes place,
 95 or while the awl and thread pusher or inserter, both out of the stock, are being moved laterally to put the thread pusher or inserter opposite the awl-hole; otherwise the helper would feed the stock laterally at the wrong
 100 time. About as the thread pusher or inserter is started to enter the awl-hole, as stated, the helper again descends on the stock and holds the same down close to the awl-hole, while the thread pusher or inserter pushes the loop into
 105 and through, it may be, said hole, and then the helper is lifted, and while the awl and thread pusher or inserter are out of the stock the feeding-frame is returned to its starting-point. At the next descent of the helper it
 110 acts to batter down the exposed end of the loop.

The thread-measuring device f , as shown best in Figs. 2, 13, and 16, is attached by a
 115 suitable screw f' to an ear of a rock-shaft f^2 , mounted in a sleeve-like bearing f^3 , attached to and movable with the segment A^6 , before described, which carries the work-support, said rock-shaft having extended backwardly
 120 from it an arm f^4 , which is normally borne against a rest f^5 , (see Fig. 17,) fast on a sliding rod f^6 , said rest having a roller or other stud 33, (see dotted line, Fig. 2,) which enters the cam-groove f^7 in the periphery of the hub
 125 B, said rod having a peculiar sliding movement back and front for each stitch. The rod f^6 is surrounded loosely by a pressing device f^8 , acted upon by a suitable spring f^9 , shown as surrounding said rod and as abutting at one end against a part of the frame-
 130 work.

The framework has attached to it in an ad-

justable manner by a set-screw h an arresting-cam h' , against which the end of the arm f^4 strikes at each complete return movement of the rest f^5 , the arm f^4 being left on the face of the cam at one or another point, according to the thickness of the stock on the work-support, the pressing device f^8 assuring contact of the arm f^4 with the cam h' . The nearer the arm f^4 to the lower end of the cam h' the thinner the stock. The rest f^5 , as it is moved to the left in Figs. 1 and 17, acts on the arm f^4 and moves it and the thread-measuring device always back to its starting-point, so that the thread will always be engaged in just the same way at the thread-guide. This backward movement of the measuring device to its starting-point happens while the awl and thread pusher or inserter are moving back to their starting-point after having made a stitch.

Just as the thread-measuring device reaches its initial or starting point the cam-surface 36, (shown by dotted lines, Fig. 2,) by its decreasing diameter, permits the roll 37 on the lever 38, pivoted at 39 on a rigid part of the framework, to turn under the action of the spring 40, and the lever 38 is thereby turned sufficiently from the upper end of the thread-guide to let a spring 41 (shown by dotted lines, Fig. 2) act on the ear of the upper end of the thread-guide and cause the delivery end thereof to press inwardly just below the end of the thread-measuring device, so that the point of delivery of the thread from the thread-guide is placed a little behind the point 25 of the measuring device, said thread-guide remaining in such position until the pusher has risen into the hole made by the awl. While the thread-guide so remains at rest, the awl is raised to enter the stock and the rest f^5 is moved back to the right, and the thread-measuring device acted upon by the pressing device f^8 is made to move away from the thread-guide in the direction to act on the thread extended therefrom to the stock, the thread-measuring device by such movement getting out of the way of the rising awl, the movement of the said measuring device to pull thread from the thread-guide, being continued until the arm f^4 meets the cam h' , which it does sooner or later, according to the thickness of the stock, between the work-support and the foot. The awl having been withdrawn from the stock and the awl and thread pusher or inserter having been moved under the stock to put the latter in line with the awl-hole, the lever 38 is moved and its outer end is depressed to act on the upper end of the thread-guide and cause its lower or delivery end to be put exactly in proper position to present the thread unerringly to the thread pusher or inserter by the time the latter arrives in position to enter the awl-hole. Now as the thread pusher or inserter acts to push a loop of thread into the awl-hole the slide-rod f^6 is again moved to the left, (see Fig. 1,) causing the rest f^5 to again

act on the arm f^4 and move the measuring device back toward its starting-point to thus enable it to give up the thread held by it to the thread pusher or inserter, as described, and go to its initial or starting point.

The length of the feeding-stroke of the shaft D' is determined, as herein shown, by a plug D⁶, (see Fig. 1,) having a shank portion provided with teeth engaged by a pinion 44 on a suitable rotatable stud 45, which may be pressed by a pin 46 or otherwise, it being held when left in suitable manner. The spring 47 (see Fig. 1) acts against one end of the shaft D' and normally keeps the roller-stud 23 against the right-hand side (see dotted lines, Fig. 3) of the cam-groove 24, said groove being at one part enough wider than the diameter of the stud 23 to provide in usual manner for a movement of the shaft D' sufficient to enable the maximum length of the stitch to be made.

The thread t is led from a suitable wax-pot m , through a stripper m' , thence over two rests or studs $m^2 m^3$, and thence once around a holding-wheel m^4 , pivoted at m^5 , said wheel having a V-shaped peripheral groove to receive the thread and having at one side a series of ratchet-teeth 50, (see Fig. 16^a,) which are normally acted upon by a pawl 51 to prevent any retrograde movement of the said wheel during the action of the pull-off m^6 , shown as a lever pivoted at m^7 and having a roller or other stud 52, which is normally kept against a suitable actuating-cam 53, (shown by dotted line in Fig. 2,) said pull-off acting on the thread t between the two supports $m^2 m^3$ while the pusher is coming back out of the stock to thus pull off from the wax-pot enough thread for the requirements of the longest stitch, said thread so pulled off being left slack by the rising of the pull-off, so that the thread pusher or inserter, when it is again to act to put thread into the awl-hole, may find slack thread which may be taken by a strain only sufficient to rotate the wheel m^4 .

The feeding-frame D has (see Fig. 3) a spline or guide 54, which is embraced by the notched lower end of the arm f^x of said rest f^5 , it in turn having a guide 55, which is embraced by the notched lower end of the pressing device f^8 , the said devices f^x and f^8 being thus each guided and separately movable in a right line.

To lower the work-support for the removal of the work, draw down rod Λ^{12} .

I claim—

1. A movable work-support, and an arc-shaped bar to which it is connected, combined with a circularly-curved guideway or track supported exteriorly to the center of movement of said bar and in which the latter is free to be moved, and means to move said bar, substantially as described.

2. In a sole-sewing machine, a stationary presser-foot, combined with a movable work-support, an arc-shaped bar to which it is connected, a circularly-curved guideway or track

supported exteriorly to the center of movement of said bar and in which the latter is free to be moved, and means to move said bar, substantially as described.

5 3. In a sole-sewing machine, a work-support, a segmental bar to which said work-support is attached, and a guide for said bar, combined with a thread-guide pivoted on said bar, and means to move the bar and also to move
10 the thread-guide on its pivot, substantially as described.

4. In a sole-sewing machine, a work-support, a segmental bar on which said work-support is mounted, and a guide for said bar, combined with a thread-measuring device pivotally mounted on said bar, and devices to move said thread-measuring device, substantially as described.

5 5. In a sole-sewing machine, an awl-sector, a curved awl connected thereto, a horizontally-movable feed-slide having a stud or fulcrum, means to turn the said awl-sector about said stud or fulcrum to cause the same to enter and retire from the work, and devices to
25 move the feed-frame horizontally while the awl is in the work, combined with a stationary presser-foot, a movable work-support, a segmental bar to which the work-support is attached, and means to move said bar, substantially as described.

6. In a sewing-machine, a presser-foot, a work-support made movable in the arc of a circle toward and from said foot, an awl-sector, a curved awl attached thereto, a sector c',
35 a curved thread pusher or inserter attached thereto and located at the same side of the stock, a horizontally-movable feed-frame carrying said sectors, and devices to actuate said parts, whereby the awl is made to enter, feed, and retire from the stock, the thread pusher or inserter thereafter moved into alinement with the awl-hole just made and actuated to push the bight of thread into and leave it in said awl-hole, the said frame being thereafter moved to place the awl opposite a part of the stock, at a distance from the thread-containing hole equal to the distance desired between stitches, substantially as described.

7. In a sole-sewing machine, a feed-frame, an awl-sector pivoted thereon, a curved awl attached to said sector, means to move the sector, means to move the feed-frame while the awl is in the work, and a presser-foot and work-support, combined with a helper, and
50 means to move it to bear on the work and travel with the feed-frame while the latter is being moved horizontally, substantially as described.

8. In a sole-sewing machine, a presser-foot, a curved awl, an awl-sector, and means to actuate said sector to cause the awl to enter and retire from the stock, combined with a yielding work-support having depending shields to act as guards to prevent the contact of the upper with the awl or its sector as the shoe is being turned on the work-support, and means to sustain said work-support and

lower it automatically to release the stock between it and the said foot preparatory to each feeding movement of the stock whatever may be the thickness, substantially as described.
70

9. In a sole-sewing machine, a work-support, a carrier therefor composed of a segmental bar, a thread-carrier, and a thread-measuring device, the said carrier and measuring device being both pivotally mounted on said bar, a lever to tip said thread-carrier on said segmental bar, combined with a positioning-cam, against one or another part
75 of which rests an arm forming part of the thread-measuring device, and devices to engage said arm wherever it be left and move the measuring device for a greater or less distance as required by the thickness of the stock, substantially as described.
85

10. A stationary presser-foot, a segmental toothed bar, a work-support connected to said bar, a lever toothed at one end to engage said bar and having ratchet-teeth, combined with a uniformly-moving pawl, and a rest for one end of said pawl when in its retracted position, said pawl engaging one or another of the ratchet-teeth of said lever according to the thickness of the stock then
90 between the work-support and said foot, said pawl in its forward or effective stroke serving to lower the work-support uniformly from a variable base-line to uniformly unclamp the stock, whatever its thickness, prior to feeding the same over the work-support, substantially as described.
100

11. The combination with a thread-measuring device and a thread-guide to present a thread directly thereto, of a spring carried by the thread-guide and acting on the thread close to the delivery-eye of the said thread-guide, substantially as described.
105

12. The combination with a work-support, a segmental bar to which it is attached, a thread-guide made as a lever provided with a roller-stud and carried by said bar, means to move the bar, and a spring to normally move said thread-guide in one direction, of a lever having a curved face to permit said
110 roller-stud to roll over it as the said bar is moved, and means to move said lever to actuate said thread-guide in a direction opposite the movement imparted to it by said spring, substantially as described.
120

13. The feed-frame, the sliding rod f^6 and its attached rest, the end of which is guided in its reciprocation by means of said feed-frame, substantially as described.

14. The feed-frame, the guide-rod f^6 and its attached rest, guided in its longitudinal movement by said feed-frame or by contact with a portion of said feed-frame, combined with the presser-arm f^8 , mounted loosely on said guide-rod and guided at its end by a portion of said rest, substantially as described.
130

15. In a sole-sewing machine, a presser-foot, a work-support, and a curved segment on which said work-support is mounted.

combined with a thread-guide also mounted on and moving with said segment, to operate, substantially as described.

16. In a sole-sewing machine, a presser-foot, a work-support, and a curved segment on which said work-support is mounted, combined with a thread-measuring device attached to and moving with said segment, substantially as described.

17. In a sole-sewing machine, a presser-foot, a work-support, and a curved segment on which said work-support is mounted, com-

bined with a thread-measuring device mounted on said segment, and means to actuate said thread-measuring device, to operate, substantially as described.

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

LOUIS GODDU.

Witnesses:

JOHN C. EDWARDS,

FREDERICK L. EMERY.