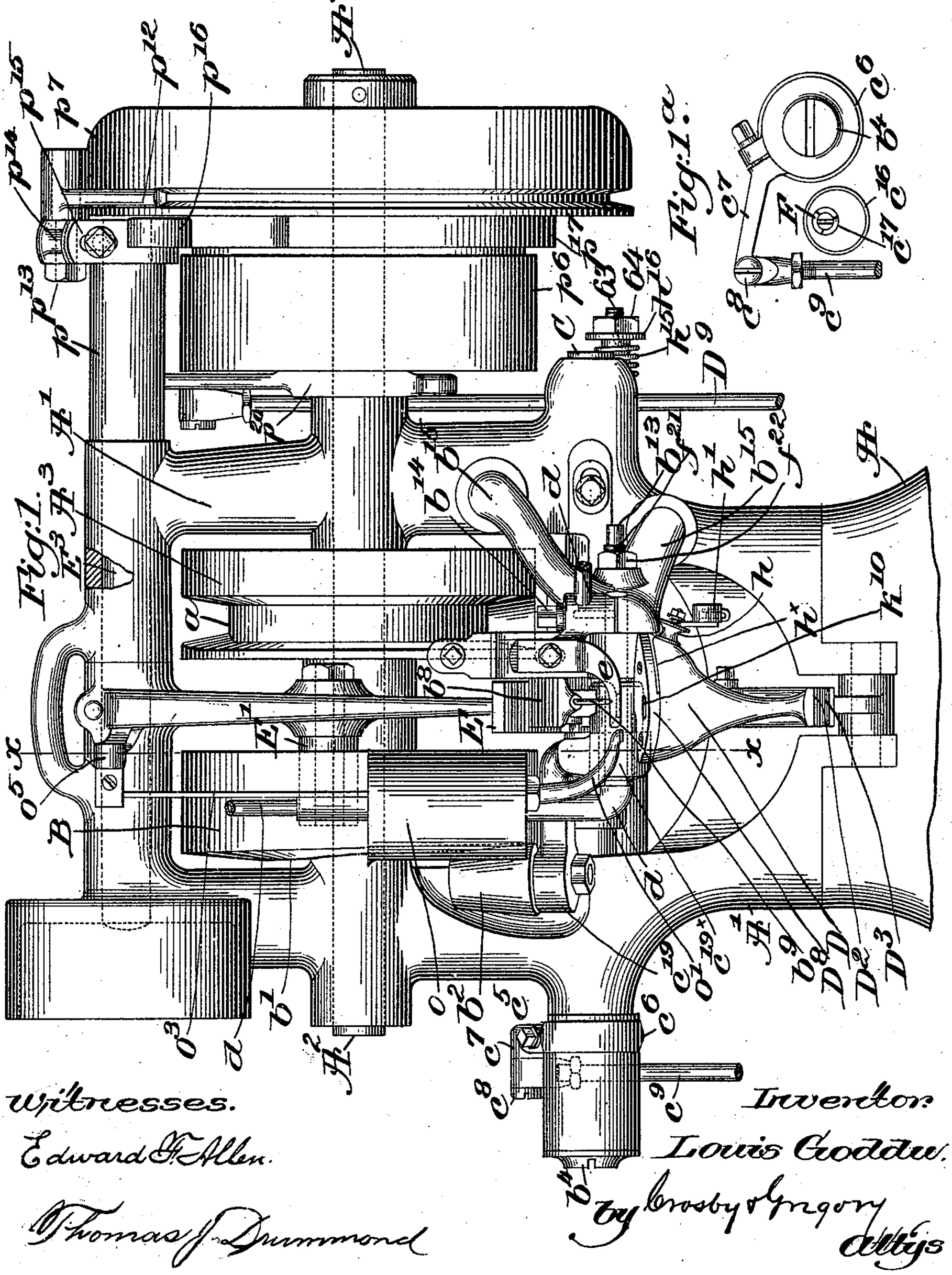
(No Model.) 6 Sheets—Sheet 1.

L. GODDU.

SEWING MACHINE.

No. 545,486. Patented Sept. 3, 1895.



Witnesses.

Edward F. Allen.

Thomas J. Drummond

Inventor.

Louis Goddu.

by Crosby & Gregory

Attys

(No Model.) 6 Sheets—Sheet 2.

L. GODDU.

SEWING MACHINE.

No. 545,486. Patented Sept. 3, 1895.

Fig: 2.

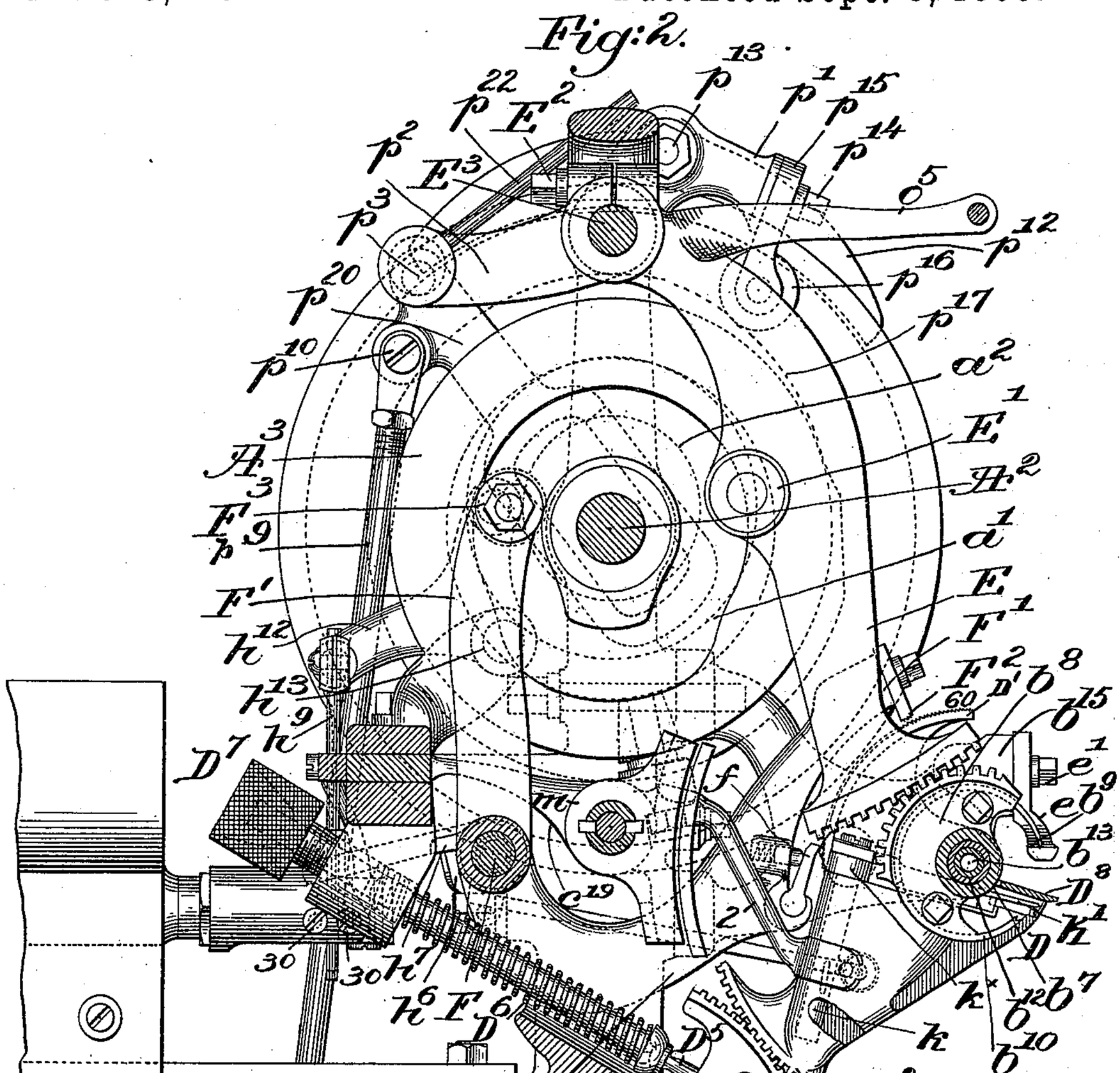


Fig: 16.

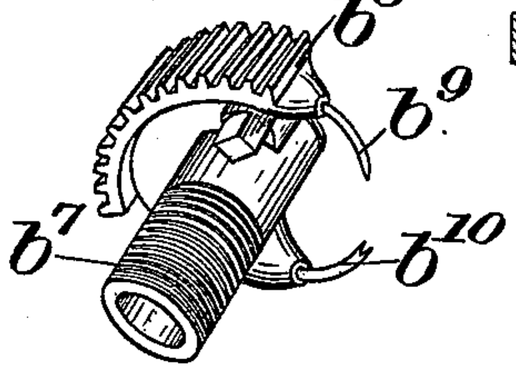


Fig: 13a

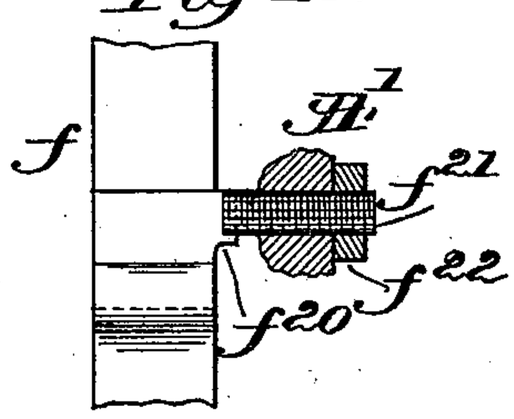
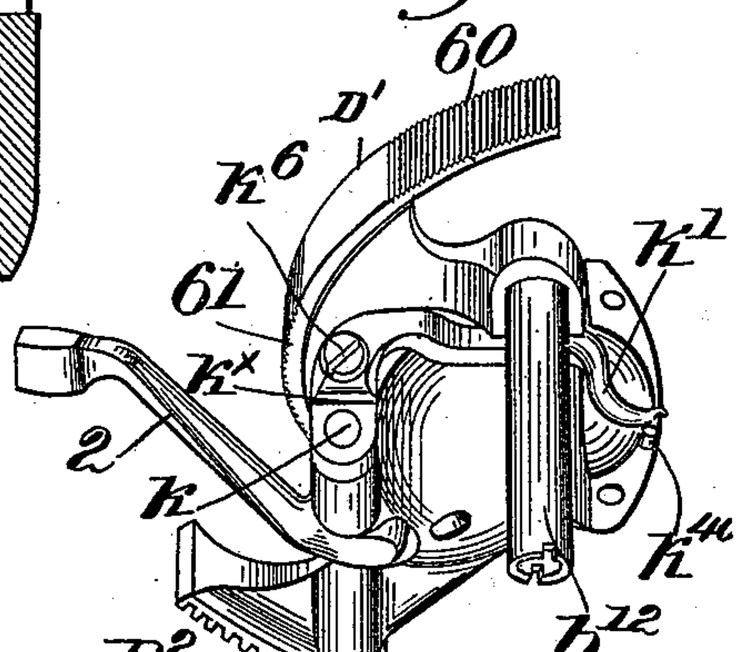


Fig: 13.



Witnesses.
Edward F. Allen.
Thomas J. Drummond

Inventor:
Louis Goddu.
by Crosby & Gregory Attys.

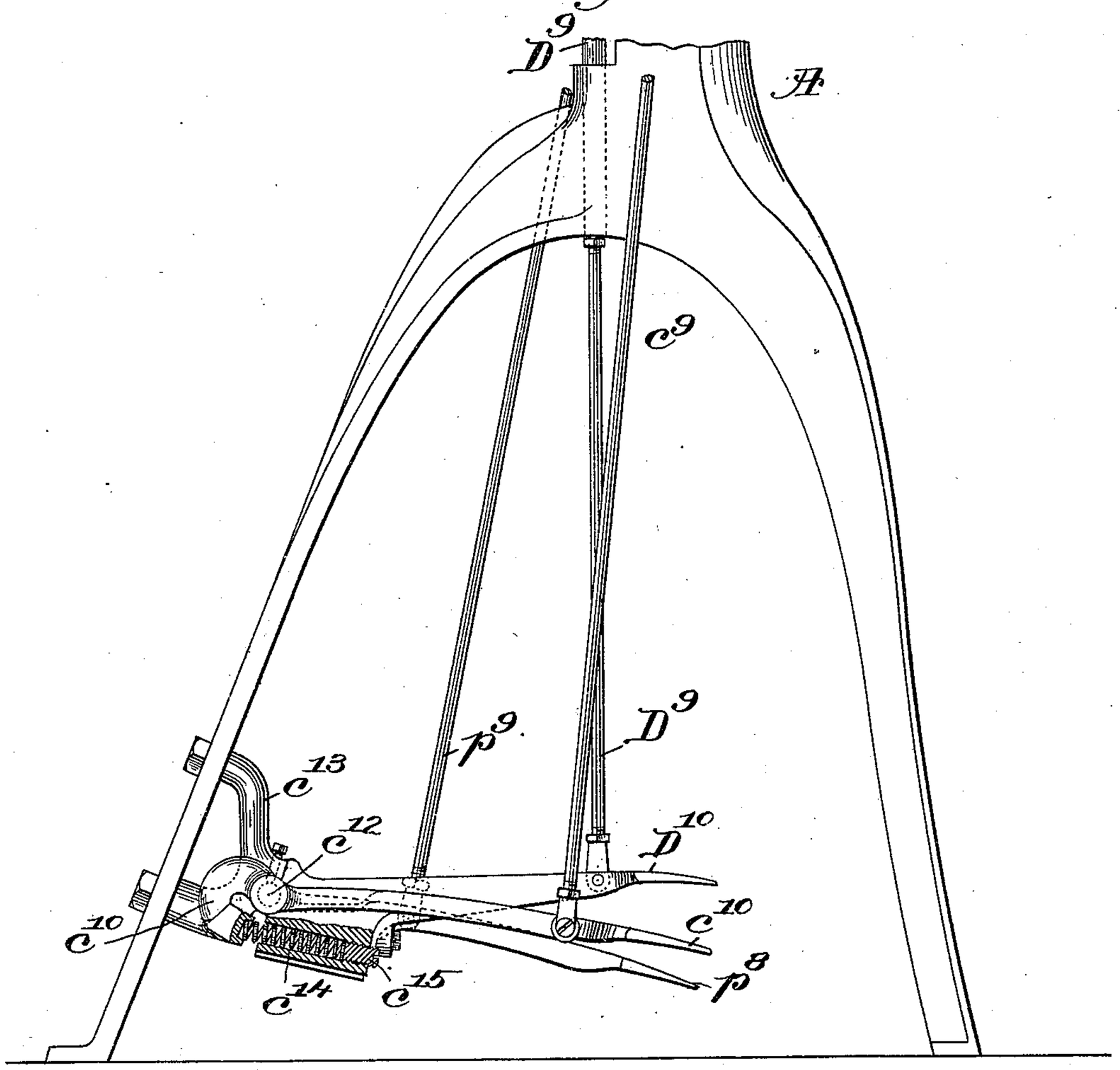
(No Model.) 6 Sheets—Sheet 3.

L. GODDU.

SEWING MACHINE.

No. 545,486. Patented Sept. 3, 1895.

Fig: 3.



Witnesses.

Edward G. Allen.

Thomas J. Drummond

Inventor:

Louis Goddu

by Crosby & Gregory

Attys.

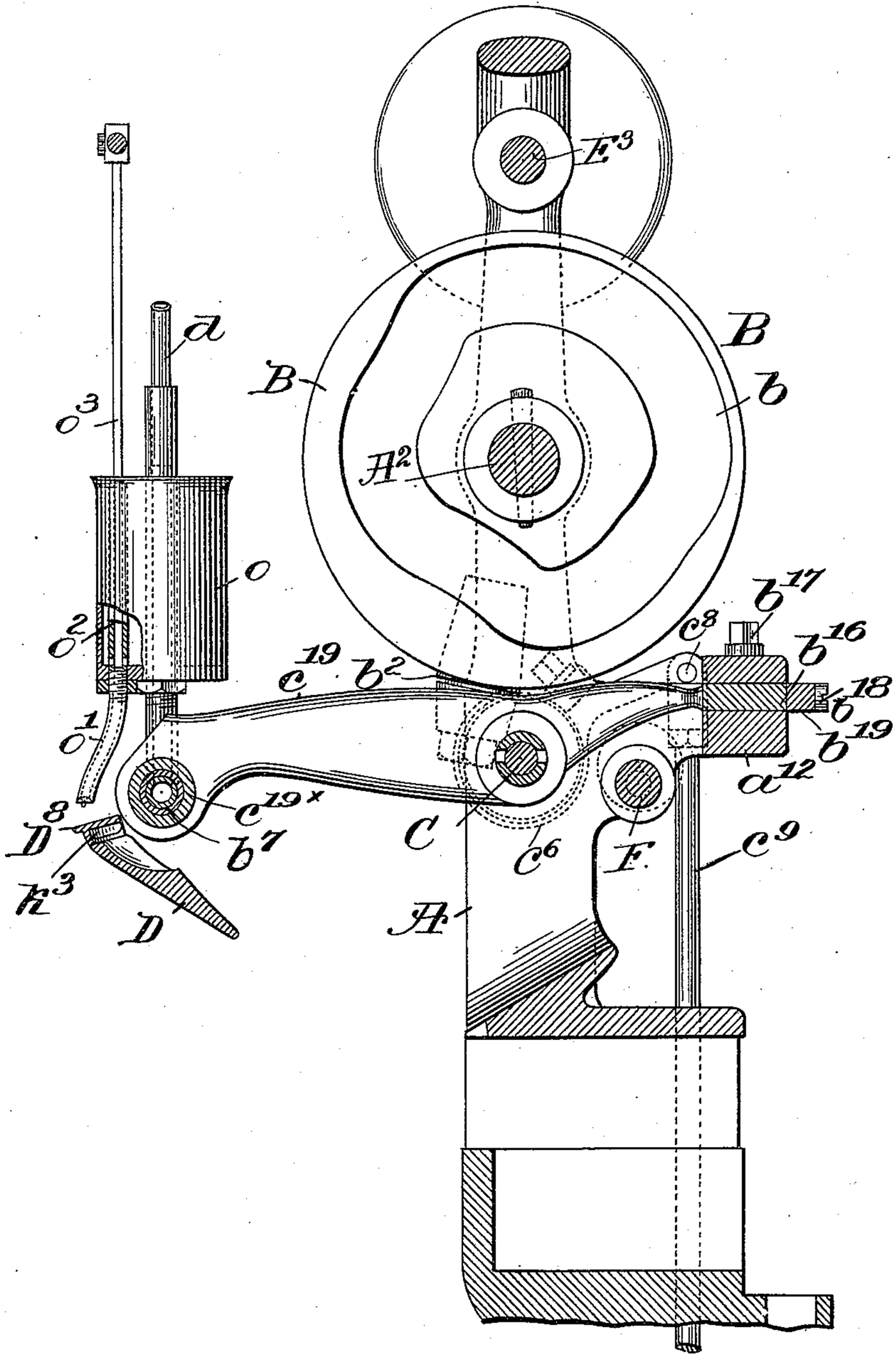
(No Model.) 6 Sheets—Sheet 4.

L. GODDU.

SEWING MACHINE.

No. 545,486. Patented Sept. 3, 1895.

Fig: 4.



Witnesses.
Edward F. Allen.
Thomas J. Drummond

Inventor:
Louis Goddu
by Crosby & Gregory
Attys.

(No Model.) 6 Sheets—Sheet 5.

L. GODDU.

SEWING MACHINE.

No. 545,486. Patented Sept. 3, 1895.

Fig: 5.

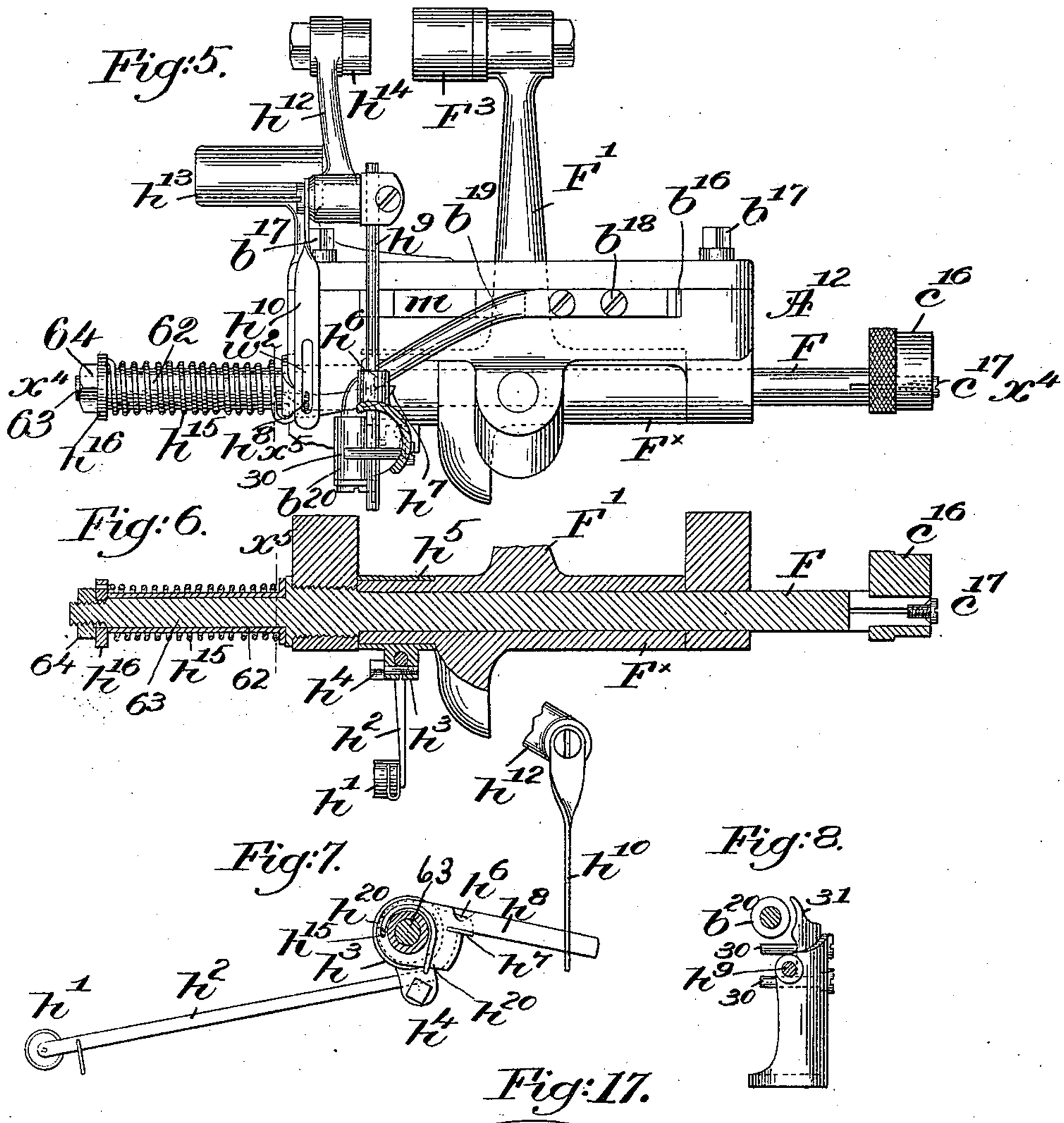
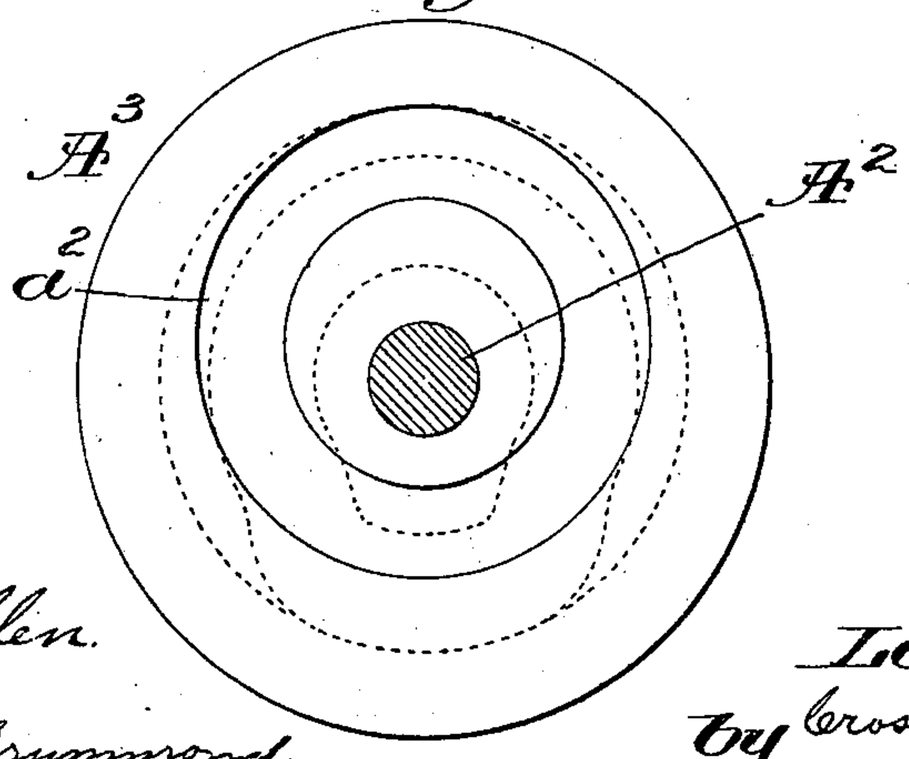


Fig: 6.

Fig: 7.

Fig: 8.

Fig: 17.



Witnesses.
Edward F. Allen.
Thomas J. Drummond.

Inventor:
Louis Goddu
by Crosby & Gregory
Attys

(No Model.)

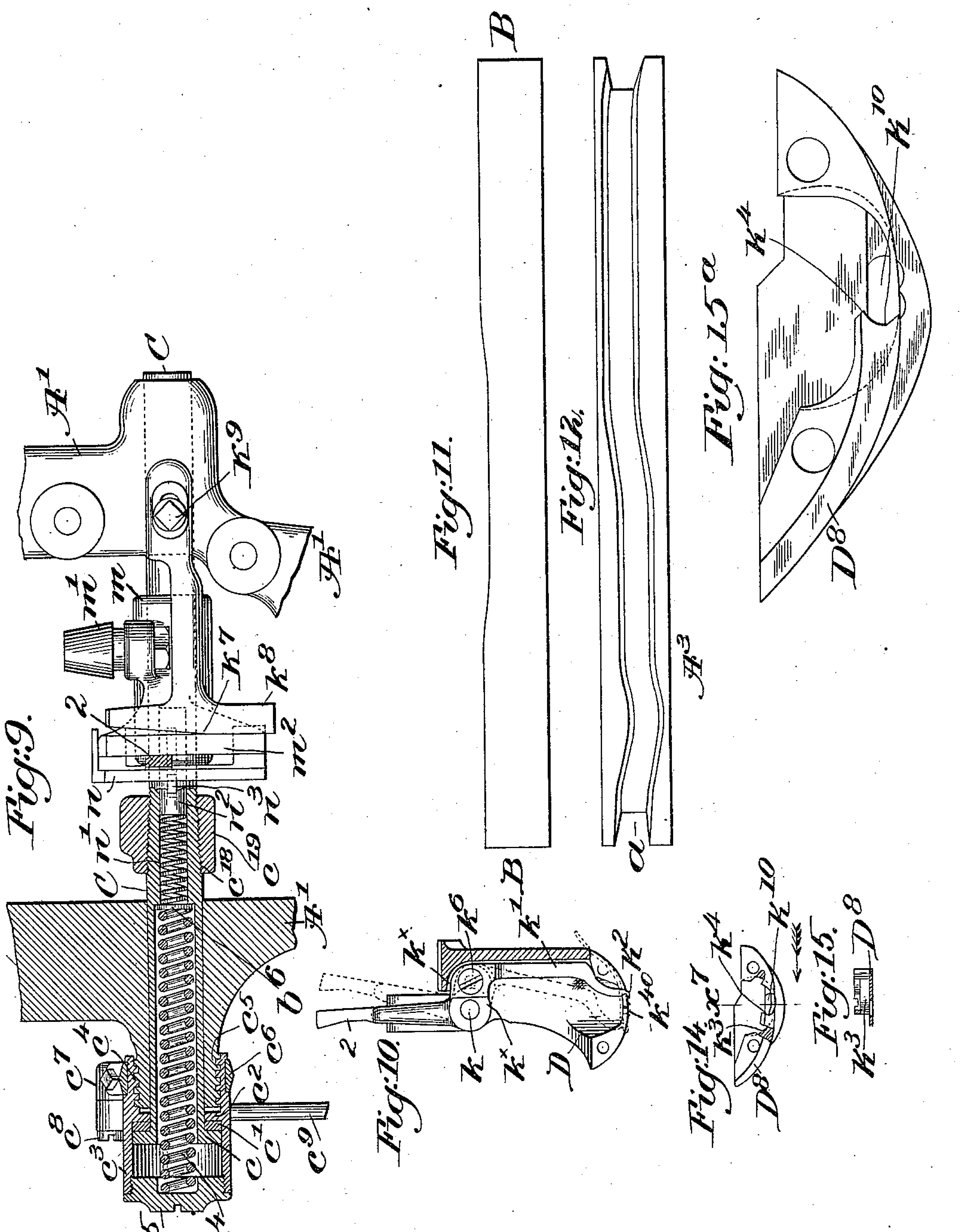
6 Sheets—Sheet 6.

L. GODDU.

SEWING MACHINE.

No. 545,486.

Patented Sept. 3, 1895.



Witnesses.
Edward F. Allen.
Thomas J. Drummond

Inventor.
Louis Goddu
by Crosby & Gregory Attys

UNITED STATES PATENT OFFICE.

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

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 545,486, dated September 3, 1895.

Application filed March 30, 1894. Serial No. 505,748. (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 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 machine is intended for sewing welts to outer soles by a one-thread stitch made into loops by a pusher and forced through the welt and into the outer sole.

In the machine herein to be described I have made provision for automatically measuring the quantity of thread to be used in the stitch to suit the thickness of the stock in which the stitch is to be made, and to do this I have provided the work-support, which is so made as to adapt itself automatically to the thickness of the stock, with a thread-measuring device, and the latter may be moved for different distances, according to the amount of thread needed for each stitch. I have also devised novel means whereby the work-support is automatically moved for a definite distance to effect the release of the work or material, whatever may be its thickness, preparatory to feeding the work.

In the machine herein to be described, it illustrating one practical embodiment of my invention, I have shown an awl and a pusher, the latter acting to force the thread into an awl-hole in the material, the awl and pusher being curved and working in the arc of a circle. I have herein shown the awl and pusher as attached to the same segment, and when this is done said segment will have imparted to it peculiar motions, to be hereinafter described.

The particular features in which my present invention consists will be hereinafter described in the specification and defined in the claims at the end thereof.

One part of my invention comprehends a sole-sewing machine containing the following instrumentalities, viz: a movable work-support, a thread-measuring device carried by said work-support, stitch-forming mechanism, and devices to actuate the said thread-measuring device for a greater or less distance, according to the thickness of the material, substantially as will be described; also in a sole-sewing machine the following instrumentalities, viz: a work-rest, a presser-foot, an awl, a pusher, devices to actuate the awl to penetrate and feed the material, as described, and to actuate the pusher, a thread-measuring device to engage and measure off the thread and hold the same preparatory to and while the pusher acts to push the thread into the awl-hole, and devices to actuate said measuring device variable distances, according to the thickness of the material, substantially as will be described.

Figure 1 is a front elevation of the upper part of a sewing-machine embodying my invention. Fig. 1ª is a detail looking at the machine, Fig. 1, from the left. Fig. 2 is a section in about the line x, Fig. 1, of the upper part of the machine, looking to the right; Fig. 3, a view of the lower part of the machine omitted from Fig. 2. Fig. 4 is a sectional detail, also in the line x, Fig. 1, looking to the left. Fig. 5 is a partial rear elevation of the machine shown in Fig. 1, said figure showing, among other things, part of the locking mechanism for holding the work-support in proper position and part of the thread pull-off, together with the stitch-controlling device. Fig. 6 is a longitudinal section in the line x^4, Fig. 5. Fig. 7 is a partial section in the line x^5, Fig. 5, it showing some of the take-up mechanism. Fig. 8 is a detail showing part of the clamp for holding the thread while the latter is being pulled out from the wax-box. Fig. 9 is a detail showing part of the mechanism cooperating with the thread-measuring device. Fig. 10 shows part of the thread-measuring device. Figs. 11 and 12 show, respectively, the cams B and A^3 developed; Fig. 13, a detail of the rocking frame which forms part of the work-support, the throat-plate being detached; Fig. 13ª, a detail of the pawl f, shown in Fig. 2. Fig. 14 shows the throat-plate or work-supporting plate removed from Figs. 10 and 13 and inverted; Fig. 15, a section of the throat-plate on the line x^7, Fig. 14, looking to the left; Fig. 15ª, a much enlarged view of the throat-plate D^8 inverted; Fig. 16, a detail of

the segment carrying the awl and pusher; Fig. 17, a detail showing the right-hand or outer side of cam A^3.

The framework consists, essentially, of a suitable column A, (see Fig. 3,) upon which is erected a head A′ of suitable shape, it having suitable bearings for the working parts, to be described.

The main shaft A^2 of the machine has fast upon it a cam A^3, provided with a peripheral groove a, and at its left-hand side with a groove a', shown by full lines in Fig. 2, and at its right-hand side with an eccentric groove a^2, shown by full lines in Fig. 17 and by dotted lines in Fig. 2. This shaft also has fast upon it a cam B, provided at its right-hand or inner side (see Fig. 4) with a groove b, the left-hand side of the cam (viewing Fig. 1) being of irregular contour, as shown at b', to co-operate with the roller b^2, to be described.

The framework has mounted in it a longitudinally-sliding shaft C, threaded at c^{18}, (see Fig. 9,) which engages a threaded portion of a carriage or feed-slide c^{19}, having a roller b^2, which is acted upon by cam b' to effect the feeding of the material. The shaft C is made hollow for part of its length, as represented in Fig. 9, and has a flange c, behind which is placed a washer c', said washer resting upon a flange c^2 of a feed-controller c^3, made as a hollow nut, having a series of threads, as at c^4, to engage with stationary threads c^5, herein shown as cut on or carried by part of the head or frame A′. The feed-controller has clamped upon it a strap c^6, (see Fig. 1^a,) having an arm c^7 provided with a crank-pin c^8, to which is connected a link c^9, extended down (see Fig. 3) and joined to a treadle c^{10}, pivoted at c^{12} on a suitable bracket or stand c^{13}, a spring c^{14}, made adjustable, preferably by a suitable adjusting device c^{15}, shown as a screw, normally acting to keep the outer end of said lever elevated and the arm c^7 out of contact with a feed-regulating device c^{16}, (see Fig. 1^a,) represented as a milled nut bored eccentrically, (see, also, Figs. 5 and 6,) and held frictionally upon a shaft F by a set-screw c^{17}, said feed-regulating device being adapted to be turned on shaft F by the hand of the operator to determine the extent of movement of the arm c^7 under the action of said treadle, according to the length of stitch required at the shank of the shoe, the stitch in the shank being commonly longer than that about the fore part.

The roller or other stud b^2 of the feed-slide (see Fig. 1) is normally kept pressed toward the cam-face b' of the cam-hub B by a spring b^4, (see Fig. 9,) located in the hollow shaft C, said spring being acted upon at its outer end by an adjusting device, shown as a nut b^5, screwed into the feed-controller, the inner end of the said spring acting against a washer b^6, contained in the said hollow shaft and resting against a suitable stop or shoulder therein, as best represented in Fig. 9. If the roll b^2 is kept constantly in contact with the cam b', then a stitch of the longest length is insured; but if the approach of said roll toward said cam is restricted, so that the roll in its inward movement will stop short of the cam, then the stitch will be just so much shorter. Consequently the normal length of the shortest stitch may be determined by the adjustment of the feed-controller c^3 on the screw-threaded part c^5, for it will be seen that the position of the feed-controller longitudinally causes its flange c^2 to act sooner or later as a stop for the flange c of the shaft C.

To determine the length of the short stitch about the fore part, the operator will release the clamp c^6 and turn the feed-controller on the screw-threaded part c^5 until it is in position to stop the movement of the feed-slide and its roll b^2 at the proper point, and will then reclamp the said clamp in position, the arm c^7 being held up through the treadle. Now, so long in the regular motion of the machine as the treadle c^{10} is not disturbed, the length of stitch will be uniform and the shortest; but the operator may put his foot on the treadle c^{10} and move arm c^7 toward or to the feed-regulating device, and in so doing will move the feed-controlling device longitudinally and increase the length of stitch.

The feed-slide has at its front end a suitable hub $c^{19\times}$, which in this instance of my invention is shown as threaded to receive threads at the outer side of the cylindrical sleeve b^7 (see Fig. 16) of the toothed segment b^8, provided at one end with an awl b^9 and at its other end with a looper or pusher b^{10}, the pusher in this instance of my invention being at the lower end of the segment, said awl and pusher being curved and occupying arcs of the same circle and having the same center of motion, the pusher resembling an eye-pointed needle cut transversely across its eye so as to leave a crotch to act upon the thread and push it in loop form into the welt and then into the outer sole.

The hollow sleeve b^7 of the segment takes its bearing on a hollow sleeve or hub b^{12}, (see Fig. 13,) connected to or forming part of the work-support D, to be described, said hollow hub b^{12} taking its bearing upon a hollow stud b^{13}, clamped at one end by a screw b^{14} to a stand b^{15}, forming part of or being rigidly fixed to the framework.

The rear end of the feed-slide is projected or extended back, as at b^{16}, (see Fig. 4,) through a suitable slot in a guideway a^{12}, forming part of the head A′, said guideway preventing any rocking of the feeding-head on or with relation to the shaft C. The guideway a^{12} is made up in part of a cap, held in place by suitable set-screws b^{17}. The extension b^{16} has fast to it by a screw b^{18} an arm b^{19}, having, as herein represented, at its other end a roll b^{20}, (see Fig. 5,) which forms part of the device for clamping the thread during the time that the pull-off, to be described, is acting to pull thread from the wax-pot.

The segment b^8, carrying the awl and looper or pusher referred to, derives its movement of

oscillation by or through a sector-lever E, having a suitable roller or other stud E′, said sector-lever being clamped by a set-screw E^2 (see Fig. 2) upon a short shaft E^3, having its ends journaled in suitable manner in part of the head A′ of the machine, so that said shaft E^3 can rock as required when the sector-lever is moved, as when the roller-stud E′ is in the cam-groove *b* (see Fig. 4) of the cam B.

The shape of the cam-groove *b*, controlling the movement of the sector-lever, is such as to move the awl as follows, assuming it to start from its highest position, viz: The awl will be made to descend until its point gets nearly to the stock, at which time the spring b^4 will act to move the feeding-frame as far to the right or backward with relation to the length of the stitch as the feed-controller will permit, and then the segment will continue its movement to thrust the awl into and through the material, and while in the material the latter will be unclamped sufficiently to let the awl, then in the material, act to feed the material for the length of the stitch required, the cam *b*′ at such time acting on the roller-stud b^2. The material having been fed by the awl for the length of stitch required, the segment will be again moved by the sector-lever to retract the awl and enable the pusher to be thrust into the hole made by the awl, the said pusher in its movement acting on the thread then held in its path by the thread-measuring device, to be described, at a point between said thread-measuring device and the thread-tension device, the pusher pushing the loop of thread in advance of it into the hole vacated by the awl. During this oscillating movement described of the segment carrying the awl and pusher, the said segment will, by reason of the screw-threads on its hub, as before described, be moved slightly longitudinally; but such movement does no harm, as it is a definite movement and its effect is calculated in shaping the cam *b*′. These screw-threads are employed not for the especial purpose of moving the said segment, but as a substitute for usual collars which are employed to restrain longitudinal motion of the segment, said screw-threads, owing to the slight longitudinal movement due to them, enabling me to dispense with collars which are usually employed to obviate longitudinal motion, the screw-threads being preferable because the space in which the parts have to move is necessarily very small and the said threads result in economy of space. As stated, the longitudinal movement of the segment due to these threads is always the same, and its effect is compensated for by the cam *b*′.

All the parts of the machine with which the waxed thread comes in contact must be kept warm, and I have in this instance shown (see Fig. 1) a steam-pipe *d* which by ports, represented by dotted lines, communicates with the hollow stud b^{13}, before described, said stud having a suitable outlet in communication with a suitable pipe to carry the steam back to whatever form of waxing device or wax-pot is used, this invention not being limited to any particular waxing device, as any usual form of wax-pot having usual scrapers or plugs may be employed.

Returning again to the work-support D, it has connected to or forming a part of it a toothed arm D′, preferably segmental in shape and provided with a series of fine teeth, as at 60 61, made preferably by milling, and at its lower end the said work-support has a toothed sector D^2, which is engaged by the teeth of a sector-lever D^3 pivoted at D^4 and acted upon by a pin or rod D^5, surrounded by a strong spring D^6, the strength of which may be adjusted by turning the milled nut D^7, having preferably a hollow shank which is screwed into a rigid part of the frame, the inner end of the nut acting upon the said spring. The spring normally acts to keep the throat-plate D^8 of the work-support pressed upwardly toward the foot *e*, to be described, and to enable the work-support to be lowered to put the work in or out I have connected with the lever D^3 a link D^9, which is attached to the treadle D^{10}, having its fulcrum upon the stud c^{12}, before described, and normally held up by the spring D^6. It is necessary that this work-support adapt itself automatically to the thickness of the material under the foot *e*, the latter being rigidly yet adjustably attached by set-screw *e*′ to the rigid part b^{15} of the framework.

The rock-shaft F, before referred to, (see Fig. 5,) has fast upon it the hollow sleeve $F^\times$ of a rocking lever F′, constituting the carrier for the locking device F^2, co-operating with the teeth 60 of the segmental arm D′ of the work-support.

The lever F′ has an upwardly-extended arm (see Fig. 5) provided with a roller or other stud F^3, which enters the groove *a*′ at the inner or left-hand side of the cam A^3. The lever F′ also carries a dog *f* (shown best in Figs. 2 and 13^a) made as a pawl, acted upon by a spring-pressed pin, (shown in said Fig. 2,) the locking device F^2 and the dog working upon the toothed parts 60 and 61 of the segmental arm of the work-support at different times, as will now be described.

Just as the awl commences to enter the material resting on the work-support the locking device contacts with the segmental arm D′ of the work-support and holds the work-support rigidly until the awl has penetrated the material, at which time the locking device rises slightly to release the said segmental arm, leaving the work-support held up only by or through the force of the spring D^6, and just as the awl is about to act to feed the material the lever F′ rises far enough to move the dog *f* against the teeth of the segmental arm, causing said dog acting on said teeth to turn the work-support a definite distance whatever may be the position of the work-support, so that the material is loosened or unclamped uniformly, whatever may be its

thickness, to let the awl move the material freely between the throat-plate of the work-support and the foot *e;* but as soon as the awl has completed its feeding movement the lever F′ is moved in the opposite direction by its cam *a′* sufficiently to retire the dog *f*, as will be described, from contact with the segmental arm D′, thus again leaving the spring D⁶ free to act and press the throat-plate of the work-support against the material and press the latter against the foot *e*, the said spring holding the material in position while the awl retires and the looper makes the stitch, as before described. The work-support in this instance of my invention is provided with a tension device *h*, shown as a spring-controlled roll over which the thread passes on its way into the groove $h^{\times}$ under the throat-plate, the said thread coming to the tension device from the wax-pot and being acted upon by a roller *h′*, carried by a lever h^2, connected with a hub h^3 by a suitable pin or screw h^4, said hub being supported on a hollow hub h^5, forming part of the rock-shaft $F^{\times}$, and having a projection h^6, which in this instance of my invention is acted upon by a crooked finger h^7, connected to a thimble 62 on the end 63 of the shaft F, (see Figs. 5 and 6,) a spring h^{15}, surrounding said thimble and connected at one end with a washer h^{16}, held in place by a set-nut 64, acting normally by its opposite end to keep the crooked finger h^7 against finger h^6 and the roll *h′* down.

The thimble or the finger h^7 has a projection h^8, which enters a slot w^2 in a link h^{10}, connected to an elbow-lever h^{12} having its fulcrum at h^{13} and provided with a roller or other stud h^{14}, which enters the eccentric groove a^2 in the right-hand side of the cam A^3. (See Fig. 17.)

The lever h^{12} has connected to it a rod h^9, having at its lower end a suitable slot or orifice, through which is extended the thread on its way from the wax-pot to the thread-tension device, to be described, the said thread at each side the slot in the rod resting on like pins 30 30, (shown in Figs. 2, 5, and 8,) so that when said rod is depressed, as it will be by the motion of said elbow-lever, it will act on the thread and pull it from the wax-pot; but to insure this the roll b^{20}, heretofore described as carried by the feeding-frame, is made to act against the concaved stop or thread-rest 31, Fig. 8, and clamp the thread positively during the time that it is being so pulled from the wax-pot, and this thread, so pulled from the wax-pot, is, when the lever is moved in the opposite direction, controlled as to its slack by the roller *h′* and spring h^{15}. In case the spring should not act to fully take up the slack thread so drawn off then the link h^{10} will act to positively lower the roll and take up the slack.

I will now describe the thread-measuring device, and first referring to the work-support it will be seen (viewing Figs. 2 and 4) that it is made as a hollow shell, and that it carries loosely a stud *k*. (Shown by dotted lines in Fig. 2 and by full lines in Fig. 10.)

The upper end of this stud has a short arm $k^{\times}$, upon which is pivoted at k^6 the thread-measuring device *k′*, having a point k^2, which is adapted to move in a pocket k^3 made in the under side of the throat-plate D^8, (see Figs. 4, 14, and 15,) the thread-measuring device being turned to the right (viewing Fig. 10) far enough to get behind the thread which is delivered over the shoulder k^4 at the end of groove $h^{\times}$ of the throat-plate, the thread passing from said shoulder up through the slot k^{10} in the throat-plate to the material.

The work-support is shown as provided with a thread-rest k^{40}, located at a short distance from the shoulder k^4 and throat-plate at a point close to the path of movement of the pusher, the latter as it rises passing close to the right-hand side of the said thread-rest, (viewing Fig. 10,) so as to meet the thread extended from said shoulder to said rest, and then held at the left-hand side of the rest by the thread-measuring device, it having previously entered the pocket k^3 and having got behind the thread, and by a movement of the thread-measuring device to the left having carried the thread just over or beyond the top of said thread-rest. By holding the thread stretched in this way the pusher unerringly catches the thread and pushes it in advance of it into the hole made by the awl. The pusher catches the thread when the thread-measuring device has completed its full movement to the left and has drawn off the proper length of thread for the stitch, and during the time that the pusher acts upon the thread to push it into the hole made by the awl the thread-measuring device, if the stitch is long or the leather is thick, will be moved backwardly toward the thread-rest; but it will pass the thread on its return movement to engage the thread for a new stitch only after the pusher has been completely withdrawn from the material.

The thread-measuring device is in practice moved to the right (viewing Figs. 1 and 10) to engage the thread behind the shoulder k^4, while the awl and pusher are both out of the work and while the awl is also being moved back or to the right, Fig. 1, preparatory to engaging the material to feed the same for another stitch. The awl enters the material as soon as the thread-measuring device has been moved far enough toward the left to be out of the way of the awl, and as the awl continues to enter the material and to feed the same the thread-measuring device continues and completes its movement to the left to stretch the thread from the shoulder k^4 to the thread-rest by the time that the awl has been started out of the material and the pusher has arrived in place to meet the thread. As the pusher rises and acts on the thread it causes the latter to be cast off from the some-

what beveled notched free end of the thread-measuring device.

I will now describe how I impart to the thread-measuring device its variable movement to thus adapt it for the difference in thickness of stock.

Viewing Fig. 2, the stud k, held loosely in the work-support, so that it can oscillate therein, has clamped upon it an arm 2, (see, also, Figs. 9 and 10,) the inner end of said arm being adapted to co-operate with the cam-face k^7 of a cam k^8, stationary yet adjustably fixed in position on the frame by a suitable set-screw k^9. The arm 2 is put into different positions with relation to the length of the said cam according to the thickness of the stock then on the work-support and between it and the stationary foot e, and the thicker the stock the nearer the arm to the upper end of the cam and the longer the stitch. It will be obvious, therefore, that according to the thickness of the stock the arm 2 will occupy different positions between the upper and lower ends of the said cam; but it will be understood that a less quantity of thread must be delivered for the thinner stock, and to provide for this automatic adjustment I have added to the machine the following devices, viz: Loose on the shaft C, before described, (see Fig. 9,) is a frame m having its rear end extended into the guideway A^{12}, before described, said frame having a roller or other stud m', which enters the peripheral groove a of the cam A^3, so that said frame has a sliding movement. This frame has fixed to it a positioning device m^2, which acts against the arm 2 after each stitch and moves the same away from the cam k^7, and during such movement causes the thread-measuring device to be carried back into its starting-point or into pocket k^3 and behind the shoulder k^4, so that the point from which it moves to take the thread will always be the same no matter what the thickness of the material. The positioning device moves this arm 2 against a spring-pressed block n, which is normally borne toward said positioning device by a spring n', located in the hollow shaft C and acting upon a short stud n^2, connected with said block, a suitable key or pin n^3, connected with the said stud and extended through slots in said shaft, acting against the block n to move it toward the said positioning device. Now, it will be understood (the arm 2 having been moved by the positioning device and the thread-measuring device having been put back to its starting-point) that said measuring device must take the thread and measure off a loop of greater or less length according to the thickness of the material, and it will be understood that the end of arm 2 will stand at a point between the ends of the cam-face k^7 according to the thickness of the material. Preparatory to giving to the thread-measuring device this movement to measure off the thread the positioning device will retire, so as to let the arm 2 contact with the cam-face k^7 at the proper point, and during this retirement of the said positioning device the block n will follow it and insure the placing of the arm 2 positively against said cam-surface.

The machine is provided (see Fig. 1) with an auxiliary wax-pot o, from the bottom of which leads a hollow pipe o', which delivers wax into the channel in the bottom of the outer sole if the sole is channeled, as it may or may not be, said wax in either event co-operating with the doubled inner ends of the thread to aid in preventing the doubled thread from being drawn back out from the awl-holes. This auxiliary wax-pot may contain a small pump o^2, (see Fig. 4,) the cylinder of which may be in communication with the pipe o', referred to, and a small piston o^3, suitably connected to arm o^5, (see Fig. 2,) may be reciprocated in said cylinder to positively force or pump the wax out through the tube.

The stud E^3, carrying the sector-lever for moving the awl-segment, is extended sufficiently beyond the outer end of the frame-work A′ to receive the hub p of a rocking lever, having arms p' p^2. The arm p^2 has, as shown, an eccentric stud p^3, to one end of which is connected the usual wedge-shaped slide p^{20}, for effecting the engagement or disengagement of the loose pulley p^6, which runs constantly, with the clutch-pulley part p^7 fast upon the main shaft. The treadle p^8, by the rod p^9 connected to the stud p^{10} of the wedge-shaped slide, will act to move the slide downwardly, and thus effect the clutching of the two pulleys.

The stopping of the machine is effected when the pulley is in a certain position.

The fast pulley p^7, as herein shown, has a a peripheral groove, in which is fitted a brake p^{12}, mounted upon a stud p^{13}, carried by the arm p', said arm also having fastened upon it by a stud-screw p^{14} a block p^{15}, having a roll p^{16}, which rides on the cam p^{17}, connected to or forming part of the fast pulley.

During the operation of the machine, should the operator remove his foot from the treadle p^8 then the roll p^{16} is permitted to enter the depressed part of the cam p^{17}, and at the same time let the brake p^{12} engage the fast pulley p^7, this being done coincident with the releasing of the running or loose pulley from the fast pulley. This cam p^{17} and roll p^{16} insure the stopping of the machine always at a certain point. The treadle p^8 is normally lifted by a spring such as described in connection with the treadle c^{10}. At times the operator desires to rotate the main shaft by hand, and to do this I have provided the eccentric stud p^3, hereinbefore referred to, it having a handle p^{22}, which may be engaged by the operator and pulled backwardly from the position Fig. 2, such movement leaving the machine free to be turned by hand. The pawl f has at one side, near its upper end, (see Fig. 13^a,) a small lip f^{20}, which, as the lever F′ is moved in the direction to carry the pawl down, strikes a stationary, yet adjust-

able, pawl-releasing device f^{21}, (shown as a short rod held in place by a set-nut f^{22},) the contact of said pawl with said releasing device causing the said pawl to leave the teeth 61.

This invention is not limited to the exact shape shown for the thread-measuring device, nor to the exact construction of the devices instrumental in providing for a greater or a less movement thereof according to the thickness of the material, nor to the precise construction of the devices for rocking and for depressing the work-support, nor to the exact shape of the sliding frame carrying the support, nor the sector which actuates the awl and pusher, for it will be obvious to those skilled in the art that the particular shape or construction of the said devices may be modified simply by the exercise of the skill of the mechanic and without invention.

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

1. In a sole sewing machine the following instrumentalities, viz;—a work rest, and a presser-foot; devices to lock the same at a distance one from the other according to the thickness of the material between them, and to separate the said surfaces to effect the release thereof during the feeding of the material; an awl, and a pusher; devices to actuate them, and to cause the awl to penetrate and feed the material, as described; a thread measuring device to engage and measure off the thread and hold the same preparatory to and while the pusher acts to push the thread into the awl hole; devices to actuate said measuring device variable distances according to the thickness of the material; a tension device, and a thread pull-off to make slack thread at one side the tension device, substantially as described.

2. A pivoted work-support; stitch-forming devices; devices to oscillate said work-support, and locking devices to lock the work-support in place; combined with a thread-measuring device carried by said work-support; and actuating devices to move the said thread-measuring device for a greater or less distance according to the thickness of the material, substantially as described.

3. A pivoted work-support; stitch-forming devices; devices to oscillate said work-support, and locking devices to lock the work-support in place; combined with a thread-measuring device carried by said work-support; and actuating devices to move the said thread-measuring device for a greater or less distance according to the thickness of the material; and with a pawl to engage the oscillating frame of the work-support and effect the release of the work between it and the said presser foot, substantially as described.

4. A work-support having a shaft provided with a thread measuring device and with an arm, and a cam to act on said arm and turn said shaft, combined with a positioning device to act on said arm after each stitch to put the thread-measuring device in its starting position, and means to actuate said positioning device, substantially as described.

5. In a sole sewing machine, the oscillating work-support provided with a throat-plate having a shoulder k^4 to support the thread; and a pocket close to said shoulder, combined with a thread-measuring device carried by said work-support; and devices to move said thread-measuring device, substantially as described.

6. In a sole sewing machine, the oscillating work-support provided with a throat-plate having a shoulder k^4 to support the thread; and a thread rest k^{40}, combined with a thread-measuring device carried by said work-support; and devices to move said thread-measuring device, substantially as described.

7. In a sole sewing machine, the oscillating work-support provided with a throat-plate having a shoulder k^4 to support the thread; a pocket; and a thread rest; combined with a thread-measuring device carried by said work-support; and devices to move said thread measuring device, substantially as described.

8. In a sole sewing machine, the oscillating work-support provided with a throat-plate having a shoulder k^4 to support the thread; a pocket; and a tension device mounted on said work-support; combined with a thread-measuring device carried by said work-support; and devices to move said thread-measuring device, substantially as described.

9. An oscillating work-support having a thread-measuring device provided with an arm 2; a cam against which said arm may move; a movable carriage, and a positioning device attached thereto; combined with a spring-pressed block to bear said arm toward said positioning device and cam, substantially as described.

10. A work-support; a shaft having an attached carriage provided with a feeding device, and devices to move said carriage, combined with a feed controller co-operating with said shaft; a feed regulating device; a treadle, and connections between it and said feed controller to operate the latter, substantially as described.

11. In a sole sewing machine, the shaft C having the flange c, its attached carriage having a stud m'; a spring to move the shaft in one direction, and a cam to act on said stud and move the carriage in the opposite direction; combined with a feed controller having a flange c^2, and devices to adjust said feed controller longitudinally to determine the approach of the said stud toward said cam, substantially as described.

12. The carriage c^{19} having a threaded portion, and the work-support having the tubular shaft, combined with an awl-carrying segment having a threaded hub screwed into said threaded portion, substantially as described.

13. The sliding feed carriage c^{19} having at one end the projection b^{19}, the thread clamping roll b^{20} carried thereby, and the rest 31

with which said roll co-operates, substantially as described.

14. The movable frame, its roll and rest to clamp the thread; combined with the rod h^9, and studs to pull the thread from the source of supply while the thread is clamped between said rod and the stitch-forming device; a lever to which said rod is connected, and a cam to move said lever, substantially as described.

15. In a sole sewing machine, a yielding work-support; an opposed rigid foot; a sector; an awl at one end of said sector, a pusher or thread-inserter at the other end thereof and located in the same vertical plane as the awl; means to oscillate the sector; a thread-measuring device carried by said work-support; devices to move said thread-measuring device to measure off thread; devices to move the sector laterally in a horizontal plane while the awl is in the material to feed the same, the devices for oscillating the said sector being moved to retract the awl at the end of its feeding movement, the pusher engaging the thread and pushing it directly into the hole last made and left by the awl, substantially as described.

16. In a sole sewing machine, the following instrumentalities, viz;—a work-rest; a presser-foot; an awl, and a pusher, devices to actuate them, and to cause the awl to penetrate and feed the material, as described; a thread-measuring device carried by the said work-rest to engage and measure off the thread and hold the same preparatory to and while the pusher acts to push the thread into the awl hole; and devices to actuate said measuring device variable distances according to the thickness of the material, substantially as described.

17. A presser-foot; a pivoted work-support; an awl having its center of oscillation coincident to that of the work-support, devices to actuate said awl, devices to actuate said work-support to keep the work on the work-support against the presser-foot while the awl is penetrating the material; and a thread-measuring device carried by said work-support; and a stitch-forming device to engage said measured thread; combined with devices for actuating said thread-measuring device, substantially as described.

18. In a sewing machine, the following instrumentalities, viz;—a work-support; a tension device; a feeding device to feed the material on the work-support; means for varying the stroke of the feeding device; a pull-off to pull the thread from the tension device; stitch-forming mechanism, and connections between the feeding device and the pull-off, whereby the latter is moved by or through the former and whereby the stroke of the pull-off is varied in accordance with the length of the stroke of the feeding device, substantially as described.

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

LOUIS GODDU.

Witnesses:

GEO. W. GREGORY,

EMMA J. BENNETT.