

No. 745,819.

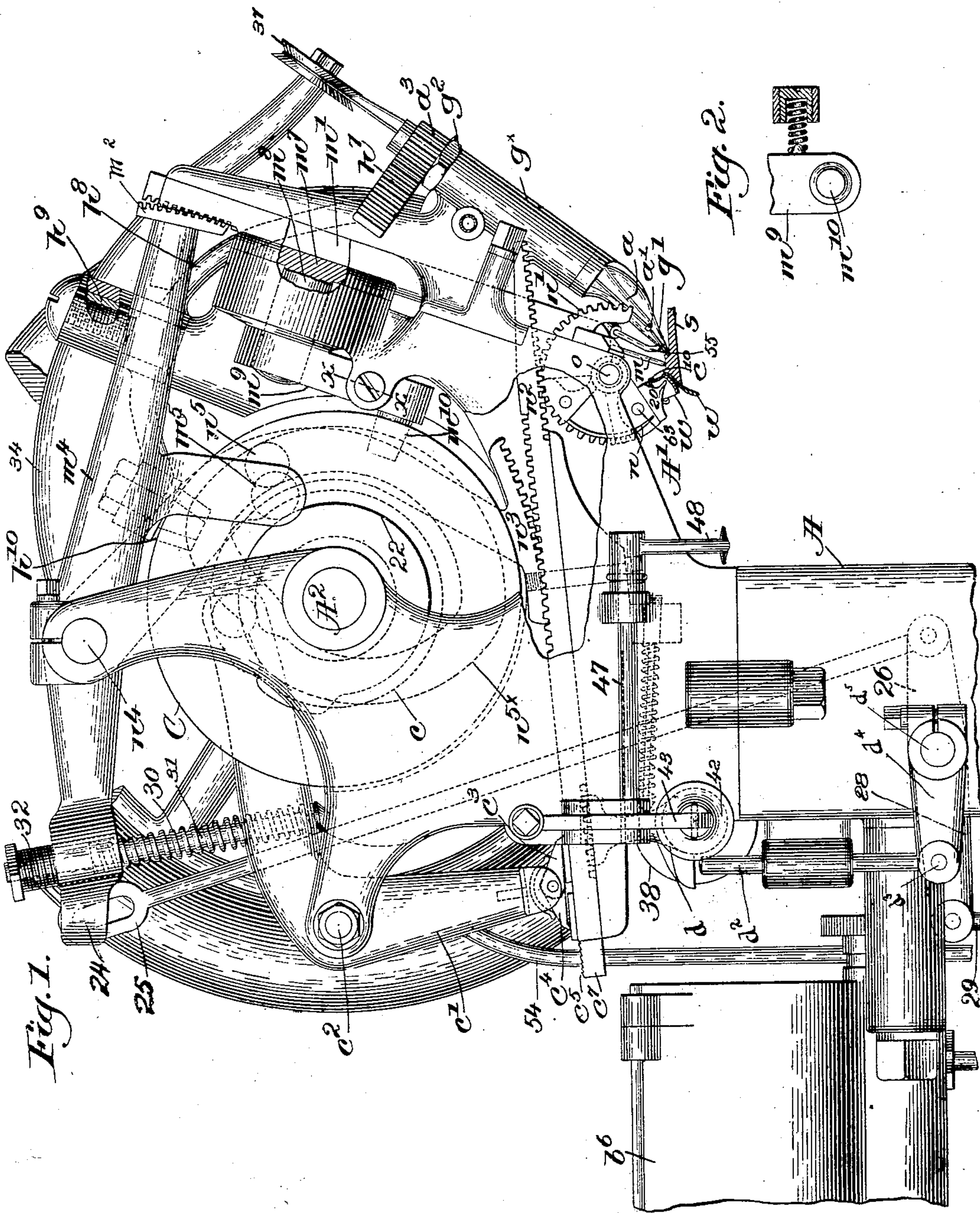
PATENTED DEC. 1, 1903.

W. GODDU.  
SEWING MACHINE FOR BOOTS OR SHOES.

APPLICATION FILED JUNE 26, 1896.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses.  
Fred S. Grumbaf.  
Thomas Drummond.

Inventor  
William Goddu.  
by Crosby Gregory  
attys.



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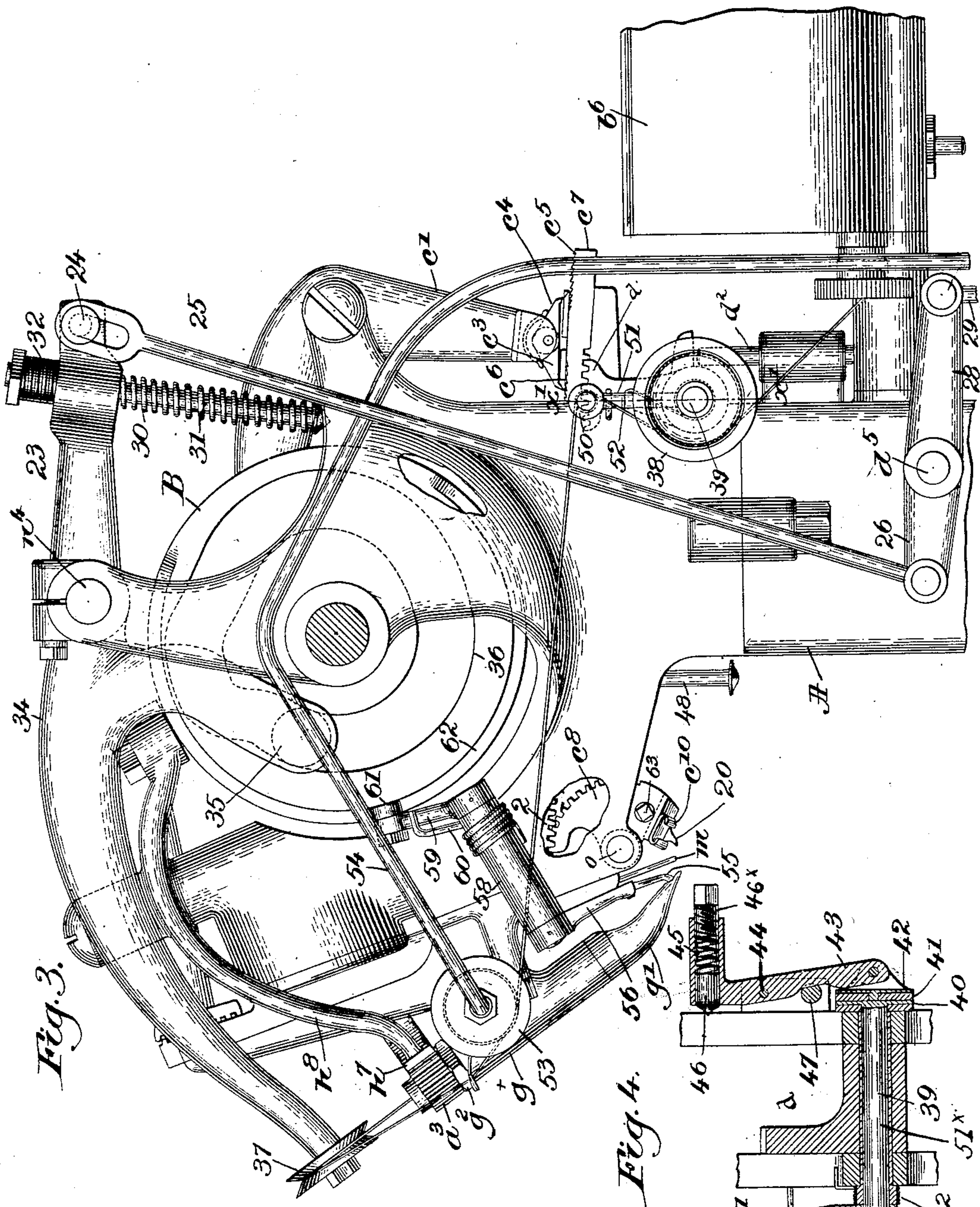
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Fred S. Gunkel.  
Thomas J. Drummond.

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William Goddu.  
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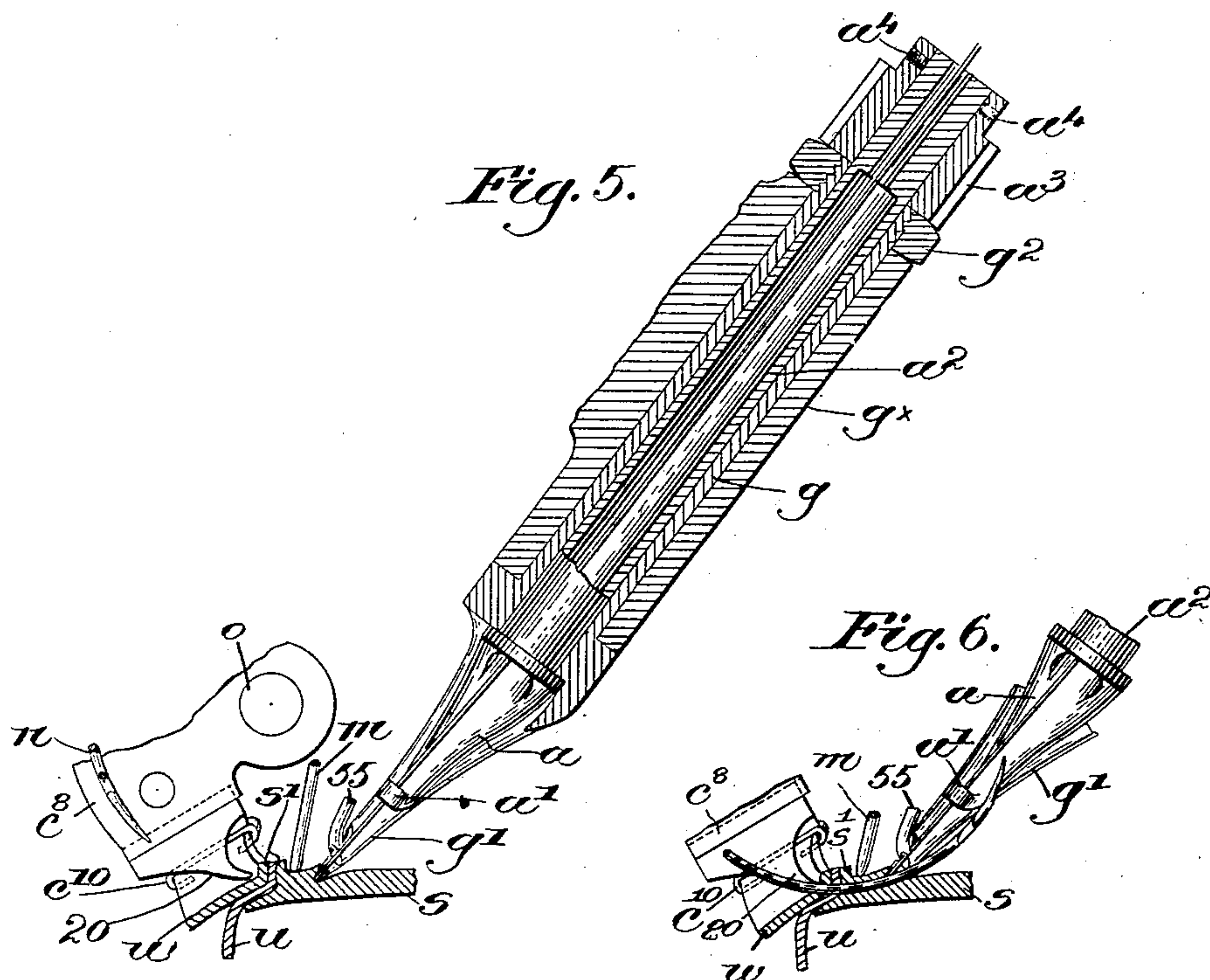


Fig. 7.

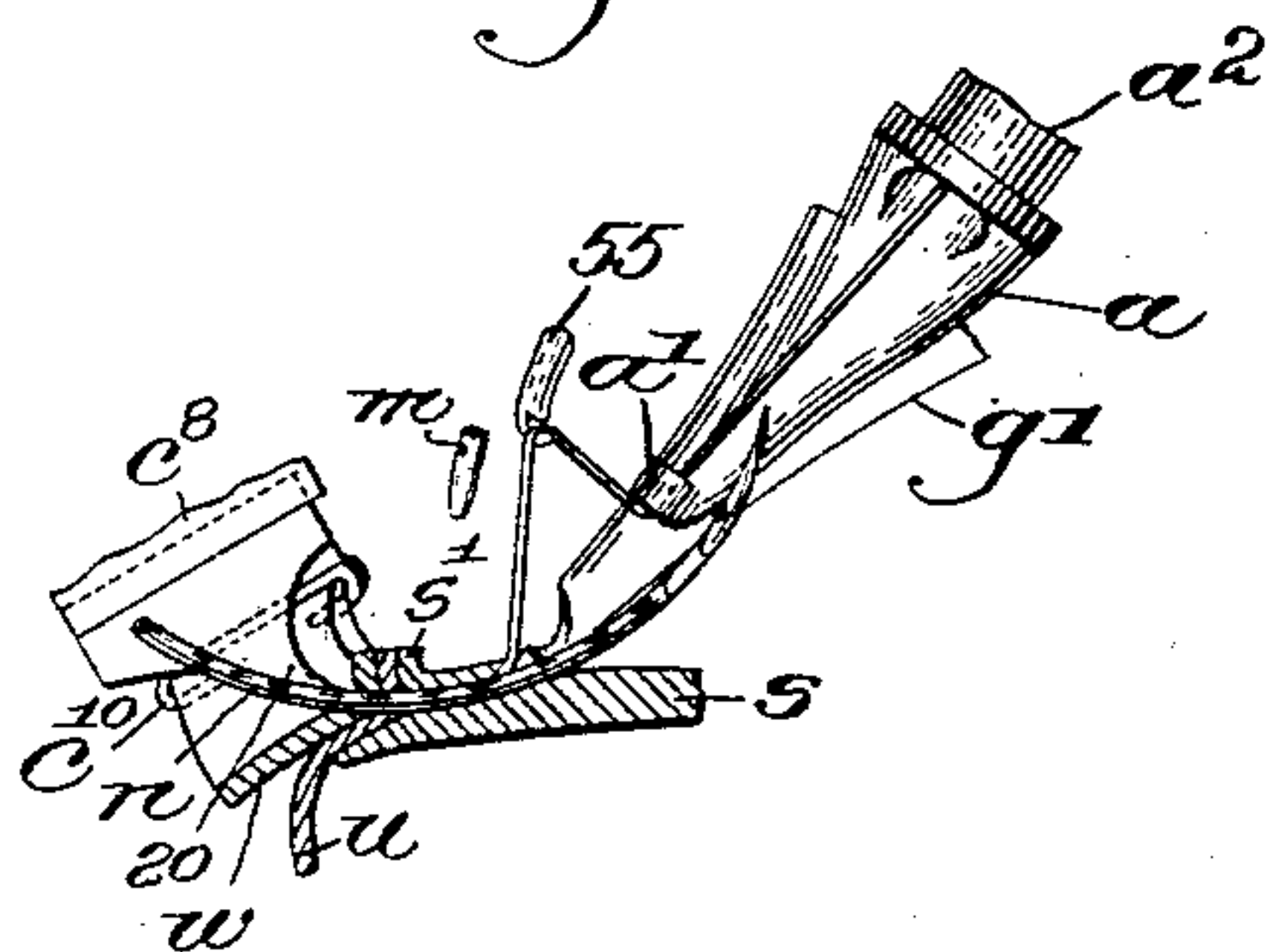


Fig. 8.

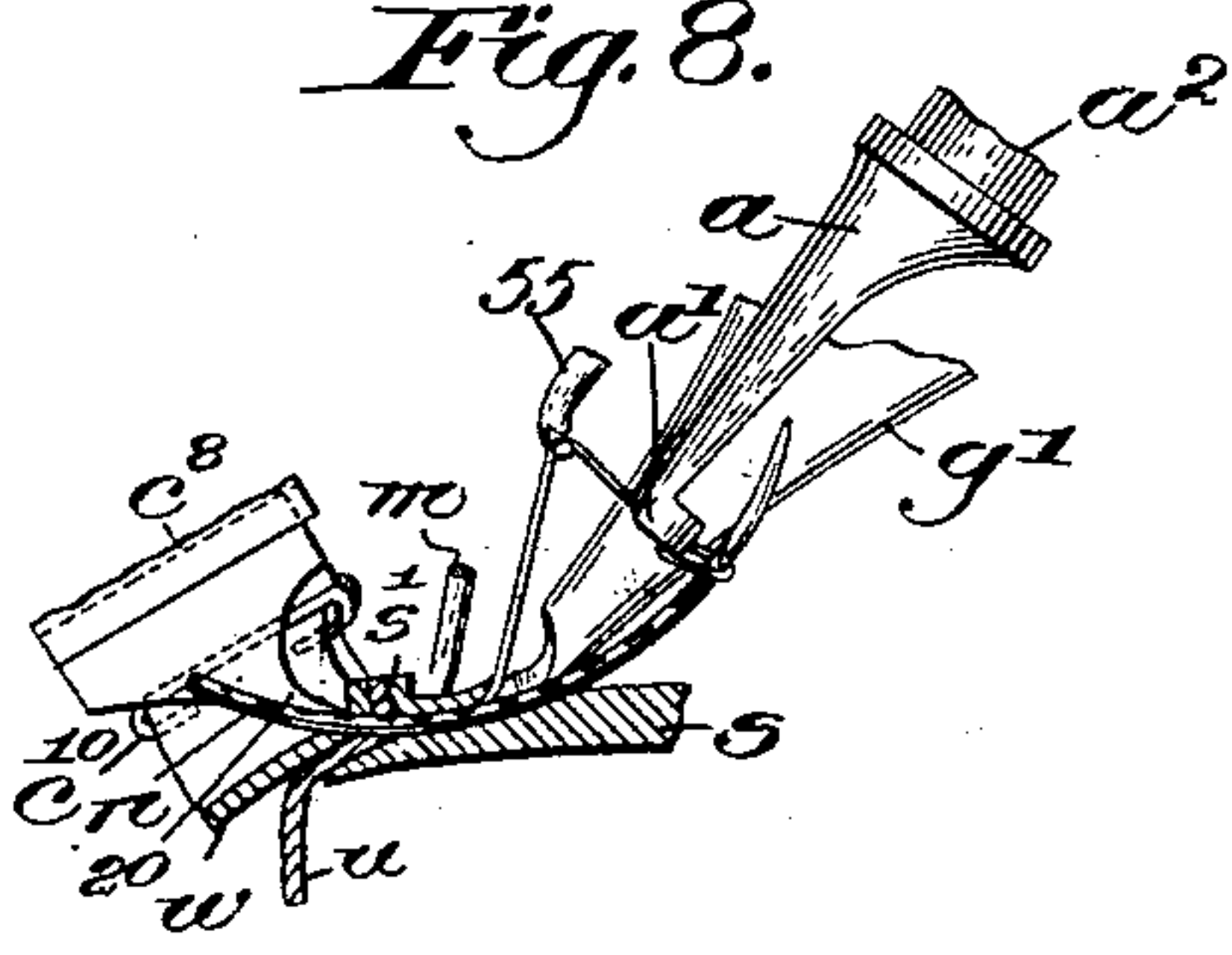


Fig. 9.

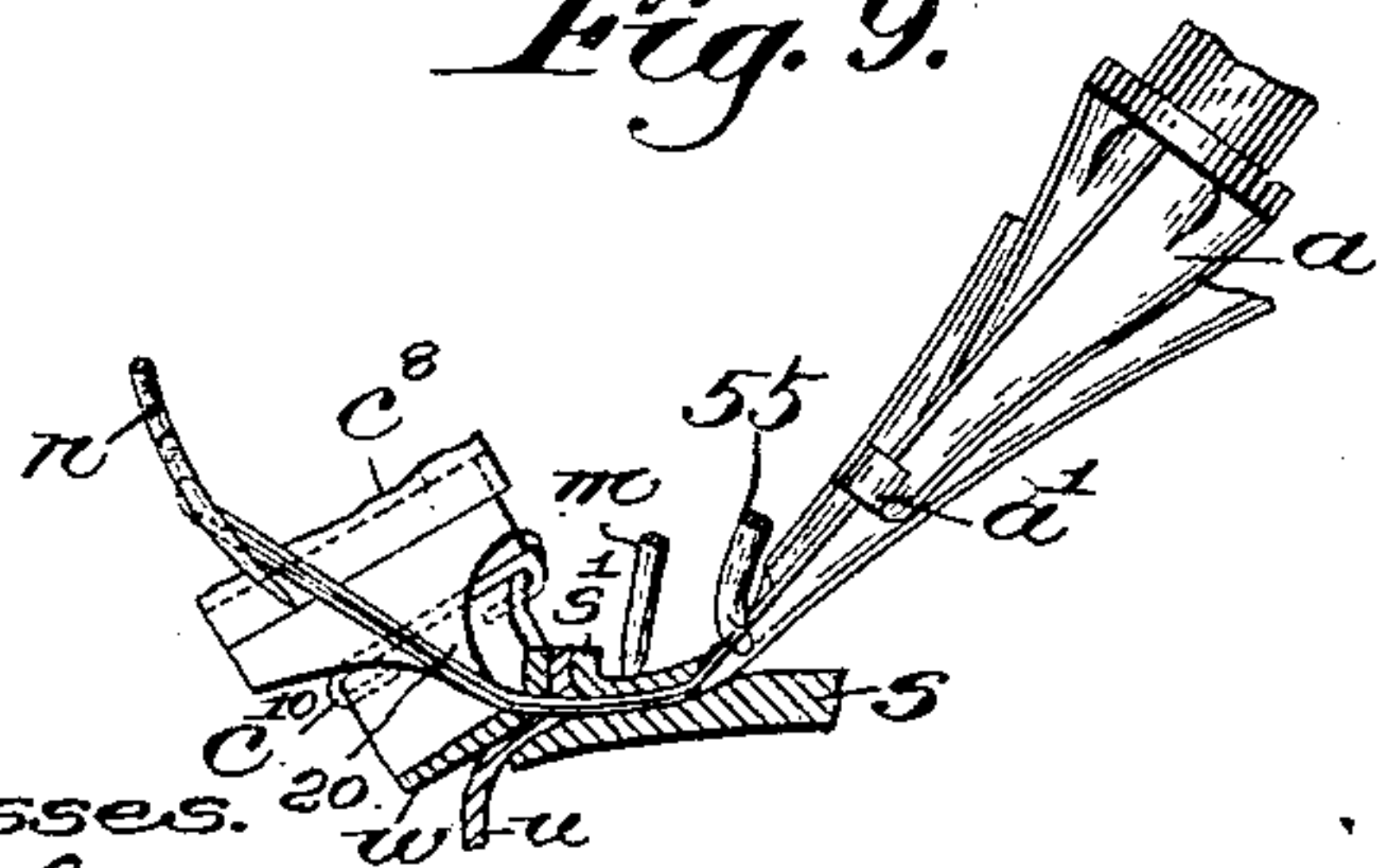


Fig. 10.



witnesses.  
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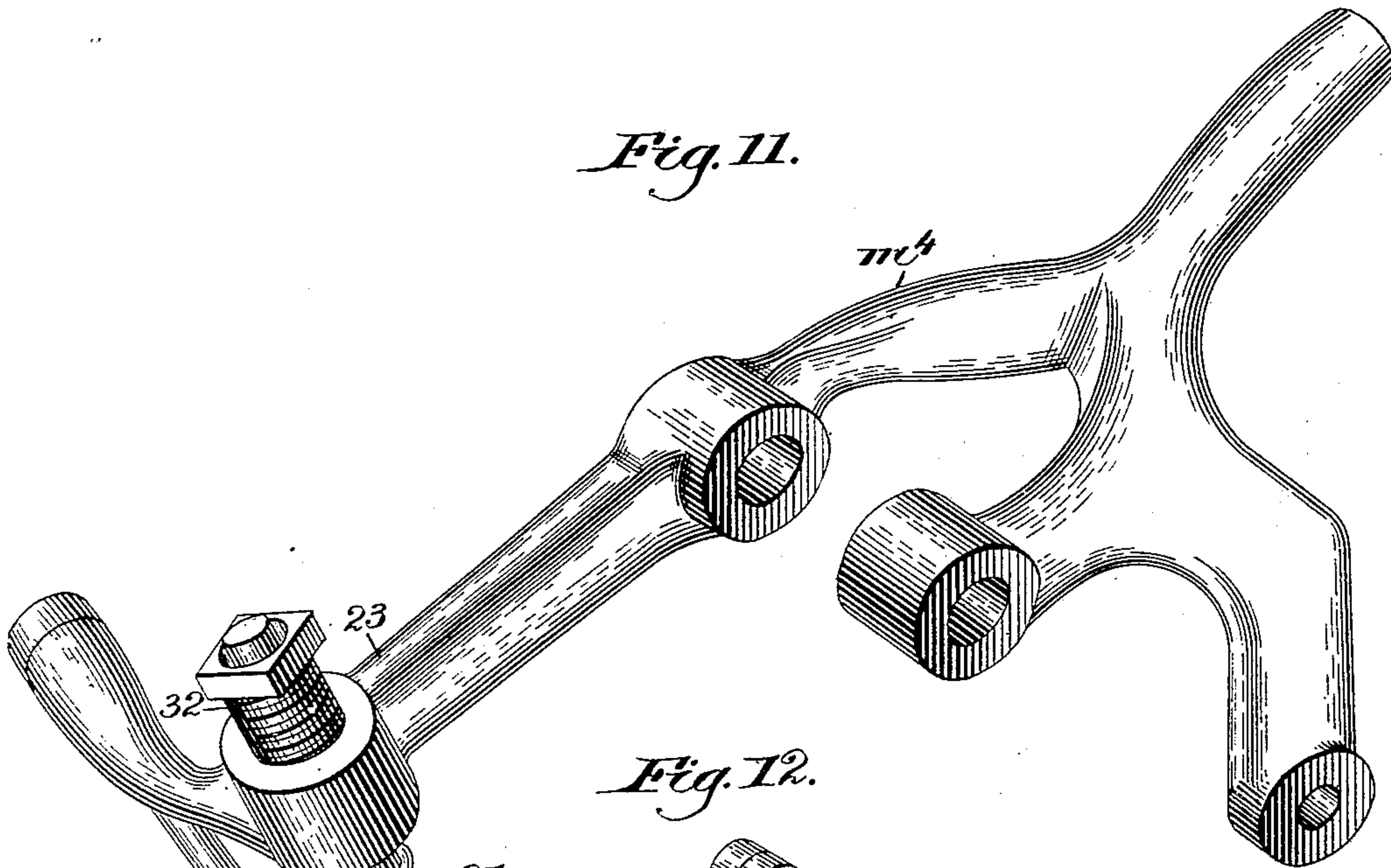
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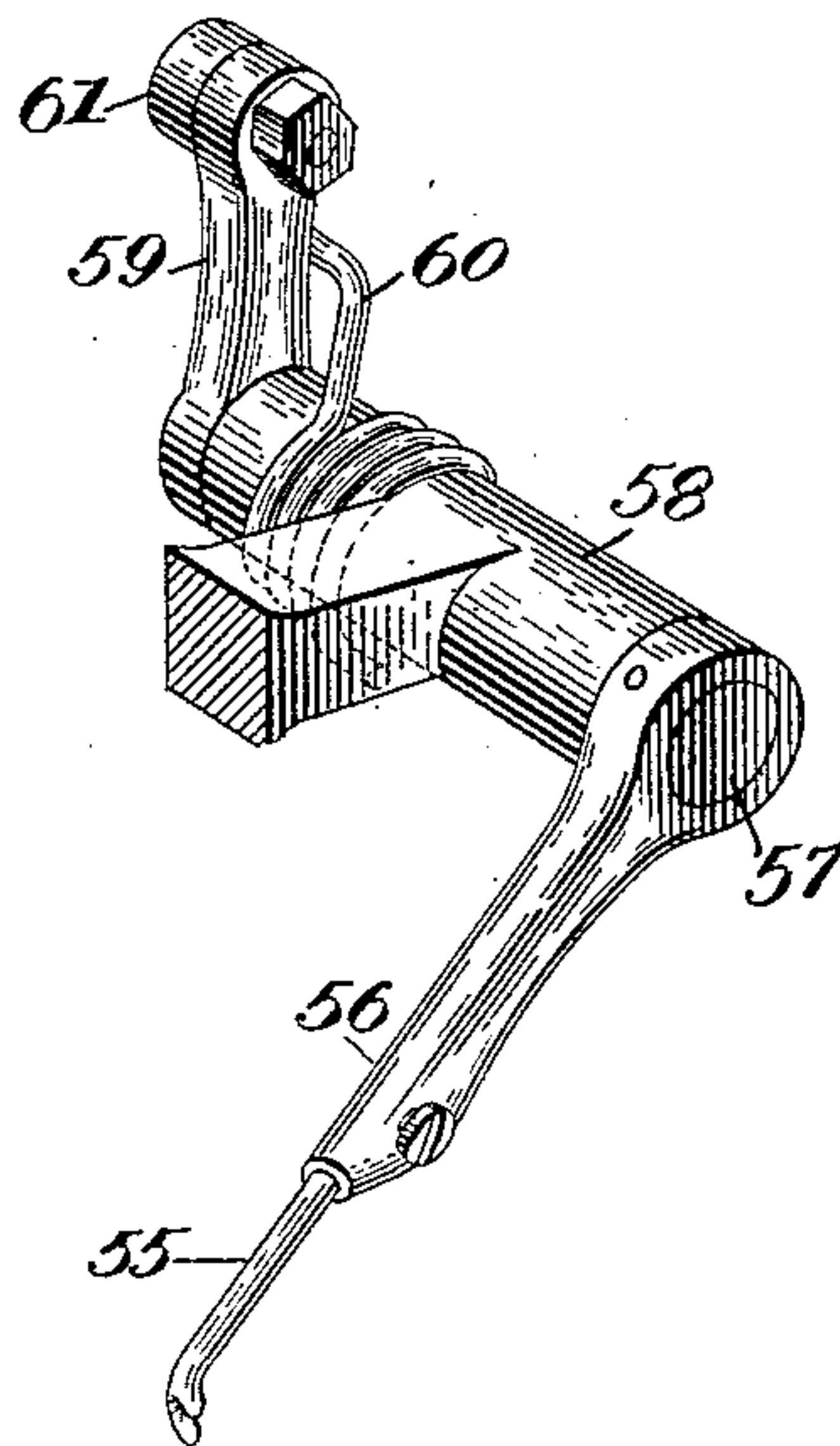
NO MODEL.

4 SHEETS—SHEET 4.

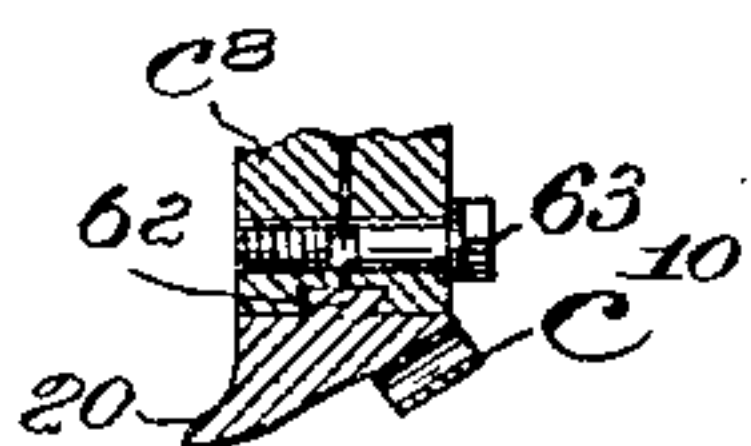
*Fig. 11.*



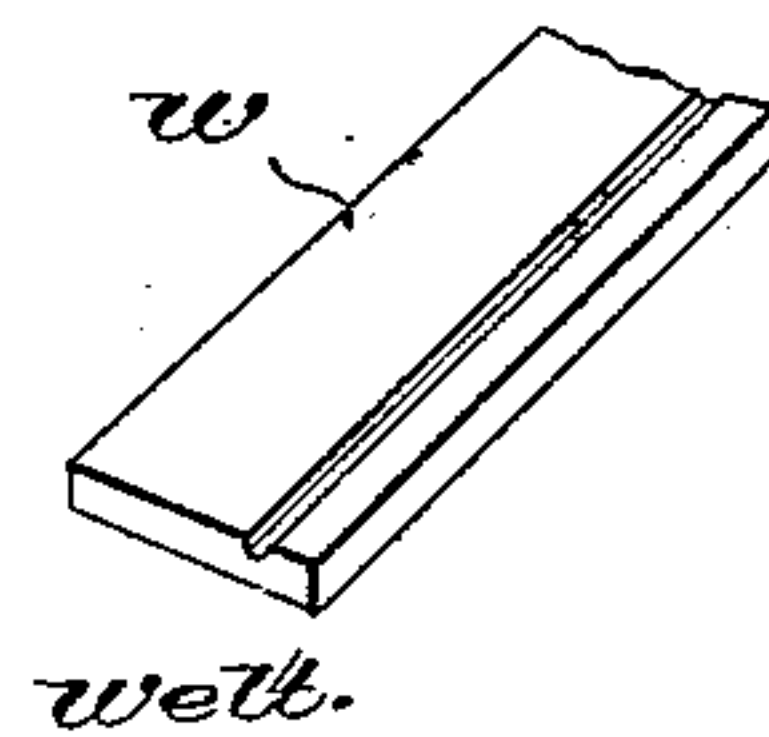
*Fig. 12.*



*Fig. 13.*



*Fig. 14.*



Witnesses.

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# UNITED STATES PATENT OFFICE.

WILLIAM GODDU, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO THE  
UNITED SHOE MACHINERY COMPANY, A CORPORATION OF NEW JERSEY.

## SEWING-MACHINE FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 745,819, dated December 1, 1903.

Application filed June 26, 1896. Serial No. 597,027. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM GODDU, of Winchester, county of Middlesex, State of Massachusetts, have invented an Improvement in Sewing-Machines for Boots or Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of an improved sewing-machine for attaching welts to uppers, the same being an improvement on the machine described in application Serial No. 574,299, filed January 4, 1896.

In this invention I have provided means whereby the feeding-point may be lifted from the work whenever desired or whenever it is desired to remove or put work in place, and at the same time the welt-guide is drawn back out of its working position.

I have provided a device for presenting the thread to the hooked needle, the same consisting of an eyed finger connected to a hollow tube through which the thread is led, and with this thread-guide I have combined a take-up to draw the thread in a substantially straight line back out of said tube.

I have also combined with the looper a thread-lifter to pull off from the looper a measured quantity of thread preparatory to the looper winding the thread about the needle to thus prevent the rendering of the thread through the hook of the needle as the latter draws the loop through the work.

I have also provided novel means for controlling the tension device, and I have made the welt-guide adjustable, so that the welt-presser attached thereto may be made to correctly enter the stitch-groove in the outside of the welt and correctly position the welt.

Figure 1 is a left-hand side view of a sufficient portion of a sewing-machine with my improvements added to enable my invention to be understood. Fig. 2 is a section in the line  $x$ , Fig. 1. Fig. 3 is a right-hand side view of the machine shown in Fig. 1. Fig. 4 is a sectional detail in the line  $x'$ , Fig. 3. Fig. 5 is a detail showing part of the frame with the shank of the work-support, channel-guide, and looper-shank in section, part of the welt-

guide and the welt and inner sole. Figs. 6 to 9 show some of the same parts, but in different position, to illustrate their actions in forming a stitch. Fig. 10 shows the welt-guide and welt-presser. Fig. 11 shows, enlarged, the lever which moves the awl-carrier, and Fig. 12 a detail of the thread-lifter. Fig. 13 is a detail of the sector carrying the welt-gage. Fig. 14 shows a short section of a grooved welt.

The column A has erected on it the head A', suitably shaped and provided with bearings to support the working parts, said head supporting the main shaft A<sup>2</sup>, provided with cams, to be described, to actuate the working parts.

In Figs. 1 and 5 to 9,  $u$  represents part of the upper,  $w$  a piece of welt, and  $s$  part of an inner sole having a channel cut therein a short distance from its edge. This channel is entered by the end of a work-support or channel-foot  $g'$ , extended from a tubular shank  $g$ , held in a fixed part  $g^x$  of the head by a nut  $g^2$ . The edge of the inner sole is shown as split, and one part is turned up, as shown at  $s'$ , leaving a space between the two parts of the split edge, into which the upper is borne, the welt  $w$  lying against the upper being forced, with the upper, closely into the bottom of the space at the split edge of the sole and being there held by the presser 20 of the welt-guide, while the needle  $n$  enters the welt, the upper, and the sole and emerges from the channel in the bottom of the sole to be supplied with thread  $t$  by a looper, shown as a finger  $a$ , having an eye  $a'$ , the finger being fixed to the lower end of a hollow shaft  $a^2$ , extended through the shank  $g$  of the channel-foot or work-support and provided with a gear  $a^3$ , attached thereto by suitable set-screws  $a^4$ , the needle-thread passing through the said hollow shaft.

The hooked needle  $n$  is fast on a needle-segment  $n'$ , pivoted on a stud  $o$ , said segment being engaged and actuated at the proper times by the teeth at the lower side of a rack-bar  $n^2$ , said bar having at its upper side a second series of teeth, which are engaged by teeth at the lower end of a segment  $n^3$ , mounted loosely on a stud  $n^4$  and provided with a roller or stud  $n^5$ , which enters a



groove  $n^{5x}$  in the right-hand side of a cam-hub C.

The welt is held in a welt-guide  $c^{10}$ , fixed to a welt-guide segment  $c^8$ , also mounted to turn on the stud  $o$ , the teeth of the welt-guide segment being engaged by the rack-teeth 2 of a sliding bar  $c^7$ , having two series of reversely-pointed ratchet-teeth  $c^5 c^6$ , which are engaged by independent spring-pressed pawls  $c^3 c^4$ , attached to a lever  $c^1$ , pivoted at  $c^2$  and having at one end a suitable cam-roll to enter a cam-groove  $c$  at the inner side of the cam-hub C to lock and release the welt-guide at the proper times. The bar  $c^7$  has at its under side ratchet-teeth which are engaged by the teeth of an arm  $d$ , (see Figs. 1 and 3,) mounted on a sleeve  $51^x$ , (see Fig. 4,) said sleeve being provided with a toe which is acted upon at times by a rod  $b^2$ , pivotally connected to one end of an arm  $a^5$  of a shaft  $d^5$ . (See Fig. 1.)

The curved hooked needle  $n$  is attached to a needle-segment  $n'$ , which segment is engaged by teeth (see Fig. 1) at the under side of a straight rack  $n^2$ , deriving its motion from the segmental toothed end of a lever  $n^3$ , pivoted at  $n^4$  and having a roller or other stud  $n^5$ , which is actuated by a groove in a cam fast on the main shaft  $a^2$ , the said groove being shown by dotted lines in Fig. 1.

In this invention the welt-guide has been provided with a welt-presser 20, which bears on the welt and presses it and the upper on which the welt rests closely into the bottom of the space left by splitting the sole, as stated, said presser by its action on the welt and upper pressing the same closely into the said space or angle close to the path of the needle.

The feeding-point  $m$ , attached to the lower end of a bar  $m'$ , fitted into ways of a guide  $m^7$ , having a rocking stud  $m^8$  extended loosely through a suitable bearing forming part of the said guide and having attached to its inner end an arm  $m^9$ , said arm having a roller or other stud  $m^{10}$ , and the toothed segment  $m^2$  for engaging the rack on the bar  $m'$  having its shank placed loosely in the end of the lever  $m^4$ , mounted on the stud  $n^4$ , are also all substantially as in the said application; but herein I have changed the shape of the lever and have actuated it by the periphery of a cam 22, fixed to the shaft  $A^2$ , instead of by a cam-groove, as in said application, said peripheral cam acting on a roller-stud of the said lever, and by moving said lever by such a cam rather than by a cam-groove it is possible at any time to raise the bar  $m'$  and withdraw the feed-point from the work, the lifting of the bar by the treadle being only when the pawls  $c^3 c^4$  are out of engagement with the rack-bar  $c^7$ . This is a matter of very great convenience in working the machine, and by it it becomes possible to manipulate the work very much more easily. The rear end of the lever  $m^4$  has in this my invention an extension 23, provided with a stud 24, which is en-

gaged by a link 25, jointed to an arm 26 of the rock-shaft  $d^5$ , said rock-shaft having a second arm 28, to which is jointed a link 29, attached in practice to a treadle at the floor, so that by putting the foot on the treadle the lever  $m^4$  may be turned to lift the rod  $m'$  and pull the feed-point from the between substance of the sole. The feed-point in practice remains in the work during the feeding operation and while the direction of the shoe is changed, owing to the changing shape or contour of the channel, the feed-point leaving the work in sewing only when the needle is in the work, and in this way the work is always held securely and fed positively. The roller-stud  $m^5$  is kept against its actuating-cam by a spring 30 on a rod 31, the upper end of the spring being made adjustable by a hollow nut 32. Whenever the lever  $m^4$  is moved to withdraw the feed-point, the arm  $d^4$  acts, as in said application, to also push the slide-bar  $c^7$  forward and remove the welt-guide from the upper.

The looper-gear  $a^3$  is engaged and actuated by a toothed sector  $h^7$ , forming part of a lever  $h^8$ , having its fulcrum at  $h^9$  and provided with a roller or other stud  $h^{10}$ , which enters a face cam-groove of a cam-hub B, said sector and its actuating mechanism being the same as in said application.

The stud  $n^4$  also serves as the fulcrum for the take-up lever 34, having at one end a roller or other stud 35, which enters a cam-groove 36 in the right-hand face of the cam-hub B, (see Fig. 3,) said lever at its outer end having a sheave 37, which is so located and moved in the arc of a vertical circle as to pull the thread  $t$  in taking up the stitch back in a substantially straight line through the hollow tube  $a^2$ . The hollow shank of the looper protects the thread between the stitch-forming devices and the take-up sheave 37 and prevents the thread from catching or whipping around any of the adjacent parts of the machine when running at high speed.

The thread  $t$  will be taken from a suitable wax-pot or device  $b^6$  and led over a tension sheave or device 38, pinned to a shaft 39, having at one end a head 40, against which bears a friction device or washer 41, carried by a disk or button 42, pivoted on a lever 43, in turn pivoted at 44, said lever containing or carrying at one end a spring 45, acting on a point 46, the said spring having combined with it an adjusting device, shown as a screw  $46^x$ . By adjusting the screw  $46^x$  the pressure of the spring 45 may be increased or diminished, and consequently the friction of the washer on the head 40 may be adjusted to regulate the tension as may be desired. At one side of the head I have placed a shaft 47, having a handle 48, and by turning this shaft a portion thereof (see Fig. 4) which is made cam shape may be made to act on the lever 43 and move it to compress the spring 45 and release the tension device, that it may turn freely, as when taking out a shoe or threading up the



machine. The thread after having been wound about the tension device is led over a roller 50 of an auxiliary take-up 51, mounted loosely on a shaft 51<sup>x</sup> and acted upon constantly by a spring 52. The thread from the roller 50 goes about a sheave 53, which is kept hot by steam in a pipe 54, and thence over the take-up sheave 37. To obviate the rendering or pulling of the thread across or through the hook of the needle while the latter is acting to pull a loop of thread through the sole and upper and welt, I have provided a lifter 55, attached to an arm 56, fast on a rock-shaft 57 in a bearing 58, said rock-shaft 57 having attached to it an arm 59, acted upon by a spring 60, said arm having a roller-stud 61, acted upon by a side cam 62. The lifter stands normally near the needle-thread when the needle is out of the work, as in Fig. 5, which shows the needle out. The needle is thrust through the work, and when it arrives in the position Fig. 6 the lifter starts and, acting on the needle-thread between the sole and the looper, it draws from the latter enough thread to provide for making one-half of the stitch next to be made, and it holds said thread, as in Fig. 7, while the needle moves a little bit farther, as in Fig. 8, and the looper is revolved once about the end of the needle to wrap its thread about the said needle in the notch of the hook, after which the needle is retracted, taking with it the thread, and as the hook of the needle nearly arrives at the work the lifter gives up the thread held by it to the needle, it drawing the loop through the work without at all drawing the thread about or through the hook of the needle. By locating the thread-lifter, as shown and described, between the work and the eye at the end of the circularly-moving looper and with the end of the said lifter within the arc of movement of the needle and by moving said thread-lifter at right angles to the path of movement of said needle, as described, it becomes possible to unerringly seize the needle-thread and with but a slight movement of the lifter draw from the thread-supply a quantity of thread for the next stitch and hold it between the work and the looper while the latter rotates about the needle to lay the thread into the hook of the needle, and then as the needle takes the loop the thread-lifter is moved in a reverse direction to give up to the needle the thread held by the lifter. The steam-pipe 54 so heats the frame or parts of the machine, and with it the fixed part *g*<sup>x</sup> of the head, that the heat is by conduction imparted to the tubular shank *g* of the channel-foot and from that to the tubular shank of the looper located within it, so that the wax-thread in the hollow shank of the looper is kept at the proper temperature. The location of one hollow shank within another, so that one acts as a bearing for the other, adds greatly to the compactness of the parts and simplifies the construction. The eye of the looper is turned inwardly, so that it occupies a position sub-

stantially central with relation to the hollow shank of the looper, and the sheath of the take-up over which the thread is drawn when taking it up in making the stitch is so located and moved with relation to the hollow shank of the looper and its eye that the thread is drawn back into said eye and hollow shank in a substantially straight line without any friction, which is a great aid in setting the stitch accurately. The eye of the looper is so located that it revolves about the needle when the latter is at the end of its thrust through the work. For the next stitch the needle again enters the work, holding the loop on its shank, and it again takes thread, as described, and draws a new loop through the previous loop, making a chain-stitch in usual manner.

The welt-guide provided with the presser 20 has, as shown, a dovetail projection 62, which enters a correspondingly-shaped groove in the welt-guide segment, the latter being split opposite said groove, as best shown in Fig. 13, a threaded set-screw 63 entering said segment and clamping it firmly on the said projection to thus confine it in the desired position.

The presser 20 for the best results must press the welt and upper firmly against that part of the edge channel of the sole close to the point where the needle is to enter the welt and upper on its way into the sole, and on this adjustment of the welt-guide the presser 20, standing in the usual groove of the welt, correctly positions the said groove to receive the stitches.

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

1. In a sewing-machine, the following instrumentalities, viz: a work-supporting channel-foot against which the work is held, a curved hooked needle, a feed-point, its reciprocating supporting-bar provided with rack-teeth, a pivoted guide in which said bar is reciprocated, means to rock said guide, a lever to reciprocate said bar, a toothed segment engaging the rack-teeth of the said supporting-bar and pivotally supported by said lever, and a peripheral cam to move said lever, combined with manually-operated means to actuate said bar and move it from the control of its actuating-cam when it is desired to draw the feed-point from the sole, substantially as described.

2. The bar having rack-teeth, its feed-point, a lever and its loosely-connected toothed block engaging the said rack-teeth, a cam to operate said lever, combined with means attached to said lever to manually place it out of the range of movement of its operating-cam when it is desired to withdraw the feed-point from the work, substantially as described.

3. The bar, its attached feed-point, a lever, and connecting devices between said lever and bar, a rock-shaft, means to move it; con-



- nections between said rock-shaft and said lever, and the welt-guide segment, its welt-guide, the rack-bar for actuating said segment, and an arm to move said rack-bar, 5 combined with devices between said arms and said rock-shaft whereby when the bar and its feed-point are raised the welt-guide is also removed from contact with the work, substantially as described.
- 10 4. The curved hooked needle, means to actuate it, a channel-foot having a tubular shank, a looper having an eye and a hollow shank extended through the tubular shank of the channel-foot and through which the 15 thread is passed to said needle and rotatable on its longitudinal axis, means to rotate said looper, and a take-up lever having a sheave located near the end of said hollow shank and receiving about it the said thread, combined 20 with means to actuate said take-up lever and move said sheave in a path substantially coincident with the longitudinal axis of said looper, substantially as described.
5. The tension-wheel, the shaft to which it is fixed at one end, said shaft having at its 25 opposite end a head, and a washer bearing against said head, combined with a lever having an attached pivoted button, and means carried by said lever to cause the button to force the washer against the head of the said 30 shaft to regulate the tension on the thread, substantially as described.
6. A stitch-forming mechanism including a hooked needle, combined with a welt-guide segment, a welt-guide thereon provided with 35 a presser and bodily adjustable on said welt-guide segment in the direction transverse to the line of feed, and means to secure said welt-guide in its adjusted position on said welt-guide segment, substantially as de- 40 scribed.
- In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.
- WILLIAM GODDU.
- Witnesses:  
GEO. W. GREGORY,  
MARGARET A. DUNN.