

No. 623,100.

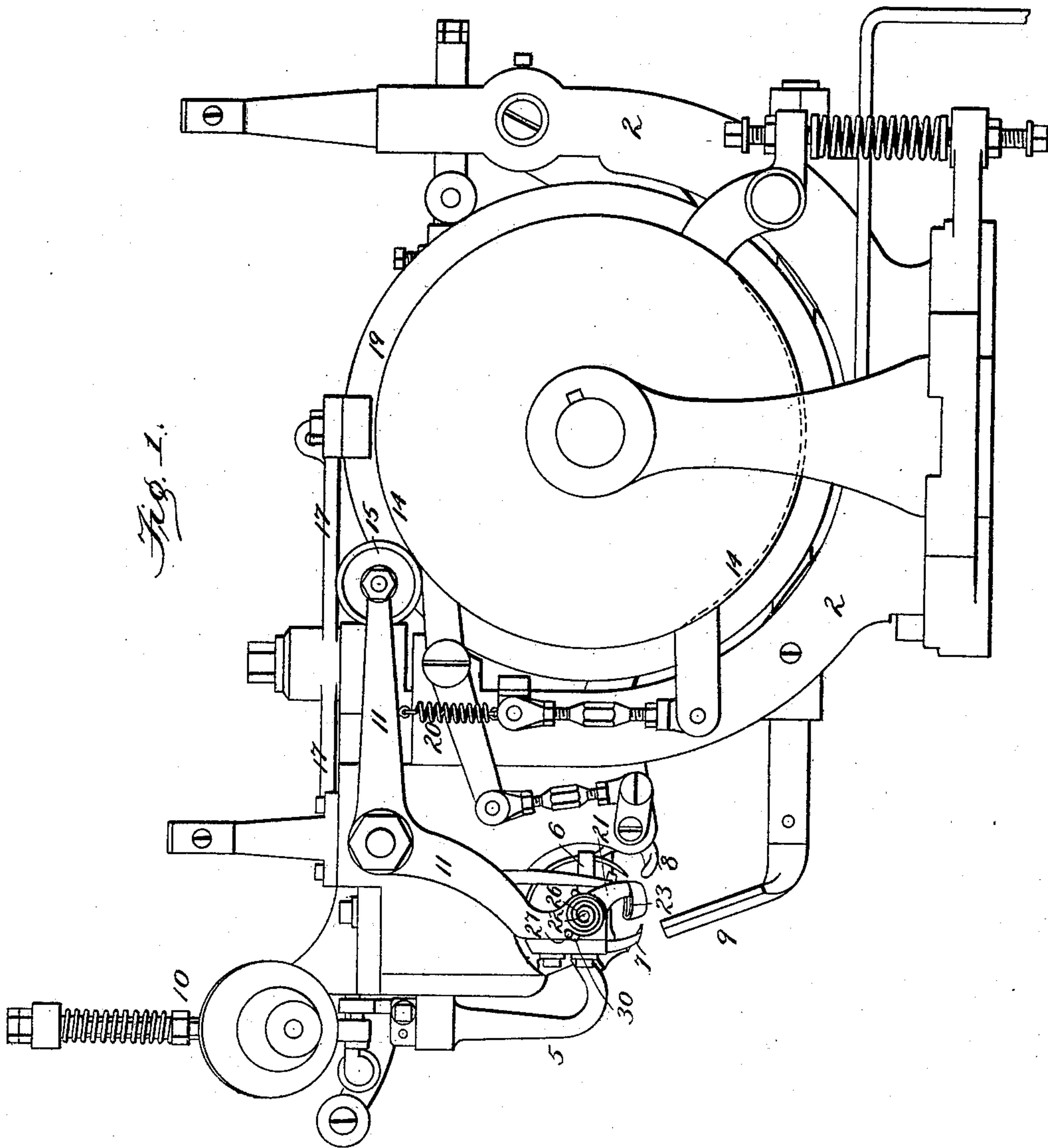
Patented Apr. 11, 1899.

F. A. MILLS.
SHOE SEWING MACHINE.

(Application filed Sept. 9, 1896.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

Edwin L. Bradford
Robt. H. M. Pherson

INVENTOR.

Francis Arthur Mills
BY
Johnson & Johnson
ATTORNEYS.

No. 623,100.

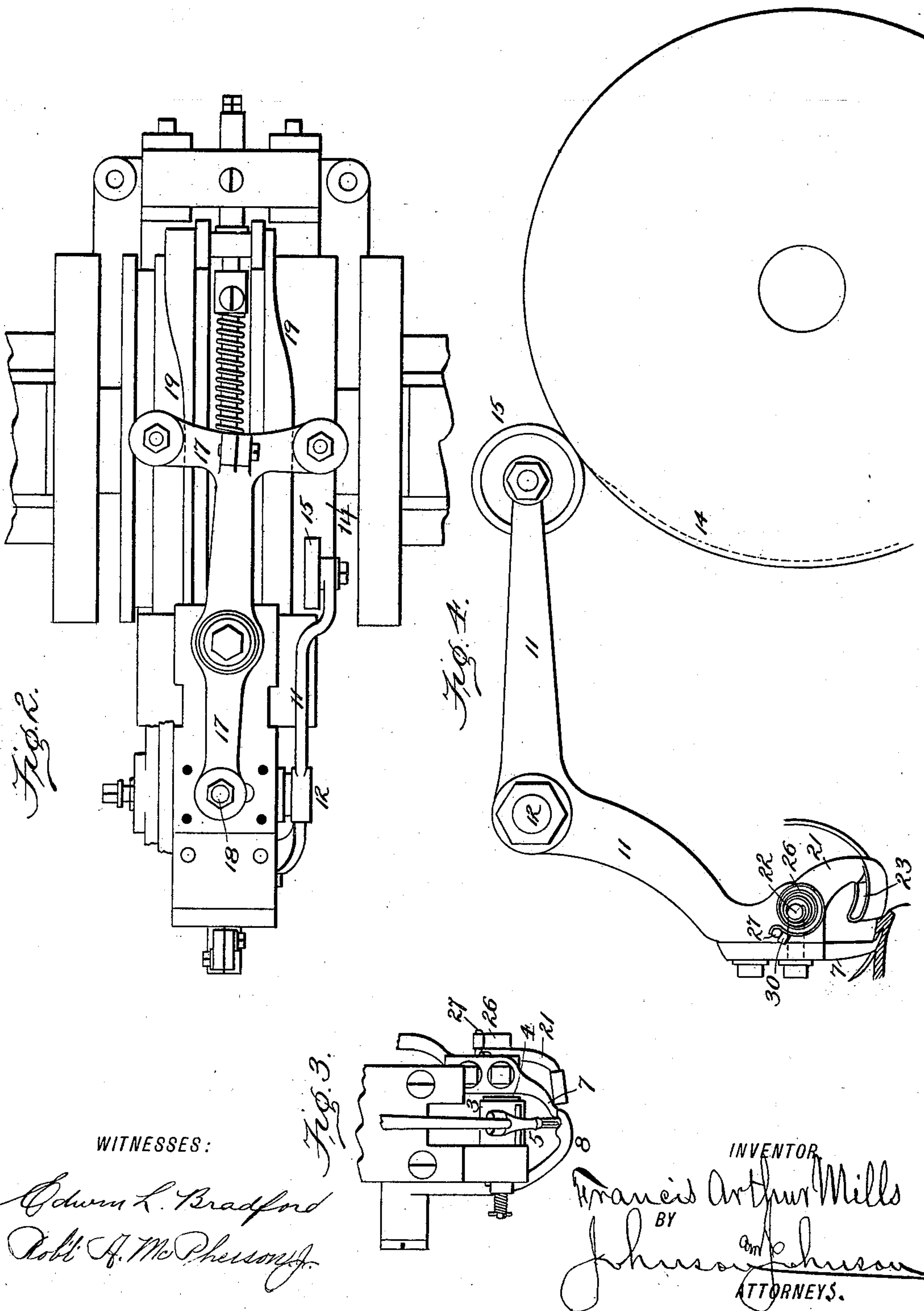
Patented Apr. 11, 1899.

F. A. MILLS.
SHOE SEWING MACHINE.

(Application filed Sept. 9, 1896.)

(No Model.)

3 Sheets—Sheet 2.



WITNESSES:

Edwin L. Bradford
Robt. H. McPherson

INVENTOR

Francis Arthur Mills
BY
Johnson & Johnson
ATTORNEYS.

No. 623,100.

Patented Apr. 11, 1899.

F. A. MILLS.
SHOE SEWING MACHINE.

(Application filed Sept. 9, 1896.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 5.

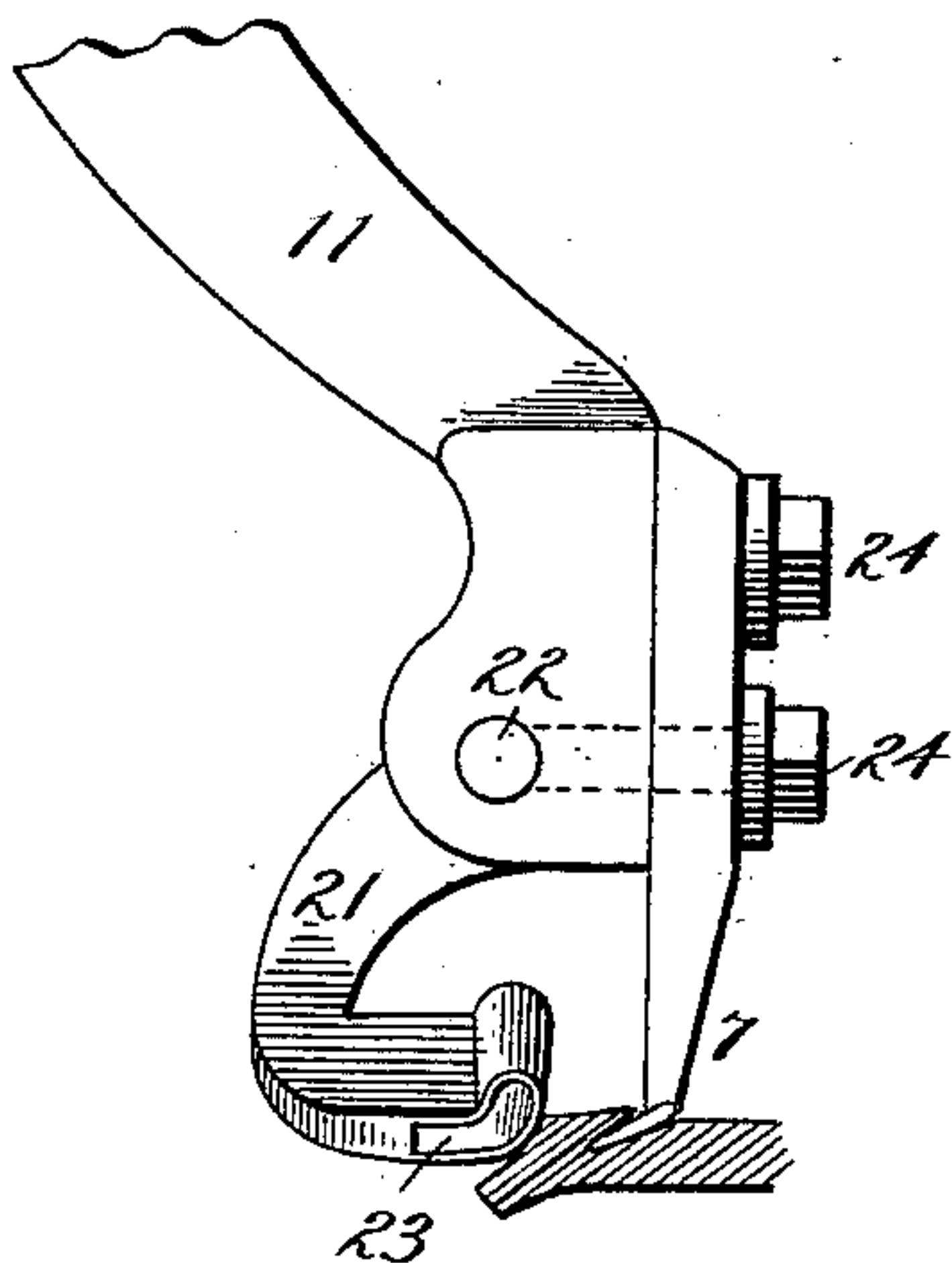


Fig. 6.

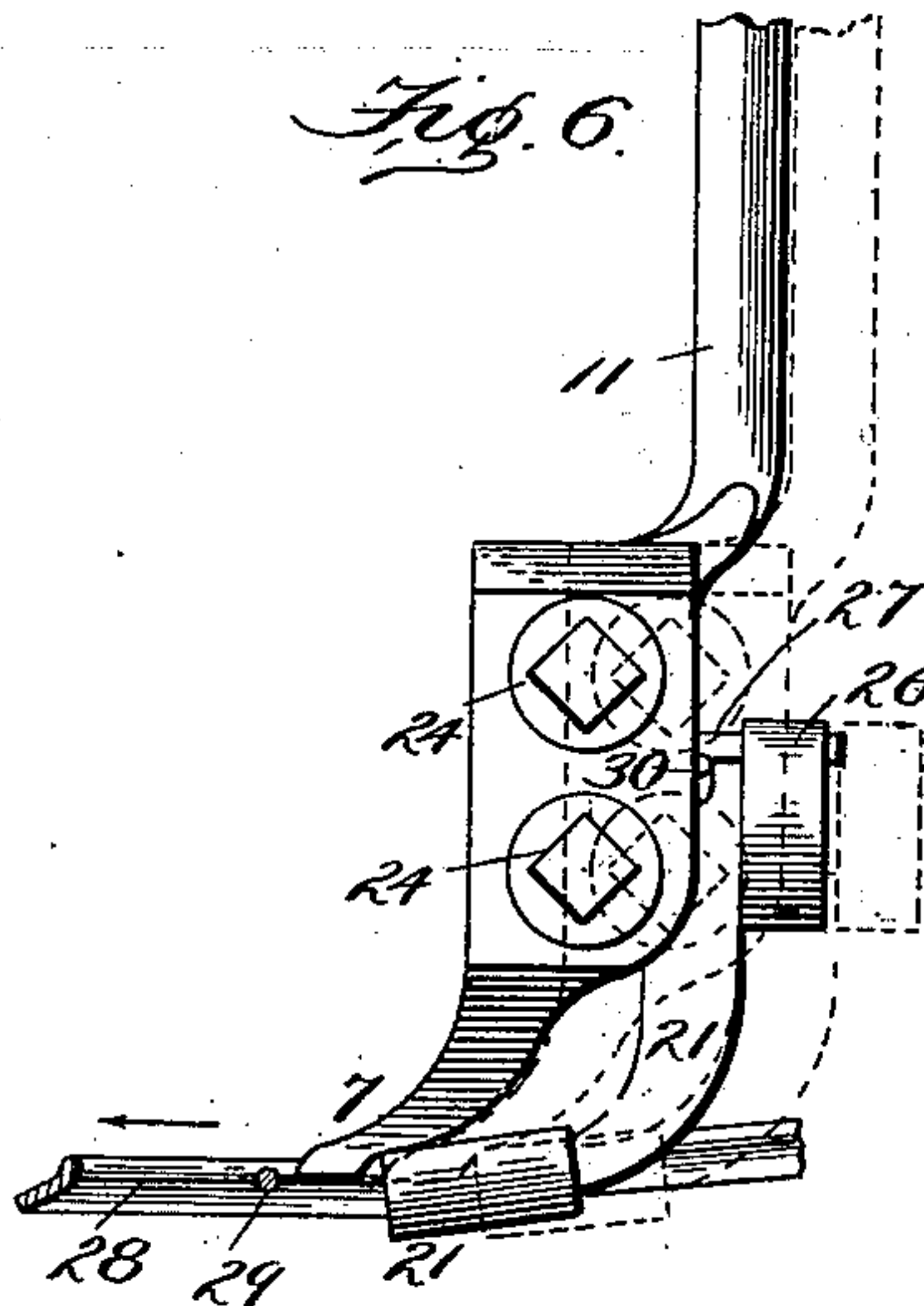
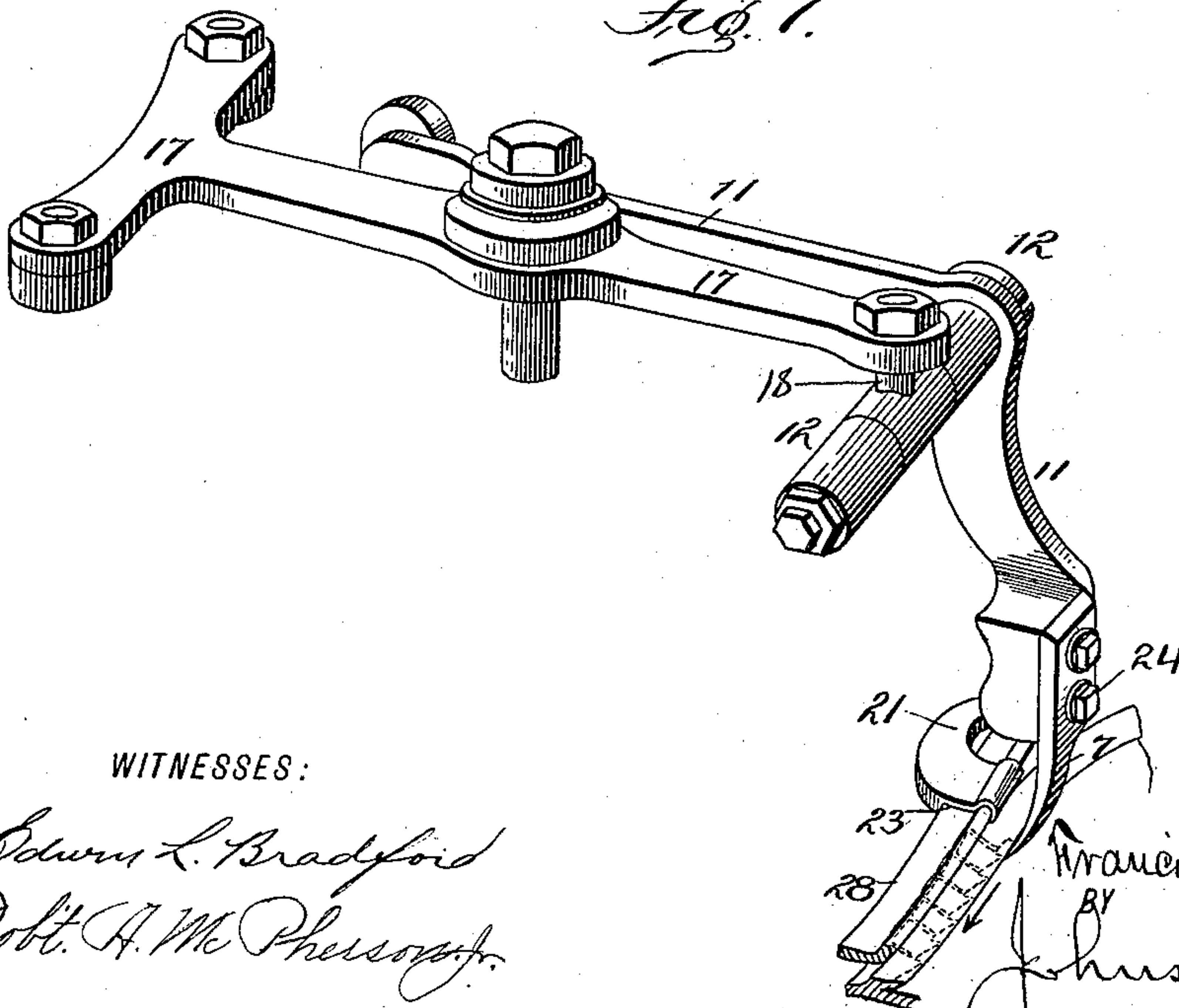


Fig. 7.



WITNESSES:

Edmund L. Bradford
Robt. A. McPherson

INVENTOR

Francis Arthur Mills

BY

Johnson & Johnson
ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANCIS ARTHUR MILLS, OF METHUEN, MASSACHUSETTS, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO THE MILLS SEWING MACHINE COMPANY, OF
MAINE.

SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 623,100, dated April 11, 1899.

Application filed September 9, 1896. Serial No. 605,298. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS ARTHUR MILLS, a citizen of the United States of America, residing at Methuen, in the county of Essex and State of Massachusetts, have invented a new and useful improvement, being a Combined Welt-Guide and Feed Device for Shoe-Sewing Machines, of which the following is a specification.

10 In the operation of sewing the welt to the upper and sole of a lasted shoe I have produced as a single device a guide for the welt upon the feed lever or lip which forms the channel-feed for the shoe, whereby the welt-
15 guide is caused to move with and in the same direction as the channel feed-lever which feeds the shoe for each and every stitch. By this combination the channel feed lever or lip is caused to measure the welt in lengths
20 equal to the length of each stitch while the needle is in the work, and this is effected simultaneously with the movement of the channel feed-lever to a position in the channel in readiness to feed the shoe and the welt the
25 length of a stitch after the needle has been drawn out of the work.

By my improvement the needle is caused to pierce the welt in the proper position under all conditions of varying thickness of the work
30 being sewed and regardless of whether long or short stitches are being made.

To more particularly describe my invention, I will refer to the accompanying drawings, in which—

35 Figure 1 is a side view of a shoe-sewing machine embracing my invention of a welt-guide on a channel feed device. Fig. 2 is a top view of the same. Fig. 3 is a front view of so much of the machine as shows the combined welt-
40 guide and feed device. Fig. 4 shows an enlarged view of the combined feed device and welt-guide. Fig. 5 is a view of the opposite side of the same. Fig. 6 is a front view of the same, and Fig. 7 shows the lever-operat-
45 ing connections for the combined feed device and welt-guide and illustrating a piece of the welt in the guide sewed to a piece of the shoe-sole.

While I have shown my combined welt-
50 guide and feed device embodied in the form

which I prefer, I wish to be understood as not limiting myself to that form or to the operating connections shown or to the use of my invention in the particular machine shown, as it is obvious that my invention can be used
55 in any machine having a hook-needle and a sole-channel feed. The sewing mechanism is contained within a head structure or housing in position for the presentation and manipulation of the work. This structure is at the
60 front of and overhangs the frame 2, wherein are mounted the cams and operating connections for the working parts.

The needle-carrier 3, Fig. 3, is mounted in the lower part of the sewing-head upon a horizontal pin 4, and a curved needle is secured
65 in the carrier and is given by it an oscillating movement toward and from the looper-arm 5, which depends and operates at the front of the sewing-head to place the loop
70 upon the needle.

6 is the needle-guide, 7 is the channel feed device, 8 is the back-gage, 9 is the slide-rest, and 10 is the tension device, all of which have
75 operating connections for imparting to them their proper functions in the operation of sewing the shoe.

As by my invention the device for feeding the shoe is made the carrier for the welt-guide I will describe the particular feed device
80 which I have shown. It consists of a lever 11, pivoted at 12 to the side of the sewing-head, and carries at its lower end the feed-lip 7, adapted to enter the channel of the sole. This lever has a compound movement—that
85 is to say, a rocking movement upon its fulcrum-bearing and a sidewise movement upon and with said fulcrum-bearing. A circumferential cam 14 on a cylinder operating upon a roll 15 in the upper end of the lever serves
90 to give the latter its rocking movement to impart to the feed-lip its inward and outward movements within the sole-channel. During the outward movement of the feed-lip the feed-lever is caused to move sidewise out-
95 ward away from the side of the machine to give the feed-lip a movement within the sole-channel the length of a stitch, and for this purpose the bearing 12 of the feed-lever is caused to slide outward in its box, so that 100

these two movements—a rocking and a side-wise movement—will cause the feed-lip to describe a zigzag path, in which its movement to the position to make the feed will be oblique to the line of and outward from the bottom of the channel, as seen in dotted lines in Fig. 7. This oblique movement carries the feed-lip away from the bottom of the channel, and at the end of such oblique movement, which is the distance or length of the stitch, the feed-lip is caused to move inward and engage the bottom of the channel, and after this engagement the stitch will be tightened and set. The lever is then caused to move inward sidewise upon and with its bearing, and it is this movement of the lever that causes the feed-lip while engaging the channel to be moved to feed the shoe for the next stitch. For effecting this feed movement of the lipped lever a second lever 17, pivoted at the top of the machine, is adapted to engage by a pin 18 the bearing 12 in a way to allow the latter to have a rocking movement with the feed-lever. This top lever is branched at its inner end to engage vertical face-cams 19 19, adapted to impart a horizontal vibratory movement to the front end of said lever, and thereby give an endwise-sliding movement to the bearing of the feed-lever to move said feed-lever feed-lip the length of the stitch, as stated. The roll end of the feed-lever maintains by means of a spring 20 its engagement with its actuating-cam 14, so that the latter acts positively to move the feed-lip into engagement with the bottom of the channel.

On the end of the feed-lever is secured the welt-guide 21 by a pin 22, the axis of which is substantially coincident with the axis of the bearing-pin of the needle-carrier, so that the welt-guide will have a yielding movement concentric with the circle of the needle, as seen in Figs. 1 and 4. The welt-guide is an arm fixed upon its supporting-pin and has a slot 23 formed on its lower end and is adapted to receive and hold the welt in position to be sewed to the shoe, as seen in Fig. 7. The supporting-pin of the welt-guide is secured in its seat preferably by one of the screws 24 by which the feed-lip arm 7 is secured to the feed-lever, so that the said welt-guide pin is free to turn with the movement of the welt-guide and can be easily removed. A spring 26, coiled on the bearing-pin 22 and connected to it and to a pin 27 in the feed-lever, serves to hold the welt-guide under pressure in its proper relation to the feed-lip and against the work. The welt-guide preferably hangs down from the outer side of the feed-lever, with its slotted end standing parallel to the line of feed, so as to hold the welt alongside of the shoe and deliver the welt to the bevel or shoulder of the shoe, as seen in Figs. 6 and 7. As the feed-lip is caused to move and measure off the length of a stitch the welt-guide moves with said feed-lip and measures out the welt the length of a stitch, as will be seen in dot-

ted lines in Fig. 6; but as the feed-lip moves in the direction of the arrow to feed the shoe the length of a stitch the welt-guide moves with said feed-lip and carries the welt 28 the length of a stitch and holds it in the proper position to receive the needle, so that the welt will always be pierced in the proper place irrespective of the thickness of the work, as shown in full lines in Fig. 6, to receive the stitch, and at this time the needle enters the work.

Referring to Figs. 1, 5, and 7 it will be seen that the thread-looper device 5 and the shoe-feeding device 7 are arranged to operate on the channeled side of the sole, that the welt-guide and needle are arranged to operate at the shoulder side of the sole, that the welt-guide is movable transversely with respect to the sole to cooperate with the channel feed device to give a clamping action on the sole, that the welt-guide is caused to move parallel with and is controlled by the movement of the channel feed device in feeding the shoe, and that it is this arrangement and conjoint operation which causes the feed device to measure out the welt the length of the stitch while the needle is in the work and which causes the chain loops to be placed on the welt (and not in the sole-channel) where they should be to give the best results in the work and in the working of the machine.

The welt-guide mounted and carried as I have described assists in the feed of the shoe, because it always maintains a contact with and moves with the feed of the shoe, and thereby prevents any dragging action of the welt through the guide at the time of feeding the shoe. After the needle has pierced the welt, upper and inner sole, and becomes substantially at rest in the work the feed-lip will move back the length for the next stitch, carrying with it the welt-guide, leaving the exact length of welt behind the guide for the next stitch while the needle is in the work. After the needle has pulled out of the work and the stitch is tightened and set the back-gage will be caused to move away from the work, and the shoe, its welt-guide, welt, and feed device will be fed the length for the next stitch.

Referring to Fig. 6, 29 shows where the needle has pierced the welt and the feed-lip in position to hold the work, and in dotted lines the feed-lip and welt-guide are shown as having moved back and left behind the length of welt for the next stitch while the needle is in the work. After the needle withdraws from the work the feed-lip, welt-guide, welt, and the work will be all caused to move forward the length for the next stitch in relation to the needle, which will be before the needle again pierces the work.

It will be understood that the welt is a continuous strip of leather and that the guide device is of the usual form to hold the welt and to allow the said guide to be freely pulled

over the welt and to lay the latter properly along the edge of the sole as each shoe is presented to be sewed.

As the spring constantly tends to force the welt-guide outward—that is, toward the shoe—I provide said guide with a stop-pin 30, which, coming against the pin 27, acts to limit the outward movement of the guide toward the feed device.

I claim—

1. In a sole-sewing machine and in combination with the needle and a channel feed device for feeding the shoe, of a welt-guide mounted upon and movable with said feed device, whereby the return movement of said feed device to a position to feed the shoe for the next stitch carries with it the welt-guide over the welt the exact length for each stitch while the needle is in the work.

2. In a sole-sewing machine, the combination with the needle and a channel feed device, of a welt-guide mounted on and movable with said feed device and having yielding movement substantially coincident with the axis of the needle-carrier.

3. In a sole-sewing machine, and in combination with the needle, and a feed device, arranged to engage the sole-channel from the surface side of the sole, of a welt-guide pivotally mounted on and movable with said feed device.

4. In a sole-sewing machine, and in combination with the needle and a feed device, arranged to engage the sole-channel from the surface side of the sole, of a spring-sustained welt-guide pivotally mounted on and movable with said feed device.

5. In a shoe-sewing machine, and in combination with a curved needle, and a feed device, adapted to operate in the channel of the sole, a welt-guide mounted upon a loose pin, a spring connecting said pin with the feed device to maintain the welt-guide in contact with the shoe, and a stop to limit the forward movement of the welt-guide.

6. In a shoe-sewing machine, and in combination with the channel feed device, a welt-guide and means whereby the same is positively and equally moved back and forth with said channel feed device in the line of the feed movement, for the purpose stated and means whereby said channel feed device and said welt-guide have also a relative movement toward and from each other.

7. In a shoe-sewing machine, and in combination with a curved needle and actuating means therefor, a feed device engaging the channel of the sole from the surface side thereof, and means for causing said device to press against the between substance, a spring-controlled welt-guide sustained by said device and caused to normally press against the shoulder of the sole, both the feed device and welt-guide being arranged at the same side of the path of the needle, and means for actuating the feed device and welt-guide whereby the latter is moved to position to feed the

welt for the next stitch while the needle is in the work.

8. In a sole-sewing machine and in combination with a curved hook-needle the lever having a feed-lip operated on one side of the line of feed and a spring-sustained welt-guide pivoted upon the said lever and operated upon the opposite side of the line of feed.

9. In a sole-sewing machine and in combination with a curved hook-needle and a lever having a feed-lip, of a welt-guide pivotally mounted on said lever movable with it and having its center of motion independent of that of said lever.

10. In a sole-sewing machine, and in combination with a curved hook-needle and a lever having a feed-lip, of a welt-guide, its pivot-pin loosely fitted in said lever and a retaining-screw for said pin, and a spring for controlling said welt-guide in those of its movements which are independent of the movements of the said lever.

11. In a sole-sewing machine, the feed-lever having a feed-lip, and a spring-sustained welt-guide pivotally mounted on said lever and having its center of motion independent of that of said feed-lever, combined with the lever 17 and the cams 14 and 19 whereby the feed-lever and the welt-guide carried by it, are operated to feed the shoe and the welt for each stitch.

12. In a shoe-sewing machine, and in combination with a curved needle and actuating means therefor, a feed device engaging the channel of the sole from the surface side thereof, and means for causing said device to press against the between substance, a welt-guide pivoted to said lever and extended to the shoulder side of the sole, a spring connecting the lever and welt-guide constantly pressing the latter toward the sole, means for causing the feed device to move toward the welt-guide to clamp the sole between it and the feed device, and means for moving the welt-guide and the feed device at the same time and to the same extent in the line of the feed.

13. In a shoe-sewing machine, a welt-guide and a lever having a feed-lip arranged to engage the channel from the channel side of the sole, the welt-guide hung to swing freely upon said lever, means whereby to cause the feed-lip and welt-guide to have a movement transversely to the line of the feed toward and from each other and independently of each other to operate upon the work, and means for reciprocating the feed-lip lever to carry the welt-guide with it the distance for the stitches, substantially as described.

14. In a shoe-sewing machine and in combination with the needle, a shoe-feeding device arranged to operate within the channel of the sole, and actuating mechanism therefor, of a welt-guide and means whereby it is caused to move parallel with the channel feed device the length of a stitch while the needle is in the work and to move with the channel feed device and with the work to feed the welt

while the needle is out of the work, the said welt-guide and feed device cooperating to clamp the work between them.

15. In a shoe-sewing machine and in combination with stitch-forming mechanism, the feed-lever 11 having at its lower end the feed-lip on the channel side of the shoe-sole and having also at its lower end the welt-guide pivoted to and depending from said lever at the shoulder side of the sole, and back of the feed-lip in the line of the feed, a spring connecting the lever and the welt-guide pressing the latter against the sole, and means for actuating the feed-lever.

16. In a shoe-sewing machine and in combination with the needle, a thread-looper device and a channel feed device for the shoe both devices arranged on the channel side of the sole and actuating mechanism, of a welt-guide movable laterally on the needle side of the work, parallel with and controlled by the movement of the feed device.

17. In a shoe-sewing machine and in com-

bination with the needle, a thread-looper device and a channel feed device for the shoe, both said devices arranged to operate on the channel side of the sole and actuating mechanism, of a welt-guide on the needle side of the work and movable transversely with respect to the sole and parallel with the feed movement of the channel feed device and actuating mechanism therefor.

18. In a shoe-sewing machine and in combination with the needle and actuating means therefor, and a feed device arranged to engage the channel of the sole, of a welt-guide pivoted on the feed device and extended to the shoulder side of the sole, a spring to press the welt-guide outward, and means whereby said feed device is caused to have a movement toward the welt-guide and a movement to feed the work.

FRANCIS ARTHUR MILLS.

Witnesses:

JOHN GRADY,

PATRICK DEMPSEY.