

A. DESTOUY.

Sewing-Machine for Boots and Shoes.

No. 131,084.

Patented Sep. 3, 1872.

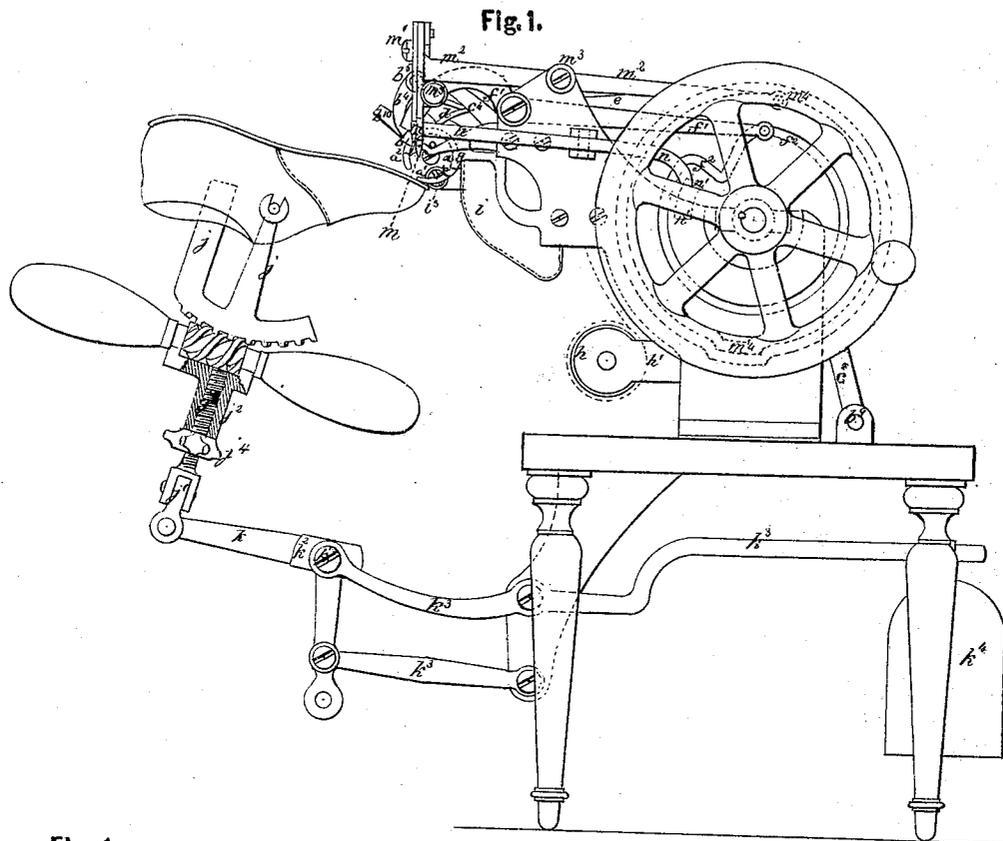


Fig. 4.

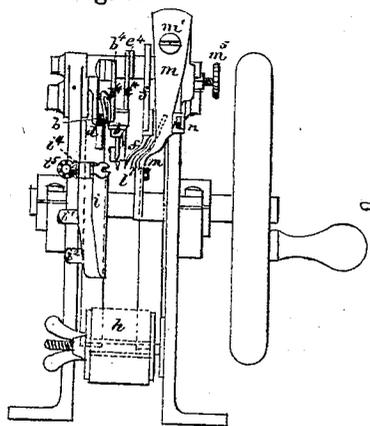
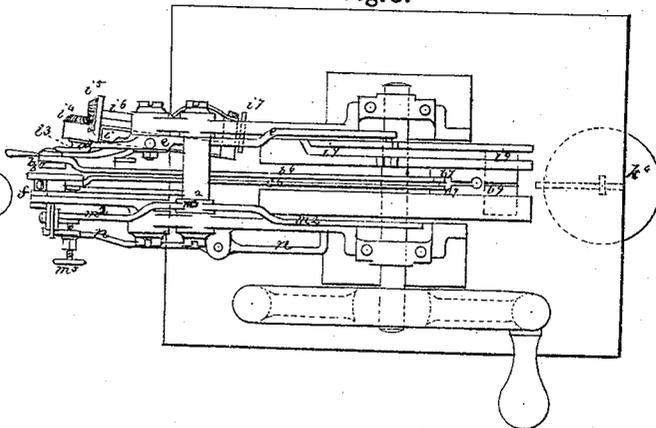


Fig. 3.



WITNESSES.

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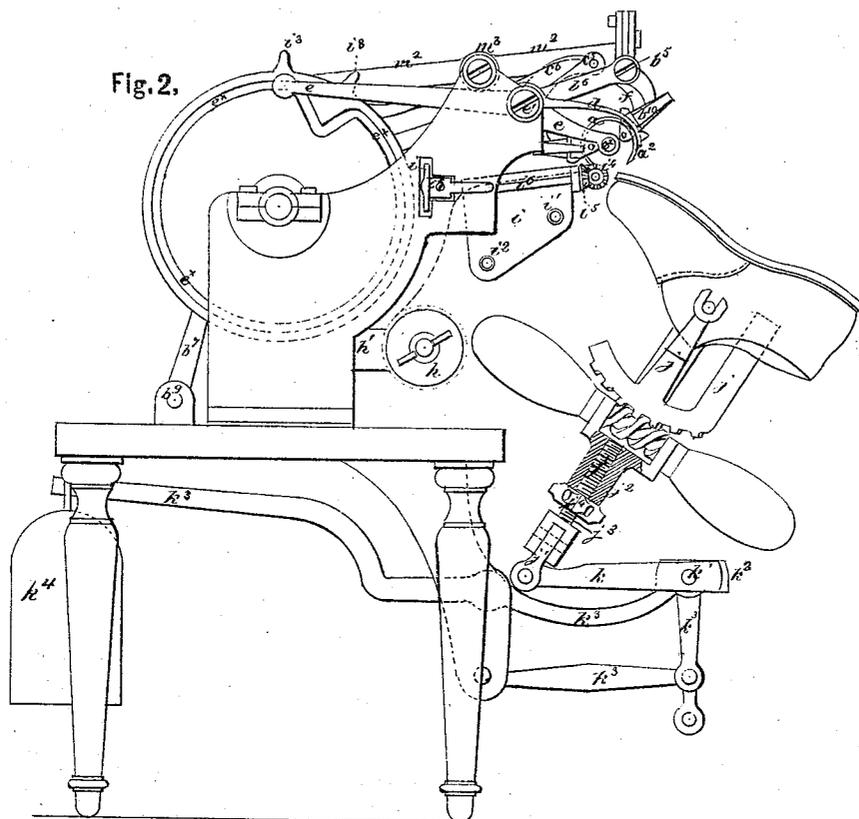


Fig. 2.

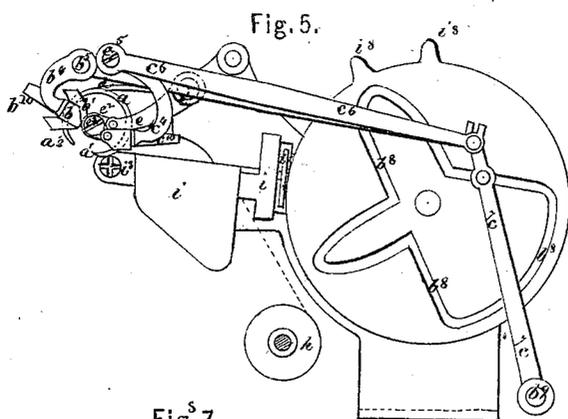


Fig. 5.

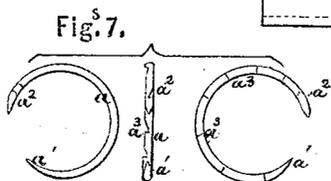


Fig. 7.

WITNESSES.

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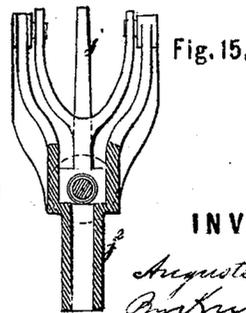
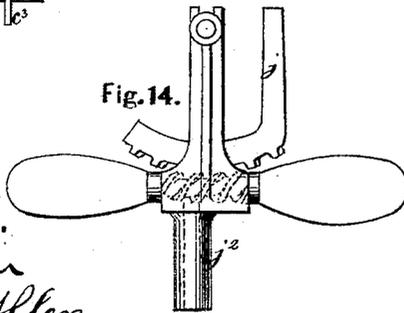
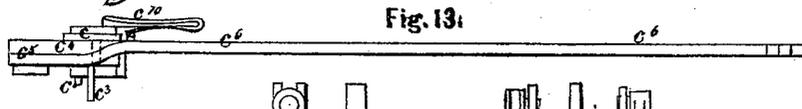
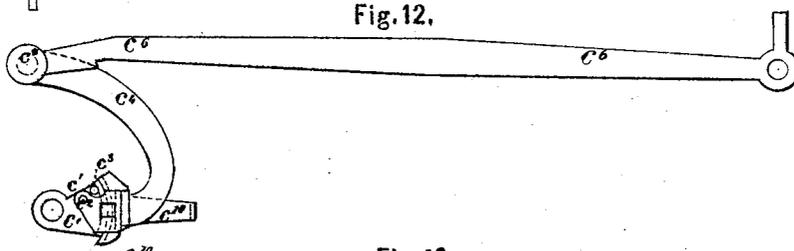
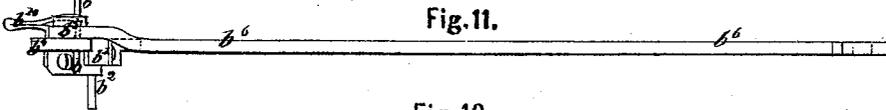
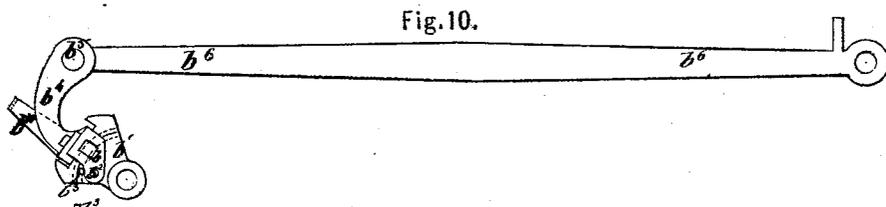
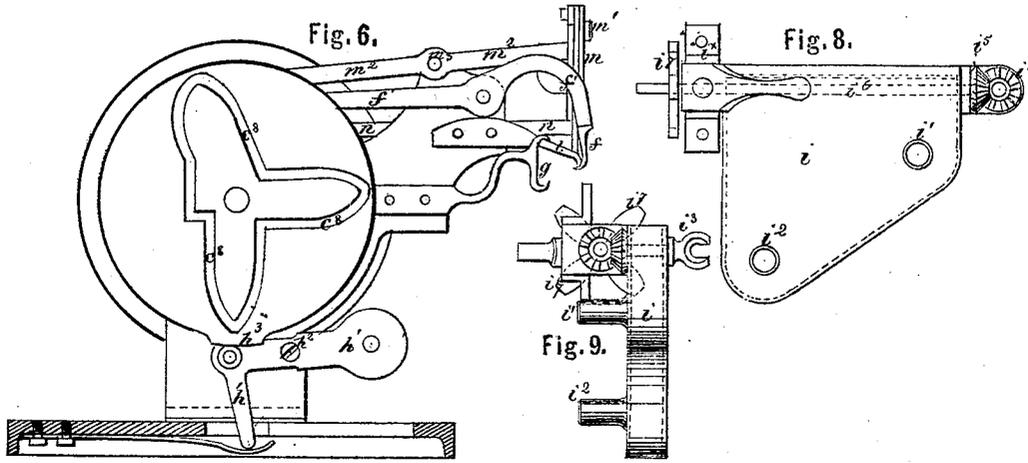
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Fig. 16.

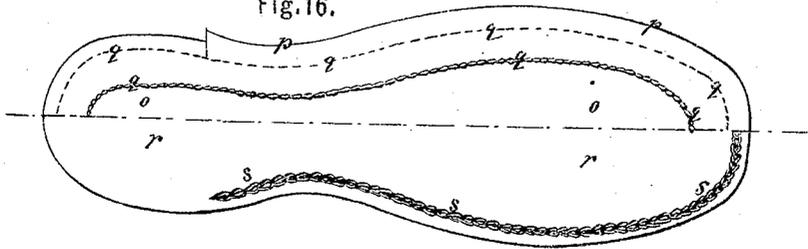


Fig. 17.

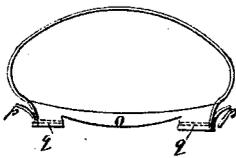


Fig. 18.

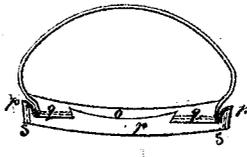


Fig. 20.

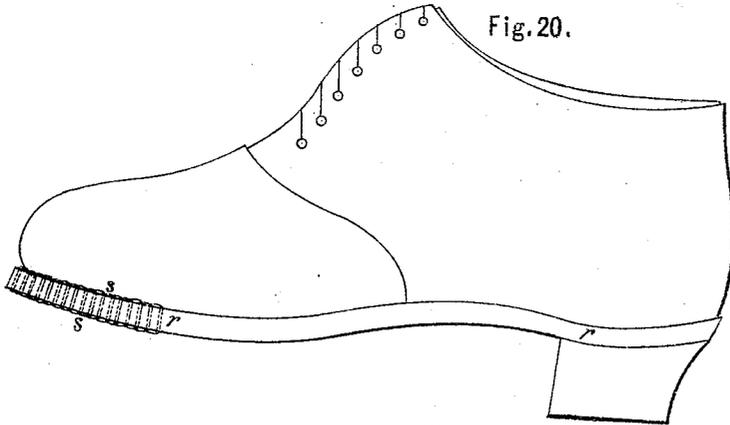
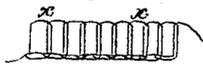


Fig. 19.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN SEWING-MACHINES FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. 131,084, dated September 3, 1872.

*To all to whom it may concern:*

Be it known that I, AUGUSTE DESTOUY, of 35 Southampton Buildings, in the county of Middlesex, England, a naturalized citizen of the United States of America, have invented or discovered new and useful Improvements in Means or Apparatus for Sewing Boots and Shoes; and I, the said AUGUSTE DESTOUY, do hereby declare that the nature of the said invention, and in what manner the same is to be performed, are particularly described and ascertained in and by the following statement thereof—that is to say:

For this purpose I employ an instrument in the form of a ring with a portion of its circumference removed, one end of such instrument being provided with a point so as to enable it to pierce the holes in the material, while close to the other end is formed a barb or hook of a similar character to a crotchet-hook to take the thread through the work. This barbed and pointed instrument is held by two holders or pinchers, which are caused, at the required times, to grasp and move it a certain distance around its axis, and cause it to enter and pass through the work, one of such holders or pinchers having a firm grasp of the hooked instrument, while the other is released therefrom and returns to a position to again grasp the hooked or barbed instrument when required, a step-by-step rotary motion being thus given to the hooked or barbed instrument by such holders or pinchers, always in the same direction. Each of these holders or pinchers is formed with two jaws, carried by a lever which is operated by a suitable cam, one of such pinchers having a jaw pin-jointed to the other so as to enable it to turn thereon as required, and being provided with a pin or projection which, at the required times, is acted upon by a cam-surface carried by a lever operated by a suitable cam, such lever being also provided with an axis or pin-joint, around which the holders or pinchers and the hooked instrument work, and having motion given thereto to facilitate the releasing of the loop from the hooked instrument at the required time, at which time an auxiliary needle or instrument is caused to enter and hold the loop until a fresh stitch is taken. The other pincher is somewhat similarly formed and operated. The thread is carried by a bobbin, from which it passes, by

suitable guides, over a chamber heated by hot water, whence it passes to a guide which has partial rotary motion given to it at the required times so as to present the thread to the point of the barbed instrument in a suitable position to be taken thereby. These guides and the hot-water chamber are mounted upon an axis of motion, and have motion given thereto to bring the thread forward into the required position to be taken by the point of the barbed and pointed instrument. The bobbin is carried by a lever, which, by means of a cam, is caused, at a given time, to rise and thereby to slacken the thread when it is about to be taken by the point of the hooked instrument to form a fresh stitch. The boot or shoe to be sewn is supported at the upper end of a lever, which is, by a universal joint, connected to a lever, which, by a pin-joint, is connected to a piece carried by a combination of links and levers, forming a kind of parallel motion, which is acted upon by a weight so as to carry the boot or shoe to be sewn up against the guiding and feeding instruments. The lever carrying the universal joint is so formed that it can be turned upon its axis and supported in either of two positions, as required, one position being suitable for supporting the boot or shoe when the insole and welt are being connected to the upper, the other position being suitable for supporting the boot or shoe when the outer sole is being sewn to the welt. The lever carrying the boot or shoe is formed with a socket to slide on a screw, and at its lower end it rests on a nut, by which means it is rendered capable of minute adjustment. The boot or shoe is fed forward for each stitch by means of a feed-lever, which has a compound motion given thereto at the times desired by means of cams acting thereon in the following manner: The feed-lever is pin-jointed to the outer end of a lever, the other end of which is operated by a cam to give it an up-and-down motion, while the outer end of another lever, operated by another cam, acts upon the feed-lever to give it a sidewise motion when required. The feed-lever is also acted upon by a screw in order to regulate the length of stitch. A suitable fixed guide is employed to enter the channel or groove formed for the stitches, so as to aid in guiding the work to the instruments. By these means facility is afforded for sewing the

inner and outer soles to the uppers of boots and shoes by the same machine.

And in order that my invention may be more clearly understood and readily carried into effect, I will proceed, aided by the accompanying drawing, more fully to describe the same.

*Description of the Drawing.*

Figures 1 and 2 are two opposite side views of a machine for sewing boots and shoes constructed according to my invention. Fig. 3 is a plan. Fig. 4 is a front view. Figs. 5 and 6 are sectional side views seen from opposite sides; and Figs. 7, 8, 9, 10, 11, 12, 13, 14, and 15 are detail views of some of the parts to a larger scale.

*a* is an instrument in the form of a ring, with a portion of its circumference removed, one end, *a*<sup>1</sup>, of such instrument being pointed, while close to the other end is formed a barb or hook, *a*<sup>2</sup>, suitable indentations or teeth *a*<sup>3</sup> being formed on one side of such instrument, in order that, as it is operated by the pinchers or holders *b c*, as hereinafter described, it shall be properly timed. This barbed and pointed instrument *a*, by its point *a*<sup>1</sup>, is caused to pierce the material, and then, as it is caused to rotate by the pinchers *b c*, the barb or hook *a*<sup>2</sup> carries the thread through the hole formed by the point *a*<sup>1</sup>. The instrument *a* is held and operated by the holders or pinchers *b c*, which are caused at the required times to grasp and move it a certain distance around its axis and cause it to enter and pass through the work, one of such pinchers or holders having a firm grasp of the instrument *a*, while the other is released therefrom and returns to a position to again grasp the instrument *a* when required. A step by step rotary motion is thus given to the instrument *a* by such holders or pinchers *b* and *c* always in the same direction. Each of such holders or pinchers *b c* is formed with two jaws, the holder or pincher *b* having a jaw, *b*<sup>1</sup>, pin-jointed at *b*<sup>2</sup> to the jaw *b*, and being provided with a pin or projection, *b*<sup>3</sup>, which, at the required times, is acted upon by a cam-surface, *d*, carried by a lever, *e*, which is mounted upon an axis of motion, *e*<sup>1</sup>, and at its rear end is operated by a cam, *e*<sup>x</sup>. The lever *e* is also provided with an axis or pin joint, *e*<sup>2</sup>, to which the holders or pinchers *b* and *c* are connected, and around which they and the instrument *a* work. The lever *e*, operated by its cam, acts upon the holders or pinchers *b* and *c* at the times required to lower them, and thereby facilitate the releasing of the loop of thread from the barb or hook *a*<sup>2</sup> of the instrument *a*, at which time such loop is entered and held by an auxiliary needle or instrument, *f*, until a fresh stitch is taken, such auxiliary needle or instrument, *f*, being formed on or fixed to a lever, *f*<sup>1</sup>, operated by a cam, *f*<sup>2</sup>. The pincher or holder *c* is similarly formed to the pincher or holder *b* having a jaw, *c*<sup>1</sup>, pin-jointed at *c*<sup>2</sup> to the jaw *c*, and being provided with a pin or projection, *c*<sup>3</sup>, which, however, in this case, is

operated by a fixed cam-surface, *g*. The holder or pincher *b* is formed on or fixed to a link, *b*<sup>4</sup>, which is pin-jointed at *b*<sup>5</sup> to one end of a link, *b*<sup>6</sup>, the other end of which is pin-jointed to the upper end of a lever, *b*<sup>7</sup>, operated by a cam, *b*<sup>8</sup>, while the holder or pincher *c* is formed on or fixed to a link, *c*<sup>4</sup>, pin-jointed at *c*<sup>5</sup> to one end of a link, *c*<sup>6</sup>, the other end of which is pin-jointed to the upper end of a lever, *c*<sup>7</sup>, operated by a cam, *c*<sup>8</sup>, the levers *b*<sup>7</sup> and *c*<sup>7</sup> being both mounted on an axis of motion at *b*<sup>9</sup>. The holders or pinchers *b* and *c* are, respectively, provided with spring-teeth *b*<sup>10</sup> *c*<sup>10</sup> to act against the teeth *a*<sup>3</sup> formed on the instrument *a*, and thereby insure the instrument *a* always being moved the desired distance. The thread is carried by a bobbin, *h*, from which it passes, by suitable guides, over a chamber, *i*, which is heated by hot water supplied thereto from any convenient supply by tubes connected to the short tubes *i*<sup>1</sup> *i*<sup>2</sup>, by which means a circulation of the water is obtained in such chamber. The thread passes from the top of such chamber *i* to a guide, *i*<sup>3</sup>, which has a partial rotary motion given thereto in the following manner at the times required, so as to present the thread in a suitable position to be taken by the point of the instrument *a* when about to form a fresh stitch. The guide *i*<sup>3</sup> is mounted on one end of an axis of motion, on the other end of which is fixed a beveled pinion, *i*<sup>4</sup>, which is taken into by and receives motion from a beveled pinion, *i*<sup>5</sup>, fixed on one end of the shaft or axis *i*<sup>6</sup>, to the other end of which is fixed a star-wheel, *i*<sup>7</sup>, which, at the required times, is acted upon by the teeth or projections *i*<sup>8</sup> formed on or fixed to one of the cams. Thus, when upon the completion of a stitch the thread has been cast off from the instruments, it is received into the notches formed in the guide *i*<sup>3</sup>, and lies therein in a direction parallel or nearly so to the direction in which the point *a*<sup>1</sup> of the instrument *a* is traveling when about to take a fresh loop, and would not, therefore, be in a suitable position to be taken thereby; but in order to insure its being properly taken by the point *a*<sup>1</sup> the guide *i*<sup>3</sup> has a partial rotary motion given thereto, in the manner before described, so as to place the thread at right angles to its former position and to the path of the point *a*<sup>1</sup>, and at the same time a projection from the chamber *i*, which is mounted on a vertical axis at *i*<sup>\*</sup>, is acted upon by the cam *i*<sup>9</sup> to bring the guide *i*<sup>3</sup> forward in such position as to allow the instrument *a* to pass through the channel in the guide *i*<sup>3</sup>, and on the inside of the thread when the guide *i*<sup>3</sup> and parts connected therewith are caused to retire out of the way of the instruments and leave the thread around the point of the instrument *a*. The bobbin *h* is carried by one end of a lever, *h*<sup>1</sup>, mounted on a center of motion, *h*<sup>2</sup>, the other end of which lever is acted upon by means of a cam, *h*<sup>3</sup>, at the required time to raise the bobbin *h*, and thereby to slacken the thread when it is about to be taken by the point *a*<sup>1</sup> of the instrument *a* to form a fresh stitch.

The boot or shoe to be sewn is supported on the upper end of a lever,  $j$ , which, by a universal joint,  $j^1$ , is connected to one end of a lever,  $k$ , which, by a pin-joint,  $k^1$ , is connected to a piece,  $k^2$ , carried by a combination of links and levers,  $k^3$ , forming a kind of parallel motion, which is acted upon by a weight,  $k^4$ , so as to carry the boot or shoe to be sewn up against the guiding and feeding instruments. The lever  $k$  is so formed that it may be turned upon its axis of motion  $k^1$ , and supported in either of the two positions shown at Figs. 1 and 2, that shown in Fig. 1 being the position it would assume when supporting a boot or shoe in position for the insole and welt to be sewn to the upper, while the position shown at Fig. 2 is that which the levers  $j$  and  $k$  would assume when the outer sole is being sewn to the welt. The lever  $j$  is formed in two parts, the upper part being formed with a socket,  $j^2$ , to pass over a screw,  $j^3$ , and rest at its lower end upon a nut,  $j^4$ , by which means it is rendered capable of minutely adjusting the boot or shoe carried thereby to the sewing and feeding instruments.

In the drawing I have shown the lever  $j$  to be provided with an endless screw taking into a rack for further adjustment, but this forms no part of my present invention. The soles of the boot or shoe are formed with suitable channels or grooves for the stitches, as is well understood, and are guided to the instrument  $a$  by means of a single fixed guide,  $l$ , which enters each of such channels or grooves, as desired. The feed-lever  $m$  is pin-jointed at  $m^1$  to the outer end of a lever,  $m^2$ , mounted on an axis of motion,  $m^3$ , the other end of such lever  $m^2$  being operated by a cam,  $m^4$ , to give it an up-and-down motion, while the outer end of another lever,  $n$ , the other end of which is operated by a cam,  $n^1$ , acts upon the feed-lever  $m$  to give it a sidewise motion. Thus a suitable compound motion is given to the feed-lever  $m$ , the lower end of which acts within the channel or groove in the sole, when required, to enable it to feed the work to the instrument  $a$ , a screw,  $m^5$ , being employed to regulate the length of the stitch, as is well understood.

At Fig. 16 I have shown a boot or shoe, one-half of such figure showing the insole  $o$  and welt  $p$ , as they would appear when united to the upper by the stitches  $q$ , the other half showing the outer sole  $r$  united to the welt by the stitches  $s$ . Fig. 17 shows a cross-section

of a boot or shoe, showing the insole  $o$  and welt  $p$  united to the upper by the stitches  $q$ . Fig. 18 shows a cross-section of a boot or shoe with the outer sole  $r$  connected to the welt  $p$  by the stitches  $s$ . Fig. 19 is a diagram showing the course of the thread in the completed stitches by which it will be seen that the stitches, which are of the character of a chain-stitch, are crossed at the point marked  $x$ , as shown. Fig. 20 is a side view of a shoe, showing some of the stitches  $s$  in dotted lines.

I would here remark that although I have shown one form of holders or pinchers,  $b$   $c$ , I do not confine myself thereto, as various other forms of holders or pinchers may be employed to operate the instrument  $a$ , while, if desired, additional holders or pinchers may be employed to support and hold the instrument  $a$  firmly.

Having thus described the nature of my said invention and the mode in which I carry the same into effect, I would have it understood that I do not confine myself to the precise details herein shown and described, as such may be varied without departing from the peculiar character of my invention; but

What I do claim is—

1. The instrument  $a$ , operated in manner substantially as herein described, and acting by its point  $a^1$  as an awl or piercing instrument and by its barb or hook  $a^2$  as a needle, to carry the thread through the work in manner substantially as herein shown and described.

2. The holders or pinchers  $b$  and  $c$  and instruments acting therewith, to operate the instrument  $a$ , in manner substantially as herein shown and described.

3. The combination with the instrument  $a$  of the guide  $i^3$  or its equivalent, acting to receive the thread and then to turn on its axis and pass into a position to enable the point of the instrument  $a$  to take the thread, in manner substantially as herein shown and described.

4. The combination and arrangement, with the shoe support, of the reversible arm  $k$  and levers  $k^3$   $k^3$ , or their equivalents, connected and operating substantially as herein described, to hold the work in the various positions for sewing the inner and outer soles.

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Witnesses:

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G. KRALSY, of Liège.