

(No Model.)

5 Sheets—Sheet 1.

A. EPPLER, Jr.

BOOT AND SHOE SEWING MACHINE.

No. 325,063.

Patented Aug. 25, 1885.

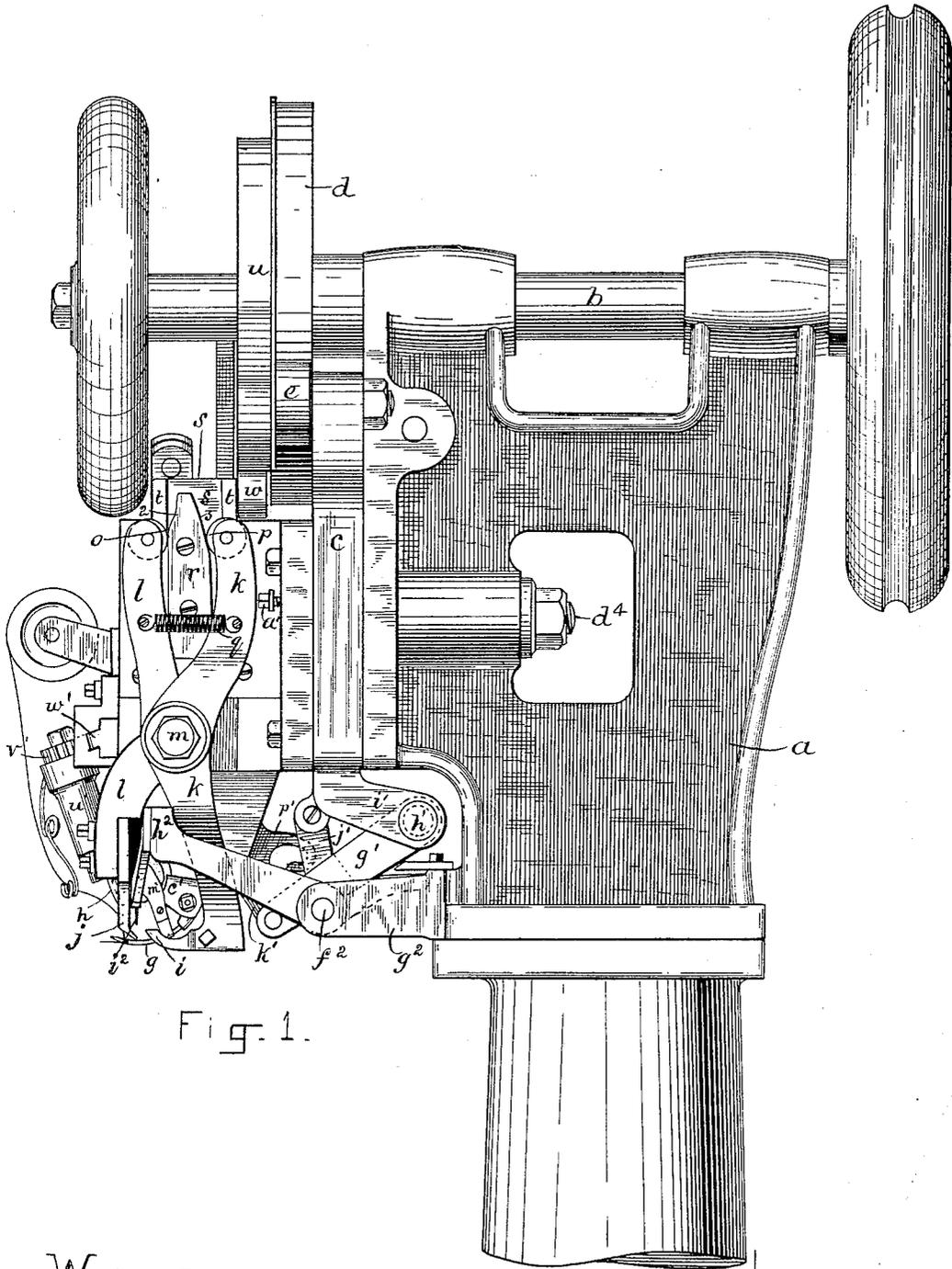


Fig. 1.

WITNESSES:
Chas. S. Gooding,
H. Brown

INVENTOR:
A. Eppler Jr
by night & Brown
Atty

A. EPPLER, Jr.

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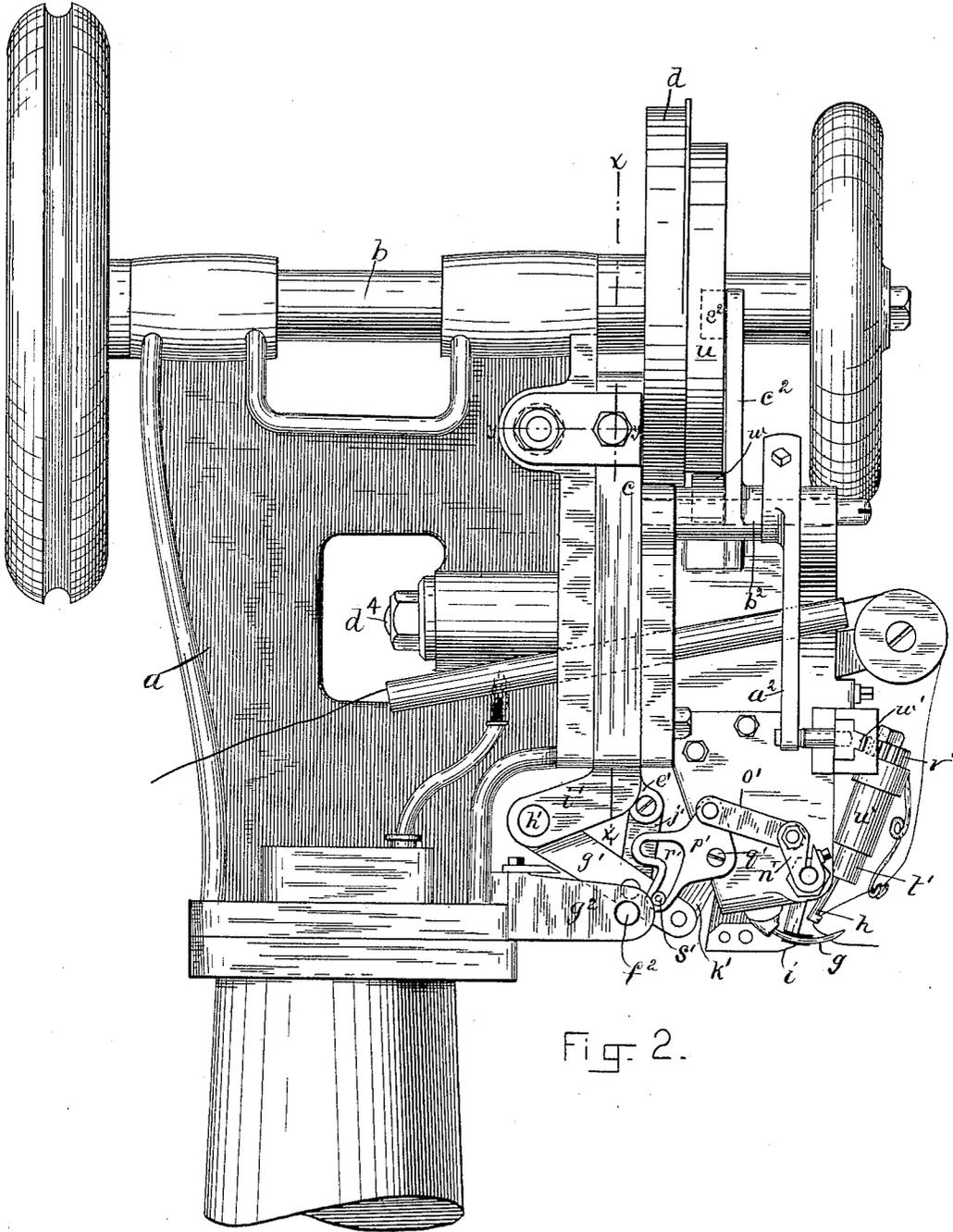


Fig. 2.

WITNESSES:
 Chas. S. Gooding.
 H. Brown

INVENTOR:
 A. Eppler Jr.
 by *H. Brown*
 Atty.

A. EPPLER, Jr.

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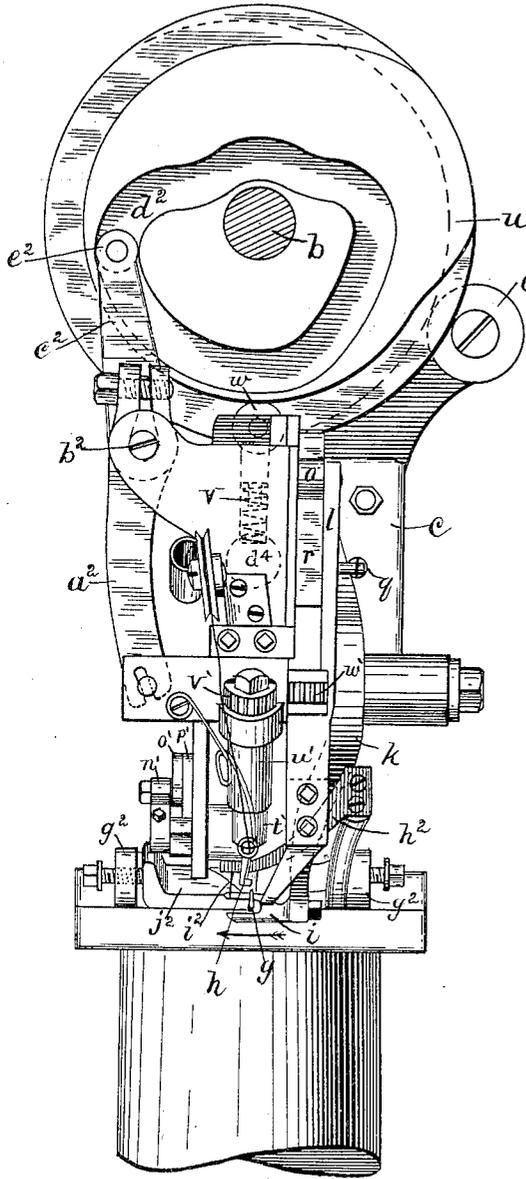


Fig. 3.

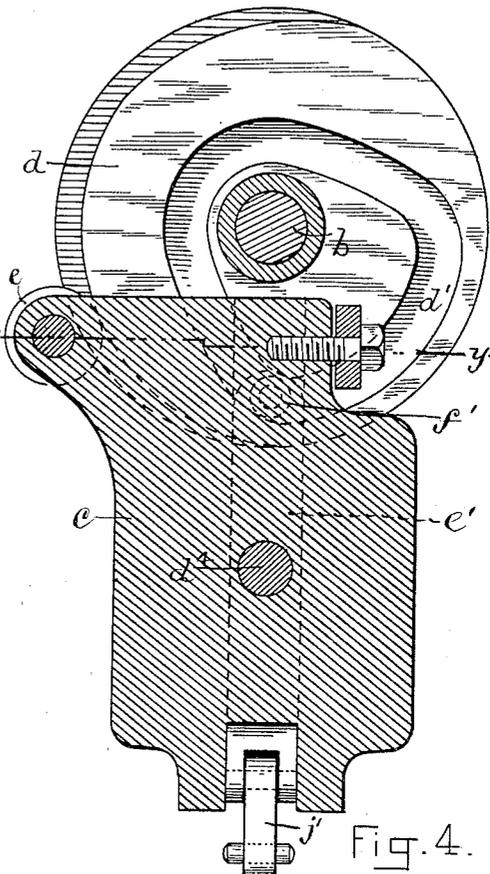


Fig. 4.

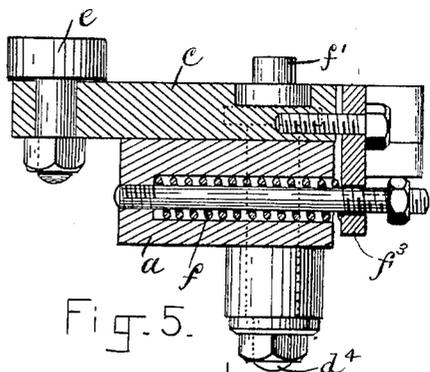


Fig. 5.

WITNESSES:
 Chas. S. Gooding.
 H. Brown

INVENTOR:
 A. Eppler Jr
 by *Might & Brown*
 Atty.

(No Model.)

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A. EPPLER, Jr.

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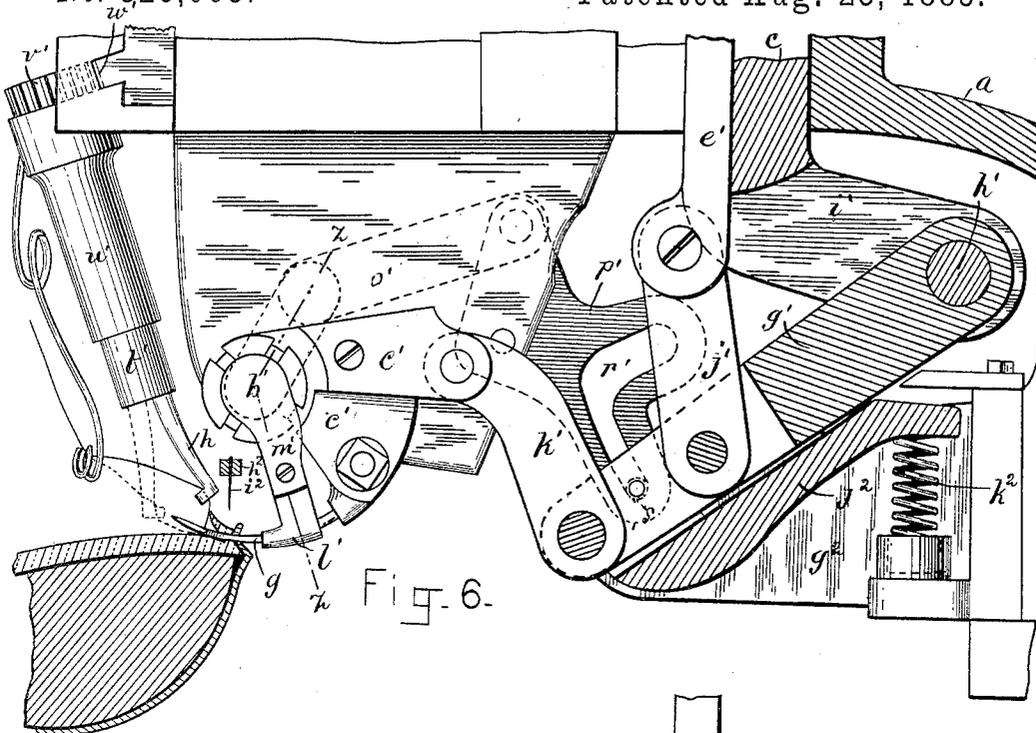


Fig. 6.

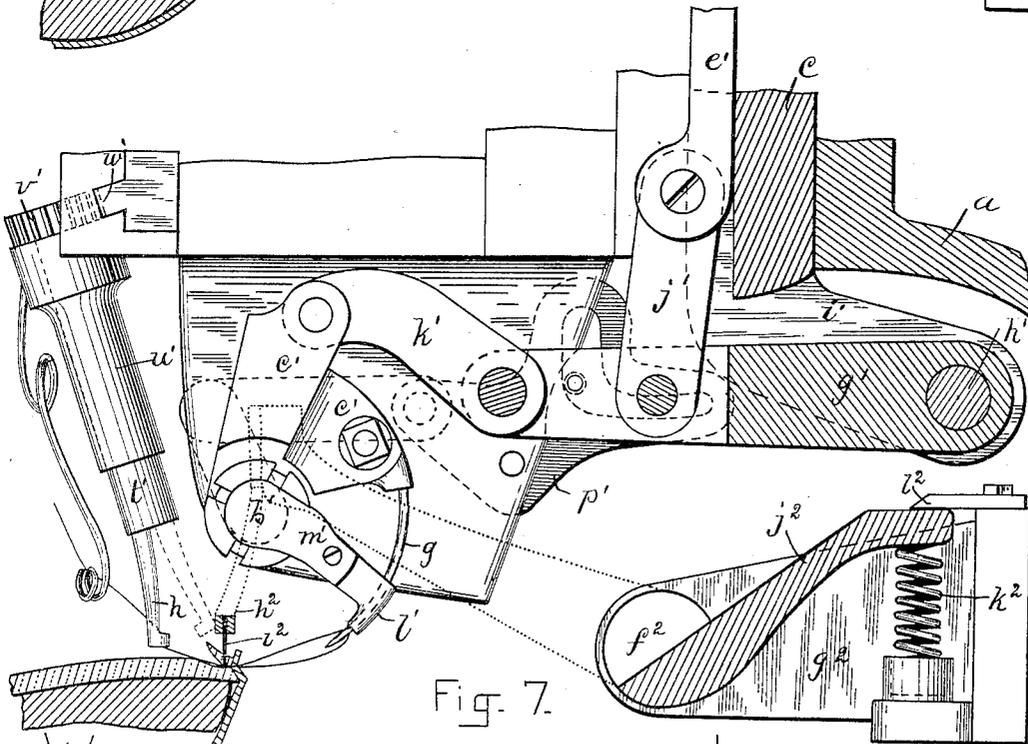


Fig. 7.

WITNESSES:
 Chas. S. Gooding.
 H. Brown

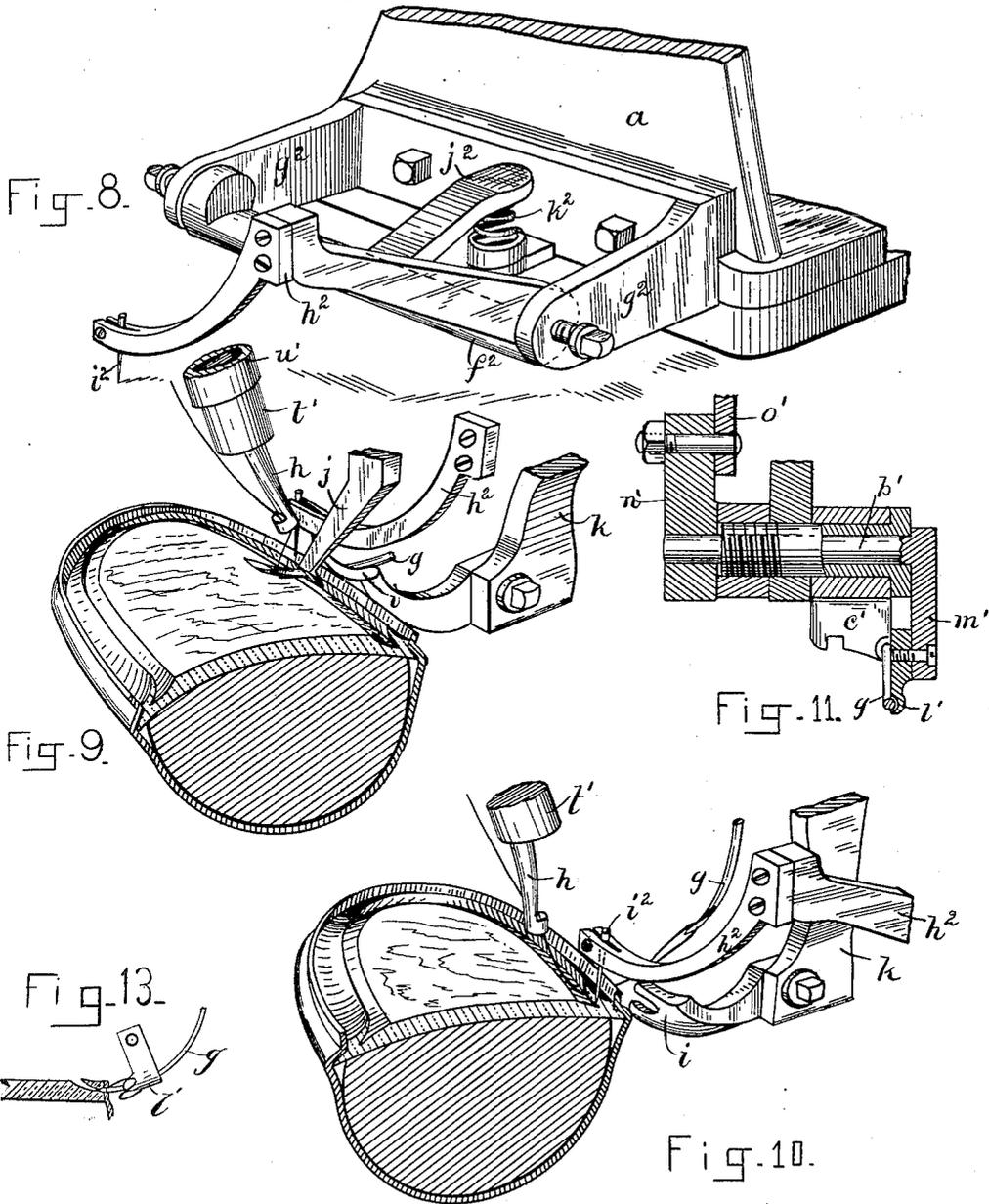
INVENTOR:
 A. Eppler Jr.
 by Wright & Brown
 Attys

A. EPPLER, Jr.

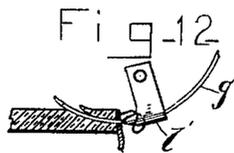
BOOT AND SHOE SEWING MACHINE.

No. 325,063.

Patented Aug. 25, 1885.



WITNESSES:
 Chas. S. Gooding.
 A. P. Brown



INVENTOR:
 A. Eppler Jr
 by *Might & Bone*
 Atty

UNITED STATES PATENT OFFICE.

ANDREW EPPLER, JR., OF BOSTON, ASSIGNOR OF ONE-HALF TO EDWIN ADAMS, OF NEWBURYPORT, MASSACHUSETTS.

BOOT AND SHOE SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 325,063, dated August 25, 1885.

Application filed March 2, 1885. (No model.)

To all whom it may concern:

Be it known that I, ANDREW EPPLER, JR., of Boston, in the county of Suffolk and State of Massachusetts, have invented a Boot and Shoe Sewing Machine, of which the following is a specification.

This invention has for its object to provide an improved machine for stitching together the upper and channeled sole of a turned boot or shoe; and it consists in the several improvements hereinafter described and claimed.

Of the accompanying drawings, forming a part of this specification, Figures 1 and 2 represent elevations of my improved machine, taken from opposite sides. Fig. 3 represents a front elevation, the hand-wheel shown at the right-hand end of the shaft *b*, Fig. 2, being removed, and said shaft being shown in section. Fig. 4 represents a section on line *x x*, Fig. 2. Fig. 5 represents a section on line *y y*, Fig. 4. Figs. 6 and 7 represent enlarged side elevations of the stitch-forming mechanism. Fig. 8 represents a perspective view of the sticker or arresting device. Fig. 9 represents a perspective view of the needle-looper, sticker, channel-gage, and back gage. Fig. 10 represents a similar view without the channel-gage. Fig. 11 represents a section on line *z z*, Fig. 6. Figs. 12 and 13 represent side views of the needle and cast-off, showing their relative positions during different parts of the operation.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the fixed supporting frame or standard, in which is journaled the driving-shaft *b*. *c* represents a head connected to the frame *a* by a horizontal bolt or pivot, *d*, so that it can oscillate independently. The head *c* is oscillated by a cam, *d*, on the driving-shaft, on the periphery of which cam bears a roll, *e*, journaled on an arm attached to the head, and a spring, *f*, Fig. 5, contained in a socket in the frame *a*, and bearing against a lug, *f*³, attached to the head *c*, and thus pressing the head in the direction required to hold the roll *e* against the periphery of the cam *d*.

The swinging head supports the curved needle *g*, the looper *h*, the back gage, *i*, for the edge of the sole, and the channel-gage *j*, which enters the channel in the sole, said parts oscillating with the head.

The back gage, *i*, and channel-gage *j* are arms or fingers attached, respectively, to a lever, *k*, and a lever, *l*, both of which are pivoted on a stud, *m*, affixed to the head *c*. The upper ends of the levers *k l* are provided with rollers *o p*, which are pressed by a spring, *q*, connecting said levers, against a cam-block, *r*, attached to a slide, *s*, which is reciprocated vertically between guides *t t* in the head *c* by a cam, *u*, on the driving-shaft, and a spring, *v*, Fig. 3, which presses the slide upwardly and holds a roll, *w*, journaled on said slide against the cam *u*. The back gage, *i*, is formed to support the edge of the sole to be stitched, and the portion of the upper which rests on said edge and the channel-gage *j* is formed to enter the usual channel formed in the sole. When the cam-block *r* descends, the inclines 2 3 at its upper end, coming between the rolls *o p*, permit the spring *q* to draw the upper ends of the levers *k l* inwardly, and thus cause the lower ends of said levers to separate, the back gage being thus withdrawn from the edge of the sole and the channel-gage partially withdrawn from the channel, so that it will not drag in the channel during the backward movement of the head. The upward movement of the block *r* causes the wider lower end to separate the upper ends of the levers *k l*, and thus move the gages toward each other. A screw, *a'*, Fig. 1, limits the movement of the lever *k*, whereby the back gage, *i*, is thrown forward. By adjusting said screw the back gage may be caused to stop at any desired distance from the channel-gage, thus accommodating the machine to the distance between the channel and the edge of the sole. In case the screw *a'* is adjusted outwardly, so as to cause the rollers *o p* to bind on the cam-block *r* and prevent its free upward movement, no strain is caused, the cam-block being moved upwardly only by the spring *v*, Fig. 3, so that it can stop at any point in its upward movement.

The needle *g* is a segment of a circle having its center in a pivot or rock-shaft, *b'*, on which the arm *c'*, to which the needle is attached, oscillates. Said arm is oscillated by means of a cam-groove, *d'*, in the rear side of the cam *d* on the driving-shaft, a vertical slide, *e'*, in the head *c* having a roll, *f'*, entering said groove, (see Fig. 4,) a lever, *g'*, pivoted at *h'* to ears *i'*

formed on the lower portion of the head *c* and connected with the lower portion of the slide *e'* by a link, *j'*, and a link, *k'*, connecting the needle-arm *c'* with the lever *g'*. The vertical reciprocating movements of the slide *e'* oscillate the lever *g'*, which in turn oscillates the needle-arm *c'*, in the arc of which the needle is a segment.

l' represents the cast off, which fits closely against one side of the needle and is attached to an arm, *m'*, which is in turn attached to one end of the pivot or rock-shaft *b'*, on which the needle-arm *c'* oscillates. To the other end of said rock-shaft is attached an arm, *n'*, (see Figs. 2 and 11,) which is connected by a link, *o'*, with a lever, *p'*, pivoted at *q'* to the head *c*, and provided with a curved slot, *r'*, which receives a stud, *s'*, on the oscillating lever *g'*. The slotted lever *p'* receives a limited oscillating movement from the lever *g'*, which is imparted through the link *o'*, rock-shaft *b'*, and arm *m'* to the cast-off, which is thus caused to accompany the needle during a part only of its movements, as hereinafter described.

The looper *h* is an arm having a thread-guiding orifice at its lower end and attached eccentrically to a stud, *t'*, fitted to rotate in a sleeve, *u'*, affixed to the head *c*. The stud *t'* is provided at its upper end with a pinion, *v'*, which meshes with a rack, *w'*, reciprocating horizontally in a guide on the head *c*. Said rack is reciprocated by means of a lever, *a'*, secured at its upper end to a rock-shaft, *b'*, which is journaled in the head *c*, said lever having a slot at its lower end receiving a pin on the rack, an upwardly-projecting lever, *e'*, on said rock-shaft having a roll, *e'*, at its upper end, and a cam-groove, *d'*, in the outer side of the cam *u* on the driving-shaft, said cam-groove receiving the roll *e'* and oscillating the levers *e'* *a'*, thus causing the rack to reciprocate and oscillate the looper, causing said looper to move over the needle when the latter is thrown forward and thus present the thread to the barb of the needle.

I employ a holding device whereby the lasted upper and inner sole are prevented from moving with the swinging head and the mechanism supported thereby when the head is moving backwardly preparatory to its forward or work-feeding movement. Said device is composed of a rock-shaft, *f'*, (see Fig. 8,) journaled in ears *g'* of the fixed frame *a*, and provided with an arm, *h'*, having in its outer end a perforating point or "sticker," *i'*, which, when the arm is depressed, enters the upper surface of the sole between its edge and the channel, and thus holds the sole against backward movement. The rock-shaft *f'* is oscillated to alternately depress and raise the sticker by the descent of the oscillating lever *g'* above described, which, when depressed, strikes an arm, *j'*, on the rock-shaft and turns the latter so as to raise the sticker, as shown in Fig. 6, and a spring, *k'*, bearing upwardly against the arm *j'* and turning the rock-shaft,

so as to depress the sticker when the lever *g'* is raised, as shown in Fig. 7. A stop, *l'*, limits the upward movement of the arm and the downward movement of the sticker.

The operation is as follows: The boot or shoe, placed upon the last wrong side out and lasted in the usual manner, is held by the hands of the operator, who inserts the channel-gage in the channel, as shown in Fig. 9. Before the needle moves forward the back gage and channel-gage are caused to approach each other, the back gage being thus brought in position to support the edge of the sole and the portion of the upper covering said edge while the channel-gage is pressed firmly into the channel. The needle now moves forward and penetrates the edge of the upper and base of the channel-flap, as shown in Fig. 9. The looper then rotates sufficiently to press the thread against the barbed side of the needle, and at the same time the head *c* swings on its pivot in the direction indicated by the arrow in Fig. 3, carrying the needle, back gage, channel-gage, and looper with it, and giving the lasted shoe its proper feed movement, the sticker being at this time raised, so that it does not touch the sole. At the close of the forward movement the needle moves backwardly and draws a loop of thread through the flap, the edge of the upper, and through the loop previously formed, the cast-off cooperating with the needle in the usual manner in holding the loop upon the barb of the needle until the needle has completed its backward movement and separating the loop from the needle during the next forward movement of the needle, so that the needle will not catch the loop last formed in drawing the next loop through it. When the needle in moving forward enters the work, as shown in Fig. 13, the loop is disengaged from the barb of the needle by the entrance of the latter into the work, the cast-off being at this time back of the barb, as shown in Fig. 13. After this the cast-off moves toward the point of the needle and into the disengaged loop, as shown in Fig. 12, and covers the barb of the needle when the latter is next withdrawn, as shown in Fig. 7, thereby retaining the new loop in engagement with the barb, said loop being thus drawn through the preceding loop. After the needle has formed the loop the gages *i j* separate to release their hold on the sole. The sticker is depressed by the spring *k'* and holds the sole, the lever *g'* being raised by the operation of withdrawing the needle. The receding portion of the cam *d* then allows the spring *f* to swing the head backwardly or in the opposite direction to that indicated by the arrow, thus bringing the needle in position to enter the upper and sole at the required distance from the loop last formed. The gages *i j* next approach each other and grasp the interposed portions of the sole and upper, and the needle again moves forward. While the needle is penetrating the upper and channel-flap the sticker remains in engagement with

the sole at a point at the opposite side of the needle from the channel-gage, the needle moving forward between said gage and sticker. The work is thus supported at both sides of the needle by the sticker and channel-gage, so that the operator is not required to exert as much effort in resisting the pressure of the needle against the work as would be the case if the work was supported only at one side of the needle.

It will be observed that the the needle, back gage, and channel-gage all moving in unison with the head co-operate in feeding the work, the two gages firmly grasping the stock interposed between them during the feeding operation, and, in connection with the needle, preventing the boot or shoe from swinging out of place while it is being fed. In fact, the boot or shoe is positively controlled by the machine during all parts of the operation, the sticker preventing the displacement of the boot or shoe while the needle and gages are separated from it.

I do not limit myself to a pivoted or swinging head supporting the needle, gages, and looper. Said head may be fitted to slide in or on suitable guides instead of oscillating; and I desire to be understood as meaning by the term "swinging head" to include any kind of reciprocating movement whereby the work may be fed intermittently.

The machine may be used for sewing welted shoes, a suitable welt-guide being provided.

A segmental needle which is reciprocated in a curved path and is moved laterally to feed the work being old, and the combination of such needle with a channel-gage and a back gage being also old, I do not claim the needle and its accompanying stitch-forming devices and the gages, excepting in connection with a reciprocating or swinging head, as described. The construction of the machine is materially cheapened and simplified by the swinging head, the number of parts required being considerably less than in machines of this class as heretofore constructed.

I claim—

1. In a sole-sewing machine, the combination of a swinging head, mechanism, substantially as described, to operate it, stitch-forming mechanism, substantially as described, including a curved needle, a back gage and a channel-gage, all supported by and moving with said head, and operating devices, substantially as described, for the stitch-forming mechanism, and operating devices, substantially as described, whereby said gages are caused to grasp the work when the needle is projected and during the feeding movement of the head, and to release the work during the backward movement of the head, as set forth.

2. In a sole-sewing machine, the combination of a swinging head, mechanism to operate it, stitch-forming mechanism, substantially as described, a back gage and a channel-gage, all supported by and moving with the

head, operating mechanism, substantially as described, for the stitch-forming mechanism, operating mechanism, substantially as described, whereby said gages are caused to grasp the work during the feeding movement of the head and to release the work during the backward movement of the head, and a pointed arresting device or sticker, and mechanism, substantially as described, to operate it, whereby the sole is held during the backward movement of the head, as set forth.

3. In a sole-sewing machine, the combination of a swinging head, mechanism to operate it, stitch-forming mechanism, substantially as described, including a curved needle supported by and moving with the head, mechanism, substantially as described, to move said head forward while the needle is projected and backward while the needle is withdrawn, and a pointed sticker or arresting device and mechanism to operate it, whereby the sticker is removed from the sole during the forward movement of the head and engaged with the sole during the backward movement of the head, as set forth.

4. The combination of the swinging head, its operating mechanism, the stitch-forming mechanism supported by the head, the channel and back gages also supported by the head, operating mechanism, substantially as described, for said gages, the rock-shaft journaled in the fixed frame of the machine, the sticker-carrying arm attached to the rock-shaft, and the devices whereby said rock-shaft is oscillated to raise the sticker while the head is moving forward and to lower the sticker while the head is moving backward, as set forth.

5. The combination of the swinging head, mechanism to operate it, the stitch-forming mechanism supported by and moving with the head, the levers *k l*, pivoted to said head and having the gages *i j* at their lower ends, and means, substantially as described, whereby said levers are oscillated and their gages caused to alternately grasp and release the work, as set forth.

6. The combination of the swinging head, mechanism to operate it, the stitch-forming mechanism supported by and moving with the head, the gages *i j*, the levers *k l*, supporting said gages and pivoted to the head, and the reciprocating wedge-block between the upper ends of said levers, and the spring which presses said ends against the wedge-block, whereby the levers are caused to approach and recede from each other, as set forth.

7. The combination of the supporting-frame, the driving-shaft having the cams *d u* journaled in said frame, the swinging head pivoted to the frame, the curved needle, the looper, the cast-off, and the channel and back gages, all supported by and moving with the head, and devices, substantially as described, whereby motion is communicated to said needle, looper, cast-off, and gages from the cams *d u*, as set forth.

8. The combination of the supporting frame, the driving-shaft having the cams *d* *u*, the head *e*, pivoted to the frame and having a roll, *e*, and a spring, *f*, which presses said roll against the cam *d*, the slide *e'* in the head, engaged with a cam-groove in the cam *d*, the curved needle, and the cast-off supported by and moving with the head, the devices whereby the movements of the slide *e'* are caused to oscillate said needle and cast-off, the channel-gage, the back gage, and their pivoted operating-levers supported by the head, the looper also supported by the head, the cam *u*

on the driving-shaft having a cam-groove, *d'*, and intermediate devices, substantially as described, whereby motion is communicated from the cam *u* to said gages and looper, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 27th day of February, 1885.

ANDREW EPPLER, JR.

Witnesses:

C. F. BROWN,
H. BROWN.