

(No Model.)

6 Sheets—Sheet 1.

E. ADAMS.
BOOT AND SHOE SEWING MACHINE.

No. 337,291.

Patented Mar. 2, 1886.

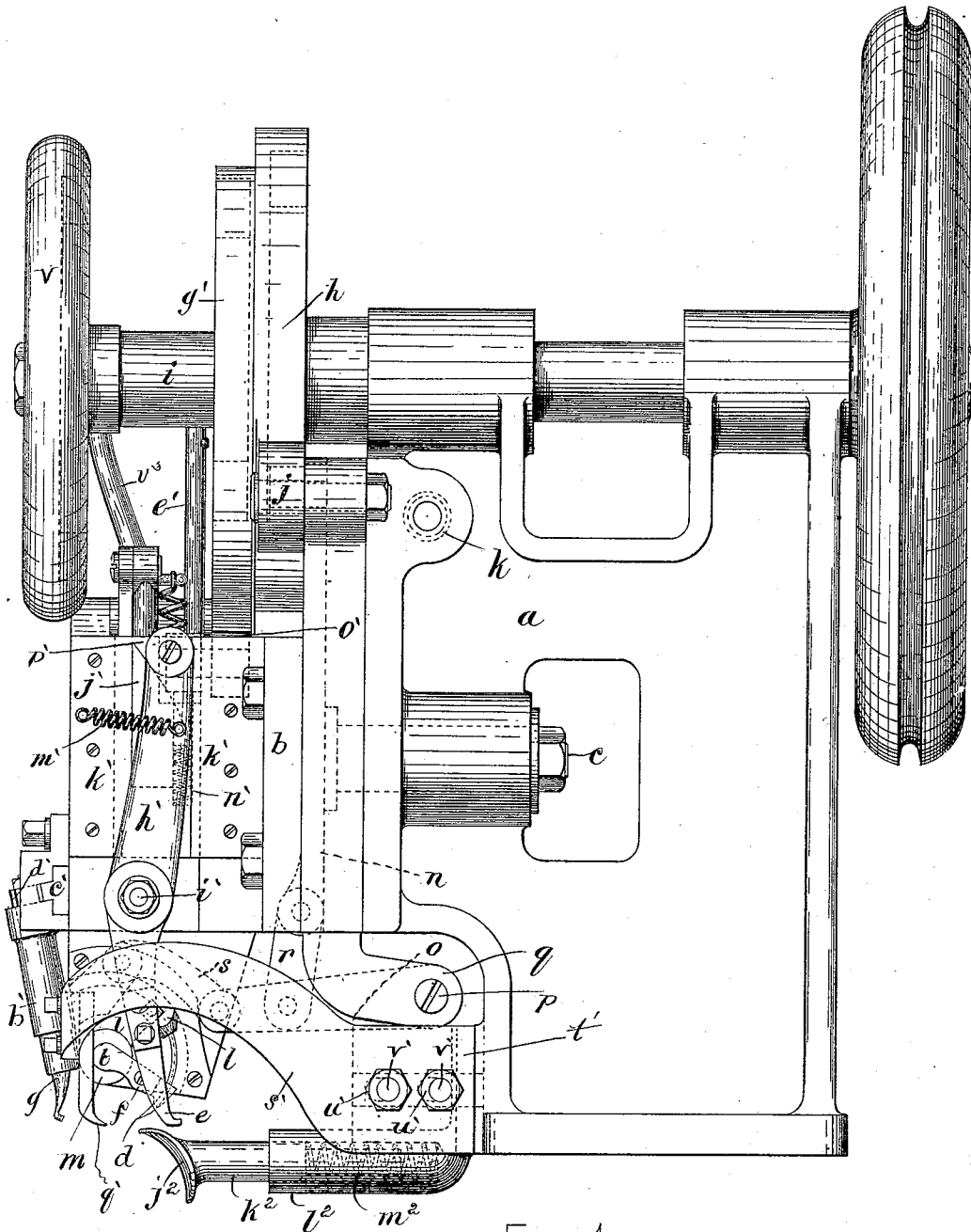


Fig. 1.

WITNESSES:

W. H. Ford.

Chas. S. Crooding.

INVENTOR:

E. Adams
by *Night & Power*
Atty.

(No Model.)

6 Sheets—Sheet 2.

E. ADAMS.
BOOT AND SHOE SEWING MACHINE.

No. 337,291.

Patented Mar. 2, 1886.

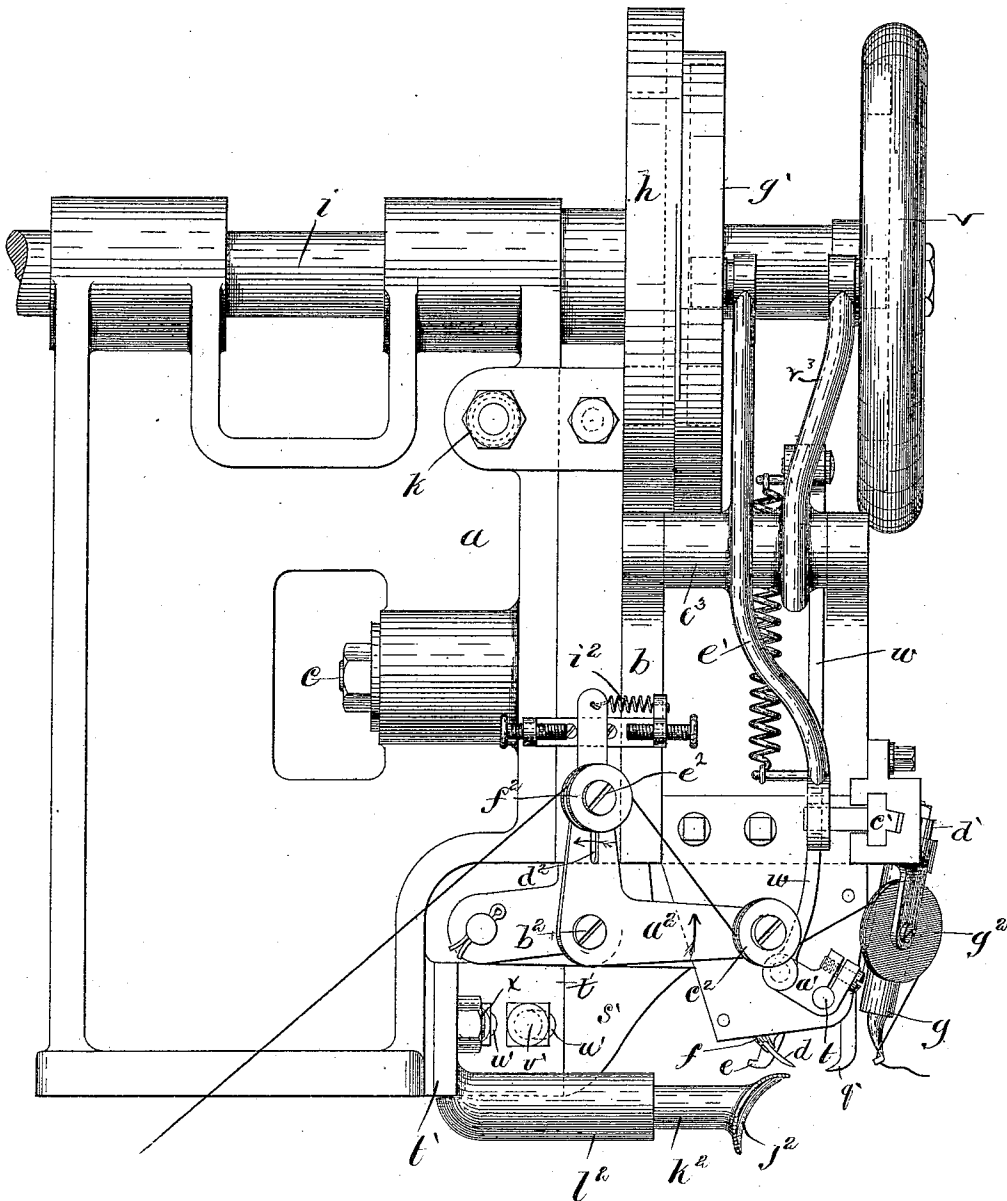


Fig. 2.

WITNESSES:

W. H. Ford.

Chas. S. Gooding.

INVENTOR:

E. Adams
by Night & Brown
Atty.

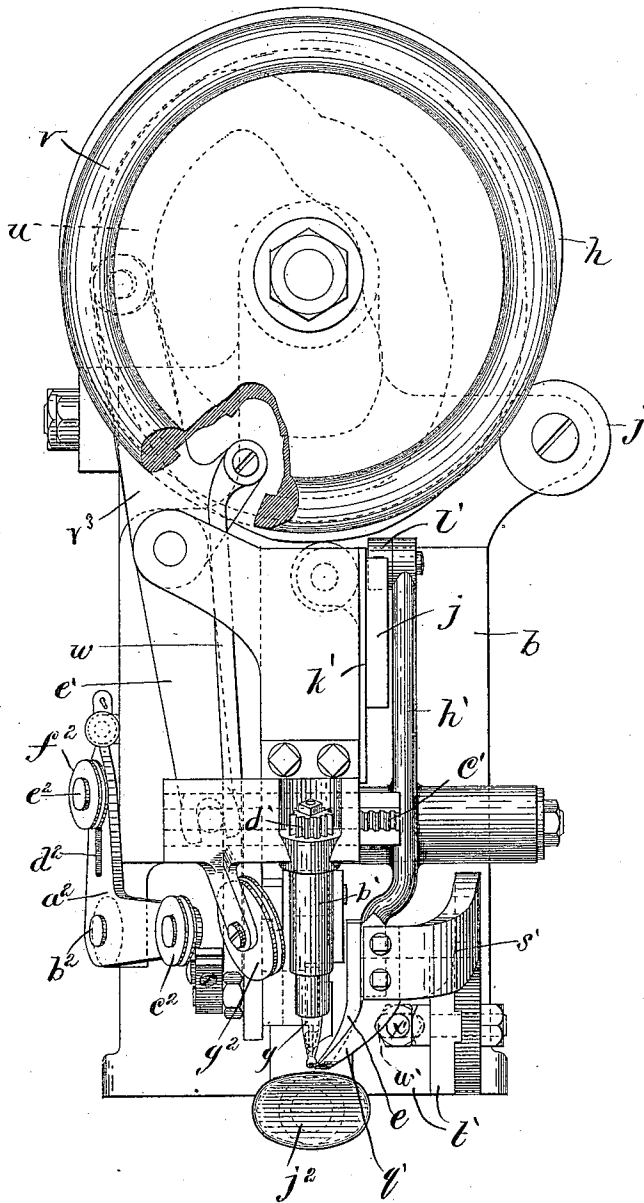
(No Model.)

6 Sheets—Sheet 3.

E. ADAMS.
BOOT AND SHOE SEWING MACHINE.

No. 337,291.

Patented Mar. 2, 1886.



WITNESSES:
W. H. Ford.
Chas. S. Gooding.

Fig. 3.

INVENTOR:
E. Adams
by Night & Brown
Atty.

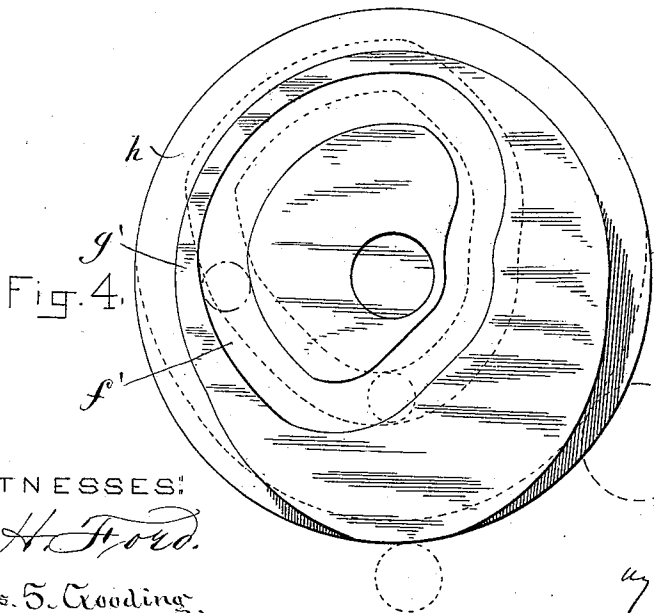
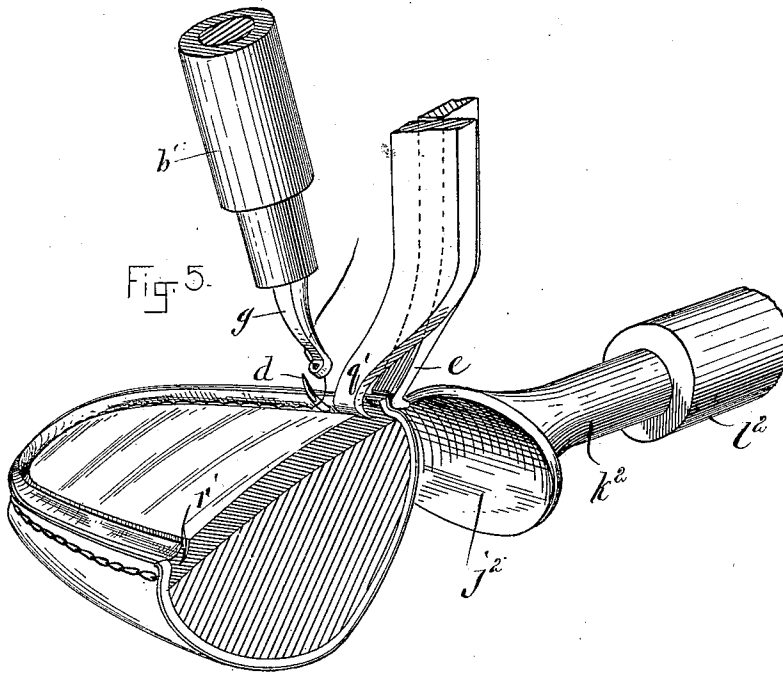
(No Model.)

6 Sheets—Sheet 4.

E. ADAMS.
BOOT AND SHOE SEWING MACHINE.

No. 337,291.

Patented Mar. 2, 1886.



WITNESSES:
W. H. Ford.
Chas. S. Gooding.

INVENTOR
E. Adams
by Night & Brown
Atty

(No Model.)

6 Sheets—Sheet 5.

E. ADAMS.
BOOT AND SHOE SEWING MACHINE.

No. 337,291.

Patented Mar. 2, 1886.

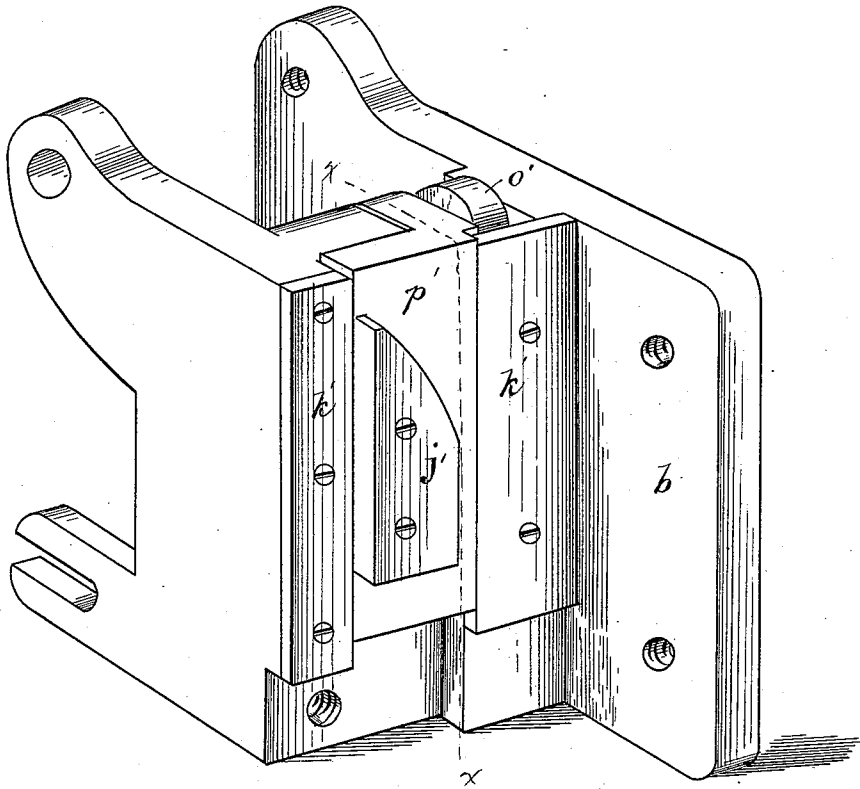


Fig. 6.

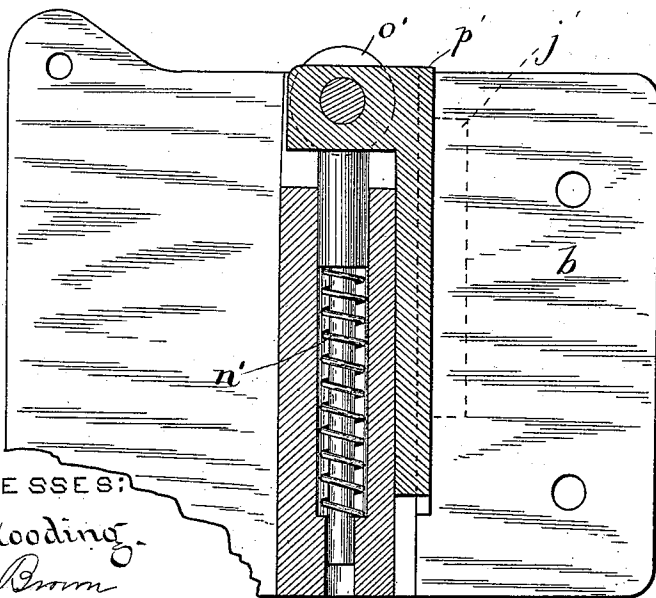


Fig. 7.

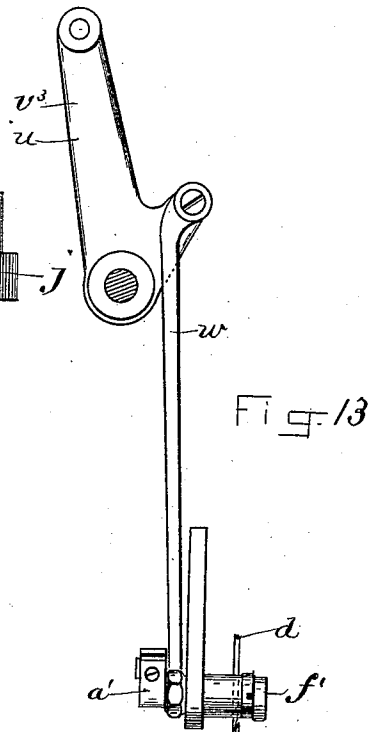
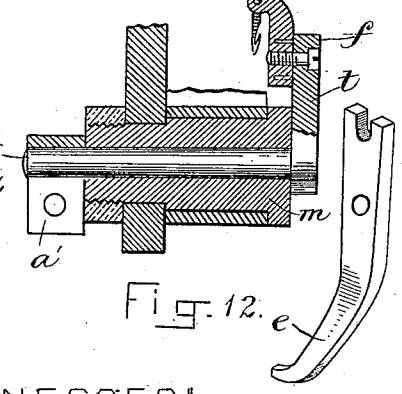
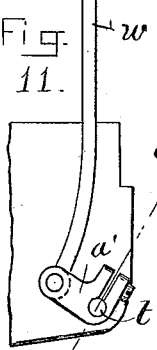
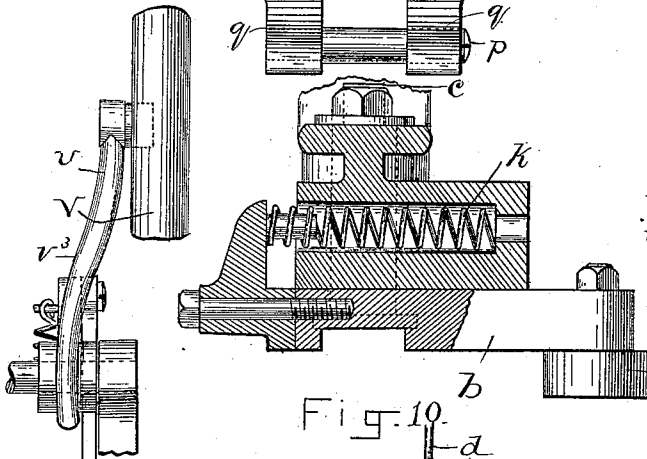
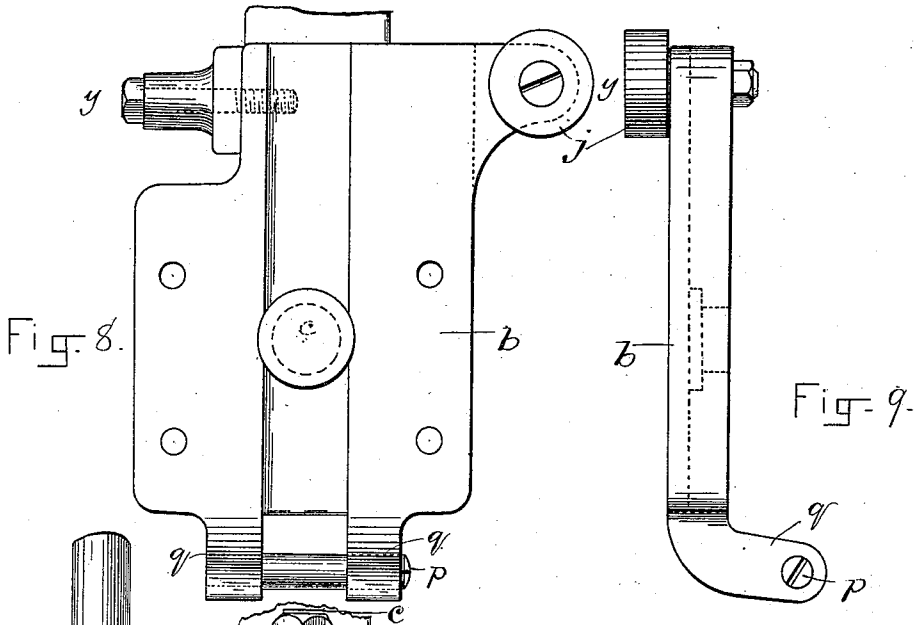
WITNESSES:
C. S. Gooding.
A. E. Brown

INVENTOR:
Edwin Adams
by *Wright & Brown*
Atty.

E. ADAMS.
BOOT AND SHOE SEWING MACHINE.

No. 337,291.

Patented Mar. 2, 1886.



WITNESSES:
C. S. Gooding.
H. E. Brown

Fig. 14.

INVENTOR:
Edwin Adams,
by Night & Brown
Atty.

UNITED STATES PATENT OFFICE.

EDWIN ADAMS, OF NEWBURYPORT, MASSACHUSETTS, ASSIGNOR TO THE
EPPLER & ADAMS SEWING MACHINE COMPANY, OF SACO, MAINE.

BOOT AND SHOE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 337,291, dated March 2, 1886.

Application filed August 24, 1885. Serial No. 175,137. (No model.)

To all whom it may concern:

Be it known that I, EDWIN ADAMS, of Newburyport, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Boot and Shoe Sewing-Machines, of which the following is a specification.

This invention relates to machines for sewing turned boots and shoes, in which a curved needle is employed which is oscillated in the direction of its length, and thus caused to alternately enter the work and draw a loop of thread through the "between substance" or the upper and that part of the sole between the bottom of the channel formed for the reception of the stitches and the upper, the latter being placed against the outer edge of the sole. In this class of machines the work is held by a channel-gage, which enters the channel, and a back-gage or work-rest, which bears against the upper where the latter bears against the margin of the sole. A lateral motion is given to the needle while it is in the work, whereby the work is fed between each stitch, the work-rest and channel-gage being arranged to grasp and hold the between substance while the needle is advancing to penetrate the same and moving laterally to feed the work.

An example of the class of machines to which my invention relates is shown in the patent to A. Eppler, Jr., No. 325,063, granted August 25, 1885.

My invention consists in the several improvements hereinafter described and claimed, relating to the channel-gage, the pull-off, the means for operating the cast-off, and means for supporting the operator's right hand during the stitching operation.

Of the accompanying drawings, forming a part of this specification, Figures 1 and 2 represent side elevations of my improved machine. Fig. 3 represents a front elevation. Fig. 4 represents a side elevation of the cams whereby motion is given to the operative parts of the machine. Fig. 5 represents a perspective view of a part of a turned shoe, the channel-gage, work-rest, looper, and the finger-rest. Fig. 6 represents a perspective view of the main portion of the swinging head. Fig. 7 represents a section on the line $x x$ of Fig. 6.

Fig. 8 represents an elevation on a reduced scale of the back part of the swinging head. Fig. 9 represents an edge view of the part shown in Fig. 8. Fig. 10 is a sectional view on an enlarged scale of the cast-off, showing how it is connected with the swinging head. Figs. 11 and 13 represent the mechanism that operates the cast-off, in elevation. Fig. 12 represents a section on line $z z$, Fig. 11. Fig. 14 represents a perspective view of the work-rest.

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

In the drawings, a represents the fixed frame of the machine, and b represents a swinging head, which is connected to the frame a by a bolt, c , and is capable of oscillating on said bolt. The swinging head carries the curved needle d , the work-rest e , the cast-off f , and the looper g , and is oscillated with said parts by a cam, h , on the driving-shaft i , said cam bearing against a roller, j , on an arm on the swinging head b , and a spring, k , which presses the roller j against the cam h , said spring being clearly shown in Fig. 10. The oscillating movements thus imparted to the head give the needle its lateral movements, whereby it is caused to feed the work when it penetrates the between substance, and is moved back to penetrate the between substance for a new stitch after each feeding movement and the formation of each stitch. The needle is mounted in an arm, l , which is adapted to oscillate on a fixed stud or pivot, m , Fig. 1, in the lower portion of the swinging head, and is oscillated so as to cause the needle to alternately penetrate and leave the work by means similar to those shown in the Eppler patent—viz., a slide, n , (shown in dotted lines in Fig. 1,) which is movable vertically in the swinging head, a cam-groove in the back of the cam h , which groove receives a roller on said slide and reciprocates the latter vertically, a lever, o , pivoted at p to ears q on the swinging head, a link, r , connecting the lever o to the slide n , and a link, s , connecting said lever to the needle-arm l . The cast-off f is an arm attached to a rock-shaft, t , passing through the center or pivot or stud m on which the needle-arm is mounted. The cast-off is formed to inclose a part of the needle and act as a shield therefor, covering the barb so as to re-

tain the loop therein while the loop is being drawn out by the backward movement of the needle, and uncovering the barb when the needle is penetrating the work, thus allowing the loop to be disengaged from the barb by contact with the work, and then moving forward into the loop thus disengaged, so as to prevent it from being caught by the barb while the needle is drawing the next loop through it. The cast-off is operated by a cam-groove, *u*, (shown in dotted lines in Fig. 3,) formed in the inner side of a wheel, *v*, on the driving-shaft, a bell-crank lever, *v*³, one arm of which has a stud entering said groove, and a rod, *w*, connecting the other arm of said lever with an arm, *a*¹, on the rock-shaft *t*, to which the cast-off is attached.

The looper *g* is composed of a stud journaled in a sleeve, *b*¹, affixed to the head *b*, and having an eccentric finger at its lower end and containing a thread-guiding eye, as in the Epler patent. The looper is rocked, so as to cause said eye to oscillate partly around the needle, by a rack, *c*¹, sliding in a guide on the swinging head, a pinion, *d*¹, on the looper-stud meshing with said rack, a lever, *e*¹, pivoted at *e*² and engaged at one end with said rack, and a cam-groove, *f*¹, in the front side of a cam, *g*¹, on the driving-shaft, said groove receiving a stud or roller on the upper end of the lever *e*¹. The work-rest *e* is a foot or finger attached to the lower end of a lever, *h*¹. (See Fig. 1.) Said lever is pivoted at *i*¹ to the swinging head, and is oscillated, so as to alternately press the work-rest against and remove it from the work, by a cam-block, *j*¹, on a slide, *p*¹, which moves between guides *k*¹ *k*¹ on the swinging head and bears against a roller, *l*¹, on the upper end of the lever *h*¹, and a spring, *m*¹, which holds said roller against the cam-block. The cam-block *j*¹ is vertically reciprocated by the face-cam *g*¹ on the shaft, and a spring, *n*¹, which presses a roller, *o*¹, on the slide *p*¹ against said cam.

*q*¹ represents the channel gage, which is a finger formed to enter the channel *r*¹, as shown in Fig. 5, and is affixed to an arm, *s*¹, (see Fig. 1,) which is rigidly attached to a bracket, *t*¹, on the fixed frame *a*, so that the channel-gage, instead of moving with the swinging head, is fixed, the work-rest *e* being moved toward and from it, to grasp and release the between substance. The arm *s*¹, to which the channel-gage is affixed, is adjustable on the bracket *t*¹, (see Figs. 2 and 3,) so that the distance between the channel-gage and the work-rest when they are in operative position may be varied to conform to the thickness of the between substances. Said adjustment is permitted by slots *u*¹ *u*¹ in the arm *s*¹ and attaching screws or bolts *v*¹ *v*¹ passing through said slots into the bracket. Said bracket is also provided with a slot or slots, *w*¹, through which passes the bolt or bolts *x*¹, which secure the bracket to the frame. The bracket is thus made adjustable, to permit the channel-gage to be adjusted toward and from the needle, so that when a

thick needle is substituted for a more slender one the channel-gage may be moved back to compensate for the increase in the thickness of the needle and preserve the required relation between the needle and channel-gage when the needle is penetrating the work.

*a*² (see Fig. 2) represents the pull-off, which is composed of a bell-crank lever pivoted at *b*² to the swinging head, and having at the end of one arm a grooved roller, *c*², under which the thread passes, and in its other arm a slot, *d*², adapted to receive and permit the adjustment of a stud, *e*², having a roller, *f*², over which the thread passes on its way to the roller *c*². The thread passes from the roller *c*² over another grooved roller, *g*², to the looper. As each loop is formed by the needle, the strain on the thread presses the roller *c*² upwardly and causes the roller *f*² to move backward, as indicated by the arrows in Fig. 2. After the loop is drawn out by the needle and while the needle is advancing to take a hold on another portion of the thread and draw the next loop, the strain on the thread is released, and the lever *a*² is moved by a spring, *i*², in the opposite direction from that indicated in Fig. 2, the rollers *c*² *f*² being caused to pull the thread forward the required distance for the next loop. The slot *d*² enables the roller *f*² to be adjusted toward and from the pivot of the lever *a*². The quantity of thread pulled forward by the take-up depends upon the distance between said roll and pivot, the quantity increased as the distance is increased, and vice versa.

*j*² represents a rest for the forefinger of the operator's hand, for the purpose of steadying the hand while sewing around the toe and heel. The area of the shoe that bears against the operator's hand while sewing at the toe and heel is comparatively small, and there is consequently more difficulty in guiding and controlling the shoe when sewing at these parts than at other parts.

It has been found that the rest *j*² makes the operation easier, and gives the operator better control of his work. The rest is a plate, preferably concave, to fit the back of the forefinger, attached to a shank, *k*², which is capable of moving in a socket, *l*², attached to the frame, and is backed by a spring, *m*², (shown in dotted lines in Fig. 1,) which normally presses the rest outwardly toward the operator and enables it to yield.

The operation is as follows: The shoe being lasted inside out, as usual, the operator holds it so that the channel-gage *q*¹ enters the channel, and the work-rest *e* bears against the upper, as shown in Fig. 5. The work-rest being moved forward, so that the between substance is grasped between it and the fixed channel-gage, as shown in Fig. 5, the needle advances and penetrates the between substance, and is then moved laterally by the swinging head, so as to feed the work. During this feeding movement the looper throws the thread into the barb of the needle, and at its close the needle with-

draws from the work, drawing a loop through the between substance. After the needle has withdrawn from the work the work-rest is moved backwardly from the work, and then the swinging head moves so as to carry the needle, the work-rest, and the other parts carried by the head laterally until the needle is in position to enter the work at the required distance from the last loop. The work-rest then moves forward against the work, and the needle penetrates the between substance, as before, and again moves laterally to feed the work, and thus the operation continues. When the needle is withdrawing from the work, the cast-off remains stationary, close to the upper, until the barb of the needle emerges from the work and is covered by the cast-off. The latter then moves backwardly with the needle. When the needle again moves forward, the cast-off lingers and allows the barb to emerge from it while it is entering the work, so that the loop will be disengaged from the barb by contact with the work. The cast-off then moves forward into the disengaged loop and against the upper, and stands in position to cover the barb when it next emerges, thus preventing the barb from catching the disengaged loop and causing the next loop to be drawn through said disengaged loop.

It will be observed that my improved machine is similar in many particulars to that shown in the above named Eppler patent, the chief differences being, first, the fixed channel-gage, (the channel-gage in the Eppler patent being movable like the back-gage or work-rest;) second, the means for operating the cast-off, (the operation of the cast-off being, however, identical with that described in the Eppler patent;) third, the take-up devices, and, fourth, the yielding finger-rest. I do not therefore claim anything shown in the said Eppler patent, excepting as combined with my improvements. The fixed channel-gage enables the operator to perfectly control the work during the backward lateral movement of the needle, said gage affording an unyielding support against which the operator can hold the channel-flap, there being no liability of the gage getting out of the channel, as is the case when the channel-gage moves with the swinging head and toward and from the work-rest, as in the machines of this class heretofore used.

I claim—

1. The combination of the movable work-rest, devices for operating it to bear against the work when the needle is penetrating and withdrawing from the work, and the stitch-forming mechanism, the swinging head supporting the work-rest and stitch-forming mechanism, and the fixed channel-gage, as set forth.
2. The combination of the fixed frame, the swinging head, the work-rest, and the stitch-forming mechanism carried by said head, the adjustable channel-gage attached to the fixed frame, and means for positively holding said gage in any position to which it may be adjusted.
3. The combination of the swinging head, means for oscillating it, the lever *h'*, pivoted thereto, having the work-rest *e*, the devices for oscillating said lever, the stitch-forming mechanism, the swinging head carrying the same, and the fixed channel gage, as set forth.
4. The combination of the swinging head, the pivoted needle-arm carrying the needle, the devices for oscillating said arm and needle, the rock-shaft *t*, concentric with the needle-arm and carrying the cast-off, the bell-crank lever *v*³, the cam-groove *u*, with which one end of said bell crank lever is directly connected for operating said lever, and the rod *w*, connecting said lever with the arm *a'* of the rock-shaft *t*, as set forth.
5. The pull-off composed of the bell-crank lever *a*², having the roller or guide *c*² on one arm and the adjustable roller or guide *f*² on the other arm, combined with the looper and needle, as set forth.
6. The combination, with the work-holding and stitching mechanism, of the yielding finger-rest having the concave head or plate formed to fit the back of the forefinger, and located wholly below the plane in which the sewing operation is performed, as shown, for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 17th day of August, 1885.

EDWIN ADAMS.

Witnesses:

C. F. BROWN,
H. BROWN.