

(No Model.)

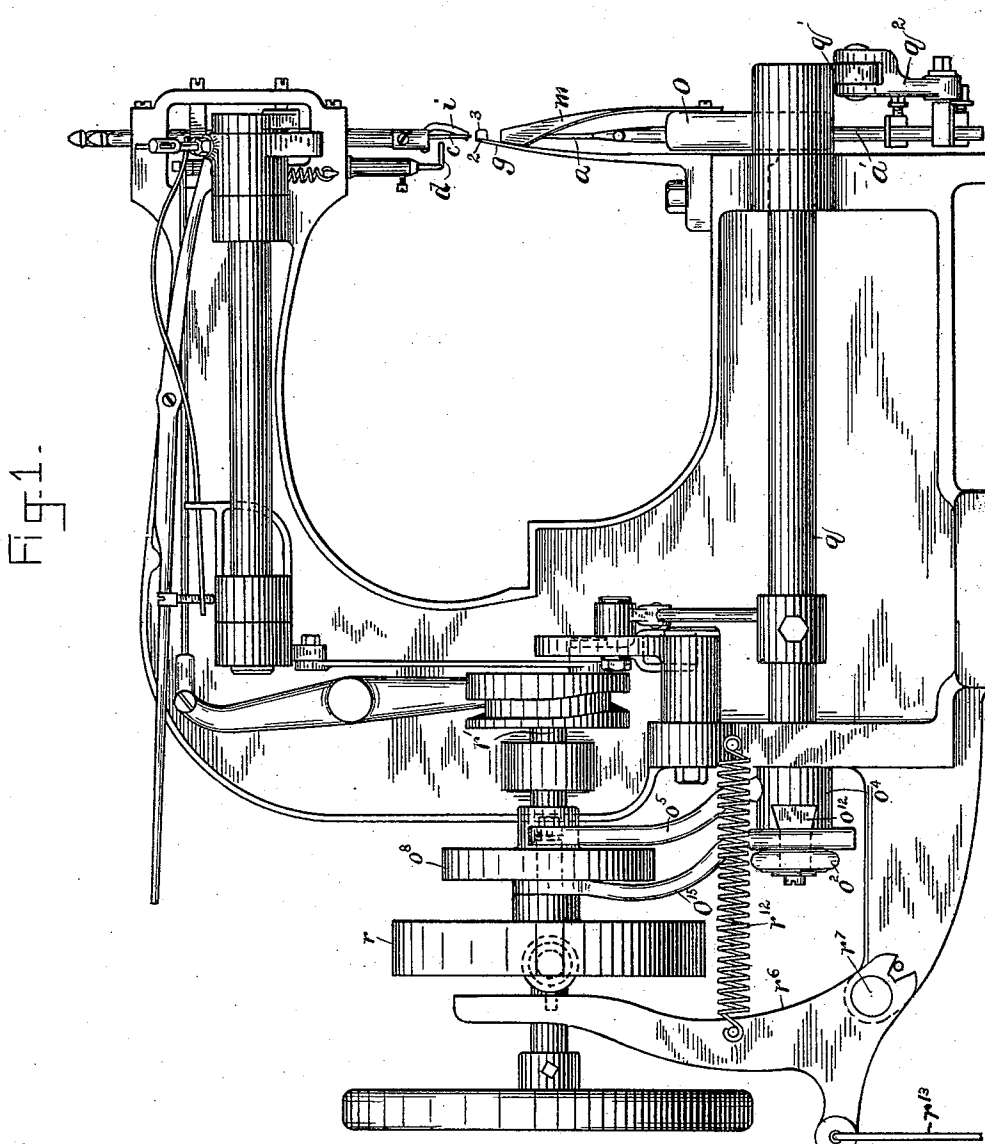
4 Sheets—Sheet 1.

A. SEAVER.

SEWING MACHINE FOR LASTING BOOTS OR SHOES.

No. 487,023.

Patented Nov. 29, 1892.



WITNESSES:

A. D. Harrison.

B. A. McShane.

INVENTOR:

A. Seaver
by Knight Bond & Co.
Atty.

(No Model.)

4 Sheets—Sheet 2.

A. SEAVER.

SEWING MACHINE FOR LASTING BOOTS OR SHOES.

No. 487,023.

Patented Nov. 29, 1892.

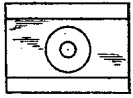


Fig. 6.

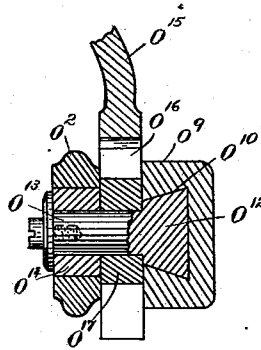
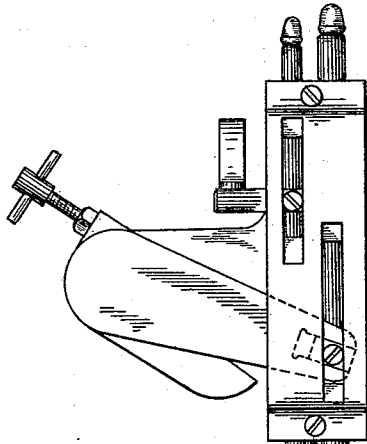


Fig. 4.

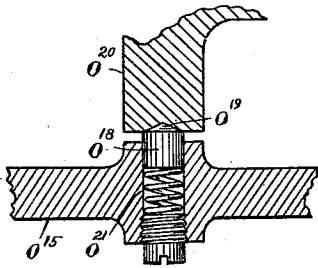


Fig. 5.

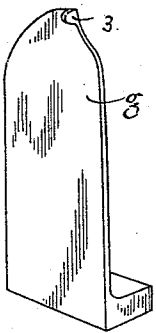


Fig. 11.

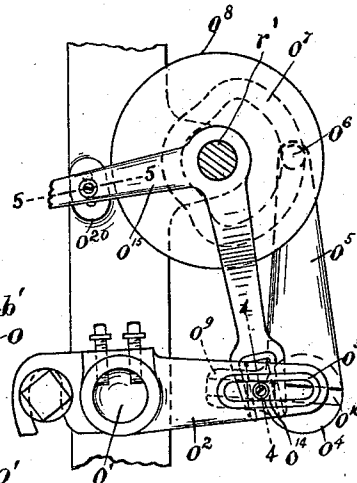


Fig. 3.

WITNESSES:

A. D. Harrison.
B. A. McShane.

INVENTOR:

A. Seaver
by night from reading
Atty.

Fig. 2.

(No Model.)

4 Sheets—Sheet 3.

A. SEAVER.

SEWING MACHINE FOR LASTING BOOTS OR SHOES.

No. 487,023.

Patented Nov. 29, 1892.

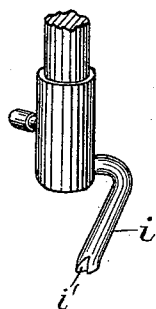


Fig. 8.

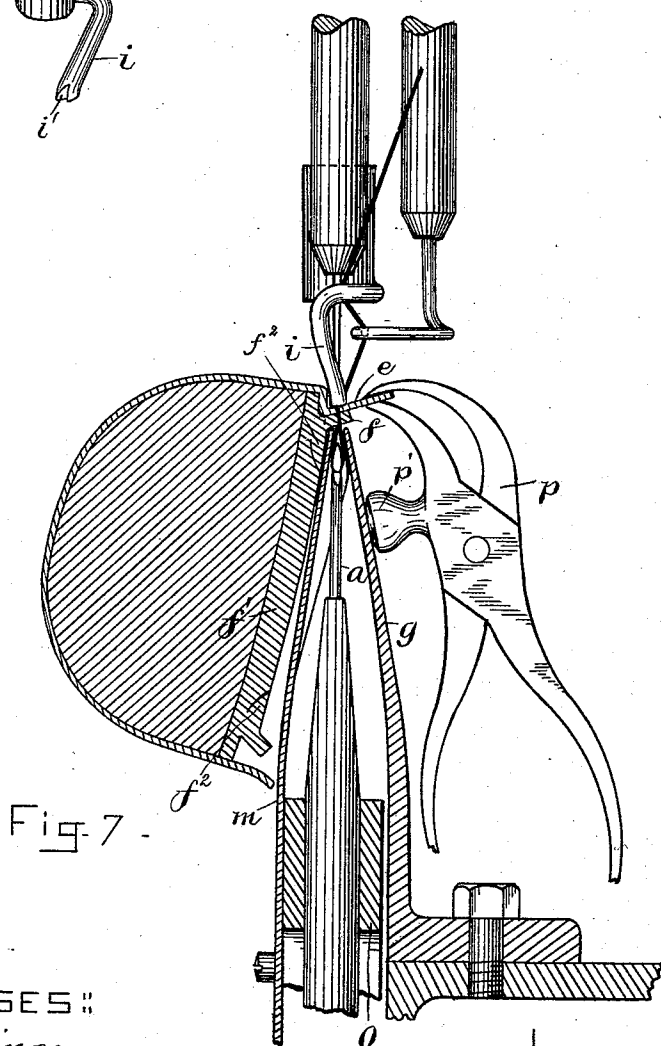


Fig. 7.

WITNESSES:

A. D. Harrison
B. A. McShane.

INVENTOR:

A. Seaver
by *Wm. Brown & Co.*
Atty.

(No Model.)

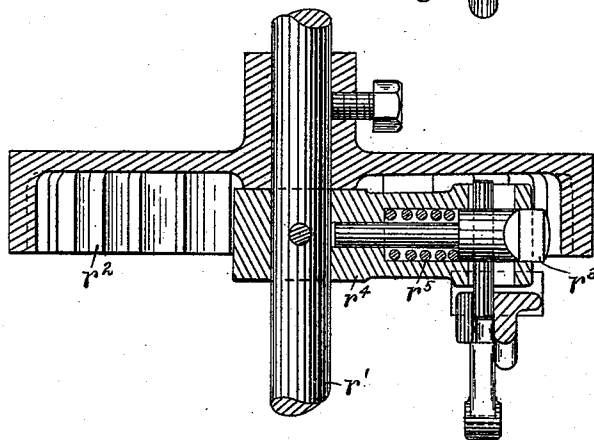
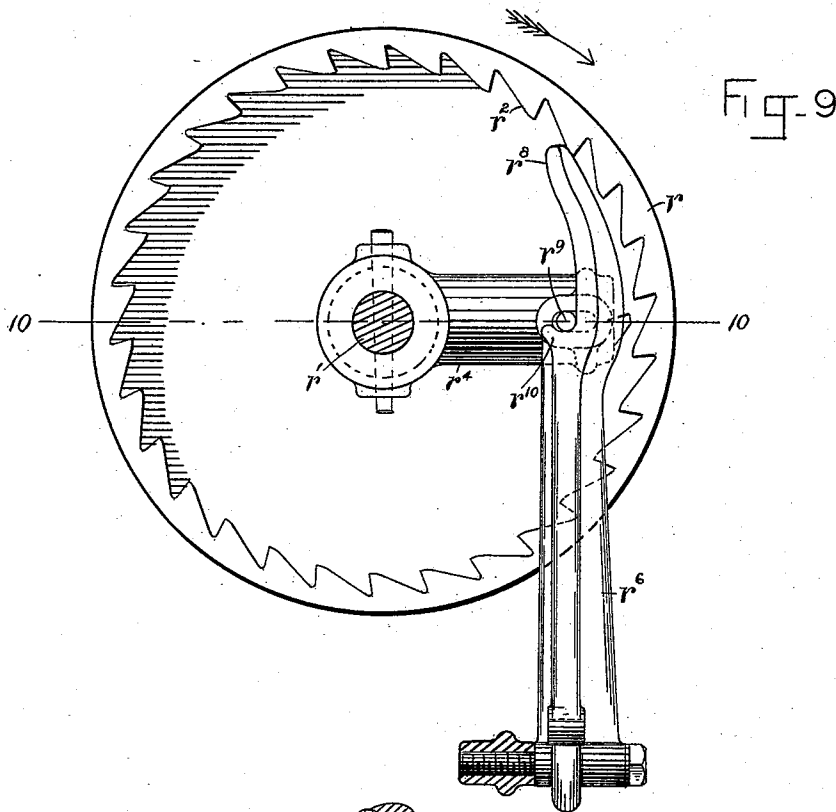
4 Sheets—Sheet 4.

A. SEAYER.

SEWING MACHINE FOR LASTING BOOTS OR SHOES.

No. 487,023.

Patented Nov. 29, 1892.



WITNESSES:

A. D. Harrison.
B. A. McShane.

INVENTOR:

A. Seaver
By Wright Brown & Co.
Attys.

UNITED STATES PATENT OFFICE.

AUGUSTUS SEAVER, OF BOSTON, MASSACHUSETTS.

SEWING-MACHINE FOR LASTING BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 487,023, dated November 29, 1892.

Application filed November 27, 1891. Serial No. 413,179. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS SEAVER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines for Lasting Boots or Shoes, of which the following is a specification.

This invention relates to sewing-machines for lasting boot or shoe uppers, and particularly the uppers of welted boots or shoes in which the edge of the inner sole is channeled or cut to form a lip adapted to be turned outwardly from the outer or under surface of the outer sole, one side of said lip forming a shoulder supporting a portion of the edge of the upper and the inner edge of the welt during the operation of attaching the upper and welt to the inner sole by stitches which pass through the welt, upper, and that portion of the inner sole known as the "between substance," which is the material of the sole intervening between the above-described cut made in the edge of the sole and the bottom of a stitch-receiving channel made in the outer face of the sole.

The invention has for its object to provide a machine adapted to attach the edge of the upper to the lip above described by means of a continuous line or series of stitches constituting fastenings for the upper, which take the place of lasting-tacks usually employed, and by reason of the fact that they are non-metallic and offer no material resistance either to the needle which subsequently attaches the welt or to a knife that is used in trimming off the superfluous portions both of the upper and of the lip, enable the welt to be attached to the upper and inner sole immediately after the operation of lasting.

Heretofore when the upper has been attached to the inner sole of a welted boot or shoe by means of lasting-tacks, the said tacks are necessarily so arranged that if allowed to remain in place during the operation of sewing the welt to the upper and inner sole they would obstruct and injure the needle to such an extent as to entirely prevent its operation. Hence it is necessary after securing the upper by the lasting-tacks to lay aside the last and the upper thereon until the upper has set or acquired a sufficiently-permanent form to enable it to remain on the last after the removal

of the tacks, it being necessary to remove the tacks before the welt can be sewed to the upper and inner sole. When, however, the upper is attached to the inner sole by stitches in accordance with my invention there is no necessity of this delay, because the stitches do not interfere with the operation of sewing on the welt. Hence the welt can be applied immediately after the upper is lasted.

My invention consists in the several improvements hereinafter described and claimed, whereby the stitch-forming mechanism of a sewing-machine is adapted to connect the upper of a welted boot or shoe to the lip at the outer edge of the inner sole.

In the accompanying drawings, forming part of this specification, Figure 1 represents a side elevation of a sewing-machine organized to connect the upper of a welted boot or shoe to the lip on the inner sole thereof. Fig. 2 represents an end elevation of the machine. Fig. 3 represents an elevation of the mechanism used to vary the length of the stitch. Fig. 4 represents a section on line 4 4, Fig. 3. Fig. 5 represents a section on the line 5 5, Fig. 3. Fig. 6 represents a detail hereinafter referred to. Fig. 7 represents a vertical section of the work-support and of an upper and inner sole on a last and supported by the work-support, together with an elevation of the needle, cast-off, presser-foot, awl, and looper. Fig. 8 represents a perspective view of the presser-foot. Fig. 9 represents a side view of the devices composing the automatic stop-motion. Fig. 10 represents a section on line 10 10, Fig. 9. Fig. 11 represents a view of the work-support.

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

In carrying out my invention I prefer to employ the well-known "National" sewing-machine, the same having a laterally-movable needle *a*, a cast-off *b*, located beside the needle, an awl *c*, which is located above the needle and reciprocated vertically without having a lateral movement, and a looper *d*, said parts constituting the usual stitch-forming mechanism of the National sewing-machine, which, being well known, requires no detailed description, it being sufficient to observe that the needle is reciprocated vertically and oscillated laterally and has a lateral work-feeding movement while it is elevated and passed

through the work, the operation of forming the stitches being in no respect different from that of the National machine above referred to.

In adapting the machine to sew the upper *e* of a lasted boot or shoe to the lip *f* at the edge of the inner sole *f'* I provide the machine with a work-support *g*, adapted to bear on the under side of the lip *f* said work-support being formed to support the lip in such manner as to permit the stitches to pass through the upper and the lip, the location of the stitches being indicated by the black line passing through the upper and lip in Fig. 7. The form of the work-support must be such as to permit the lateral or work-feeding movement of the needle and to support the work, not only beside the path along which the needle moves, but also at one or both ends of said path. In other words, the work-support must be at one or both ends wide enough to support the lip *f*, so that said lip will not yield and bend downwardly when the awl in its descent strikes the upper side of the lip. I find a suitable form of the work-support is that shown in Fig. 11, the work-support comprising a narrow portion 2, located at one side of the path of the needle when the latter is making its work-feeding movement and having an ear or projection 3 at the ends of said path, said projection giving the work-support sufficient width to enable it to prevent the lip *f* from yielding to the pressure of the awl. The work-support is here shown as located at the inner side of the needle. At the opposite or outer side of the needle is a plate or shield *m*, which is attached to the needle-carrier *o*, and projects upwardly therefrom, far enough to be interposed between the needle and the inner sole, and to prevent the needle from catching the lip *f* forming the outer side of the usual channel made in the face of the inner sole for the reception of the stitches that secure the welt to the upper and inner sole. The shield *m*, moving laterally with the needle and bearing against the work, aids the needle in feeding the work.

I have provided a presser-foot *i* of peculiar form, adapted to co-operate with the work-support, the presser-foot being made correspondingly narrow and formed to bear on that part of the upper *e* which lies on the outer side of the lip *f*, the presser-foot bearing on the upper at one side of the shoulder formed by the edge of the main portion of the inner sole and directly over the work-support. The presser-foot *i* has a slot *i'*, which is arranged to receive the awl when the latter is descending and the needle when the latter is ascending. The presser-foot therefore bears upon the upper at opposite sides of the point through which the awl and needle pass, so that the presser-foot supports the upper and the lip *f* against the upward thrust of the needle, the lip being thereby prevented from being bent upwardly when the needle is rising to pass through the lip and upper.

It will be seen from the foregoing that the

work-support and presser-foot, formed as above described, are adapted to hold the lip *f* and the portion of the upper bearing thereon in a position substantially at right angles with the direction of movement of the needle and awl and to prevent said lip and upper from being displaced by the downward pressure of the awl and by the upward pressure of the needle. Hence the stitch-forming mechanism is enabled to connect the upper and the lip by a continuous series or chain of stitches. The elevation of the work-support is such that there is sufficient room below its upper end to accommodate the entire width of the inner sole, as shown in Fig. 7, so that the lip *f* and the part of the upper bearing thereon can occupy a substantially-horizontal position between the work-support and presser-foot, while the inner sole occupies a nearly-vertical position.

In the operation of lasting boot or shoe uppers it is customary for the operator to grasp the edge of the upper with a pair of pinchers and to pull the edge of the upper by said pinchers over upon the inner sole sufficiently to conform the upper to the shape of the last, the upper having been heretofore attached to the inner sole to retain the stretch thus imparted to the upper by means of lasting-tacks driven through the upper into the inner sole.

In the operation of lasting by means of the machine forming the subject of this application pinchers are or may be employed for the same purpose, and to enable the operator to properly manipulate the pinchers *p*, Fig. 7, I provide a rest or bearing, which is arranged in position to support the foot *p'*, projecting from the under jaw of the pinchers, said rest being arranged so that the operator, holding the handles of the pinchers in one hand at a point below the work-support, may cause the jaws of the pinchers to grasp the edge of the upper at one side of the work-support and presser-foot, as shown in Fig. 7, and exert the desired pull or tension on the upper to draw it over and adjust it to the last and upon the lip *f* by rocking or swinging the pinchers upon the rest, the foot *p'* bearing on said rest and constituting the fulcrum upon which the pinchers move. The said rest, as here shown, is a portion of the work-support *g*, the latter being made of considerable width below its work-supporting upper end, so that the operator can press the foot *p'* against it and allow said foot to move along when the work is being fed, it being necessary for the pinchers to move with the work to hold the part of the upper adjacent to that in which the last stitch was formed in suitable relation to the lip *f*.

The needle-carrier *o* is or may be of the construction commonly used in the National machine. As here shown, the said carrier is affixed to a rock-shaft *o'*, which is rocked or oscillated in bearings in the supporting-frame by suitable connections with the driving-shaft of the machine, as hereinafter described, the needle-bar *a'* and cast-off bar *b'* being fitted

to move longitudinally in guides in the said carrier o in the usual manner and reciprocated by means of a rock-shaft q , which is connected with the driving-shaft of the machine in any suitable way, and has at one end an arm q' , connected by a link q^2 with a block or head q^3 , affixed to the needle-bar, said block being adapted to slide between blocks q^4 on the cast-off bar b' , this being the usual and well-known mechanism for operating the needle and cast-off in the National machines.

It will be observed that the rest g is arranged so that the pinchers may occupy a substantially-vertical position above the base or lower portion of the supporting-frame of the machine, the work-support being sufficiently elevated above said base to permit the handles of the pinchers to be freely moved in and out toward and from the rest without striking the base of the supporting-frame.

The rest, arranged to support the pinchers as above described, is an important element of the machine, it being necessary in most cases to exert a considerable degree of tension on the upper to properly draw it down upon the last and to adjust it upon the lip f , the described arrangement of the rest relatively to the work-support and stitch-forming mechanism enabling it to co-operate with the pinchers very effectively in stretching and adjusting the upper.

It is new with me to combine with a work-support and a presser-foot adapted to co-operate, as above described, in supporting and holding the lip on the inner sole of a welted boot or shoe and the portion of the upper that bears thereon a rest adapted to support the fulcrum of a pair of pinchers. Hence I regard any rest that is arranged to perform the described function as coming within the spirit of my invention.

An important feature of my improved machine is an automatic stop-motion arranged to automatically arrest the movement of the rock-shaft q , that reciprocates the needle-bar after the formation of each stitch, and while the needle is depressed below the work-support. There are many organized mechanisms known as "stop-motions" for automatically disconnecting a driven shaft from the shaft that drives it and arresting the driven shaft at a given point in its rotation. I have shown in Figs. 9 and 10 a suitable type of automatic stop-motion for the present purpose. In said figures r represents the driving-pulley, which is rotated by a belt running from a source of power, and is loosely mounted on a shaft r' , which shaft is journaled in bearings on the frame of the machine, and when rotated communicates motion through the usual connecting mechanism to the needle, cast-off, looper, and presser-foot. The pulley r is provided on its interior with a series of ratchet-teeth r^2 , which are adapted to engage with a spring-pressed tooth r^3 adapted to slide on an arm r^4 , which is rigidly affixed to the shaft r' . The tooth r^3 is fitted to slide in a socket in the arm r^4 , and is nor-

mally pressed outwardly by a spring r^5 into engagement with one of the ratchet-teeth r^2 . The pulley r being continuously rotated, it will be seen that when the tooth r^3 is pressed outwardly and engaged with one of the teeth r^2 of the pulley the motion of the pulley will be communicated through the tooth r^3 and arm r^4 to the shaft r' , which in turn will communicate motion to the stitch-forming mechanism. r^6 represents an arm, which is pivoted at r^7 , Fig. 1, to the supporting-frame of the machine, its upper end standing beside the pulley r and being movable toward and from said pulley. The arm r^6 is provided with a cam-shaped face r^8 at its upper end, which is arranged to come in contact with a pin r^9 , affixed to and projecting laterally from the movable tooth r^3 , said cam-shaped face being so formed that when the pin r^9 comes in contact with a stud upon it the tooth r^3 will be reciprocated and withdrawn from engagement with the tooth r^2 with which it was engaged, the shaft r' being thus disconnected from the pulley r . At the lower end of the cam-shaped face r^8 the arm r^6 is provided with a shoulder r^{10} , which is formed to arrest the pin r^9 , and thus stop the rotation of the shaft r' . The arm r^6 is normally held by a spring r^{12} in position for its cam-shaped face r^8 and shoulder r^{10} to act upon the pin r^9 in the manner above described. A rod r^{13} , Fig. 1, connects the arm r^6 with a treadle (not shown) arranged to be moved by the foot of the operator, the depression of said treadle causing the movement of the arm r^6 in the direction to the left in Fig. 1. This movement withdraws the arm r^6 from contact with the pin r^9 and permits the spring r^5 to force the tooth r^3 outwardly into engagement with a tooth of the pulley r , thus causing the pulley to rotate the shaft r' . When the operator releases the treadle, the spring r^{12} restores the arm r^6 to its normal position, so that when the rotation of the shaft r brings the arm r^4 to such position that the pin r^9 strikes the cam-shaped face r^8 of the lever r^6 the tooth r^3 is withdrawn, as above described, after which the rotation of the shaft r' is arrested by the shoulder r^{10} . The arrangement of the parts of the stop-motion and of the mechanism connecting the shaft r' with the needle-bar is such that the needle is depressed below the work when the shaft r' is stopped. It will be seen, therefore, that the stitch-forming mechanism is caused to operate by the movement of the lever r^6 caused by an act of the operator, and is automatically stopped after the completion of a stitch by the lever r^6 if the latter is allowed to return to its normal position. If, however, the operator holds the lever r^6 out of its normal position, the stitch-forming mechanism continues to operate so long as the lever r^6 is so held. In stitching the upper to the lip f along the comparatively straight portions at the sides of the sole the stitch-forming mechanism may operate continuously without stopping; but at

the more abruptly-curved portions, particularly at the toe, the operation of uniting the upper to the lip is much more satisfactorily performed when the stitch-forming mechanism stops after the formation of each stitch, the operator being thus given time to adjust the upper upon the lip and to properly arrange the plaits or folds of the upper which necessarily exists at the toe portion in consequence of the gathering in of the edges of the upper. It is often necessary to raise the presser-foot while the upper is being stretched and drawn to place at the toe, and then to depress the presser-foot to hold a plait or fold of the upper. This can only be done properly when the stitch-forming mechanism is at rest. I do not limit myself to the particular form of automatic stop-motion here shown, and may use any other suitable mechanism which will accomplish the same result.

Another important part of my invention is the provision of means for varying the length of the stitches, so that the stitches may be made shorter at the toe portion than at the sides of the sole, the work being more satisfactorily performed when shorter stitches are made at the toe than are required at the side portions. To this end I provide an adjustable connection between the rock-shaft o' , that imparts the work-feeding movement to the needle-carrier o and the shaft r' , from which motion is imparted to said rock-shaft. Said adjustable connection, as shown in Figs. 1, 3, and 4, comprises an arm o^2 , affixed to the rock-shaft o' and having a slot o^3 in its outer end, a hub or collar o^4 , mounted to rock or oscillate on a suitable stud or support, which may be the shaft q , an arm o^5 , affixed to said hub and having at its outer end a trundle-roll o^6 , engaged with a cam-groove o^7 in a disk o^8 , affixed to the shaft r' , a shorter arm o^9 , affixed to the hub o^4 and provided with a groove o^{10} , which extends through said arm and across one end of the hub o^4 , and a slide o^{12} , fitted to move in the groove o^{10} and provided with a pin o^{13} , which projects from the arm o^9 through the slot o^3 in the arm o^2 , and is fitted to turn in a block o^{14} , which is adapted to slide in the slot o^3 . The slide o^{12} , pin o^{13} , and block o^{14} constitute an adjustable connection between the arm o^9 , which is oscillated in an unvarying path by the cam o^7 , and the arm o^2 , which communicates motion to the rock-shaft o' . By moving said connection toward and from the center of oscillation of the arm o^9 the extent of the rocking movement imparted to the rock-shaft o' , and therefore the extent of the oscillating movement imparted to the needle-carrier by said rock-shaft, may be decreased or increased, said movement being decreased by moving the said sliding connection toward the axis of the arm o^9 and increased by moving said sliding connection in the opposite direction.

o^{15} represents a bell-crank lever mounted on the shaft r' and adapted to oscillate loosely

thereon, one arm of said lever having a slot o^{16} , which receives a block o^{17} , Fig. 4, through which the pin o^{13} passes. The other arm of the lever o^{15} projects toward the front of the machine within convenient reach of the operator and constitutes a handle, by which the operator may move said lever to effect a change in the position of the said sliding connection. The lever o^{15} may be held in either of two or more positions by means of a spring-pressed pin or latch o^{18} , Fig. 5, supported by the lever o^{15} and formed to engage one of a series of recesses or cavities o^{19} in a boss or projection o^{20} on the supporting-frame of the machine, a spring o^{21} being employed to force the latch o^{18} into engagement with said recesses. The latch o^{18} is formed so that when engaged with a recess it will prevent the lever o^{15} from moving accidentally, and will at the same time yield when the operator forcibly moves the lever o^{15} .

I claim—

1. In a sewing-machine for lasting boots or shoes, the combination of a stitch-forming mechanism, including a work-feeding needle, an elevated narrow work-support formed to bear on the inner side of the lip on the inner sole of a welted boot or shoe, a correspondingly-narrow presser-foot formed to bear on the upper at one side of the edge of the inner sole and to hold the upper against said lip, and a rest or bearing for the pinchers used to stretch and adjust the upper upon the lip, as set forth.

2. In a sewing-machine for lasting boots or shoes, the combination of a stitch-forming mechanism, including a work-feeding needle, an elevated narrow work-support formed to bear on the inner side of the lip on the inner sole of a welted boot or shoe, a correspondingly-narrow presser-foot formed to bear on the upper at one side of the edge of the inner sole and to hold the upper against said lip, a rest or bearing for the pinchers used to stretch and adjust the upper upon the lip, and an automatic stop-motion whereby the movement of the needle is arrested after the formation of each stitch to afford time for the adjustment of the upper by the pinchers, as set forth.

3. In a sewing-machine for lasting boots or shoes, the combination of the stitch-forming mechanism, including a laterally-movable needle, an elevated narrow work-support located, mainly, at the inner side of the needle, and a shield attached to the needle-carrier and adapted to cover the channel in the face of the inner sole, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of November, A. D. 1891.

AUGUSTUS SEAYER.

Witnesses:

C. F. BROWN,
A. D. HARRISON.