

C. S. GOODING.
SEWING MACHINE.

No. 489,945.

Patented Jan. 17, 1893.

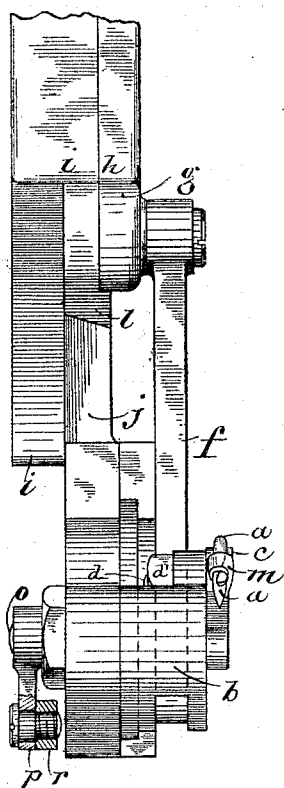


Fig. 2.

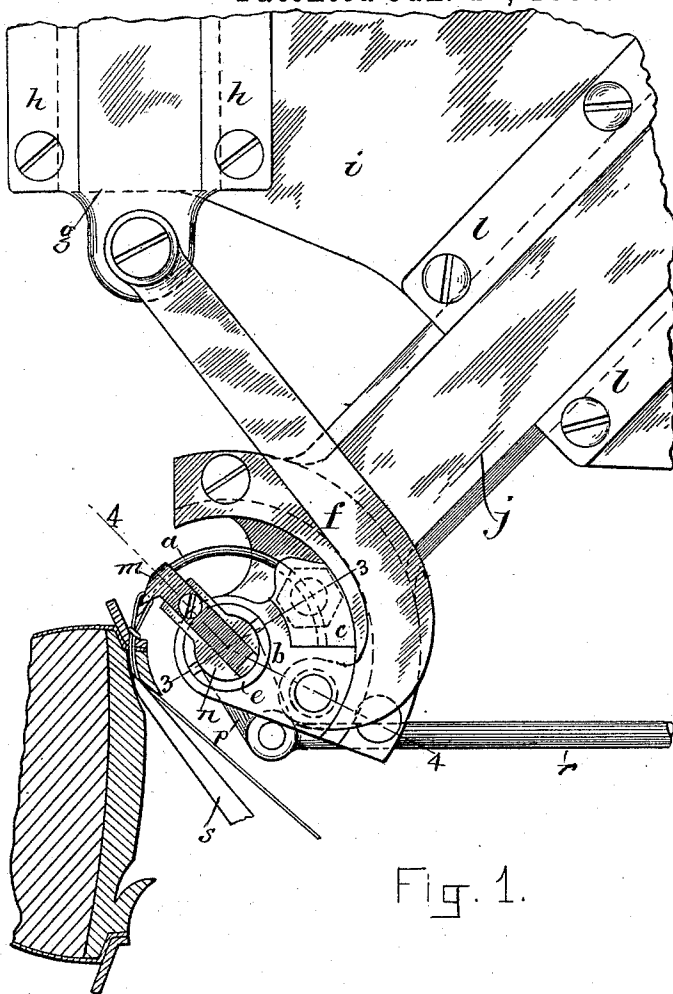


Fig. 1.

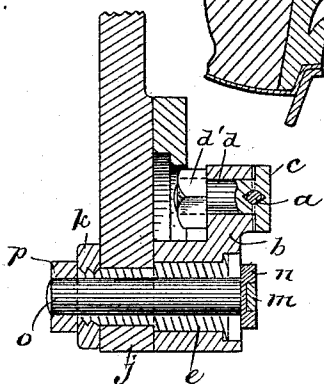


Fig. 3.

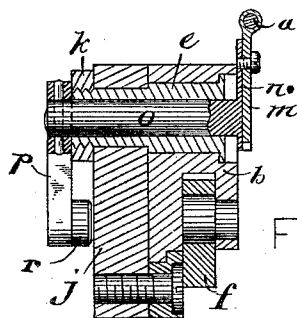


Fig. 4.

WITNESSES:
A. D. Harrison
B. A. McShane

INVENTOR:
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by M. H. Brown & Co.
Attys.

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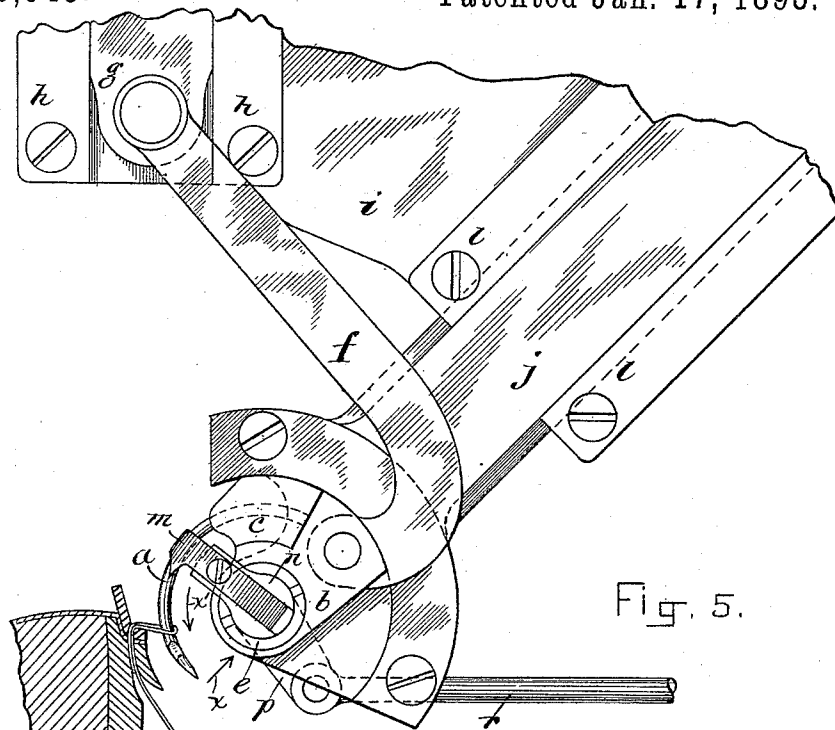


Fig. 5.

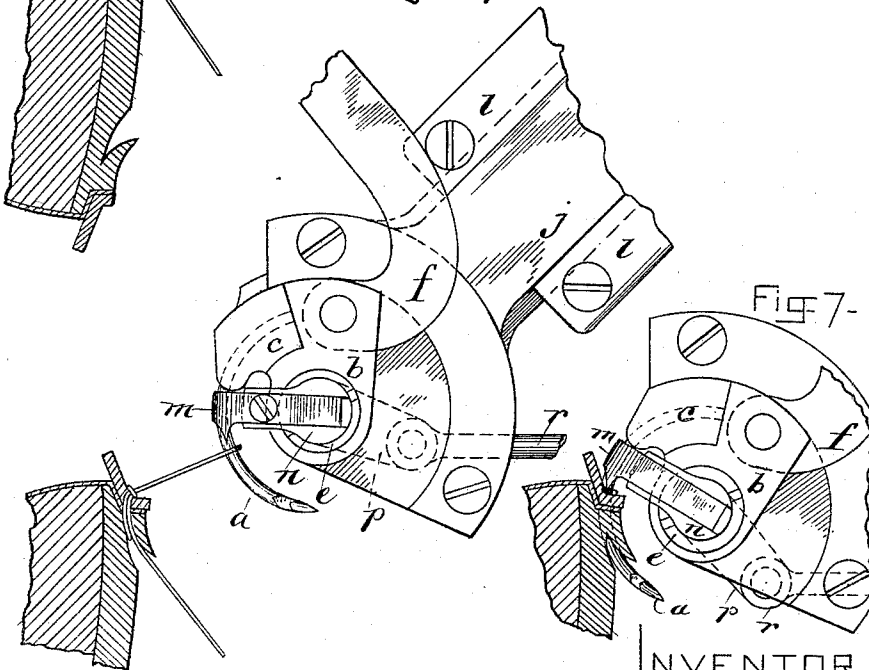


Fig. 6.

Fig. 7.

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(No Model.)

4 Sheets—Sheet 3.

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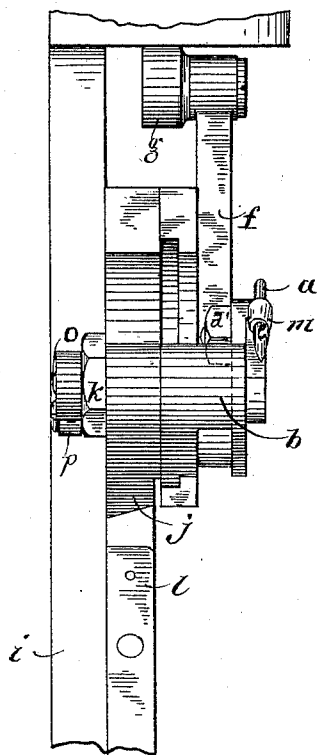


Fig. 9.

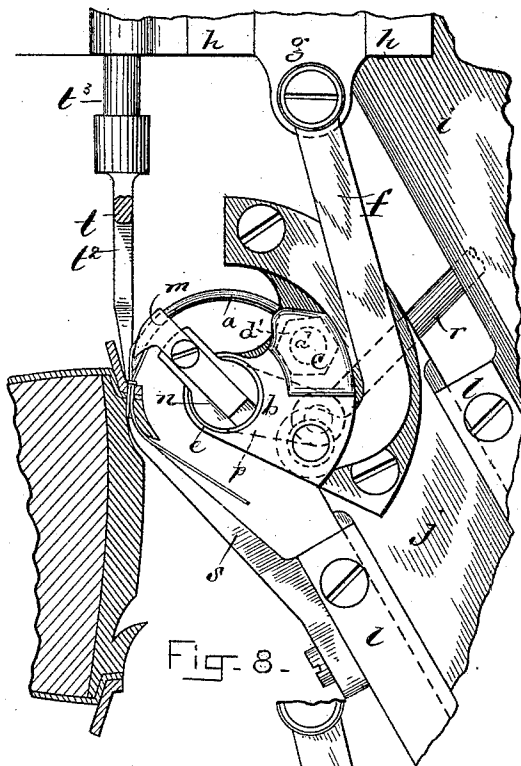


Fig. 8.

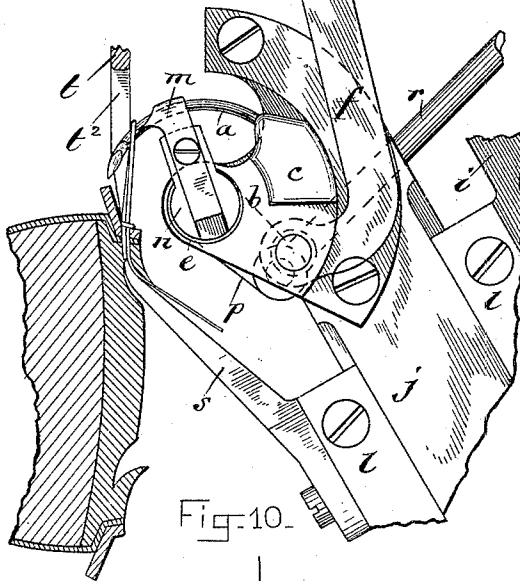


Fig. 10.

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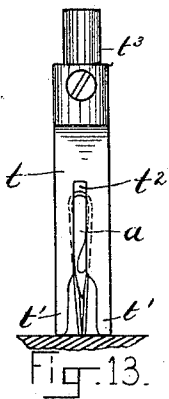


Fig. 11.

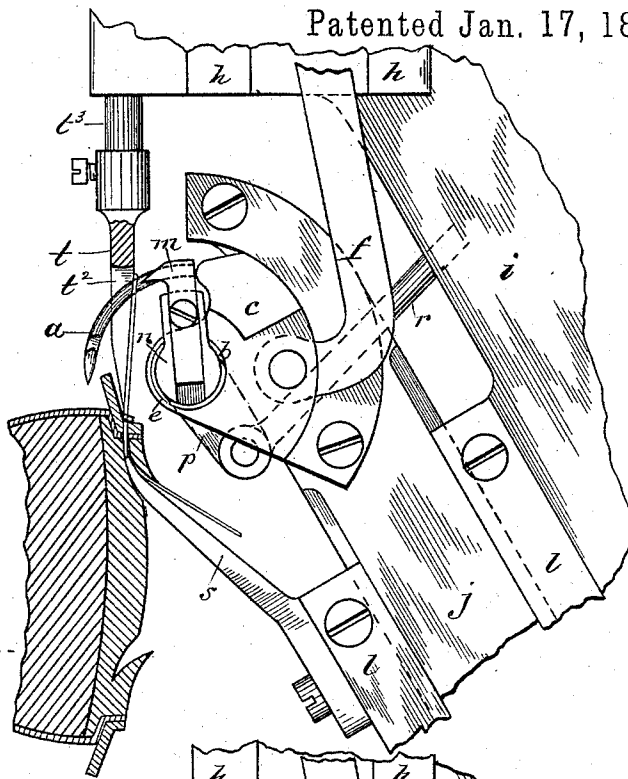
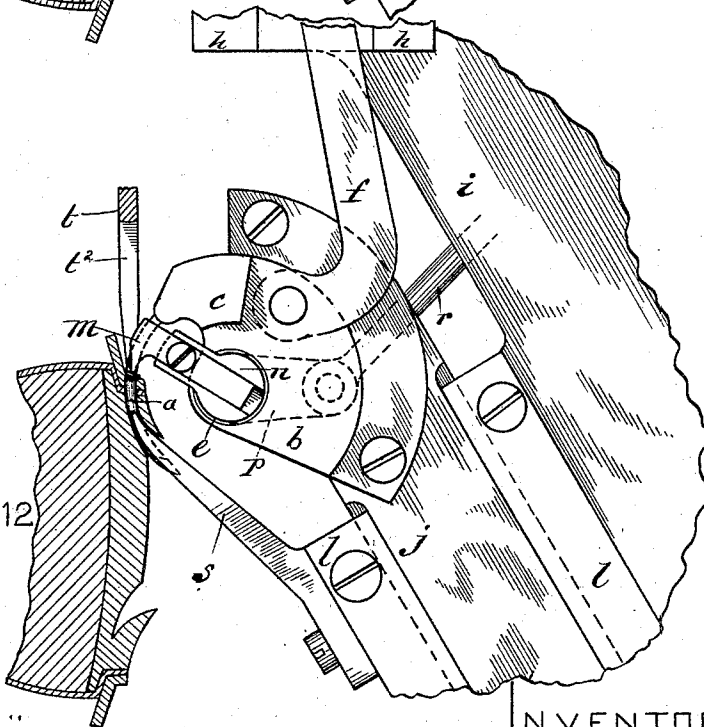


Fig. 12.



WITNESSES:
A. D. Harrison
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INVENTOR:
C. S. Gooding
by Night & Son, Attys.

UNITED STATES PATENT OFFICE.

CHARLES S. GOODING, OF BROOKLINE, ASSIGNOR TO THE SEAVER SEWING MACHINE COMPANY, OF BOSTON, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 489,945, dated January 17, 1893.

Application filed December 19, 1891. Serial No. 415,631. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. GOODING, of Brookline, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

This invention, although applicable to sewing-machines generally, is more particularly adapted to boot or shoe sewing-machines, and especially to that class of machines for sewing welted and turned work with a wax-thread and chain stitch.

The machine uses a curved needle, adapted to be oscillated about its center, as usual, to penetrate the material and draw the loop therethrough, and said needle may have a lateral movement, each movement being obtained by an independent mechanism. The needle, however, may be oscillated without lateral movement, or given a lateral movement without oscillating, or it may be oscillated and moved laterally at the same time.

The object of this invention is to prevent the reeving of the thread through or in the barb of the needle during the operation of setting the stitch, and to enable the shank of the needle to support the thread while a supply is being drawn from the waxing device for a new stitch and while the previous stitch is being set. By thus supporting the thread while strain is being exerted upon it, I obtain the following advantages: First, I am enabled to use a needle of small diameter with any size of thread, without liability of springing or breaking the needle when the stitch is being set, the loop bearing on the shank of the needle close to the point where the needle is supported by its carrier. Secondly, I am enabled to reduce the radius of the curved needle to the minimum, it being very desirable in welt sewing and in machines for stitching out-soles to welts to use a curved needle of as small radius as possible; but, in all machines prior to my invention, using a curved needle and drawing a long loop for the next stitch, it has been necessary to use a needle having a large radius, in order to draw a long loop without revolving the needle through a large angle. In this invention, a needle of very short radius may be em-

ployed, as it is only necessary to oscillate the needle sufficiently to penetrate the stock and receive the loop, the thread being drawn from the waxing device by the lateral movement of the needle. Thirdly, the thread reeves or slips on the needle only when supported by the shank thereof, instead of by the barb, as heretofore, the fraying or wearing of the thread, caused by its reeving across the angular surfaces of the barb portion of the needle, being prevented, because the shank of the needle presents a smooth support across which the thread can reeve without fraying or wearing to any injurious extent.

To these ends, the invention consists in the improvements hereinafter described, whereby the following stitch-forming operation is permitted, viz: The loop is drawn through the stock by the barb of the needle in the usual manner, by giving an oscillating movement to the needle. The loop is then cast out of the barb and up on the shank of the needle, as near as possible to the point at which the needle is supported. Thread for a new stitch is then measured off by giving a lateral movement to the needle, and the previous stitch is finished and set either by pulling the thread with the shank of the needle from the tension; or, the thread is measured off by the lateral movement of the needle, and the previous stitch set by a take-up, the thread being supported and reeving or slipping on the shank of the needle while the take-up sets the stitch.

In the accompanying drawings, forming part of this specification: Figure 1 represents a front elevation of a portion of a welt sewing machine embodying my invention, as applied to a machine for sewing welts to the uppers of boots or shoes, and in which the parts are so arranged in relation to the boot as to lay the chain on the welt or outside. Fig. 2 represents a left-hand side elevation of Fig. 1. Fig. 3 represents a section on line 3—3, Fig. 1. Fig. 4 represents a section on line 4—4, Fig. 1. Figs. 5, 6 and 7 are front elevations similar to Fig. 1, showing the parts in different positions. Fig. 8 is a front elevation of a portion of a welt machine similar to Fig. 1, illustrating a different manner of throwing the loop out of the barb and up on the shank of the

needle. Fig. 9 is a side elevation of Fig. 8. Figs. 10, 11 and 12 are front elevations similar to Fig. 8, showing the parts in different positions. Fig. 13 is a front elevation of the
 5 presser-foot, illustrating the manner of casting the loop out of the barb and on to the shank of the needle.

In the class of machine illustrated in the drawings, the shoe is held with the sole substantially vertical and feeds away from the operator. It is evident that, after the loop is drawn through the stock, it may be cast out of the barb upon the shank of the needle in a variety of ways. I have illustrated in the
 10 drawings two ways in which this may be done; Figs. 1 to 7, inclusive, illustrating the employment of the shoe as the means for casting the loop onto the shank of the needle while the latter is out of the stock; and Figs. 8 to 13
 15 illustrating the presser foot as the means for casting the loop onto the shank of the needle when the latter is out of the stock. I will first explain the method of casting the loop upon the shank by means of the shoe itself.
 20 The same letters of reference indicate the same parts in all the figures.

In the drawings: The curved needle *a* is gripped to a carrier *b* by a cap *c*, said cap having a stud *d* and nut *d'* by which it is fastened to the needle-carrier, the needle passing through a hole in the center of the stud. The needle *a* receives its oscillating movement through the carrier *b*, which is oscillated upon a stud *e* by the link *f* and slide *g*, said slide being guided in the guides *h h* on the frame *i*. The slide *g* may be reciprocated by any suitable mechanism, such as a cam, connected with the slide, either directly, by a roll upon the slide, or by a lever pivoted to the frame, one end of said lever being provided with a roll to engage with the cam, and the other end connected to the slide by a sliding block and stud.

I have not shown the mechanism for oscillating the needle, or the mechanism for giving the needle the lateral movement herein-after described, as suitable mechanism for these purposes can be supplied by any skilled mechanic without invention or experiment.

50 The needle *a* receives its lateral movement through the slide *j*, the stud *e* upon which the needle-carrier is pivoted being fastened to the slide *j* by the nut *k* (Fig. 3). Said slide *j* is guided in the guides *l l* on the frame *i* of the machine. The slide *j* is reciprocated in the proper time and to the desired extent by any suitable mechanism, as in the case of the slide *g*.

The needle *a* is surrounded by the cast-off
 60 *m*. Said cast-off is fastened by a screw in a groove in the holder *n*, said carrier being formed upon the end of the shaft *o*. The shaft *o* has a bearing in a hole drilled through the center of the stud *e*, and is pinned to the
 65 arm *p*, said arm being connected by the link *r* to any suitable actuating mechanism adapted to give a reciprocating motion to the link

r, thus communicating an oscillating movement to the cast-off by means of the arm *p*, shaft *o* and holder *n*. 70

The shoe is supported upon the channel-gage *s*, as illustrated in Fig. 1. A presser-foot (not shown) rests upon the welt *w*, and keeps the shoe firmly pressed against the channel-gage. The welt is guided to the needle by any suitable welt guide. 75

The shoe is fed by a curved awl (not shown), entering the inner sole from the opposite side of the welt to that at which the needle enters, or, in the case illustrated, from the channel side. 80

The operation of the mechanism in an organized sewing-machine is as follows: The awl having fed the shoe, the needle is oscillated by the link *f* and slide *g* so as to enter 85 the hole pricked by the awl and pass out through the shoe in the position shown in Fig. 7. A looper or thread-guide (not shown), of any suitable construction, passes the thread into the barb of the needle. The needle then 90 retreats, drawing the loop through the stock to the position illustrated in Fig. 1. The awl then feeds the shoe forward, and the slide *j* moves the needle, needle-carrier and cast-off in the direction indicated by the arrow *x* 95 (Fig. 5), away from the shoe. The needle is then given a curvilinear movement in the direction indicated by the arrow *x'* to the position shown in Fig. 5. The last-mentioned movement of the needle causes its barb to 100 pass below and outside of the welt, so that the welt or any other part of the stock serves as a stripper, to hold the loop while the needle passes down through it and thus casts it off of the barb and upon the shank. The 105 cast-off, during the last operation, has been moved back upon the needle, so as to allow the loop to be thrown out of the barb, as described. The needle is next given a combined oscillating and lateral motion until it 110 assumes the position illustrated in Fig. 6, drawing out a loop of the length required in order to form the next stitch, and setting the stitch, either by pulling with the needle by giving it a lateral motion or by setting the 115 stitch with a take-up, the thread at the time of setting the stitch being around the shank of the needle and the needle out of the stock. The next movement of the needle is to return to the position illustrated in Fig. 1, by means 120 of a combined lateral and oscillating movement. The needle next receives an oscillating movement, and passes through the stock, ready to receive a new loop (Fig. 7), the cast-off moving forward to the position shown to 125 receive the loop cast off by the needle passing through the stock.

It will be noted that in the process of casting the loop on the needle, previously described, the loop is drawn up by the concave 130 or inner side of the needle. In Figs. 8 to 13, I have illustrated a method of throwing the loop out of the barb and on to the convex or outer side of the needle. The needle is adapt-

ed to be oscillated or moved laterally, as before, except that the direction of motion of the slide *j* is different.

The loop is cast out of the barb and upon the shank of the needle by a presser-foot *t*. Said presser-foot is provided with a slot or opening *t*², which is of substantially the same width as the diameter of the wire of the needle. The slot *t*² is enlarged at the bottom of the presser-foot to admit the cast-off when the parts are in position indicated in Fig. 12. The lower part of the presser-foot bears upon the stock at two points *t'* *t'*, one on each side of the needle. The presser-foot is attached by a set-screw to the rod *t*³, said rod having bearings in the frame of the machine, and being provided with suitable mechanism for raising the presser-foot for the introduction of the stock and for automatically raising and lowering it when the shoe is being fed by the awl.

Fig. 8 represents the needle with a loop of thread on the barb, just drawn through the stock. The needle is next moved laterally, and is also given an oscillating movement, both in the direction indicated by the arrows, until it assumes the position indicated in Fig. 10. The needle passes into the slot *t*² in the presser-foot, and the thread is pushed out of the barb by the walls of said slot on to the convex side of the shank of the needle, as shown in Fig. 10. A further oscillating and lateral movement is imparted to the needle, until it assumes the position indicated in Fig. 11, thus drawing out a loop of the requisite length and setting the stitch with the loop on the convex side of the shank of the needle.

Fig. 12 indicates the position of the parts when the needle has returned by a combined oscillating and lateral movement to the position shown, the needle having penetrated the

stock to receive a new loop, the previous loop being retained by the cast-off.

I claim:

1. In a sewing machine, the combination of a hooked oscillating needle and mechanism timed to give the needle when retracted a bodily lateral movement out of the path in which it oscillates in forming the loops, and a curvilinear movement whereby the loop is transferred from the barb to the shank of the needle, the said lateral movement causing the shank of the needle to exert a pulling strain on a loop of thread engaged therewith and to thereby set the stitch, as set forth.

2. In a sewing machine, the combination of a hooked oscillating needle, means for transferring the loop of thread drawn through the stock thereby from the barb to the shank of the needle, and mechanism timed to give the needle when retracted a bodily movement out of the path in which it oscillates in forming the loops, as set forth.

3. In a sewing machine, the combination with an oscillating, laterally movable needle, of a presser foot having a slot, the sides of which are in close proximity to the sides of the needle when the latter is in the slot, the presser foot slot being arranged to receive the needle during the lateral movement thereof, so that the sides of the slot transfer the loop from the barb to the shank of the needle, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 16th day of December, A. D. 1891.

CHARLES S. GOODING.

Witnesses:

WILLIAM CLAUS,
FRANK MYRICK.