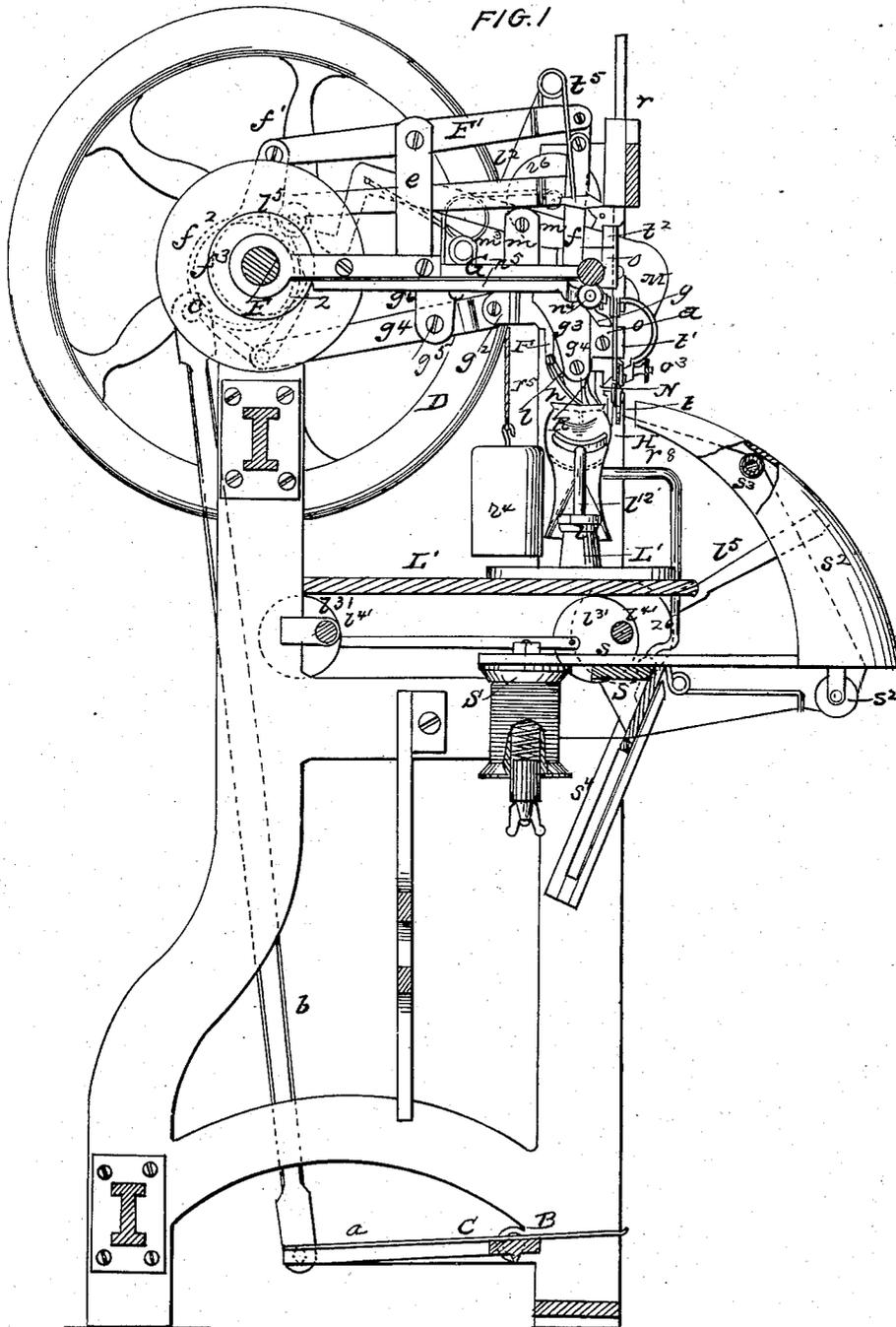


M. J. STEIN.  
Sewing Machine.

No. 47,666.

Patented May 9, 1865.



WITNESSES

*J. P. Hall*  
*Wm. P. O'Connell*

INVENTOR

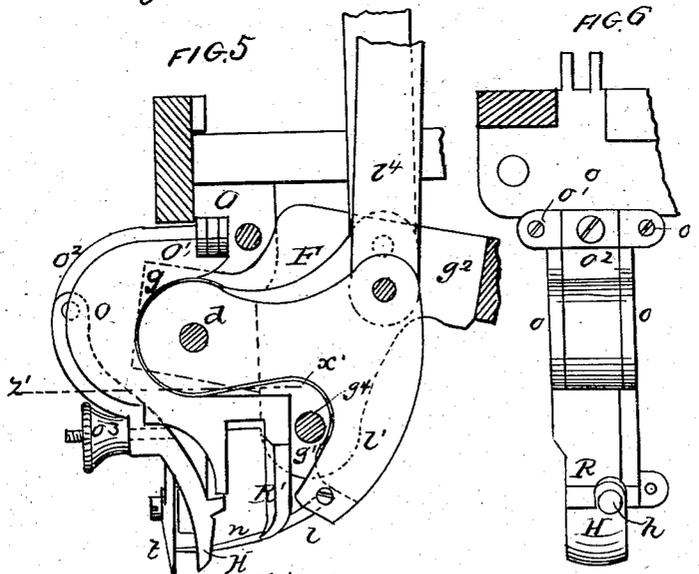
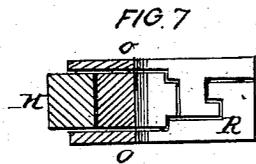
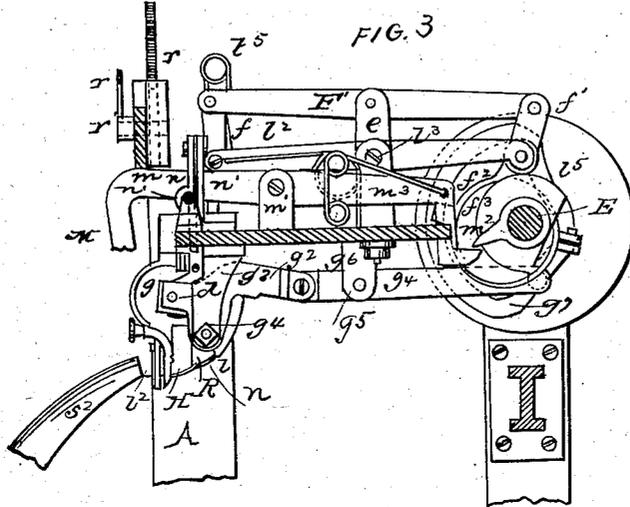
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# UNITED STATES PATENT OFFICE.

MICHAEL JOSEPH STEIN, OF NEW YORK, N. Y.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 47,666, dated May 9, 1865.

*To all whom it may concern:*

Be it known that I, M. J. STEIN, of the city, county, and State of New York, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a transverse vertical section of this invention, the line  $xx$ , Fig. 2, indicating the plane of section and looking in the direction of the arrow marked near to that line. Fig. 2 is a front elevation of the same. Fig. 3 is a transverse vertical section of the same, taken in the plane indicated by the line  $yy$ , Fig. 2, and looking in the direction of the arrow marked near to that line. Fig. 4 is a plan or top view of the same. Fig. 5 is a partial vertical section of the principal working parts of this invention in a larger scale than the previous figures, the plane of section being indicated by the line  $zz$ , Fig. 2, and looking in the direction of the arrow marked near to that line. Fig. 6 is a rear elevation of the adjustable gage detached. Fig. 7 is a horizontal section of the same, taken in the plane indicated by the line  $x'x'$ , Fig. 5. Fig. 8 is a detached plan view of the needle.

Similar letters of reference indicate like parts.

This invention relates to certain improvements in that class of sewing-machines which are used to sew on the soles to boots and shoes, and the mechanism is arranged to imitate the operation of sewing on the soles to turned round shoes or to such shoes as are turned inside out in order to sew the soles to the upper. A curved hook-needle inserted into a suitable head is made to pierce the sole and upper which are secured to the last and held in the proper position by an adjustable gage. The last is adjustable on a movable platform, which is arranged to receive lasts of different size, and an adjustable feeder feeds the work along and determines the length of the stitches. The stitch is produced by the combination of the hooked needle with a looper which works side by side with the needle and catches and retains each loop until the needle with a new loop has passed through and with a curved oscillating thread-guide, which delivers the thread at suita-

ble intervals to the hooked needle. The stitch is drawn up tight as the needle recedes, and during the time the needle moves forward and the thread is relieved from all strain the feed takes place, which would be impracticable during the time the thread is subjected to a strain or while the needle recedes.

A represents a frame, made of iron or other suitable material sufficiently strong and firm for the occasion. The lower part of this frame forms the bearings of a rock-shaft, B, to which the foot-plates C are firmly secured, and an arm,  $a$ , extending from this rock-shaft, connects by a pitman or shackle bar,  $b$ , with an eccentric wrist-pin,  $c$ , which is secured in one of the arms of a wheel, D, mounted on the end of the main driving-shaft E of the sewing-machine. This shaft carries a series of cams and eccentrics, which produce the motion of the various working parts of the mechanism, as will be presently explained.

The needle  $n$  is curved and provided with a hook, as shown in Fig. 8. It is secured in a head, F, which oscillates on a pivot,  $d$ , and to which motion is imparted by a working-beam, F', which has its fulcrum in a standard,  $e$ , and which connects at one end by a rod,  $f$ , with the head F, and at its opposite end by a rod,  $f'$ , with a strap,  $f^2$ , which embraces an eccentric,  $f^3$ , mounted on the driving-shaft E.

The standard  $e$  rises from a platform, G, which supports the entire sewing mechanism, and the operation and object of which will be hereinafter explained. The pivot  $d$ , which forms the fulcrum of the needle-head F, has its bearings in one arm,  $g$ , of a three-armed lever,  $g g' g^2$ , which has its fulcrum on a pivot,  $g^3$ , secured in two hangers,  $g^4$ , that are suspended from the platform G. Said pivot passes through the arm  $g'$  of the three-armed lever, and the third arm,  $g^2$ , of said lever is hinged to one end of a working-beam,  $g^5$ , which has its fulcrum on a pivot,  $g^6$ , secured in a hanger,  $g^7$ , that is suspended from the platform G, and the other end of which catches in a cam-groove,  $g^8$ , as shown in Figs. 1 and 3. By this combination of the three-armed levers  $g g' g^2$  with the needle-head F the point of the needle is depressed just before or while it enters the material to be sewed, and thereby said point is brought in such a position that it readily enters the material; but in order to cause the point to pass out at the proper place and to

prevent it from running too deep, it is raised again while passing through the material, and the direction of the hole thus made by the needle is precisely the same as that of holes made in sewing on the soles of boots or shoes by hand.

The stitch is produced by the combined action of the needle, the looper, and the thread-guide.

The looper  $l$  is composed of a curved piece of steel wire, similar in shape to the needle, but shorter, and made without a hook, and with a dull point instead of the hook at the end of the needle. This looper is secured to a head,  $l'$ , similar in shape to the needle-head  $F'$ , and connected to the same movable fulcrum,  $d$ . An oscillating motion is communicated to said looper-head by a working-beam,  $l^2$ , which has its fulcrum on a pivot,  $l^3$ , in the standard  $e$ , and one end of which connects by a rod,  $l^4$ , with the looper-head, while its opposite end bears on the periphery of a cam,  $l^5$ , being held in contact therewith by the action of a spring or other suitable device. The motion thus imparted to the looper resembles that of the needle; but it takes place at different periods in such a manner that a loop formed by the action of the needle is taken up by the looper and held in position for the needle to pass through the same on its next stroke, and to draw the new loop through that first formed.

The thread used in this machine and represented in red outlines is taken from a spool,  $S$ , which is secured to the under surface of a bracket,  $s$ , which is rigidly attached to a beam,  $S'$ , that slides up and down in oblique guide-grooves  $s'$ . The bracket  $s$  extends across the beam  $S'$ , and its outer end bears the horn  $S^2$ , through which the thread is carried up to the thread-guide  $t$ . Suitable rollers,  $s^2$   $s^3$ , under and in the horn form the guides for the thread in its passage from the spool to and through the horn, and while passing through said horn the thread is to be heated in any proper manner to render the same limber, particularly in cold weather.

The thread-guide  $t$  is pivoted to the outer surface of the gage  $H$ , which determines the position of the work in relation to the needle, and which is perforated with a hole,  $h$ , to allow the needle to pass through. The thread-guide works close in front of the hole  $h$ , and it is curved and provided with a hole, through which the thread is drawn. The tail of said thread-guide connects by a link,  $t'$ , with a slide,  $t^2$ , which is guided by a suitable socket on the outer edge of the platform  $G$ , and which is subjected to the action of a spring,  $t^3$ , whereby the same is forced up. The upper end of the slide  $t^2$  forms a shoulder,  $t^*$ , rounded below and flat above, and a spring-toe,  $t^4$ , which is hinged to the rod or link which connects the working-beam  $F'$  with the needle-head, comes in contact with the top surface of said slide and carries the same down, causing the thread-guide to rise and to deposit the thread on the hooked end of the needle. At the moment this object is

accomplished the toe  $t^4$  passes the shoulder  $t^*$ , and the slide  $t^2$ , being released, resumes its original position, carrying back with it the thread-guide. The toe  $t^4$  on its upward stroke glides over the lower rounded surface of the shoulder  $t^*$ , being allowed to yield by the action of a spring,  $t^5$ , and by these means said toe is allowed to clear the shoulder and re-assume its position above the slide, ready for a new stroke.

The shoe to be sewed is turned inside out and secured to the last in the ordinary manner. The last is adjusted on the supporter  $L$ , which consists of a platform provided with a series of sockets,  $l^1$ , to receive and hold the supporting-rods  $l^2$ . These rods are made so that they can be lengthened and shortened, and that by these means the sole of the shoe can be adjusted in the required position.

The supporter  $L$  may be arranged on rollers, so that it can be readily brought into the requisite position in relation to the needle. It rests upon the table  $L'$ , which is guided by the uprights of the frame  $A$ , and which is vertically adjustable by eccentric-disks  $l^3$ , which support the same, and which are mounted on shafts  $l^4$  and connected to each other, so that they can be operated by one and the same handle,  $l^5$ . This handle is retained in the required position by a serrated disk,  $l^6$ , and spring-catch,  $l^7$ , or in any other suitable manner.

The sole of the shoe to be sewed is channeled in the ordinary manner, and after the last-supporter has been set upon the table  $L'$  the sewing mechanism is lowered until the rest  $R$  passes into the channel in the sole and retains the shoe in the proper position for sewing. This operation is effected by hinging the rear end of the platform  $G$ , which supports the sewing mechanism, to the driving-shaft  $E$ , and connecting its front end to a toothed rack,  $r$ , which gears in a pinion mounted on a shaft,  $r'$ , to which a rotary motion can be imparted by a handle,  $r^2$ . By turning this handle in the direction of the arrow marked on it in Fig. 2 the platform  $G$  is lowered, and by turning it in the opposite direction said platform is raised, and when it has reached its highest point the handle is locked by the spring-catch  $r^3$ . The weight of the sewing mechanism supported by the platform  $G$  is counterbalanced by two weights,  $r^4$ , which are suspended from ropes or chains  $r^5$ , that pass over pulleys  $r^6$  and are connected to arms  $r^7$ , extending from the front end of the platform  $G$  in opposite directions, as clearly shown in Figs. 2 and 4.

The arms  $r^7$  connect by rods  $r^8$  with the beam  $S'$ , which supports the horn  $S^2$ , so that said beam and horn are compelled to rise and fall with the platform  $G$ , and the horn will always preserve its relative position toward the sewing mechanism.

The rest  $R$  is connected by double jaws  $o$  and hinge-joints  $o'$  to a bracket,  $O$ , which is rigidly attached to the front edge of the platform  $G$ , and by means of said joint it (the rest) is enabled to accommodate itself to the changes in

the level of the sole or channel on which it bears. A slot in the edge of the rest permits the needle to pass, and by the rest the sole is firmly held in place on either side of the needle while the stitch is made. From the bracket O extends an arm,  $o^2$ , which connects by a hinge-joint with the upper end of the gage H, and a set-screw,  $o^3$ , serves to adjust the gage according to the distance of the channel from the edge of the sole. This distance varies on one and the same shoe, it being greater on the hind quarter than on the other parts, and while sewing the sole to the upper the operator has to adjust the gage to suit the various parts of the shoe.

To prevent the needle from becoming injured by coming in contact with tacks or pegs, a track-clearer, M, is applied, which consists of a claw running on the outside of the channel of the sole. Said claw is rigidly attached to or made solid with a working-beam,  $m$ , which has its fulcrum in a standard,  $m'$ , rising from the platform, and to which an oscillating motion is imparted by a cam,  $m^2$ , which is mounted on the driving-shaft and acts on the rear end of said working-beam. A spring,  $m^3$ , throws the track-clearer or claw down upon the sole whenever the working-beam is released from the cam, and thereby the said claw is held in the proper position to receive the next tack, which, when caught by the claw, is withdrawn by the action of the cam. The shoe is fed along by the action of the feeder N, which consists of an arm with serrated foot, hinged to the lower end of a pendent lever, N, which is pivoted with its upper end to a standard,  $n'$ , rising from the platform G. A spring,  $n^2$ , connecting with the feeder, has a tendency to throw the same in the direction of the arrow marked on it in Fig. 2, and a thumb-screw,  $n^3$ , which is tapped into a lug secured to the platform G, and which bears on an ear projecting from the pendent lever  $n$ , limits the motion of the feeder in the direction of said arrow.

The pendent lever N connects by a rod,  $n^4$ , with an oscillating lever,  $n^5$ , which is pivoted to the under side of the platform, and the rear end of which catches into a cam-groove,  $n^6$ , on the periphery of a disk, which is secured to the driving-shaft E.

The rod  $n^4$  is provided at its end with a screw-thread and nut, so that its length can be adjusted and the position of the feeder can be regulated to suit circumstances.

The operation is as follows: After the shoe has been adjusted on the last-supporter in the proper position and the machine set in motion the needle  $n$  is brought down and made to pierce the sole and upper. - By the action of the thread-guide the thread is deposited on the needle, the hooked end of which draws the same in and through the material as it recedes, and a loop is formed on the inside of the chan-

nel in the sole. When the needle begins to move forward the feeder takes effect and pushes the shoe along, and by the action of the looper the loop previously formed by the needle is pressed into the channel and held there until the needle passes through it, forms a new loop, and draws the same in through that which has been previously formed. As soon as the new-loop has passed through the old one the looper recedes and the old loop is drawn in tight by the action of the receding needle, the tension of the spool S being so regulated by a spring and screw or other suitable means that each loop is drawn in before any more thread unwinds from the said spool. During this operation the attendant takes care to keep the side of the shoe in contact with the gage, and when the distance of the channel from the side of the shoe varies he adjusts his gage accordingly. All turned round shoes or pump-sole boots can be sewed on this machine; and the operation is performed in a quick, neat, and durable manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. Mounting the sewing mechanism upon a platform or frame which oscillates upon the driving-shaft, substantially as herein set forth.

2. The rest R, applied in combination with the sewing mechanism supported by the hinged platform G, substantially as and for the purpose set forth.

3. Giving to the needle, in addition to its usual motion for penetrating and withdrawing from the material, a slight falling and rising motion by means substantially as herein described or any other equivalent means, so as to depress its point while entering the material to be sewed and raise the same when passing out of said material, for the purpose set forth.

4. The hinged adjustable gage H, applied in combination with the rest R and needle  $n$ , substantially in the manner and for the purpose set forth.

5. The last-supporter L, with a series of sockets,  $l^1$ , in combination with a sewing mechanism, constructed and operating substantially as and for the purpose set forth.

6. The vertically-adjustable table  $L'$ , in combination with the last-supporter L and with the sewing mechanism secured to a hinged platform, G, substantially as and for the purpose described.

7. The combination of the hinged oscillating thread-guide  $t$ , looper  $l$ , and needle  $n$ , constructed and operating substantially as and for the purpose set forth.

M. J. STEIN.

Witnesses:

JAMES P. HALL,  
M. M. LIVINGSTON.