T. J & M. C. DENNE. 2 Sheets--Sheet 1.

Machine for Sewing on the Soles of Boots and Shoes.

No. 166,509 Patented Aug. 10, 1875.

Fig. 5.

Fig. 2.

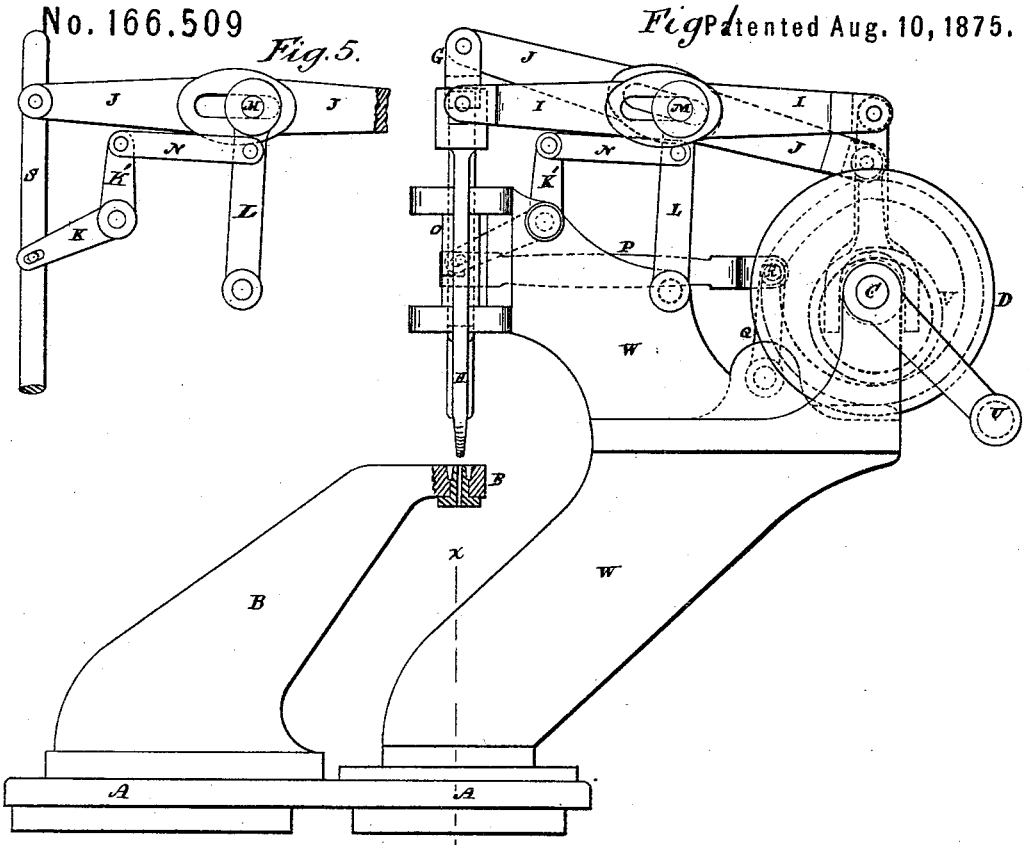


Fig. 6.

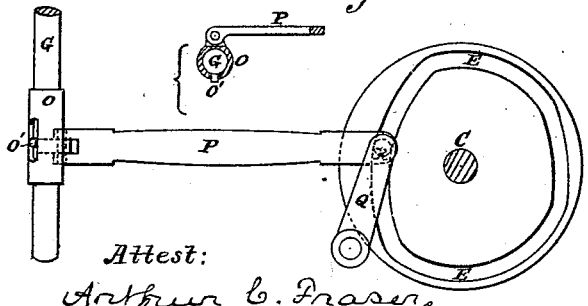
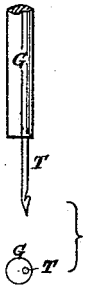
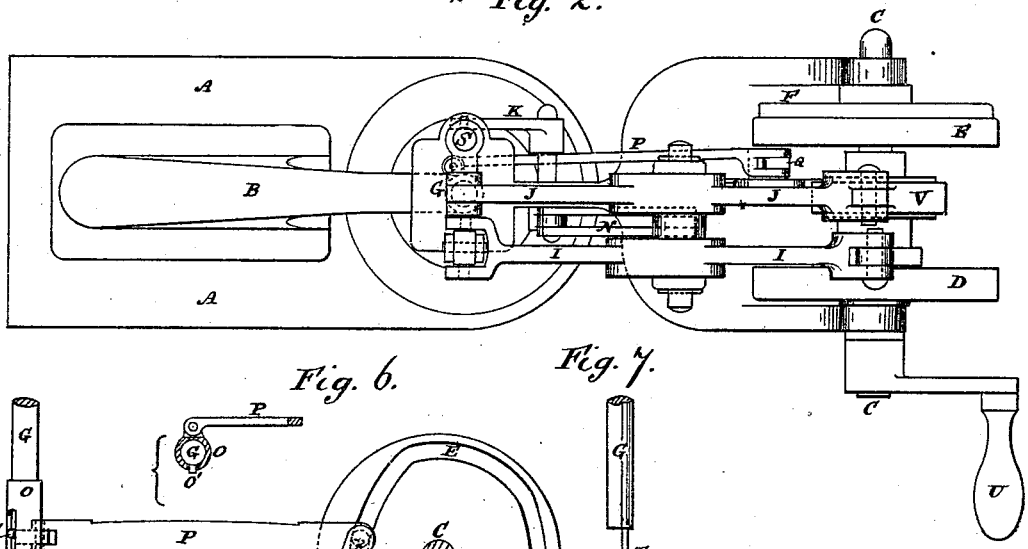


Fig. 7.





Attest:
Arthur C. Fraser
Thomas J. Keighan

Inventors:
Thomas J. Denne,
Mark C. Denne,
Per Burke & Fraser
Attys

2 Sheets--Sheet 2.

T. J & M. C. DENNE.

Machine for Sewing on the Soles of Boots and Shoes.

No. 166,509. Patented Aug. 10, 1875.

Fig. 3

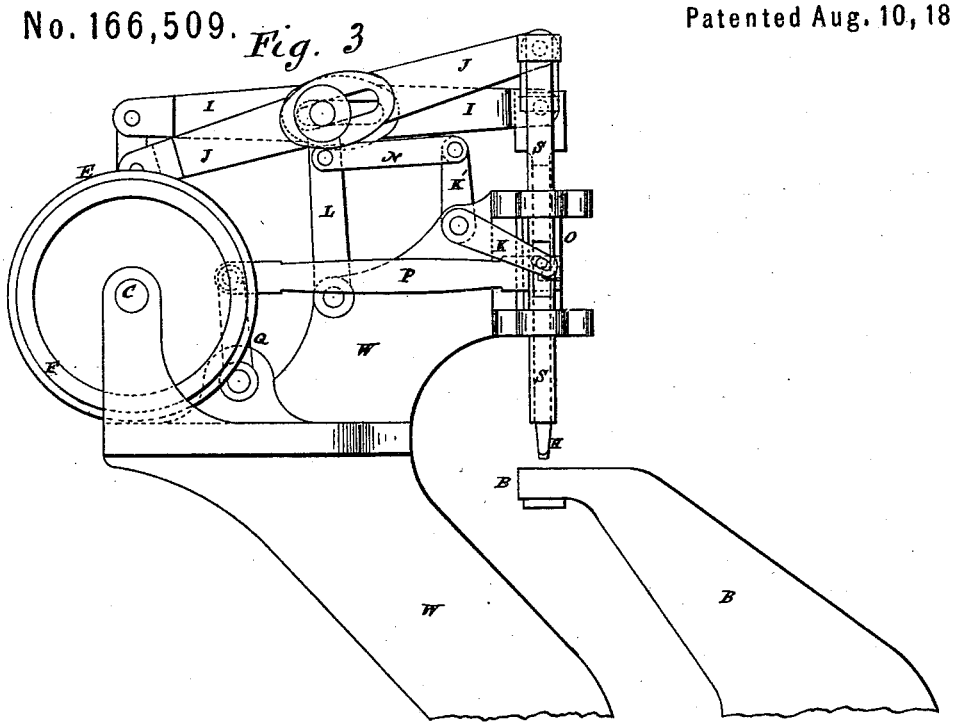
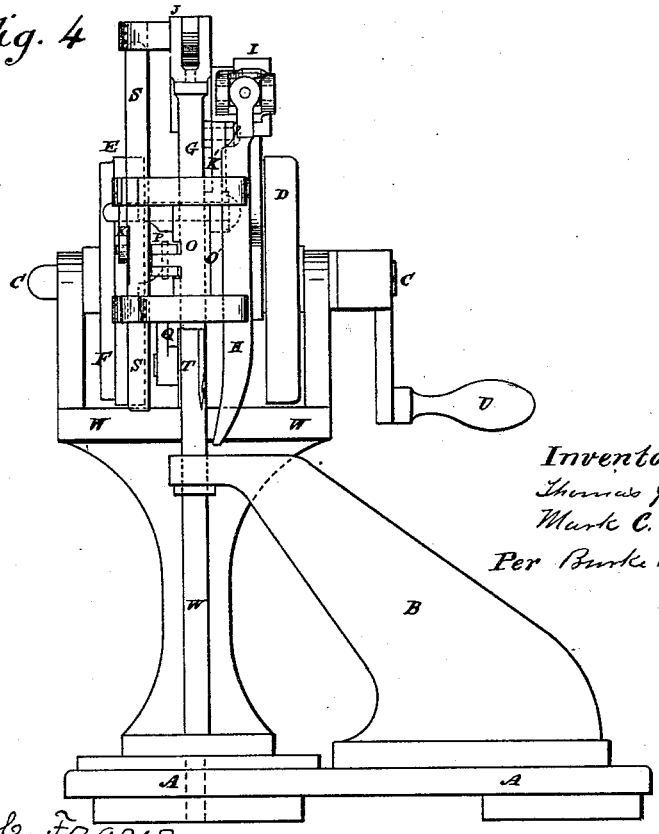


Fig. 4



Inventors:
Thomas J. Denne,
Mark C. Denne,
Per Burke & Fraser
Attys.

Attest:
Arthur C. Fraser.
Thomas J Keighan

UNITED STATES PATENT OFFICE.

THOMAS JAMES DENNE, OF CROYDON, AND MARK CHARLES DENNE, OF NEW CROSS, ENGLAND.

IMPROVEMENT IN MACHINES FOR SEWING ON THE SOLES OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. **166,509**, dated August 10, 1875; application filed May 24, 1875.

To all whom it may concern:

Be it known that we, THOMAS JAMES DENNE, of Croydon, county of Surrey, England, and MARK CHARLES DENNE, of New Cross, county of Kent, England, have jointly invented certain Improvements in Machines for Sewing on the Soles of Boots and Shoes, of which the following is a description:

Our invention relates particularly to that class of sewing-machines in which a barbed needle and a waxed thread are used.

The objects sought to be accomplished are, first, to regulate the "throw" or strike of the needle automatically to suit the varying thickness of the material being sewed, as the different kinds of boot and shoe soles; second, to render more certain the formation of the stitch, and avoid "skipping," by an automatic motion of the needle, independent of the regular up-and-down movement.

Our invention consists, essentially, in the distinct devices for producing these two effects, which we will now describe.

In the drawings, Figure 1 is an elevation of our machine viewed from the right-hand side. Fig. 2 is a plan. Fig. 3 is an elevation viewed from the left-hand side. Fig. 4 is a view showing the "head" of the machine turned to the front at right angles to the base, the latter appearing as in Fig. 3. Fig. 5 is a detached view, showing the bell-crank and adjoining parts. Fig. 6 is a detached view, showing the mechanism for rotating the needle-bar. Fig. 7 is an elevation and plan, showing the needle-bar and the needle placed eccentrically therein.

Let A represent the bed-plate of the machine; W, the frame to support the moving parts, arranged to rotate on the bed-plate; and B, the horn or rest. A cylindrical needle-bar, G, is arranged to move up and down in guides in the frame W, and is provided with jaws at its upper end, which embrace the front end of a walking-beam, J, to which it is jointed or pivoted. The beam J has a movable fulcrum on a pin, M, and its other or rear end is jointed to a rod bearing a strap that encircles an eccentric, V, on the main shaft C. When the shaft C is rotated by power applied through a driving-pulley or a crank, U, the needle-bar G receives a vertical reciprocating motion. An adjusting-bar, S, has bearings in the main frame, and is parallel to the needle-bar, the lower end being arranged to rest on the work being sewed. A stud on the side of said bar S engages a link, K, which is secured at the other end to a short shaft having a bearing in the main frame. To the other end of this shaft is secured a link, K′, which is jointed to another link, N, this latter taking hold of a rock-lever, L. The rock-lever is pivoted to the main frame at the bottom, and bears the fulcrum-pin M at the top. The links K K′, with the connecting-shaft to which they are keyed, form a bell-crank, so called. The fulcrum-pin M has a slotted bearing in the beam J, and when the bar S is pushed up and down this motion is communicated, through the bell-crank and the link N, to the rock-lever L, and causes the pin M to move back and forth in the slot, thus varying the length of the needle-stroke just in proportion as the pin M is moved one way or the other. It follows that as thicker material is forced under the bar S, (the horn B being immovable,) it is forced up, and the stroke of the needle increased proportionally.

The presser-foot H is pivoted at the top to the end of a beam, I, which is constructed similar to the beam J, and, like it, provided with a slot to receive the pin M. To the rear end of this beam is pivoted a guide-fork, which bears on its face a stud or roller, to engage a groove on the inner face of the cam D on the main shaft C. This cam causes the presser-foot to lift slightly once in every revolution, and at the proper moment, as will be explained farther on. The rock-lever L being pivoted directly beneath the rear end of the slot in the beam I, and the upper end of said lever bearing the pin M, moving in an arc of a circle, it follows that when the bar S is lifted by the extra thickness of the material being sewed it pushes the pin M back in the slot, and lifts the beam I. This carries the presser-foot up with it, and thus adjusts it to the thickness of the material.

It will be observed that the tip of the horn B is perforated vertically for the passage of the thread, and that around this perforation

is an annular groove. The needle T is not set in the axial center of the bar G, but to one side, and just far enough from the center to engage with said annular groove in the horn, so that when the needle-bar is rotated the needle-point will traverse the said groove, the latter being made deep enough for the full stroke of the needle.

The needle-bar G is caused to rotate back and forth through a partial revolution by the following means: Around the said bar, between its bearings in the frame, is placed a sleeve, O, which fits it snugly. This sleeve has a longitudinal slot, which engages a stud, O′, on the needle-bar G, in such a manner as to compel the bar to rotate with the sleeve, but permit it to play up and down independent of the sleeve. The sleeve is provided with a lug, to which is pivoted or hinged an arm, P, which extends back and takes hold of a rock-lever, Q, which bears a roller, R. This roller engages the groove in a cam, E, on the main shaft C. At each revolution of said shaft the needle-bar is rotated forward and back, the material being sewed moving, of course, with the needle. To enable it to do so the cam D, that lifts the presser-foot H, is so set as to raise the foot from the work at the proper time. The cam E rotates the needle-bar while the needle is at the lowest point of its stroke, thus insuring the engagement of the needle-barb with the thread, and the consequent success in the formation of the stitch. The back rotation of the bar does not take place until the needle is lifted out of the work.

It will be seen that a line, as *x x* in Fig. 1, drawn through the vertical axis of rotation of the head of the machine on the bed-plate A will pass through the vertical axis of the needle-bar. This arrangement permits the operator to turn the head of the machine around at any angle at will without disarranging the work. To permit this change of position of the head the annular channel for the needle in the tip of the horn B is continued entirely around; otherwise it would need to extend but a part of the way.

In the construction herein shown the jaws at the top of the needle-bar G, which embrace the end of the beam J, are attached to the bar by a swivel-joint, so that the bar may rotate, though the jaws cannot.

We have obtained Letters Patent in England for the within-described invention, which Letters Patent were dated in 1873, and are numbered 3,451.

Having thus described our invention, we claim—

1. The combination of the needle-bar G, arranged to receive a needle, T, set eccentrically therein, as shown, the slotted sleeve O, stud O′, arm P, pin or roller R, and cam E, with a horn, B, perforated to receive a sewing-thread, and provided with an annular groove around said thread-hole, substantially in the manner shown, and for the purpose specified.

2. The combination of the adjusting-bar S, bell-crank and link K K′ N, rock-lever L, fulcrum-pin M, slotted beam I, cam D, and presser-foot H, all constructed substantially as shown, and arranged to operate as set forth.

3. The combination of a needle-bar, G, having the needle T arranged eccentrically therein, and adapted to be rotated back and forth, as described, with a horn, B, having an opening for the passage of the thread, and an annular groove or channel around said thread-hole for the travel of the needle, as and for the purposes specified.

THOMAS JAMES DENNE.
MARK CHARLES DENNE.

Witnesses:
J. EDN. BEESLEY,
HENRY F. JAMES,
Gentlemen, both of No. 2 Pope's Head Alley, Cornhill, London.