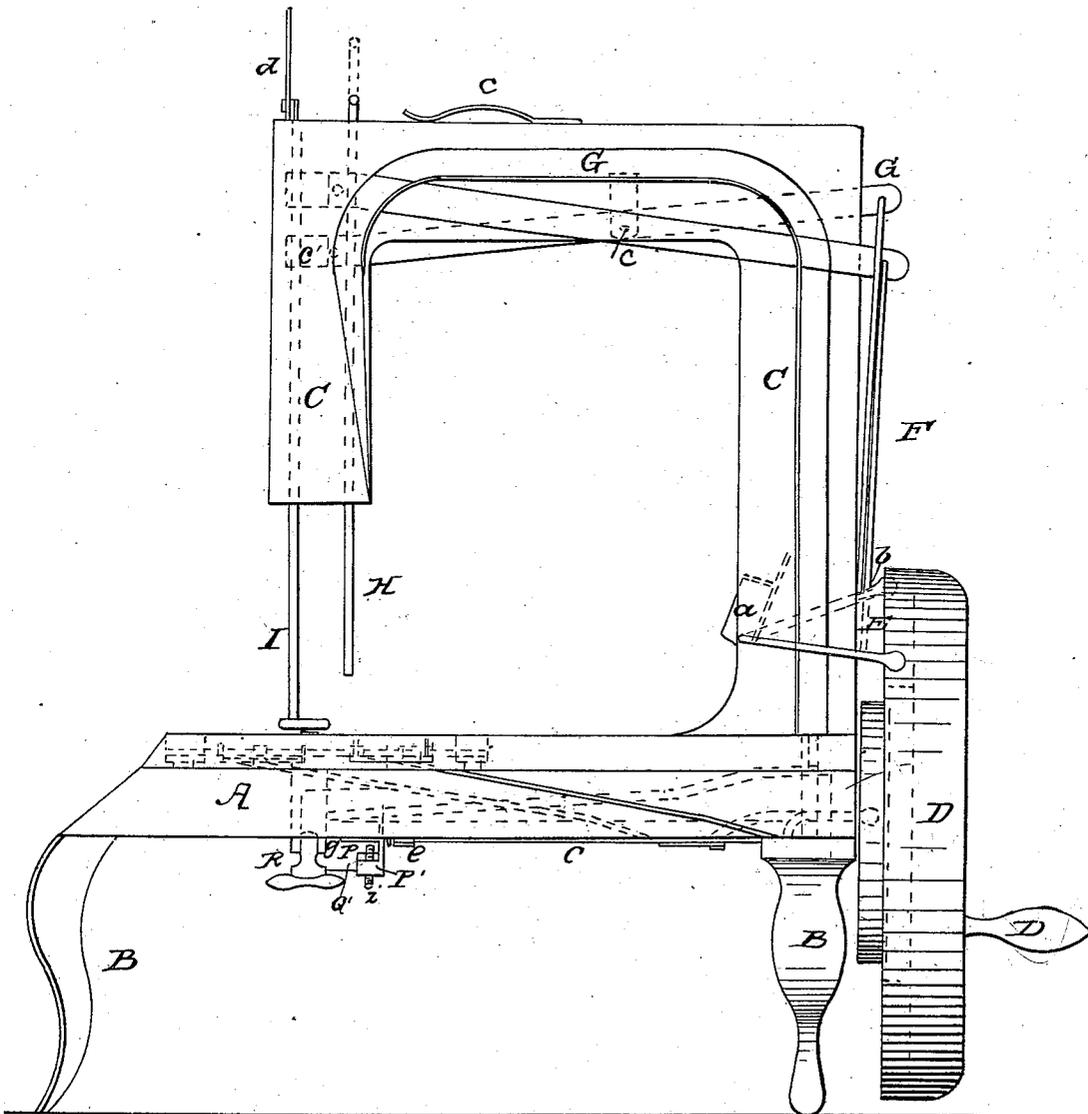


T. SHAW.
Sewing Machine.

4 Sheets—Sheet 1.

No. 23,789.

Patented April 26, 1859.

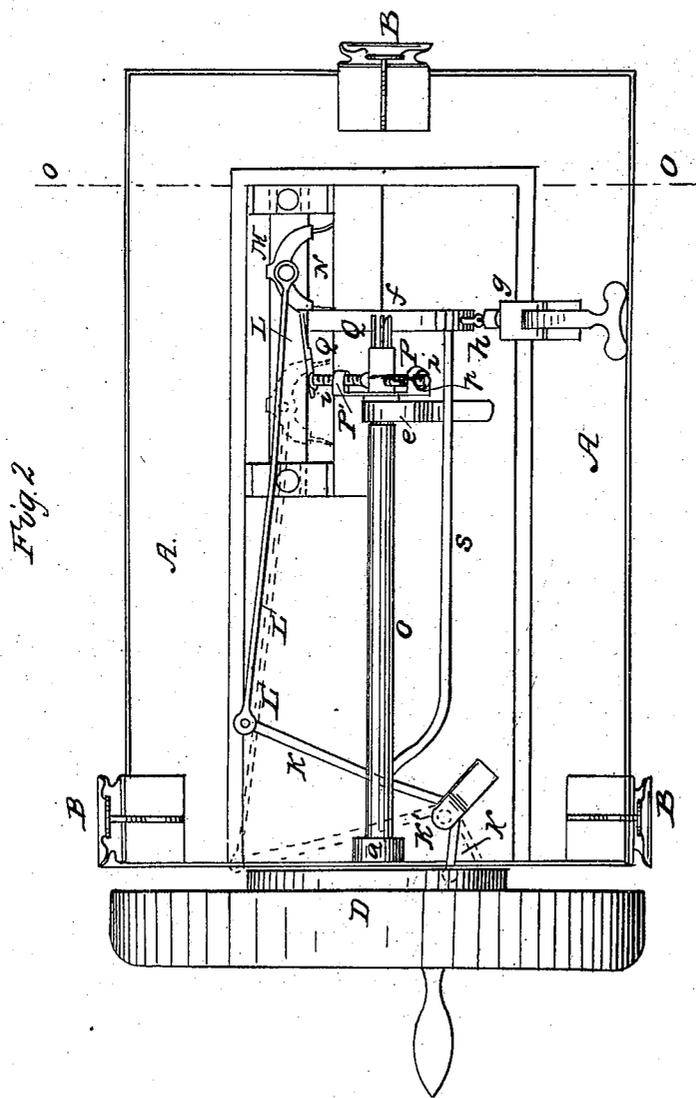


T. SHAW.
Sewing Machine.

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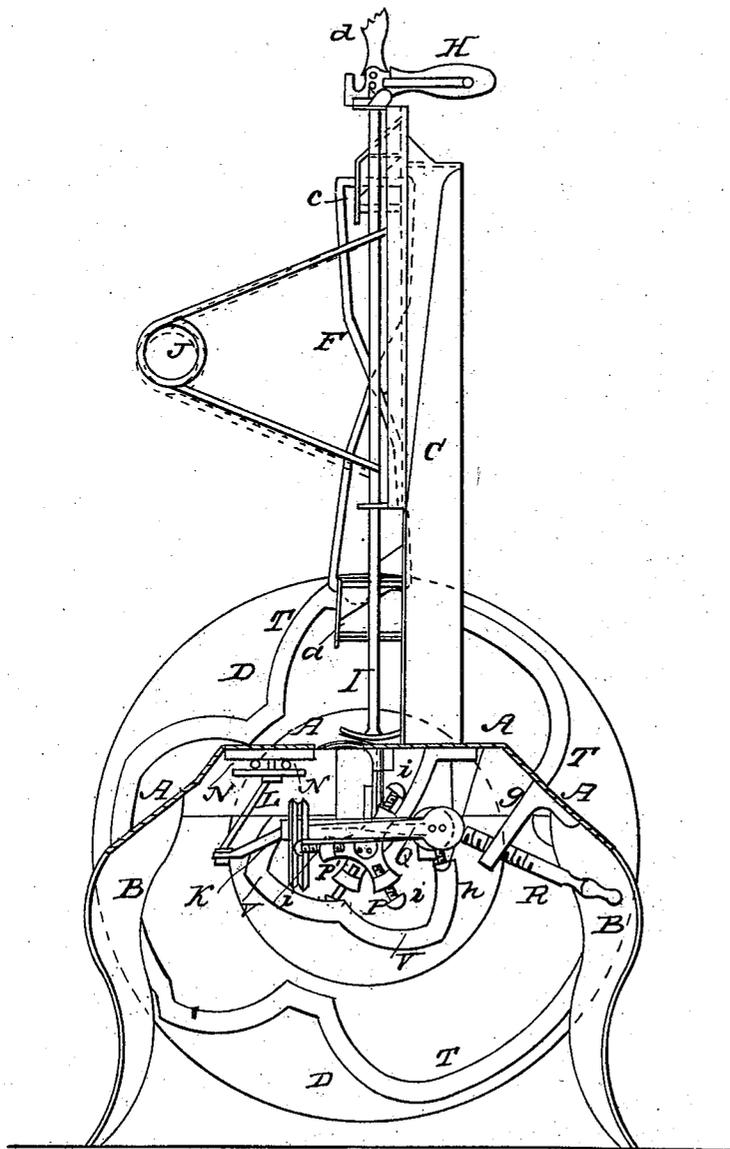
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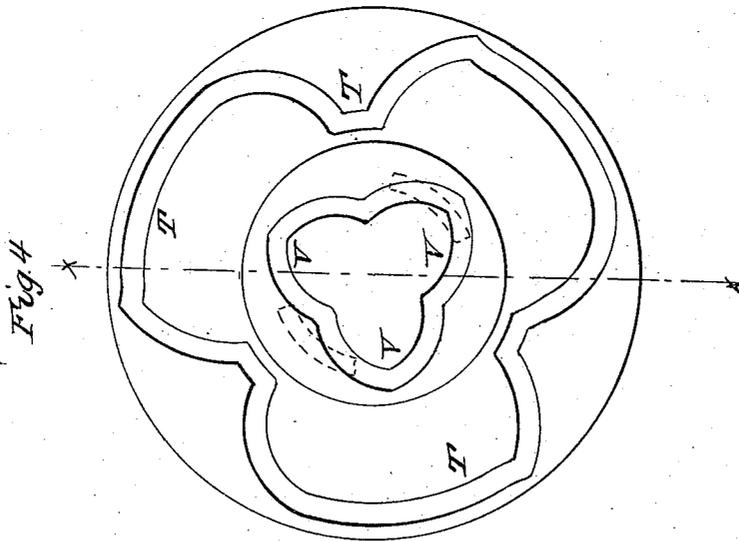
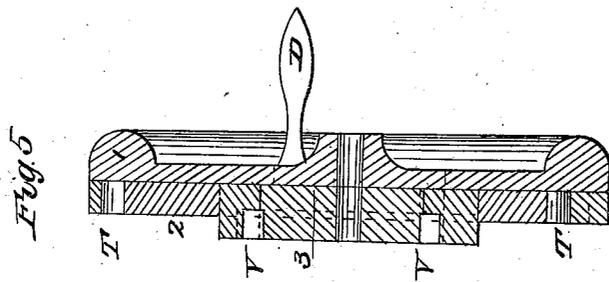


T. SHAW.
Sewing Machine.

4 Sheets—Sheet 4.

No. 23,789.

Patented April 26, 1859.



UNITED STATES PATENT OFFICE.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 23,789, dated April 26, 1859.

To all whom it may concern:

Be it known that I, THOS. SHAW, of the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to improvements in reciprocating-shuttle sewing-machines for forming the lock-stitch; and my improvements consist in attaching to a spring a feed-bar to which a vertical reciprocating motion is imparted by revolving rods acting in conjunction with the said spring, and to which a horizontal reciprocating motion is imparted by revolving adjustable set-screws and the same spring, the horizontal motion of the feeding-bar being regulated by a set-screw in a bracket on the base of the machine, and the whole of the above-mentioned parts being arranged substantially as described hereinafter.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form part of this specification, Figure 1 is an exterior elevation of my improved sewing-machine; Fig. 2, a plan of the base inverted; Fig. 3, a transverse sectional elevation on the line *o o*, Fig. 2; Fig. 4, a face view of the cam-wheel; Fig. 5, a sectional view of the same.

Similar letters refer to similar parts throughout the several views.

A is the base of the machine, supported on suitable legs, B, and to the base is secured the frame or standard C, which carries the needle-bar and appliances connected therewith.

D is the main driving-wheel, in the face of which are two recesses, T and V, of the form illustrated in Fig. 4. In the recess T fits a roller, *h*, on the end of the arm E, a rod on which is pivoted on one side to the frame C and on the opposite side to the bracket *a*, secured to the said frame. To this arm E is jointed the lower end of the rod F, the upper end of which is connected to the end of the needle-lever G. The latter is pivoted at *e* to the frame C and to a bracket projecting from the frame. The opposite end of the lever G is jointed to a cross-head, *e'*, which is arranged

to slide on the pressure-bar I, the latter fitting into openings in projections on the side of the frame C. A spring, J, with one end secured to the pressure-bar I and the opposite end to the frame C, serves the double purpose of pressing the bar down and of preventing it from turning round. The needle-bar H is permanently secured to the cross-head C, above alluded to.

On reference to the inverted plan view, Fig. 2, it will be observed that a bell-crank lever, K, is hung to the under side of the base A. The short arm of this lever is furnished with a roller which fits into the recess V of the main driving-wheel D. The end of the long arm of the bell-crank lever is connected to the end of the rod L, the opposite end of which is connected to the shuttle-carrier M. The shuttle is of the ordinary construction and moves in a race, as in ordinary reciprocating-shuttle sewing-machines. The carrier M is arranged to slide on the two round guide-rods N and N', the opposite ends of which fit against projections on the under side of the base, and are confined by a simple plate and screw to the said projections. The shaft O, to which the main driving-wheel is secured, turns in the projections *e e* on the under side of the frame, and on the end of this shaft are three arms, P', each arm carrying a screw, *i*. As the arms revolve each screw in succession strikes against a plate, Q', which projects from the feed-bar Q. The latter is secured to a spring, S, which is attached to the under side and near the rear of the base A. The rods F project from the end of the driving-shaft O, each rod in succession striking against the under side of the feed-bar Q and elevating the same. A thumb-screw, R, screwing into a bracket, *g*, secured to the base, limits the backward movement of the feed-bar Q, this backward motion being caused by the spring S, to which the bar is secured, the forward movement of the bar being caused by the heads of the screws *i* on the arms P. A plate with a roughened surface is attached to the feed-bar, and this plate projects through and slightly above the upper surface of the base A, so as to coincide, or thereabout, with the pad on the bottom of the pressure-bar. A spring, C'', is secured to the top of the frame C, the point of the spring bearing on the needle-thread, so as to impart to the latter the requisite tension.

On turning the driving-wheel with its shaft O the following movements will take place: first, a vibrating movement of the bar G, and consequently a reciprocating movement of the needle, caused by the cam-groove T acting on the lever E, and the latter on the rod F; second, the reciprocating motion of the shuttle-carrier, caused by the grooved cam acting on the bell-crank lever K, and the latter on the rod L; third, the horizontal reciprocating movement of the feed-bar Q, caused by the revolving screws *i*, in conjunction with the spring S; and, fourth, the vertical reciprocating motion of the same feed-bar, caused by the revolving pins F F, in conjunction with the aforesaid spring S.

It will be observed that the cam-wheel is so formed that each of the above movements is repeated three times during one complete revolution of the driving-shaft.

As regards the feeding device, it will be observed that the screws *i* may be so adjusted that one shall move the feed-bar a greater distance than the other. For instance, the whole of the three screws may be made to project different lengths, in which case three stitches in succession will be different in length, the three irregular stitches being repeated at every complete revolution of the crank-shaft. By this arrangement a row of stitches may be formed so as to present a partially-ornamental appearance, which will be especially prominent when a series of rows stitched side by side are required, as in some parts of harness, where colored thread is used on the black ground of the leather.

The feed-bar, instead of moving in guides, as usual, is supported only by the spring S, which likewise serves the purpose of moving the bar backward after it has been released from the head of each of the screws *i* in succession, and also of depressing the bar after it has been raised by each of the rods F in succession. By this arrangement great simplicity of parts is effected.

The screw R, adapted to a bracket attached permanently to the base, affords a ready and simple means of regulating the backward movement of the feed-bar, and consequently the length of the stitch.

By employing simple round rods N N as guides for the shuttle-carrier M, and by attaching these guides to projections on the under side of the base, in the manner already described, but little fitting and adjusting is required compared with the shuttle-carrier guides of other sewing-machines.

By connecting the needle-bar H to the cross-

head C', allowing the latter to be guided by the pressure-bar I, and jointing the needle-lever G direct to the cross-head, instead of to the needle-bar, I am enabled to make the latter out of a simple round wire, thus saving the expense of constructing the bar of a form necessary to prevent it from turning. The needle-thread passes through an orifice in the spring C', near the point where it is secured to the frame, and passes thence between the end of the spring and the portion of the frame on which it rests. By this arrangement any irregularity or small knot on the thread can pass under the spring without breaking, as the point of the spring will rise to accommodate itself to the inequality. Should the thread break, it can at once be passed through the opening of the spring and under its point without any adjustment of the spring, which always imparts the same tension to which it has been adjusted. A screw or any equivalent device may be used for effecting the original adjustments.

On reference to Figs. 4 and 5 it will be observed that the main driving-wheel is constructed in a peculiar manner. The piece which forms the outer edge of the groove T is separate from the piece which forms the inner edge of the same groove. The pieces which form the inner and outer edges of the groove V are also separated from each other, as well as from the pieces which form the groove T. All these pieces are secured to the face of the driving-wheel, the central pieces being so attached as to be readily adjusted, thereby affording an opportunity of arranging the groove V so as to bear a proper relative position to the groove T.

I do not claim, broadly, a needle-bar to which a vertical as well as horizontal motion is imparted by cams or their equivalents; but

I claim and desire to secure by Letters Patent—

The feed-bar Q, attached to and carried solely by the spring S, operated vertically by the combined action of the rods F F and the aforesaid spring, and horizontally by the combined action of the independently-adjustable screws *i* and the same spring, S, and regulated by the screw R on the stationary bracket *g*, the whole of the above parts being arranged substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS SHAW.

Witnesses:

HENRY HOWSON,

CHARLES D. FREEMAN.