3 Sheets—Sheet 1.

J. N. TARBOX.

SEWING MACHINE.

No. 49,803. Patented Sept. 5, 1865.

Fig. 1.

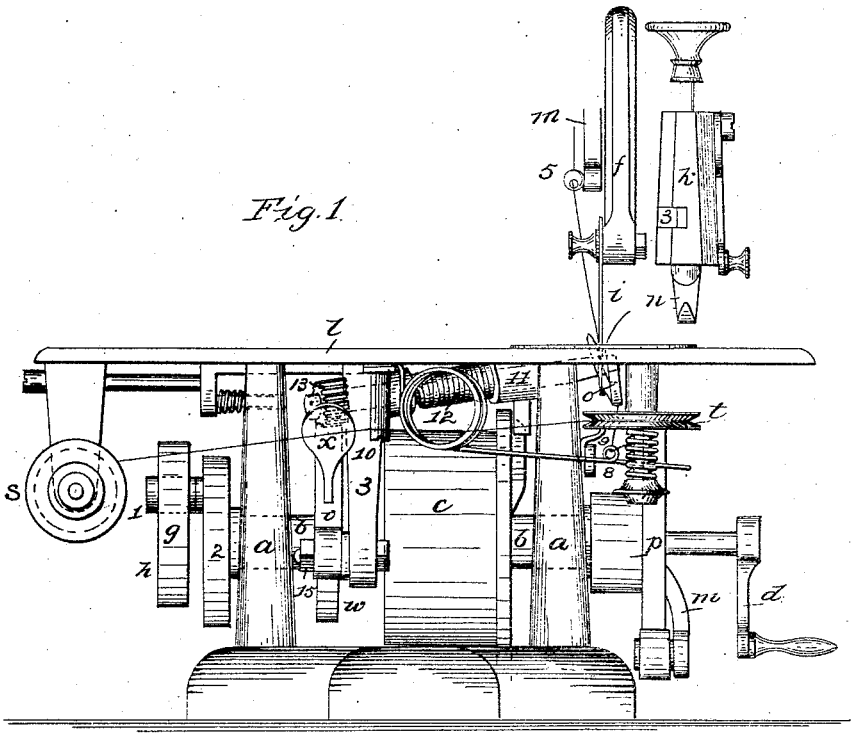
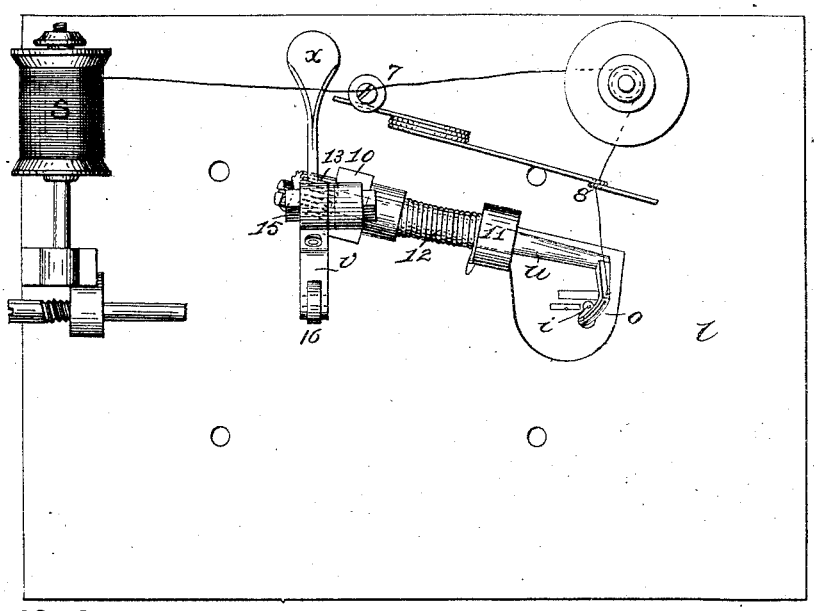


Fig. 2.



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3 Sheets—Sheet 2.

J. N. TARBOX.

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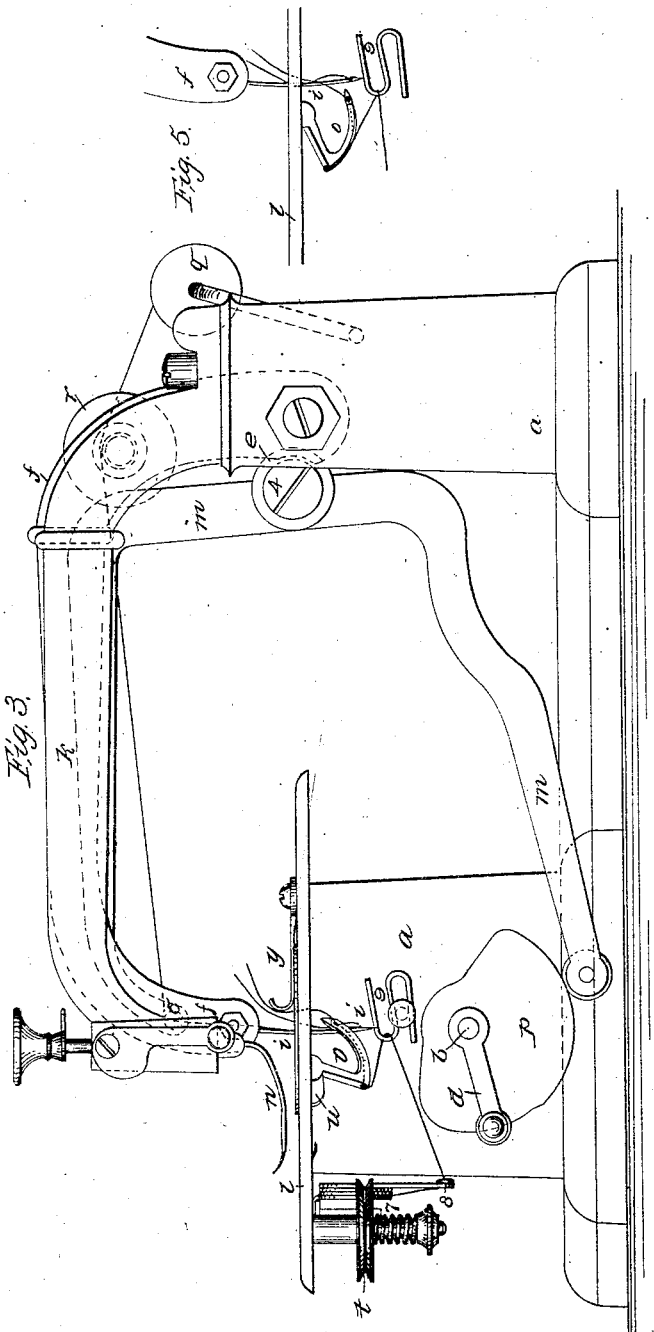

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3 Sheets—Sheet 3.

J. N. TARBOX.

SEWING MACHINE.

No. 49,803. Patented Sept. 5, 1865.

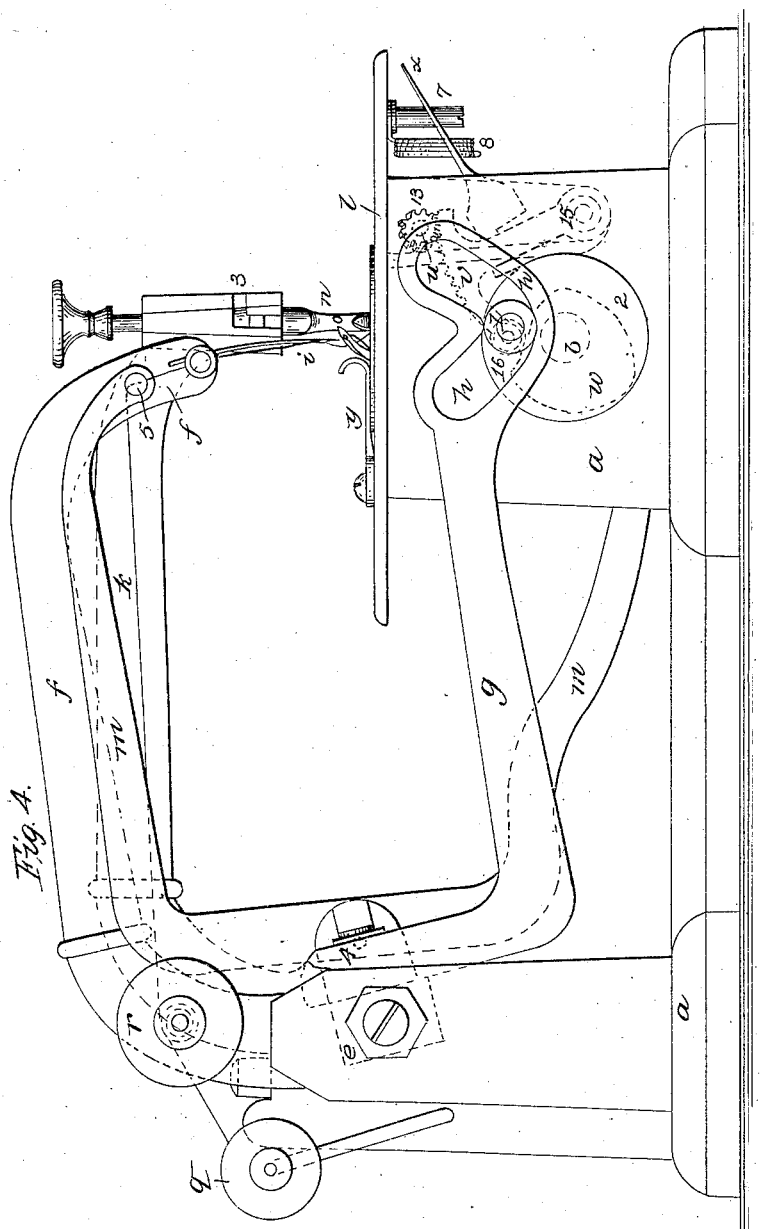

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN N. TARBOX, OF BUFFALO, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **49,803**, dated September 5, 1865.

To all whom it may concern:

Be it known that I, JOHN N. TARBOX, of Buffalo, in the county of Erie and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Sewing-Machines adapted to Making Button-Holes, &c.; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a front elevation of my machine. Fig. 2 is an inverted plan of the bed-plate and parts attached thereto. Fig. 3 is an elevation of the machine at the side where the looper operates, and Fig. 4 is an elevation of the machine on the opposite side, showing the device for moving the needle-arm and needle.

My invention relates to mechanism for producing a double-looped or button-hole stitch, one loop being taken from the needle while it is below the cloth, over a looping-instrument that itself carries the second thread, and, crossing the path of the needle, rises above the cloth, so that the needle, on its descent, takes a loop from said looper. The looper, retiring below the cloth, drops the first loop of needle-thread, which, by the movement of the needle and take-up, draws up around the second or lower thread, and then the looper goes forward and takes a looper of needle-thread, and the sewing proceeds as before. These concatenations are effected principally by a looper that is on the arm of a rock-shaft, placed diagonally to the feeding device and at an inclination to the bed of the machine, so that the looper moves in the arc of a circle the plane of which crosses the needle, the looper entering the loop of needle-thread on one side of the needle; thence rising, passes with its point on the other side of the needle to give off a loop of its own thread, as aforesaid.

In the drawings, *a* is the frame-work of the machine, carrying the main shaft *b*, rotated by a band to the pulley *c*, or by any other suitable device. The crank *d* may be provided for st[illegible] the machine by hand or for finishing off the stitching with care.

e is the rock-shaft with the needle-arm *f*, carrying the eye-pointed needle *i*, and *g* is an arm upon the rock-shaft *e*, extending to the left of the machine, terminating with a heart-shaped slot, *h*, operated upon by a crank-pin or roller, 1, on a disk, 2, at the end of the main shaft *b*. The shape of the heart-cam slot *h* is such that the needle moves rapidly when out of the cloth and remains in the cloth a longer period in order that the looper may have time for its movement, and the roller 1, passing below the point in the heart-slot, gives a momentary rise to the needle to form a loop.

The arm *k* from the frame *a* extends over the bed *l* of the machine, as usual, and has at its end an ordinary pressure-foot, *n*, that is kept down by a spring within the end of the arm. Said foot, however, is capable of being raised until its guide-key comes to a horizontal slot, 3, in the said arm, that allows of its being, with the presser *n*, turned into the position shown in Fig. 1, out of the way of the needle and looper, when the button-hole is being put into its position on the bed, and then turned back again to hold down the cloth while being sewed.

I find it necessary to keep the tension of the needle-thread sufficient to properly pull up the loops in sewing and to keep the thread out of the way in perforating the cloth. Therefore I employ a positive take-up, consisting of the bent lever *m* on the fulcrum 4, one arm of which has an eye, 5, through which the needle-thread passes, and the other arm terminates with a roller, 6, that is operated on by the cam *p* upon the shaft *b*. This cam *p* is shaped, as shown, to keep up the slack of the needle-thread at all times, except when a loop is being formed and taken by the looper.

q is the spool of needle-thread, and *r* any usual friction apparatus, applied to the thread to give the necessary tension. The needle-thread is shown in blue lines, while the lower thread is shown in red lines passing away from the spool *s* through the eye 7, thence around the friction or tension plates *t*, through an eye, 8, on the spring take-up, to the guide-hook 9, and thence to the looper *o*. The looper *o* is formed in the arc of a circle, and is attached to the end of an arm that projects from the shaft *u*, set in bearings 10 11 depending from the under side of the bed *l*. This shaft is diagonal to the bed and at an inclination, also, to its surface. A spring, 12, around this shaft *u* tends to rotate the shaft so as to keep the end of the looper projected through a hole provided for it in the bed adjacent to and joining with the needle-opening. At the other end of the shaft *u* is a pinion, 13, taking into teeth on the segment *v*, vibrating on a fulcrum, 15, and a

roller, 16, on said segment is operated upon by a cam, *w*, on the main shaft *b*. The shape of this cam is such that the motions required are given to the looper by the rotation of its shaft *u* through the segment *v* and pinion 13, the spring 12 keeping the roller 16 to the cam *w* at all times, except when the work is being entered or withdrawn, when an arm, *x*, upon the segment *v* is employed to draw that forward and draw down the looper, in which position the parts may be held by a shoulder on the arm *x* acting as a button to hold the segment forward when said arm *x* is given a partial turn to cause the shoulder to button over a catch upon the pendent bearing 10.

A guide-hook, *y*, is provided above the bed *l* and adjacent to the opening for the looper, which hook, projecting through the button-hole in the cloth, holds it open sufficiently for the looper to pass up without touching the side of said button-hole opposite to that on which the sewing is being performed. The looper *o* has an eye near its back end, through which the thread passes into a groove extending toward the eye in the point.

The sewing is performed as follows: The needle *i* perforates the cloth. The looper *o* draws back as the needle descends and assumes the position shown in the detached Fig. 5, the lower thread passing from the hook 9 up to the looper, and thence to the cloth. The looper then goes forward (the spring take-up 8 keeping the thread tight) and the looper takes a loop of needle-thread, as seen in Fig. 3, and crossing the path of the needle, as seen in Fig. 1, carries its own thread through the button-hole, (or at the edge of the fabric,) the needle in the meanwhile rising and quickly descending, while the looper pauses, so that the needle takes a loop of thread from the looper. The looper is then moved suddenly backward and down under the table, dropping its previous loop of needle-thread, which is drawn up by the take-up and the further descent of the needle, the looper also drawing back, its thread being around the hook 9, which also assists to cause the previous stitch to be drawn up tightly. The needle then rises slightly, forming a loop of thread; the looper flies forward through that loop; the needle rises, dropping its previous loop of lower or second thread around its own thread, and so on, concatenating the loops of the two threads, so as to form a strong and handsome button-hole that presents on the upper side stitching with the loops of lower thread around the thread passing into the perforations, and the loops of lower thread passing over the edges of the fabric and interlacing near the lower edge with the loop of the needle-thread coming out from the under side of the perforations in said fabric. The lower thread being around the hook 9, the thread is drawn most tightly to pull more thread off the spool when the looper is back in the position shown in Fig. 5; hence the previous stitch is pulled up when the perforating-needle is at its lowest point. This draws the loops together near the lower edge of the fabric; but if the lower thread does not pass around this hook 9, and there is no change of tension, the loops will be pulled up when the looper is above the fabric, and the interlacing of the loops will be nearer the top edge of the cloth.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of the following devices: first, a looper formed as an arc of a circle, with an eye near the end and a groove extending along the side and edge thereof to an eye near the back end; second, an arm at the end of a rock-shaft placed diagonally to the bed of the machine and to the feed; third, a pinion and segment acted on by a cam for giving motion to the looper and carrying its point and eye from below the cloth up over the edge; and, fourth, an eye-pointed needle acting from above the cloth and taking a loop from the looper, and having a loop of thread taken from itself below the cloth, substantially as specified.

2. The combination of an eye-pointed needle acting from above the cloth and a looping-instrument acting from below the cloth in the arc of a circle at an inclination to the eye-pointed needle, as specified, with a pressure-foot acting to keep the cloth to the bed, but capable of being swung aside for passing the button-hole over the point of the looper, as specified.

3. The eye-pointed needle, curved looper, and swinging pressure-foot, fitted and acting as aforesaid, in combination with the hook *y* for holding the button-hole open where the looper ascends, as specified.

4. The hook 9, in combination with the looper *o*, for the purposes and as specified.

5. In combination with an eye-pointed needle acting above the cloth and a looping-instrument passing up from below the cloth and delivering its loop of thread over the needle in the manner specified, the cam *p*, lever *m*, and eye 5, to take up the slack of the needle-thread, as specified.

6. In combination with the eye-pointed needle *i* and looper *o*, operating substantially as specified, the heart-shaped slot *h* and crank-pin 1, or equivalent mechanism, for communicating the movement specified to the needle, so that the same will pause while in the cloth and move rapidly when out of the cloth, as specified.

In witness whereof I have hereunto set my signature this 3d day of May, A. D. 1865.

J. N. TARBOX.

Witnesses:
CHAS. H. SMITH,
JAMES E. SERRELL, Jr.