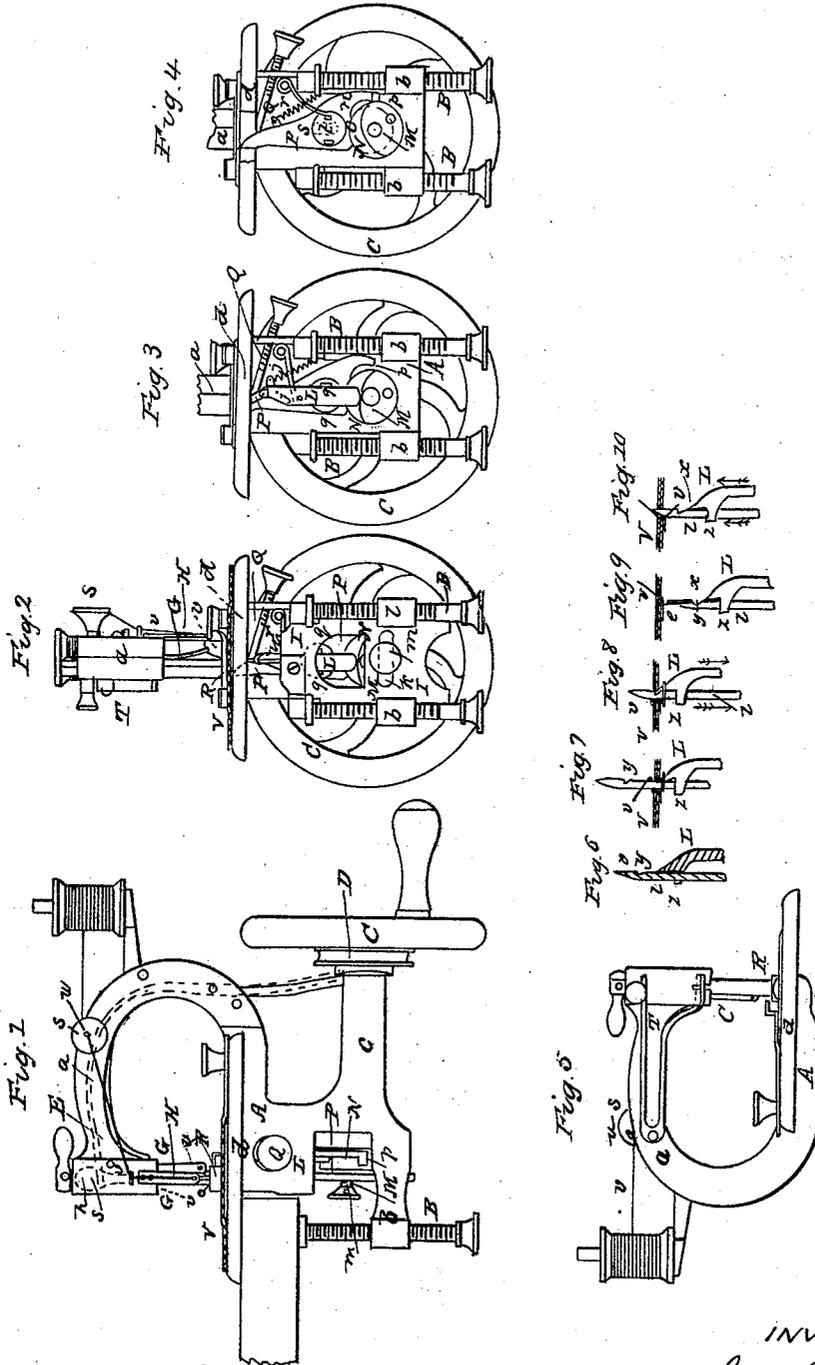


J. W. HARDIE.
Sewing Machine.

No. 30,854.

Patented Dec. 4, 1860.



WITNESSES
R. J. Ogden
C. H. Smith

INVENTOR
J. W. Hardie
By J. S. Brown

UNITED STATES PATENT OFFICE.

JASON W. HARDIE, OF NEW YORK, N. Y., ASSIGNOR TO JAMES H. STEVENS, OF SAME PLACE.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 30,854, dated December 4, 1860.

To all whom it may concern:

Be it known that I, JASON W. HARDIE, of New York, in the county of New York and State of New York, have invented a new and Improved Sewing-Machine; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a side elevation of the machine; Fig. 2, a front elevation thereof; Fig. 3, a front elevation, certain parts of the machine being removed; Fig. 4, a similar elevation, still other parts being removed; Fig. 5, a side elevation of a portion of the machine; Fig. 6, a central longitudinal section of the needle and "cone" on an enlarged scale; Figs. 7, 8, 9, and 10, detailed views on an enlarged scale, exhibiting the different steps in the process of forming the stitches.

Like letters designate corresponding parts in all the figures.

My invention relates to single-thread sewing-machines, and to that particular class in which a barbed or hook needle is used for drawing the thread through the cloth, together with a swinging or vibrating "guide" for hooking the thread into the barb of the needle.

The construction of the machine, except in the parts to which my improvements especially relate, may be in any desired or convenient form and manner.

In the drawings, I have represented a frame or body, A, with a curved arm, *a*, above the cloth-plate *d*, for sustaining the thread-guide and cloth-presser, with projecting arms *b b*, for receiving thumb-screws B B, by which the machine may be clamped to a table or other support, and with a socket-arm, *c*, in which the shaft of the winch C and driving-pulley D turns. For the purpose of compactness and neatness of construction, the curved arm *a* is made hollow nearly its whole length, to receive therein a rod, E, for giving to the thread-guide G its vibratory movement. The arrangement for producing this movement is shown in Fig. 1. The guide G swings on a pivot, *h*, in its upper end, and at a suitable distance below the pivot one end of the rod E is jointed or pivoted to it, as at *i*. The rod E is also pivoted in the arm *a* at *g*, while its

lower end presses against the hub of the pulley D, which serves as a cam to give the required movement. The upper arm or portion above the pivot *g* is flexible and elastic, and when the rod is in position it is somewhat bent, so that by its tending to straighten, the lower end of the rod is kept pressed against its cam or hub. When the rod is pressed against the plane end of the cam, the guide G is in the position shown by black lines in Fig. 1; but there is a hollow, *f*, in one side of the cam, properly located and shaped, so that when the end of the rod E is allowed to spring therein its upper arm becomes somewhat straightened, and consequently lengthened, whereby the guide G is swung forward into the position shown by red lines in the same figure.

The needle *l* is secured in a vertical plate, I, which slides in proper grooves in the body A of the machine, and to which the proper reciprocating motion for forcing the needle up through the cloth is given by means of a crank-pin, (*m*, in the face of a cam, M, on the driving-shaft,) working in a horizontal groove, *k*, Fig. 2, in said needle-plate.

The barb or hook notch *y*, for receiving the thread, is formed so as not to increase the size of the needle, as shown, and for the purpose of closing the barb-notch, so as not to catch hold of the cloth when the needle descends or retreats through it, as well as to assist in holding the thread therein at the proper times; and in casting off the loop at the desired moment I employ a pointed piece, *x*, arranged and operating in connection with the needle substantially as follows: This piece, from its general shape, may be simply termed the "cone," for convenience. It is formed or secured on the upper end of a stem or shank, L, which slides vertically between guides *q q*, behind and parallel with the needle-plate I, and the proper reciprocating movement is given to it by the cam M and a counter-spring, *j*, or its equivalent. The upper end of the stem L has an aperture, *z*, which accurately fits around the needle *l*, and thus keeps the cone *x* in the exact position required under all circumstances. In the barbed side of the needle is a longitudinal groove, *w*, Fig. 6, in which the point of the cone *x* slides, thus being beneath the surface of the needle, as represented. The

movements of the cone, in connection with those of the needle, will be readily understood by reference to Figs. 7, 8, 9, and 10. First, the needle *l* ascends to its full height, and the cone with it, till the point thereof just reaches up through the cloth *V*, as indicated in Fig. 7. In that position of the parts the thread-guide *G* (which has the thread *v* strung through an eye in its lower end) vibrates from the position shown by black lines in Fig. 1 to the position shown by red lines in the same figure, and as the thread is held at nearly right angles across the path of the guide's movement, on one side by the cloth and on the other side by a thread-holder, *H*, this movement of the guide stretches the thread against the barbed side of the needle, as shown in Fig. 7, and holds it there till the needle descends again and catches it in the barb or notch *y*. The cone *x* retains its highest position till the barb of the needle holding the thread just passes by it, as shown in Fig. 8. Then both needle and cone descend together, the cone thus shutting over the barb, so that it cannot catch hold of the cloth to the end of the downward movement, as in Fig. 9. Then the needle commences its upward movement, first leaving the cone below the barb till the loop of the thread is started therefrom by the retreating of the needle from it, as shown in Fig. 10. Finally, the cone again commences its ascent, and thus invariably passes under or within the loop, thereby insuring the forming of every stitch without the possibility of failure.

The feeding of the cloth along is effected by the motions of a single piece or feed-bar, *P*, and will be understood by referring to Fig. 4. Its feeding edge, points, or surface, *o*, is intended to press the cloth and move it against

the presser-plate *R* above. It has a vertical slot, *s*, near its center, which allows a longitudinal motion of the feed-bar over a pin-guide, *t*. A cam-surface, *O*, on the driving-shaft, works against the base *n* of the feed-bar and presses it up against the cloth. Then another cam *N*, on the same shaft, strikes a heel, *P*, of the feed-plate laterally, and consequently gives the required lateral feed motion to the upper end. As the cams *N O* recede from the feed-bar a counter-spring, *r*, brings it back against a stop, *Q*, which, being adjustable out or in, varies the extent of vibratory movement given to the feed-bar, and consequently the length of the stitches. The thread, *v*, as it is rendered from the spool, passes through the head of a conical pin or peg, *s*, which fits and tightens in a hole in the arm *a*. By turning this pin the thread is wound around it till the required tension is given thereto.

I do not claim a barbed or hook needle, nor a swinging thread-guide in connection therewith; but

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

The method of communicating the vibratory or swinging movement to the thread-guide *G* by means of the bent elastic rod *E*, in combination with the cam *f* on the driving-shaft, substantially as herein set forth.

In witness that the above is a true specification of my improved sewing-machine I hereunto set my hand this 28th day of December, 1859.

JASON W. HARDIE.

Witnesses:

S. B. ELLITHORP,
HENRY L. STEVENS.