

S. H. ROPER.
Sewing Machine.

2 Sheets—Sheet 1.

No. 18,522.

Patented Oct. 27, 1857.

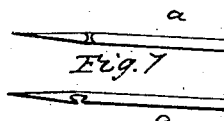
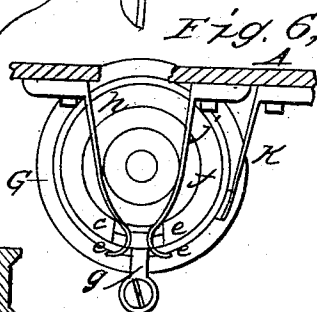
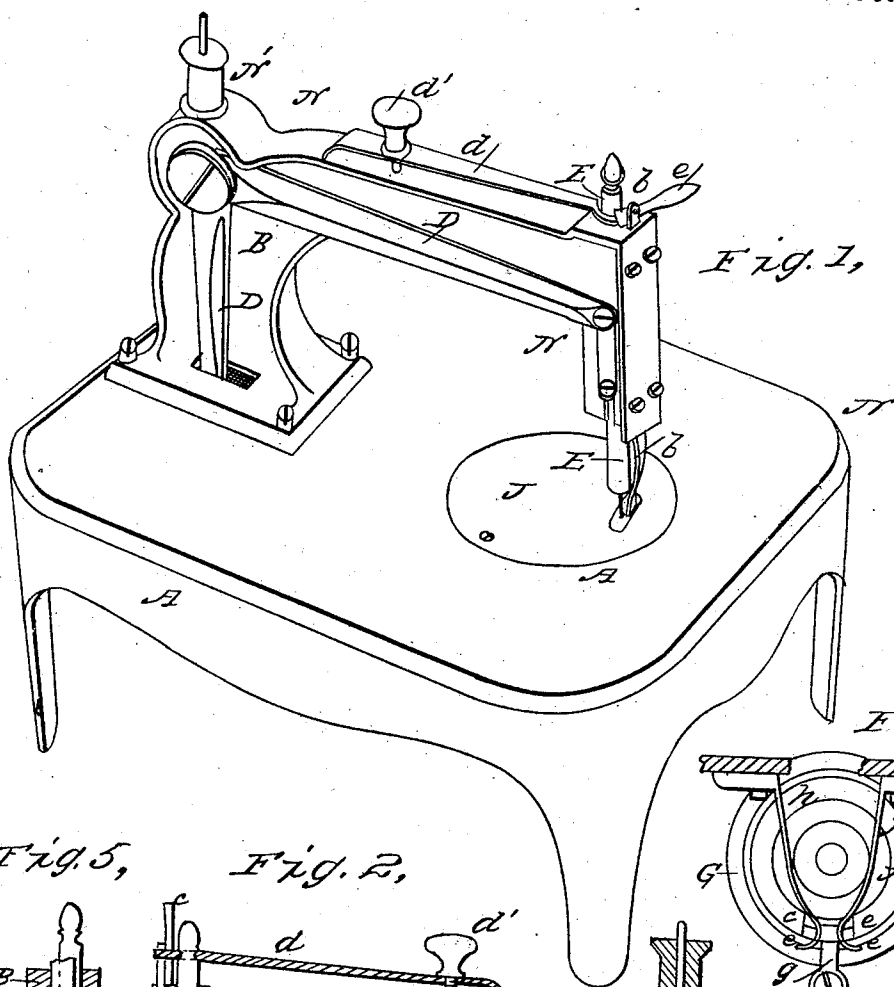
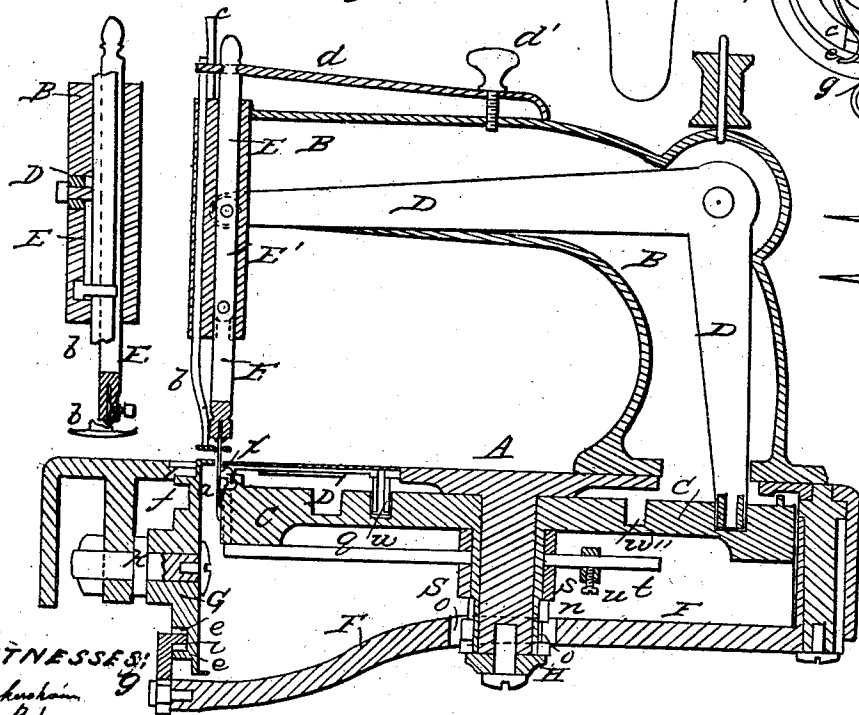


Fig. 5, Fig. 2,



WITNESSES:
M. Michelson
J. Roper

INVENTOR:
S. H. Roper

UNITED STATES PATENT OFFICE.

S. H. ROPER, OF ROXBURY, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 18,522, dated October 27, 1857.

To all whom it may concern:

Be it known that I, S. H. ROPER, of Roxbury, county of Norfolk, and State of Massachusetts, have invented a new and useful Improvement on the Sewing-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification.

Each letter of reference will designate the same part in the several drawings.

In the specification of my machine, Figure 1 is a perspective view. Fig. 2 is a side sectional elevation. Fig. 3 is a top view of the machinery immediately under the top of the table. Fig. 4 is a bottom view of said machine. Fig. 5 is an end sectional view of the arm in which the needle-bar plays. Fig. 6 is an end view of the feeding apparatus; Fig. 7, an enlarged view of the needle. Fig. 8 illustrates the several stages of the formation of the stitch, and the three kinds of stitch which my machine will make.

In specifying the parts of said machine, A represents a table or stand, to which most of the machinery is attached. B is an arm, fastened onto said table, containing the needle-bar, which gives motion to the same; also the cloth-presser. C is the fly-wheel, upon the upper side of which is cut the cam to give motion to the needle, and also the cam to give motion to the thread-guide. D is the lever, working the needle-bar. E is the needle-bar. F is the feed-lever. G is the feed-wheel. H is the crank. I is the handle to the crank. K is a friction-spring for the feed-wheel. *a* is the needle. *b* is the cloth-presser. *c* is a lever to raise the cloth-presser. *d* is a spring to hold the cloth-presser down on the cloth. *ee* are two plates nicely fitted into the groove *f* in the feed-wheel. *g* is a short lever, one end of which is attached to the feed-lever, and the other end has a projection, *i*, which extends in between the two plates *ee* in such manner that when the feed-lever F is moved either way the projection *i* will press the plates *ee* hard against the sides of the groove *f*, so that they will not slip in it, but will cause the feed-wheel to turn round when the lever *g* is thus moved. *h* and *j* are two springs to keep the projection *i* stationary until it binds the plates *ee*. *k* is a stud on which the feed-wheel turns. *l* and *m* are two screws in the sides of the feed-

lever, and so arranged that the cam *o* will strike against them and cause the feed-lever to move the feed-wheel suitably for sewing a back or a half-back stitch. *m* is a cam on the same shaft with the cam *o*, but higher up, and suitably arranged to strike against the screw *p*, and is used in connection with the cam *o* and the two screws *m* and *p* in sewing the running-stitch.

q is a rod, one end of which is fastened into the cylinder *s*, which is fitted movably onto the hub of the fly-wheel C, and the other end is formed into a hook, *r*, and extends up to the upper side of the fly-wheel, at the edge, through a place cut out suitably for it to play in. This hook is to take the thread out of the hook of the needle and carry it sufficiently far around the edge of the fly-wheel that the end may pass entirely through the cloth each stitch that is sewed. On the opposite side of the cylinder *s* is a rod *t*, upon which is fitted a movable block, *w*, with a set-screw in it. To this block is attached a spring, *v*, the other end of which is fastened to the under surface of the fly-wheel, and all arranged in such manner that the spring *v* will keep the rod *q* and the hook *r* in the position shown in Figs. 3 and 4 relatively to the fly-wheel, yet so that said hook will yield a little, and even pass back to the position *r'* before the thread will break in case the thread should be too tight in the cloth to slip through it without breaking until the needle withdraws. The nut *u* is adjustable, and when it is near the other end of the rod *t* it gives a greater, and when near the cylinder *s* gives a less, spring-force to the hook *r*.

w is a small slide or thread-guide fitted movably into the under side of the plate J, with a roll, *w'*, projecting downward from one end into the groove *w''*, in such manner that the slide *w* is operated thereby. At the end of said slide, near the needle, there is a small projection, *x*, so formed that when the slide *w* is moved toward the needle the projection *x* will press against the side of the spring *y*, so as to hold the thread between them, and to keep it tense, and thereby more effectually guide it into the hook of the needle. *z* is the cloth.

Having described the several parts of my machine, I will proceed to explain its operation.

We will suppose the machine is turned by moving the crank H to such position as will bring the needle to its highest position above the cloth *z*, as seen in example 1, Fig. 8. The thread N is there taken from the spool N', carried around the screw-handle *d'*, and then placed in one of the hooks of the needle *a*, which said needle is formed with two hooks for the purpose of carrying the thread both ways through the cloth, as shown in a front and side view, on a large scale, in Fig. 7. The machine is then turned to the position shown in Figs. 1, 2, 3, and 4, which brings the needle to its lowest position, carrying the thread through the cloth with it, and by turning the machine a little farther the needle begins to rise up, causing the thread to spread out from its sides and form a loop for the hook *r* to pass into, as seen in example 2, Fig. 8. The hook *r* then in its passage round takes the thread out of the hook of the needle and draws the loose end entirely through the cloth and leaves it on the upper side of the fly-wheel, near the edge, in a place cut out to receive it, close underneath the cloth. In the meantime the cam *o* presses against the screw *m*, causing the feed-lever F to move the lever *g* toward the spring *j*, which prevents the said lever from moving until it has caused the plates *ee* to bind in the groove *f*, and thereby cause the feed-wheel G and the cloth which is pressed upon the upper side of it by the cloth-presser *b* to move with it, carrying the needle, the cloth, and the thread to the position shown in Example 3, Fig. 8. Next movement of the machine carries the needle down. The thread-guide *w* is then moved toward the needle, (though a little to one side of it,) causing the projection *x* to press the thread against the spring *y*, which is passed between them by the hook *r*, which holds it firm, while the thread-guide moves still farther and wraps the thread partly around the needle, causing it to pass into the hooks of the needle when they come up even with the said thread, as shown in Example 4. Next movement of the machine passes the needle up and the thread along with it, and the cloth is fed in a contrary direction from that previously described, and only half the distance, by means of the cam *o* pressing against the screw *l*, causing the lever *g* to move toward the spring *h*, which prevents its moving until it has caused the plates *ee* to bind in the groove *f*, causing the feed-wheel and the cloth resting on it to move with said lever, as before described, only in a contrary direction, and half as far, which brings the needle, cloth, and thread to the position shown in Example 5. Thus in the formation of every stitch in sewing what is called the "back-stitch" the cloth is fed twice the length of the stitch forward and once the length of the stitch back, as described, and shown at Example 8. In sewing the half-back stitch, as shown at Example 9, the cloth is fed back only one-third

the distance of the forward feeding, and in sewing the running-stitch, seen in Example 10, the cloth is fed forward the length of a stitch in the formation of each stitch without back-feeding by means of the cams *o* and *n* pressing against the screws *m* and *p*, causing the feed-lever and the lever *g* to move in the direction of the spring *h* every half-round of the machine, and moving the feed-wheel, as before described. At next movement of the machine the needle carries the thread down and rises up a little, forming a loop, and the hook *r* passing into said loop, as shown at Example 6, which is the same as Example 2, except that another stitch has been sewed. At next movement the needle rises up, the hook *r* takes the thread through the cloth and around the fly-wheel, bringing the needle, the cloth, and the thread in the positions shown in example 7.

The needle and the needle-bar get their motion from the cam D' through the bent lever D and the link E', which connects the lever D with the needle-bar. I will say, further, with regard to my feed, that simply a lever, *g*, with its projection *i* in the groove *f* so arranged as almost to fill the groove, has been used before, but without success, as the lever, from the small amount of surface in contact with the groove, will invariably wear so loose that it will not move the feed-wheel with regularity; but I have entirely overcome this difficulty by the use of the plates *ee*. The friction-spring *k* prevents the feed-wheel from turning until it is impelled by the lever *g*.

After having thus described my machine and the operation thereof, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The feeding of the cloth alternately in opposite directions, for the purposes herein specified, and in the way described, or in any equivalent manner.

2. The use of the two plates *ee*, for the purpose of giving uniformity to the length of the stitches by preventing the wearing of the lever *g*, as described.

3. I do not claim the hook *r* for the purpose of taking the thread through the cloth, as has before been used; but what I claim is the yielding force of the hook *r*, which will allow said hook to remain stationary, if the thread does not readily pass through the cloth, until the needle is withdrawn, as herein described.

4. I do not claim the double hook and needle, or the use of it, in taking the thread both ways through the cloth; but what I claim is the combination of the double-hooked needle and the hook *r*, for the purposes herein specified, all substantially as herein described.

S. H. ROPER.

Witnesses:

W. WICKERSHAM,
JOHN T. ELLIS.