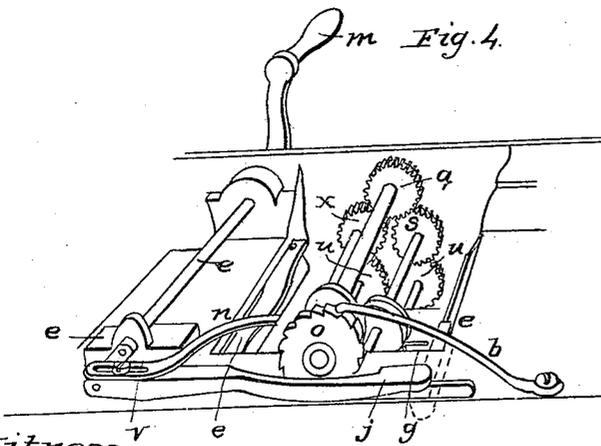
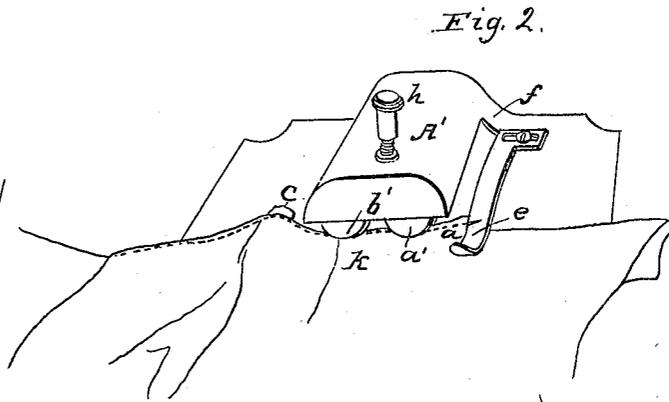
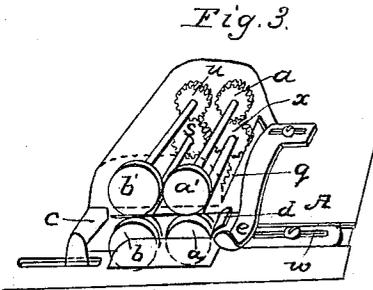
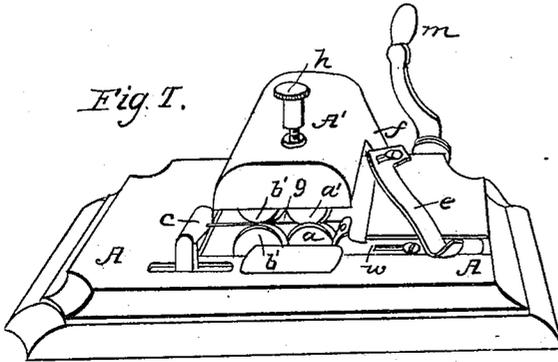


W. S. PRATT.  
Sewing Machine.

No. 40,853.

Patented Dec. 8, 1863.



Witnesses:

*J. D. Lewis*  
*A. C. Farnham*

Inventor:

*W. S. Pratt*

# UNITED STATES PATENT OFFICE.

WILLIAM S. PRATT, OF NEW YORK, N. Y.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 40,853, dated December 8, 1863.

*To all whom it may concern:*

Be it known that I, WILLIAM S. PRATT, of the city and State of New York, have invented a new and Improved Sewing-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof and of its construction and mode or manner of operation, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The general nature of my invention or improvement consists in the production of a sewing-machine which makes the ordinary "running stitch," as it is called, (and is therefore particularly adapted for milliner's use, as well as for many other uses and purposes,) and in the same manner a seamstress makes such a stitch when sewing upon or over her finger, and which makes use of, in forming such stitch, the ordinary needle and a continuous thread.

Figure 1 is a general perspective view of my improved sewing-machine, showing the needle in the position as when about to enter the fabric and the needle-driver against the head of the needle, but no fabric is placed in the machine. Fig. 2 shows the machine with a piece of fabric in it, being sewed, and showing the needle in the position it has when it has passed through the fabric and the stitch has been made. Fig. 3 is a view of the machine with the top part of the frame removed, so as to show the mechanism moving or feeding the fabric and carrying back the needle, the needle being in the same position as in Fig. 2, and the needle-driver a little away from the head of the needle. Fig. 4 is a bottom view of the machine, showing the feed mechanism and the device for varying the length of the stitch.

The operating parts of such machine consist of two or more pairs of rollers, *a a'* and *b b'*, rolling together on their peripheries, one pair of which keeps the needle in position and prevents it taking any lateral motion, and the other pair of which feeds the fabric, and also carries back the needle after a stitch is made, of a needle-driver, *c*, which acts against the head of the needle, pressing it through the fabric in the same manner as a thimble, an elevated lip or finger, *d*, over which the fabric is drawn, and by means of which the stitch is made, a feeding apparatus, and, in connection therewith, a device to vary the length of the stitch, all supported in and by a neat com-

compact frame. This frame *A A'* may be made of any suitable material, but can be made most cheaply of iron, which gives all requisite strength, with great compactness and lightness. The lower part of such frame supports or contains the lower rollers of the several pairs, the needle-driver, and the feed apparatus, and the device for varying the length of the stitch; and the upper part, *A'*, of the frame carries the upper rollers of the several pairs. The upper part or crown *A'* of the frame is connected or attached to the bottom part, *A*, only at one end, as shown at *f*, Figs. 1, 2, so that the fabric to be sewed can readily pass between such upper and lower parts of the frame as it is moved along by the feeding apparatus or mechanism.

The needle *g* is placed between the pairs of rollers before referred to, and in the lower roller, *a*, upon its face, is made a slight groove, in which the needle rests, but so shallow that the smallest needle used will stand up or project a little above the face of the roller, and so that the upper roller, *a'*, the face of which is entirely smooth, as it is forced down by the thumb-screw *h*, will rest upon the needle and keep it in its proper position and prevent its taking or having any lateral direction or movement. The rollers *b b'*, which feed the fabric being sewed, as hereinafter mentioned, have also in the face of each of them a groove in the same line with that in the roller *a*; but such grooves are designed simply to permit the needle to pass through them as the fabric is fed along, and therefore such grooves are made large enough to allow any needle to pass or be carried through them freely and without any obstruction.

When the machine is being used the thumb-screw *h* is turned down, so as to cause the roller *a'* to press hard enough upon the needle *g* to keep it in its proper position in the groove in the lower roller, *a*; but no greater pressure is required. Such screw also acts upon the roller *b'* to keep it in contact with the fabric, and thus cause it to be fed by the action of the two rollers *b* and *b'*. This screw *h* is loosened when the fabric is to be placed in the machine, or when desired for any purpose.

The needle-driver *c* is worked through any proper connection, *j*, by the crank-shaft *l*, which is revolved by the winch *m*, and it comes in contact with the head of the needle when

the needle is in the position shown in Fig. 1, or when the point of the needle is a little away from the surface of the lip *d*. Such needle-driver then forces the needle against the lip *d* through the fabric and beyond the lip and in the position shown in Figs. 2, 3. As will be seen, the point of the needle is slightly elevated as it is forced along by the driver, and this position is produced by having the top of the lip or finger *d* a little higher than the surface of the rollers *a* and *b*. Such relative position of the lip in respect to the rollers or needle-seat is necessary, in order to cause the needle while being driven forward to pass into or through the fabric, and then out again to form the stitch. The elevation or bend of the point of the needle is, however, but slight, and not sufficient to crook or injure it; nor will the point of the needle be injured by such contact of its point against the lip. When the needle is in the position shown in Fig. 2, and the stitch is made, the needle-driver *c* begins to return or move back from the needle, and moves a little distance, as represented in Fig. 3, before any movement is given to the fabric or to the needle; but when the needle-driver has thus been carried a little away from the needle, the arm or impelling-pawl *n*, Fig. 4, comes in contact with the ratchet-wheel *o* and revolves it to the extent of one or more of the teeth of such wheel, or so long as the arm or pawl *n* remains in contact with such wheel, when the pawl *p* drops into the teeth of the ratchet *o* and holds it until such time as the arm or pawl *n* again acts upon and revolves it. As the ratchet *o* is revolved by the arm or pawl *n* the toothed wheel *q*, which is on a shaft fixed to the ratchet *o*, gives motion to the two wheels *r* and *s*, and these again give motion to two other wheels, *t* and *u*. These wheels *r*, *s*, *t*, and *u* are on shafts fixed to the several rollers *a b* and *a' b'*, and cause these rollers to revolve in opposite directions and toward each other. The extent of the revolution of such rollers will of course be equal to the distance the ratchet *o* is revolved by the arm or pawl *n*, and as the fabric being served passes between such rollers, their revolutions, which are in a direction away from the point of the needle and toward the driver, draws the fabric back or feed it, and at the same time carry the needle back to the position shown in Fig. 1, or in the position to commence a new stitch. The feed of the fabric and the consequent length of stitch are thus governed and regulated by the distance the ratchet *o* is revolved by each movement of the arm or pawl *n*.

The wheels or rollers *b b'* are made a little larger than the rollers *a a'*, so as to act a little quicker upon the fabric, and take up any slack or stretch there may be in it before the feed actually commences.

The needle-driver, during the feed motion of the fabric, continues to preserve a little distance between itself and the needle, so that the operator can draw back the fabric upon the

thread and prevent its accumulating between the needle-driver and the head of the needle, so as to interfere with its proper action.

The length of the stitch depends upon and is regulated by the number of the teeth of the ratchet *o*, taken by the arm or pawl *n* at one of its movements, and the consequent degree or extent of the revolution of such ratchet. If a loose or long stitch is desired, the ratchet *o* is caused to revolve the distance of two teeth, and when a shorter stitch is required, such ratchet is made to revolve the extent of but a single tooth. The position of the arm or pawl *n*, so as to act sooner or later upon the ratchet *o* and revolve it to a greater or less extent, is regulated by means of the slot *v*, Fig. 4, and a set-screw passing through it. The lip or finger *d* is also made adjustable by means of the slot *w* and a set-screw, so that it can be changed in position according to the length of the needle used. When the needle is short the position of the lip *d* will be close to the rollers, but when the needle is longer the lip *d* will require to be moved away from them such a distance that the point of the needle will have its proper position near to the surface of such lip, as before described.

If the needle is very long long, it may be desirable to insert an additional pair of rollers to steady it.

The pressure-bar *e* is designed to hold down the cloth or fabric being sewed over the lip *d*, as shown in Fig. 2, and for that purpose is lower than such lip, as shown in Fig. 3, so that the needle, as it is acted on by the driver *c*, will be forced through the cloth, as also represented in Fig. 2. Such bar is also made adjustable by means of a slit, (shown in Figs. 1, 2, and 3,) so that it can be accommodated to the position of the lips *d*, as this is moved nearer to or farther from the rollers *a a'*. The fabric to be sewed may, however, be held down over the lip *d* by the fingers of the operator, which will then be the equivalent of such bar. The cloth being thus held down over the lip *d*—on the one side by the bar *e* or the hand of the operator, and on the other side by the rollers. The surface of the rollers being, as before stated, a little lower than the top of the lip *d*, the point of the needle, being pressed down upon the surface of such lip by the position and action of the rollers, is caused to pass through the cloth in one direction, and then, as it is driven along by the driver *c*, the cloth being drawn over the lip, as described, it passes through it in the other direction, and the stitch is completed.

The needle used in my machine is the ordinary sewing-needle, which is threaded in the usual manner, and it takes the stitch, as will be apparent from the foregoing description, in the same way such stitch is taken by hand-sewing.

It will be noticed that the needle is not stationary, as is the case in other machines making the running stitch, or using a needle resembling the ordinary sewing-needle, and that

the stitch is not made by carrying the cloth to the needle and forcing it upon it; but the needle is moved or driven forward through the cloth to make the stitch, and after the stitch is so made or taken the cloth and needle are carried back the required distance, and then another stitch is made by another forward movement of the needle, and so on.

The spool holding the thread may be placed where convenient, as there is no necessary connection between it and the machine.

The machine represented in the drawings is worked by hand; but it may be worked by a treadle or by any other power.

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

1. A sewing-machine, making a running stitch and using an ordinary sewing-needle, operating substantially as described, in which the needle is not stationary but is carried or

driven forward through the cloth in making the stitch, and then carried backward with the fabric preparatory to the making another stitch.

2. The arrangement of the lip *d*, in combination with the needle *g* and the rollers *a a'* and bar *e* for making the stitch, substantially as described.

3. The combination and arrangement of the ratchet *o* and impelling arm or pawl *n*, with the mechanism rotating the rollers *a a' b b'*, substantially as and for the purposes set forth.

4. The combination of the adjustable arm or pawl *n*, with the ratchet *o*, for the purpose of regulating and varying the length of the stitch, substantially as described.

WM. S. PRATT.

Witnesses:

S. D. LAW,  
A. C. FARHAM.