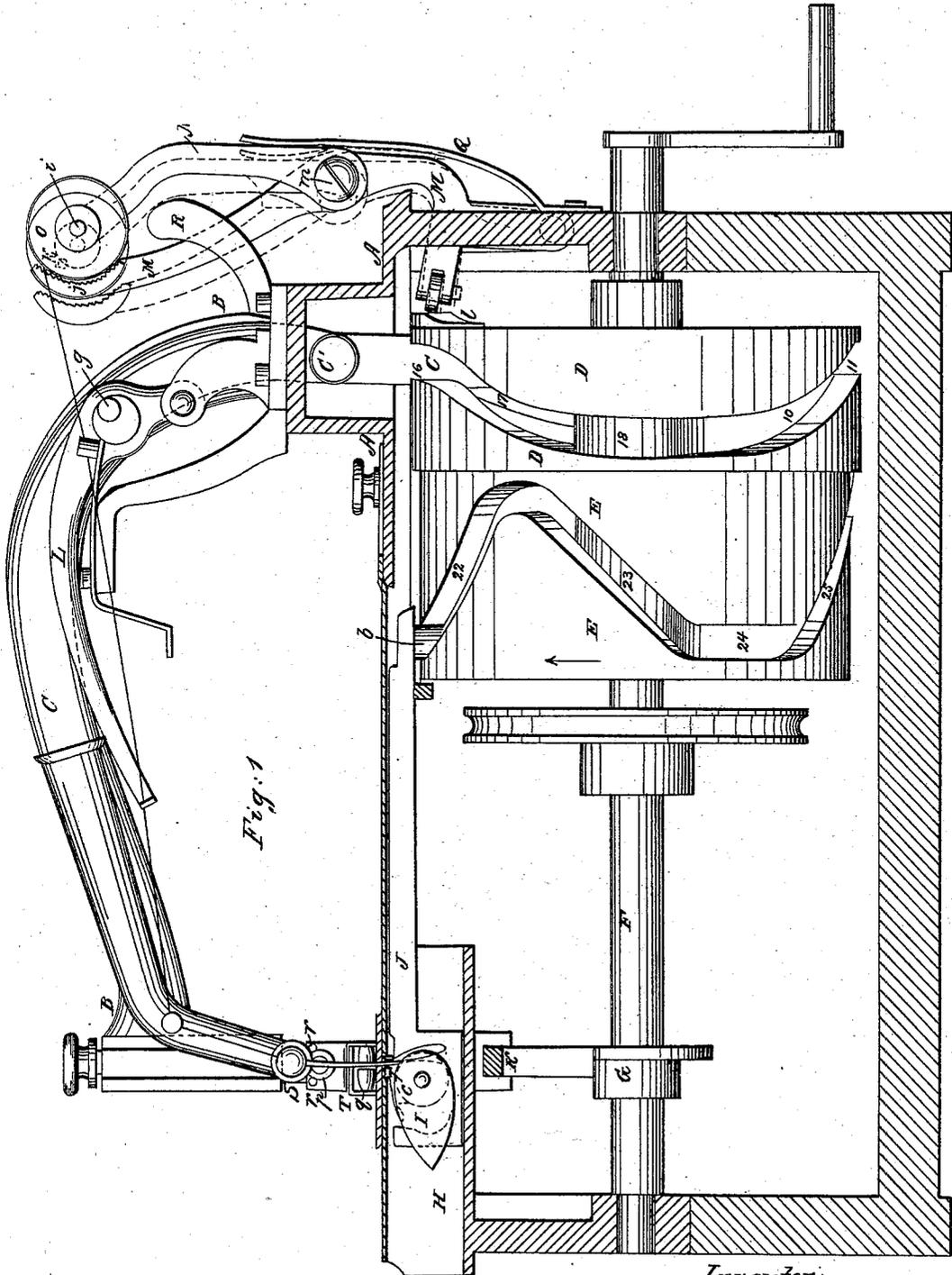


J. P. SHERWOOD.
Sewing Machine.

2 Sheets—Sheet 1.

No. 32,315.

Patented May 14, 1861.



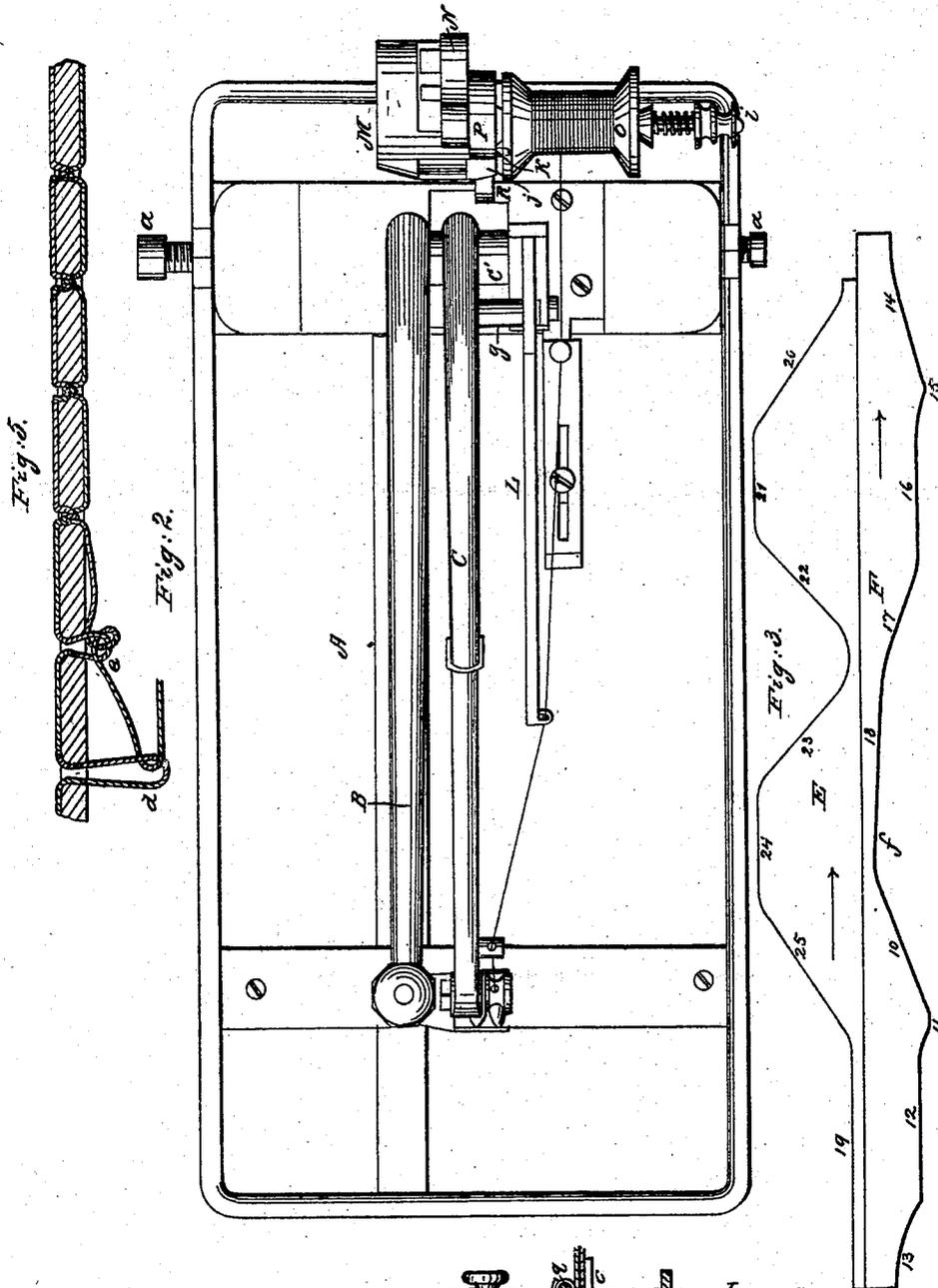
Witnesses:
J. W. Coombs.
R. S. Spencer.

Inventor:
J. P. Sherwood.
per Mum & Co.
Attorneys.

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Sewing Machine.

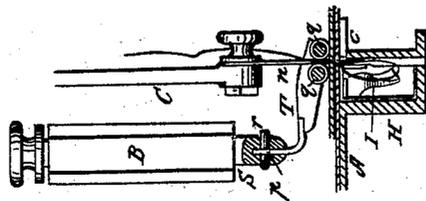
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Fig. 4.



Inventor:
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per Mum & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

J. P. SHERWOOD, OF FORT EDWARD, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 32,315, dated May 14, 1861.

To all whom it may concern:

Be it known that I, J. P. SHERWOOD, of Fort Edward, in the county of Washington and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a machine with my improvements. Fig. 2 is a plan of the same. Fig. 3 exhibits a plane projection of one edge of the groove of the shuttle-operating cam and one edge of the groove of the needle-operating cam, showing the construction and relation of the grooves of the two cams. Fig. 4 is a view of the needle, shuttle, and presser, taken on the left side of Fig. 1, the shuttle-race and presser being represented in section. Fig. 5 is a longitudinal view of a piece of sewing done by the machine.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in the employment, in combination with a needle and shuttle so operated that the shuttle passes twice in the same direction through every loop of the needle-thread, of mechanism for drawing back the needle-thread through the cloth, operating relatively to the needle and shuttle, as hereinafter specified.

It also consists in an improvement in the presser whereby it is made to adapt itself better to irregularities in the thickness of the work.

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

A is the bed-plate of the machine. B is the stationary arm. C is the needle-arm, attached to a horizontal rock-shaft, C', arranged to work between center screws, *a a*, just above the bed-plate, and having its lower arm passing through an opening in the bed-plate to the needle-operating cam D, which, with the shuttle-operating cam E and feed-cam G, are carried by a horizontal shaft, F, arranged in bearings below the bed-plate in a well-known manner. H is the shuttle-raceway, arranged parallel with the planes of oscillation of the needle-arm. I is the shuttle. J is the shuttle carrier and

driver, working horizontally in guides under the bed-plate, and furnished with a roller, *b*, which works in the groove of the cam E. K is the horizontal reciprocating feed-bar carrying the feed-dog *c*, and working at right angles to the shuttle in guides under the bed-plate.

The needle-operating cam D and shuttle-operating cam E are constructed to produce relative movements of the needle and shuttle as follows: The needle *n* descends and perforates and carries its thread through the cloth and rises slightly to let its thread slack to commence the forming of the loop, while the shuttle remains stationary, with its point drawn back clear of the needle. The needle then remains stationary, while the shuttle advances and passes through the loop of the needle-thread. The shuttle then becomes stationary, while the needle rises high enough to bring its eye above the path of the shuttle, in order that the shuttle may not catch or pass through the loop as it moves back again. While the backward movement of the shuttle takes place the needle descends again as far as it did the first time, and then rises again to throw its thread slack to commence the reopening of the loop, and then again remains stationary, while the shuttle advances again through the same loop as before, the needle not having been withdrawn from the cloth. The shuttle then rests while the needle is withdrawn from the cloth, and then moves backward quickly enough to complete its backward movement as the needle completes its upward movement. The feed movement now takes place preparatory to the next perforating movement of the needle. By the above operation the shuttle is caused to twice advance into and pass through the same loop of the needle-thread, and this is repeated with every loop, making the stitch shown in Fig. 5, in which the needle-thread is shown in red and the shuttle-thread in blue color. At the extreme left of this figure a loop, *d*, of the needle-thread is represented as having had the shuttle-thread passed once through it, the shuttle being supposed to have returned outside of the loop preparatory to its passing a second time into and through it. The next loop *e* of the needle-thread is represented as having had the shuttle-thread passed twice through it; but this stitch is represented

as not having been drawn tight. The other stitches are all shown as drawn tight. It will be understood by reference to the loop *e* that the shuttle-thread is coiled once completely round the needle-thread; but when the lock of the stitch is drawn into the middle of the cloth the shuttle-thread will have formed rather more than a complete coil round the needle-thread, making a very secure stitch, but making a more elastic seam than is possible with a knotted stitch.

I will now briefly describe the cams with reference to Fig. 3. The revolution is in the direction of the arrows. The roller *f* of the needle-arm, being on the back side of the cam, is a quarter-revolution in advance of the roller *b* of the shuttle-driver, which is at the top of the cam. The two rollers occupy the respective positions represented in the figure when the needle is about to commence its descent to make a new stitch. The inclination 10 on the needle-cam produces the descent of the needle to carry the loop through the cloth; the offset 11 produces the loop motion to throw out the slack; the plane 12 holds the needle while the shuttle passes through the first time; the inclination 13 draws back the needle to allow the shuttle to return without passing through the loop; the inclination 14 carries the needle down again, and the offset 15 produces the second loop motion to throw out the slack for the second passage of the shuttle through the loop; the plane 16 holds the needle stationary while the shuttle makes its second passage through the loop; the inclination 17 withdraws the needle from the cloth, and the more gradual inclination 18 completes its upward movement and produces the tightening of its thread in the stitch. The plane 19 of the shuttle-cam holds the shuttle back while the needle makes its perforating movement; the inclination 20 produces the first advance of the shuttle into the loop; the plane 21 holds the shuttle stationary while the needle rises after the shuttle has passed the first time through its loop; the inclination 22 draws back the shuttle outside of the needle-loop preparatory to its second passage through said loop; the inclination 23 produces the second advance and passage of the shuttle; the plane 24 holds the shuttle stationary while the needle is withdrawn from the cloth, and the inclination 25 draws back the shuttle the second time.

In the above-described operation of the needle and shuttle to make a stitch it is necessary, after the first passage of the shuttle through the loop, to draw back through the cloth all the slack of the loop of the needle-thread, in order that after the second descent of the needle its thread may be in a proper condition to re-form the loop for the second entrance of the shuttle into it. In order to effect this, I employ what I will term a "drawback" mechanism, operating entirely independent of the ordinary "take-up" mechanism, by which the

needle-thread is drawn back through the cloth to complete the stitch, and held back during the first part of the perforating movement of the needle.

The machine represented has what is known as a "lever take-up." *L* is the take-up lever, and *g* the stud on the needle-arm for operating it.

The drawback mechanism consists as follows:

M is a lever, having its lower end attached by a fixed fulcrum-pin to the bed-plate *A*, and carrying a friction-roller, *h*, to work against a face-cam, *l*, formed upon the back of the needle-cam *D*. To one side of this lever is pivoted, by a pivot, *m*, the lower end of an independent arm, *N*, which is capable of oscillating in planes parallel with the planes of oscillation of the lever *M*, and to the upper part of this lever is secured the spindle *i* of the needle-thread spool *O*. The said spool is fitted to turn upon the said spindle, and has applied to it an adjustable tension apparatus of any well-known or suitable kind. The said spindle *i* has also fitted to turn upon it a roller, *P*, having a notched or roughened periphery covered with cloth or other material, which may be operated upon to stop the revolution of the said roller by means of a roughened brake-shoe, *j*, which is formed upon or rigidly secured to the upper part of the lever *n*. The roller *P* has secured to its side next the spool *O* a pin, *k*, which, by entering a notch in the end of the spool, prevents the latter from turning on the spindle *i* without the roller.

Q is a spring secured to the bed-plate and pressing against the arm *N* in such manner as to force the spool *O* toward the needle. The said spring always either keeps the arm *N* resting against a fixed stop, *R*, secured to the bed-plate, or keeps the roller *P* in contact with the brake-shoe *j*; but in either case it tends to hold the roller *h* toward the cam *l*, which has but a narrow offset in its whole circumference, the remainder of which is a perfect plane.

The operation of the drawback mechanism is as follows: While the needle is making its first descent through the cloth—that is to say, its perforating movement—the arm *N* is held by the spring *Q* in contact with the stop *R*, and the spindle *i* of the spool *O* is stationary, though the spindle is free to turn; but as the needle rises after the shuttle has passed for the first time through the loop of its thread the offset of the cam *l* comes into action on the roller *h* and drives back the lever *M*, bringing the brake-shoe *j* of the latter into contact with the roller *P*, and so preventing the spool *O* from turning, while the latter is forced away from the needle and caused to draw back the whole of the slack of the needle-thread through the cloth. Fig. 1 represents the needle as rising after its perforating movement and preparatory to its second descent, and the drawback mechanism is shown in black outline in a position to correspond. As the nee-

dle begins to descend for the second time, preparatory to the second passage of the shuttle through the loop, the offset of the cam *l* having passed the roller *h*, the spring *Q* is allowed to bring back the arm *N* into contact with the stop *R*, and afterward to remove the brake-shoe *j* from the roller *P*, as shown in red outline in Fig. 1, and so leave the spool *O* free to turn. The lever *M*, arm *N*, and spool *O* remain in the last-described condition during the completion of the second descent of the needle and during the whole of its withdrawal movement, and until after its next perforating movement has been completed and the shuttle has passed the first time through the new loop, when the offset of the cam *l* comes into operation again and brings the lever *M* and its brake-shoe *j* into operation on the spool *O*.

S is the upright stem of the presser, applied in the usual manner.

T is the foot-piece pivoted to the stem *S* by a pin, *p*, in such manner that it is capable of oscillating in a direction transverse to the feed movement. This foot-piece is fitted with two rollers, *g g*, the peripheries of which form the pressing-surface, such rollers being arranged with their axes parallel with each other and at right angles to the feed movement, in such manner that the needle will pass between

them, and having their peripheries convex in a longitudinal direction to facilitate their swinging with the foot-piece *T* from the pin *p* to adapt themselves to irregularities of the surface or thickness of the cloth.

r r are stop-pins secured to the upper part of the foot-piece, one on each side of the stem *S*, to prevent a greater amount of swinging movement of the foot-piece than is necessary.

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

1. In combination with a needle and shuttle applied, combined, and operating together, as above specified, the employment of a draw-back mechanism operating to draw back the whole of the slack of the needle-thread loop through the cloth between the first and second passages of the shuttle through it, substantially as herein described.

2. Though I do not claim broadly the employment of rollers in the presser-foot, I claim the combination of the laterally-oscillating foot *T* and the rollers *g g*, having a convex longitudinal profile, substantially as and for the purpose herein specified.

J. P. SHERWOOD.

Witnesses:

EDWIN CRANE,
THOMAS A. SHERWOOD.