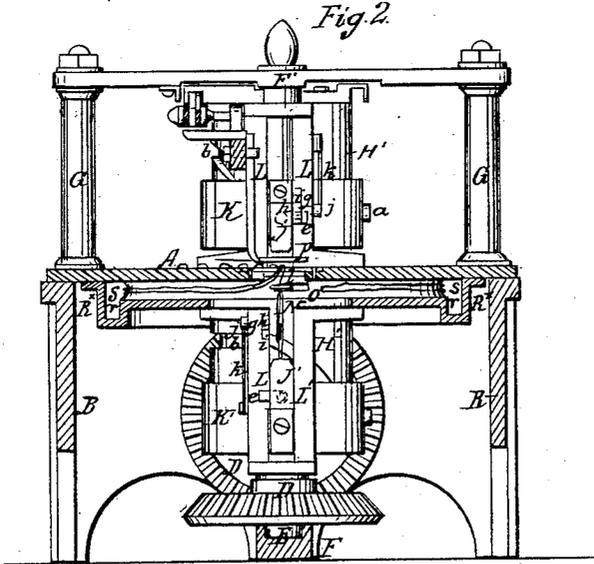
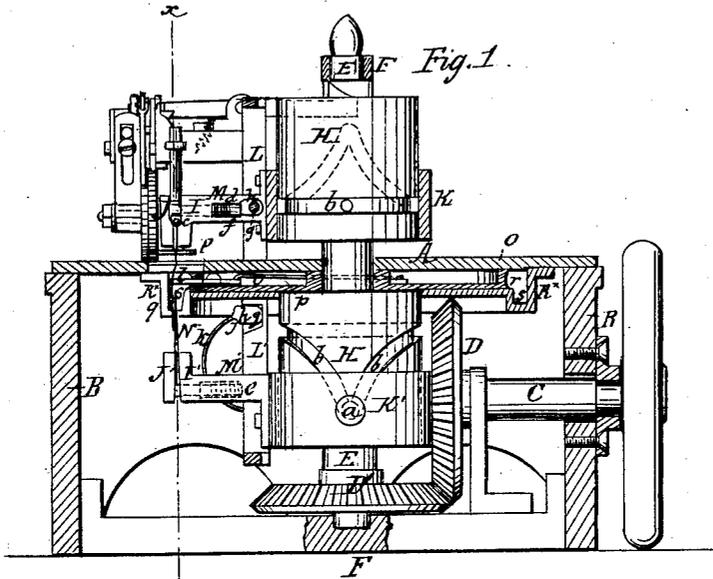


T. S. WELLS.
Sewing Machine.

No. 17,400.

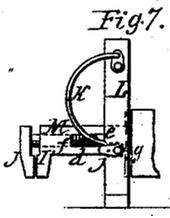
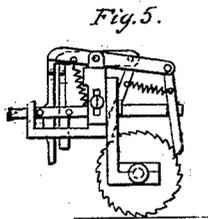
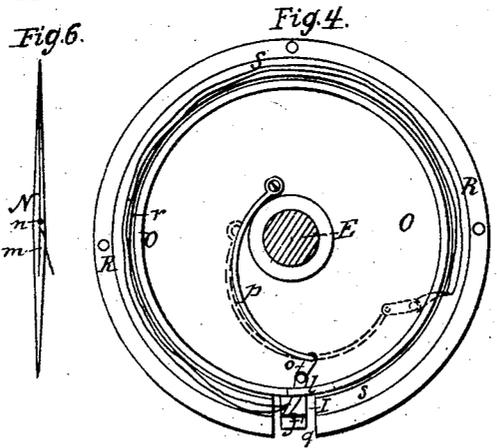
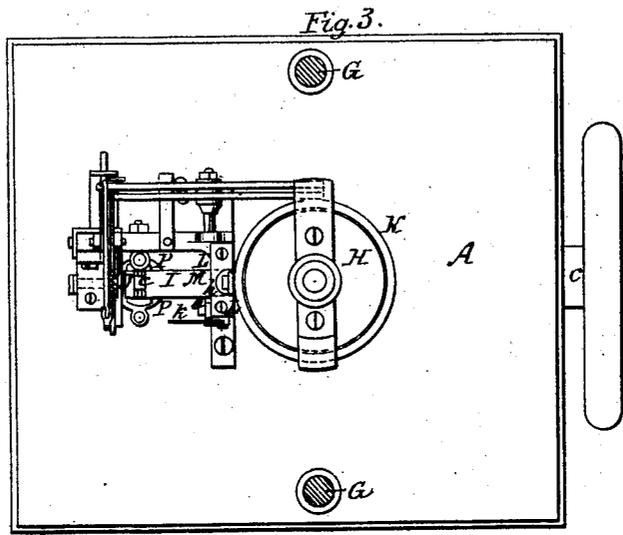
Patented May 26, 1857.



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UNITED STATES PATENT OFFICE.

THOS. S. WELLS, OF UTICA, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 17,400, dated May 26, 1857.

To all whom it may concern:

Be it known that I, THOMAS S. WELLS, of Utica, in the county of Oneida 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, taken in a direction transverse to the line of sewing. Fig. 2 is a vertical section at right angles to Fig. 1 in the line *x x*. Fig. 3 is a plan of the same with the top rail of the framing omitted. Fig. 4 is a plan of the device which operates, in combination with the needle, to make the stitches. Fig. 5 is a front view of the feeding apparatus. Fig. 6 represents the needle on a larger scale than the other figures. Fig. 7 is a side view of the upper one of the two pairs of nippers by which the needle is operated, and the contrivances for opening them. Fig. 8 is a perspective view of a part of the contrivance for opening the nippers.

Similar letters of reference indicate the same parts in all the figures.

This invention relates to that description of sewing-machine in which the sewing is effected by a needle, with a point at each end, passing entirely through the cloth or other material to be sewed from opposite sides alternately.

It consists in certain means of taking up the slack of the thread, which prevents it catching or tangling, and admits of a longer needleful of thread being used than is admitted in machines of the same kind as heretofore constructed.

It also consists in an improvement in the needle, by which facility is afforded for inserting the thread, and at the same time provision is made for securing the end of the thread therein.

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

A is the bed or table on which the sewing is performed, supported upon a stand, B.

P is the foot-piece, which confines the cloth to the table.

C is the main shaft of the machine, arranged in horizontal bearings and carrying a bevel-wheel, D.

E is an upright shaft arranged in bearings in a rail, F, placed across the bottom of the stand B, and another rail, F', that is supported by two pillars, G G, on the top of the table A, and carrying at its lower end the bevel-wheel D', gearing with the bevel-wheel D, for the purpose of imparting to it a rotary motion from the main shaft C. This upright shaft also carries two cylindrical cams, H H', the former being situated above the table for operating the upper pair of needle-nippers, I J, and the latter below the table for operating the lower pair of needle-nippers, I' J', said nippers being attached to two cylindrical yokes, K K', which encircle the cams H H' closely, but not tightly, and receive a direct vertical motion therefrom through the agency of grooves *b* in the peripheries of the said cams, and pins *a* projecting from the interior of the said yokes into the said grooves. The nippers are arranged opposite each other and prevented from turning on the cams by means of guide-posts L L and L' L', attached, respectively, to the top and bottom of the table A, which posts serve to guide them in a vertical direction. The grooves in the two cams are so formed that during one half of the revolution of each cam its respective pair of nippers is stationary near the table, and during the other half the nippers move first a little nearer to the table, then away from it a distance equal to half the distance the needle requires to move to pass entirely through and as far as required clear of the cloth, and then, without remaining at rest, return to their position near the table. In Fig. 1 the upper nippers are represented in this last-named position and the lower nippers at their greatest distance from the table, the latter having taken the needle N from the former after the former had pushed it half way through the cloth and drawn it entirely through and as far therefrom as necessary. The movement of each pair of nippers commences just as that of the other pair terminates, each pair in turn pushing the needle half-way through the cloth, and then the other pair instantly taking hold of it and completing its operation. Just as the movement of each pair of nippers to push the needle half-way through the cloth is completed, the jaws require to open to liberate the needle, and just as the movement commences to draw the needle

through the cloth they of course require to close.

The construction of and mode of effecting the opening and closing of the jaws will now be described.

The jaws $I I'$ are attached rigidly to their respective rings by means of arms $M M'$, of which they form parts, and the jaws $J J'$ are provided with stems $c c$, (see Figs. 1, 3, and 7,) standing at right angles to them and fitting to slide in the arms $M M'$ of the stationary jaws. Spiral springs $d d$ are applied within the arms $M M'$ to the stems $c c$ in such a manner as to exert a tendency to keep the jaws always closed. Each stem is provided at one side of its extremity with a stud, e , projecting through a slot, f , in one side of the arm M or M' , (see Figs. 1, 2, and 7,) and in one of the guide-posts $L L$ or $L' L'$ of each pair of nippers there is fitted a short rocker, g , carrying at one end an arm, h , with a beveled point, which works in a recess, i , on the inside of the guide-post, and at its other end an arm, j , outside of the guide-post.

To the arm j is applied a spring, k , to force it toward the table to hold the arm h against the end of the recess i nearest the table A —that is to say, the bottom of the recess in the guide-post L and the top of that in the post L' . When either pair of nippers is just about terminating its movement toward the table to push the needle through the cloth, its stud e comes in contact with the beveled point of its respective arm h , which, resting within the recess, becomes rigid and causes the stud, and with it the movable jaw of the nippers, to move outward, thus effecting the opening of the jaws and liberation of the needle. By the time the jaws are thus opened, the nippers become stationary, with the stud e resting against the arm h , in which condition the upper nippers are represented in Figs. 1 and 2. When the movement of the nippers commences again, the slight motion toward the table which first takes place carries the stud e clear of the point of the arm h , and thus allows the spring d to close the nippers upon the needle preparatory to their drawing it out of the cloth, and as the nippers move away from the table to draw out the needle the arm h moves out of the way of the stud e , room being allowed for such movement of the arm in its recess i . After the stud e has passed it, the arm h is returned by the action of the spring k on the arm j to the end of the recess nearest the table, ready to act upon the stud e again to open the nippers when they have pushed the needle halfway through the cloth again. The needle N is made with an eye, n , at the middle of its length, and with a close slit, m , extending in both directions from the eye, although the said slit needs only to extend in one direction. The end of the thread on being passed through the eye of this needle requires to be drawn into the slit to secure it, as shown in Fig. 6, where, as well as in Figs. 1, 2, and 4, the thread is shown in red color, which can be done with-

out the inconvenient process of forcing open the slit as required in the needle described in the patent of Hezekiah B. Smith, dated January 16, 1856.

l in Figs. 1, 2, and 4 is the finger by which the thread is drawn through the cloth every time the needle is withdrawn on the under side thereof. This finger is carried by a wheel, O , on the rotating shaft E . It is of the form of a lever of the first order, and is attached to said wheel by a pivot, o , and its point is generally caused to protrude some distance outward through a slot in the periphery of the wheel by the action of a spring, p , upon its opposite extremity, said spring being secured to the wheel. The protruding portion of the finger l is caused, by the rotation of the wheel O , with the shaft E , to pass between the point of the needle and the table A at the precise moment when the needle has been withdrawn to the greatest distance from the cloth on the under side, and, catching hold of the thread, forms a loop in it, and by its continued revolution draws it through the cloth, doubling it and winding it upon the periphery of the wheel O , in the manner represented in Figs. 2 and 4, till the stitch is drawn tight, when the drag of the thread on the finger l overcomes the force of the spring p , and allows the finger to fall back, as shown in red outline in Fig. 4, far enough for it to slip off. In Fig. 2 the finger is represented as just coming into operation on the thread, and the thread (which is there represented wound upon the wheel) is as it has just been left by the finger in tightening up the last completed stitch.

The wheel O is inclosed within a case, R^* , that is bolted to the bottom of the table A , the only opening in the said case R^* being in front at q , Figs. 1 and 4, where one is necessary for the needle to pass through, and also to allow the nippers to come so near to the table that a very long needle will not be necessary. The wheel is fitted snugly into a slight recess in the bottom of the table A , so that the upper edge of its periphery is covered for the purpose of preventing the thread slipping over the top of the wheel; and the case R^* is made with a lip, r , to cover the lower edge of the periphery of the wheel to prevent the thread slipping off the wheel in a downward direction; and, besides these preventive means, the periphery is made slightly concave to encourage the thread toward the middle for the same purpose. A sufficient space, s , is left within the case R^* , outside of the wheel, to permit the revolution of the finger, and thus space is left wide enough vertically to allow plenty of freedom to the movement of the thread when it is being drawn off the wheel after the finger has slipped out of it and during the repetition of the stitch. It will be readily understood that by taking the slack of the thread on the periphery of an inclosed wheel protected from injury and maintained in such condition or position, it will work freely when being drawn through the cloth, besides which it presents an extensive

surface over which to lay the thread, and thus enables a longer needleful to be used than can be used in other machines operating on the same principle. A wheel of six inches in diameter admits of a needleful of about a yard long—that is to say, of the length of twice the circumference—and that length can be used without any difficulty.

By a straightforward feed-motion the machine makes a "running stitch." By a double feed-motion, making a longer movement forward and a shorter movement backward alternately, the "back stitch" is produced, and by other variations in the feed other stitches may be effected. R R' are two cams on the top of the cams H H', for operating a double feed-motion, which I have not considered it necessary to here describe.

I do not claim the invention of a two-pointed needle with an eye in the center, nor a two-pointed needle with a slit or fissure to receive and pinch the thread; nor do I claim the em-

ployment of a revolving finger for the purpose of drawing the thread through the cloth, or any other device described in the specifications of Hezekiah B. Smith or J. J. Greenough; but

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

1. The employment of a wheel, O, to carry the finger and take up the slack of the thread on its periphery as it is drawn through the cloth in tightening a stitch, substantially as and for the purpose herein specified.

2. Inclosing the wheel O within a case, R*, substantially in the manner described, to prevent the thread slipping off the wheel, and to guide the slack while it is being drawn through the cloth in the production of the successive stitches, as herein set forth.

THOS. S. WELLS.

Witnesses:

GEO. H. CONGER,
SILAS A. CONKEY.