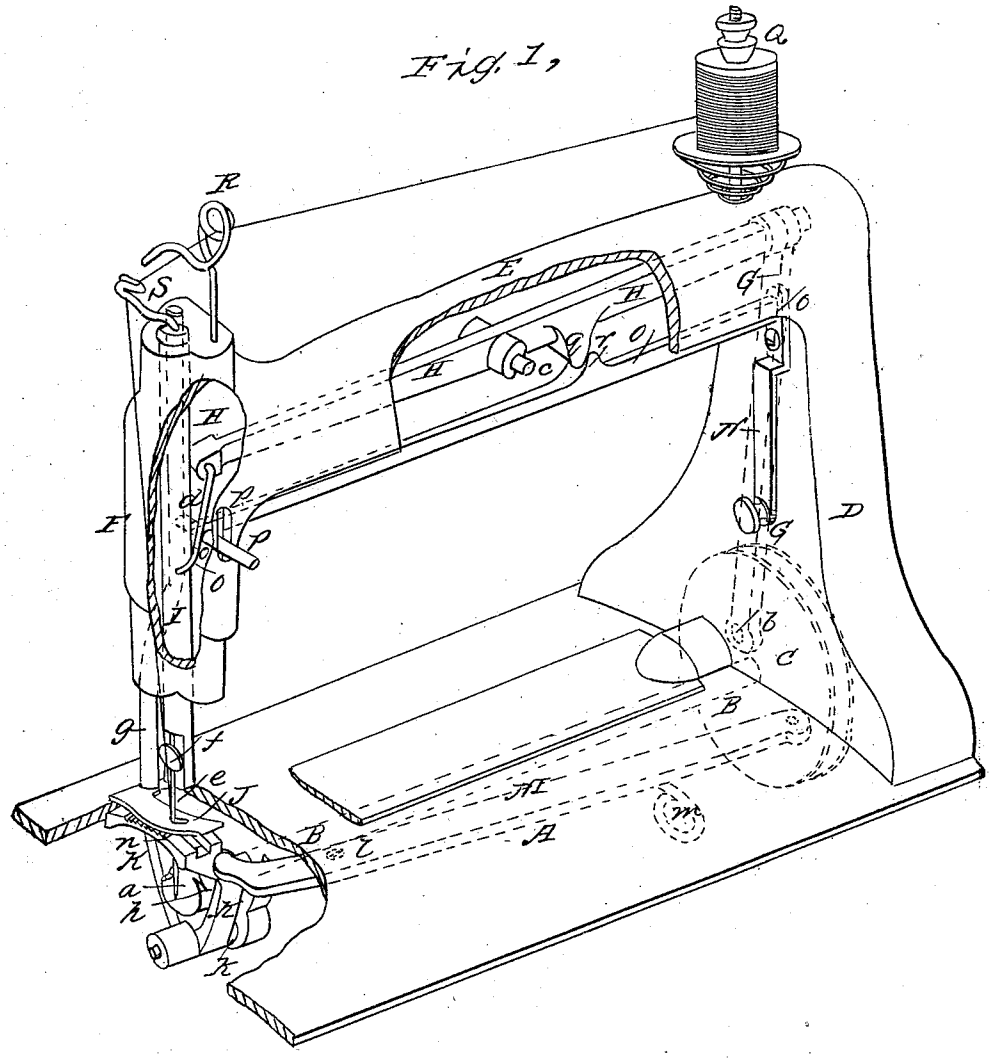
2 Sheets—Sheet 1.

O. & Z. W. AVERY.

Sewing Machine.

No. 22,007. Patented Nov. 9, 1858.

Fig. 1.



2 Sheets—Sheet 2.

O. & Z. W. AVERY.

Sewing Machine.

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Fig. 2,

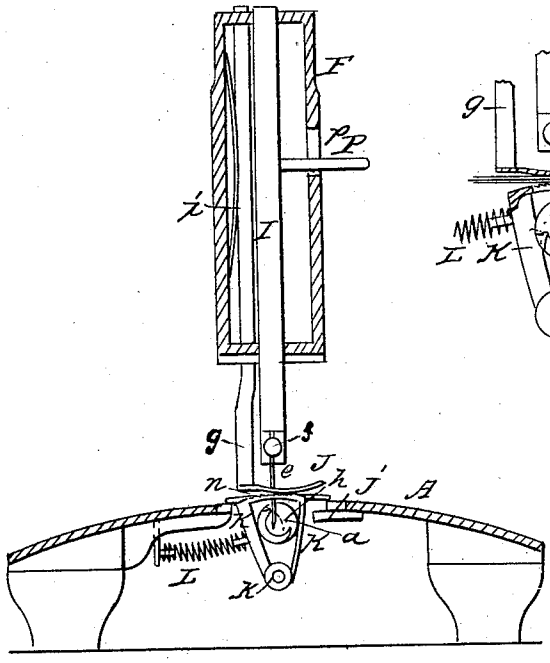


Fig. 3,

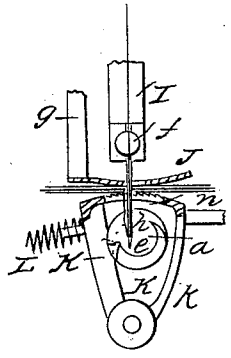


Fig. 4,

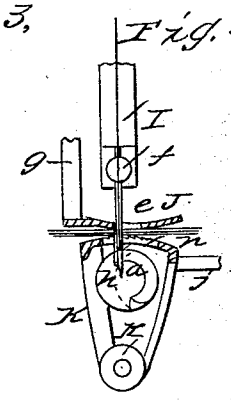


Fig. 5,

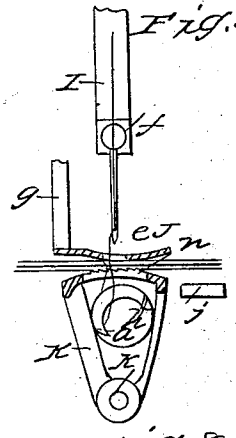


Fig. 6,

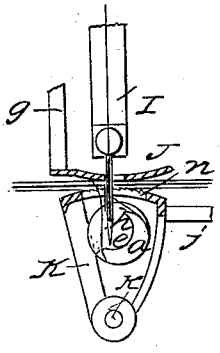


Fig. 7

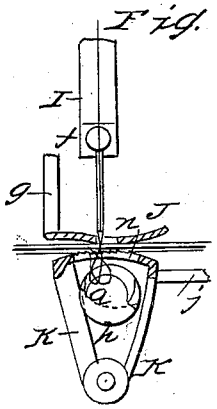
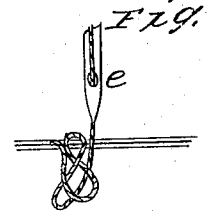


Fig. 8,



UNITED STATES PATENT OFFICE.

O. AVERY AND Z. W. AVERY, OF BETHANY, PENNSYLVANIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **22,007**, dated November 9, 1858.

To all whom it may concern:

Be it known that we, OTIS AVERY and ZELOTES W. AVERY, of Bethany, in the county of Wayne and State of Pennsylvania, have invented certain new and useful Improvements in Sewing-Machines; and we do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of the machine, with portions of the frame and stand broken away to show the parts behind and underneath them. Fig. 2 represents a vertical section through the machine at or near the sewing-point thereof. Figs. 3, 4, 5, 6, 7, and 8 represent detached parts in the several positions which they assume in forming, locking, drawing up, and tightening the stitch.

Similar letters of reference, where they occur in the several drawings, denote like parts of the machine in all of them.

Our invention relates to that class of sewing-machines known as the "single-thread" or "tambour" machine; and its nature and object will be fully set forth and stated in the subjoined description, in connection with the accompanying drawings.

A represents a table or stand, underneath which, in suitable bearings, is hung a shaft, B, (in dotted lines in Fig. 1,) which extends from the rear to the front of the machine, and on its rear end is a pulley, C, for receiving a belt or band to give it motion, said belt passing over any of the common well-known first movers for this purpose. On the front end of this shaft B there is a cam-shaped hook, *a*, for taking the first loop of the thread and passing through it the second loop, holding and at the proper time releasing the first-formed loop to form the lock while the needle is out of the cloth or raised up, as will be hereinafter explained. This hook has a continuous rotary motion, so that there is no check or slack of the machinery to compensate for, which makes the operation of sewing more certain.

The upright portion D of the frame, as well as the horizontal part E and vertical part F, (which latter two parts may be termed the "arm" of the machine or frame,) is hollow, so as to receive the several parts that communicate motion to the needle and operate the presser or foot for controlling the cloth that is being sewed.

To a wrist-pin, *b*, eccentrically placed on the pulley C, is attached one end of a pitman, G, the upper end of which is connected to a walking-beam, H, which is hung upon journals or trunnions *c* in the horizontal part E of the arm of the frame, so that the rotation of the pulley C gives a vertical vibratory motion to said walking-beam H. A link, *d*, connects the front end of the beam H to the needle-bar I, and vibrates said bar in a perpendicular line through its bearings in the vertical or hanging portion F of the arm of the frame.

The needle *e*, which is straight and of the ordinary kind used in sewing-machines, with an eye at or near its point, is secured by a set-screw, *f*, to the lower end of the needle-bar, said needle reciprocating immediately in front of the hook and so near to it that the point of the hook will pass in between the needle and is thread.

J is the cloth-presser or foot, through a slot in which the needle works. This presser holds the material from being raised up by the needle. It is attached to a rod, *g*, which passes up through the part F of the frame, in suitable bearings therein, and behind this rod there is a spring, *i*, for throwing it toward the needle-bar after it has aided to feed up the cloth for one stitch, so as to be ready for the next succeeding feed.

Immediately behind the hook *a* on the shaft B there is a cam, *h*, as seen by the dotted lines in its several working positions in the figures from 2 to 7, inclusive, which rotates in a yoke, K, that is pivoted to the frame at *k;* and said yoke is kept up against said cam *h* by the spring L, so that as the cam rotates on its shaft the yoke shall vibrate on its pivoted point *k*. The upper portion, *n*, of this yoke projects through the table, and is cut with teeth or notches, or otherwise roughened so that it shall carry the cloth, which is pressed to it by the presser or foot J, with it when moving in the direction of the points of its teeth for effecting the feeding up of the cloth, but slip on the cloth when it returns for the next feeding operation. The distance that this yoke traverses regulates the length of the stitch, and, so that the stitches may in turn be regulated in length, the vibration of the yoke must be controllable. This is effected as fol-

lows: A gage-bar, M, is pivoted at *l* to the under side of the stand A, and is held in any adjusted position simply by its friction against said stand, *m* being a hook or handle for moving it. The yoke K, as it vibrates, strikes against the short arm *j* of the gage-bar, and thus regulates the distance it may move, which distance determines the length of the stitch.

To release the presser or foot J from the cloth, the following devices are arranged, viz: To the upright D is pivoted, at *o*, a thumb-lever, N, and to the short arm of this thumb-ver is attached a bar, O, by one of its ends, the other end of said bar O being connected to a stud or pin, P, that is fast in the presser-bar *g*, and projects through the frame F in a slot, *p*, so that by taking hold of said stud or pin P the presser-bar and presser or foot J may be raised up to release the cloth for removing, replacing, or turning it under said presser. On the beam H there is a cam, *q*, and on the bar O another cam, *r*, which operate as follows: When the beam H is raising the needle out of the cloth, the cam *q* is pressing down against the cam *r*, and thus the raising of the needle forces the presser tight against the cloth to hold it firmly against the rising of the needle. When the needle descends, the operation of these parts is reversed and the presser released, at which time the feed takes place. Now, by drawing out the thumb-lever N the cam *r* on the bar O is removed away from the cam *q* and no action between them takes place. Consequently by taking hold of the stud P the presser-bar and the presser or foot can be raised up to release or turn or remove the cloth.

The bobbin Q is set on a spring, *s*, to cause friction enough to prevent its too readily giving out the thread. The thread from the bobbin passes through and over or under a bent wire, R, on top of the arm F, and thence through an eye in another bent wire, S, on top of the needle-bar I, (the bent wire R being stationary, while the one S reciprocates with the said needle-bar,) and then through the eye of the needle, as shown by the red lines in the several figures. The object of the bent wires is to put more friction on the thread when the stitch is being tightened up and to remove it when the thread is paying out to form the loops. When the needle is down, the line of strain on the thread is more direct, and there is less friction. When it is up, the line of draft is broken by three angles, and of course the friction is greater.

The method of forming the loop, releasing it, and forming the lock, and drawing up the stitch is distinctly shown in the several figures 3, 4, 5, 6, 7. Fig. 8 shows on an enlarged scale how the lock is formed. When the stitch has advanced to the form shown in Fig. 7, (which is the same as in Fig. 8, though on a reduced scale,) the several parts of the machine will also be in the position shown in said Fig. 7, and it only remains to tighten up the stitch, which is done by the rising of the needle and the rotation of the hook. The completion of the locking of the stitch is thus effected while the needle is out of the cloth.

It will be seen that the hook never releases the first loop until it has taken the second one, and so on, and although the rising of the needle-bar draws up some of the slack of the thread the hook completes the operation.

Having thus fully described the nature and object of our invention, what we claim therein as new, and desire to secure by Letters Patent, is—

1. The combination of the rocker or yoke K, pivoted as described, and the presser J, operated as set forth, for the purpose of firmly holding the cloth while it is being fed up or moved, as herein represented.

2. In combination with the beam H and its cam *q*, the bar O and its cam *r*, when said parts effect the purposes herein described and in the manner set forth.

OTIS AVERY.
ZELOTES WM. AVERY.

Witnesses:
CHARLES S. MINOR,
STEPHEN TORRY.