(No Model.) 2 Sheets—Sheet 1.

G. McKAY.

SEWING MACHINE.

No. 540,400. Patented June 4, 1895.

Fig: 1.

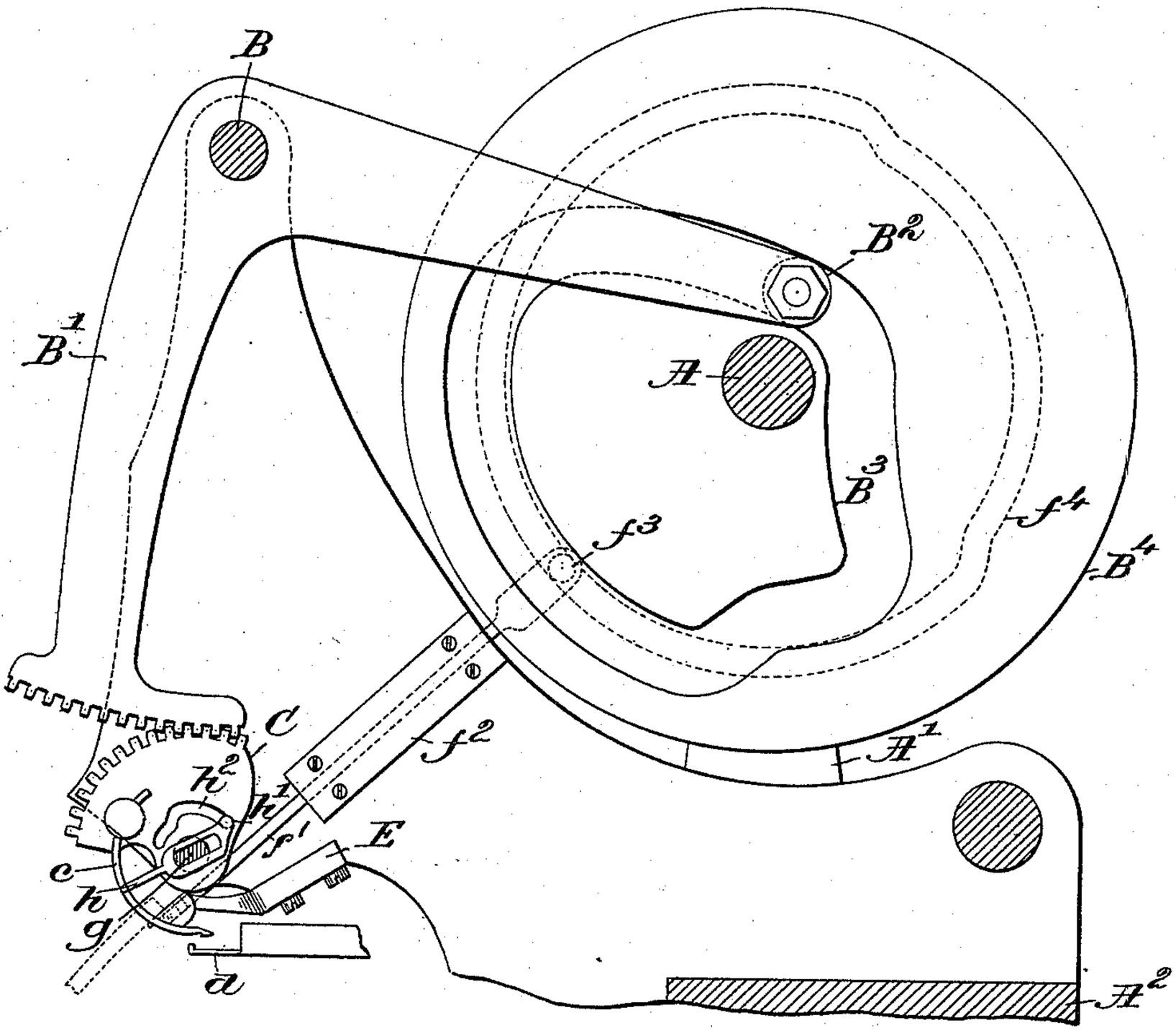


Fig: 2.

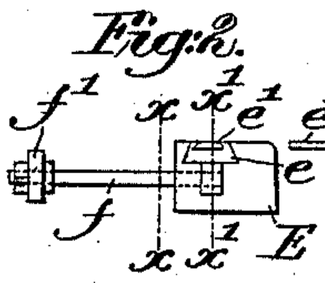


Fig: 3.

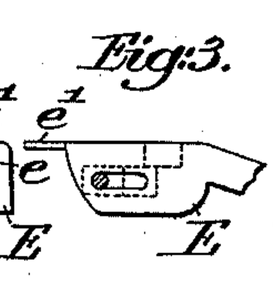


Fig: 4.

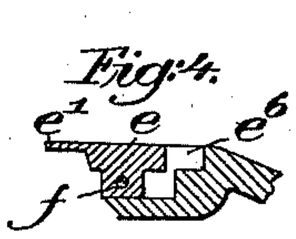


Fig: 5a.

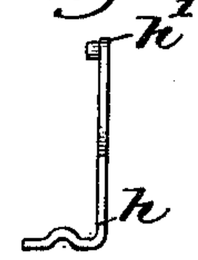


Fig: 5b.

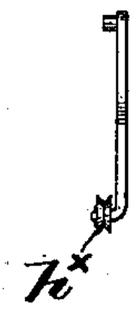
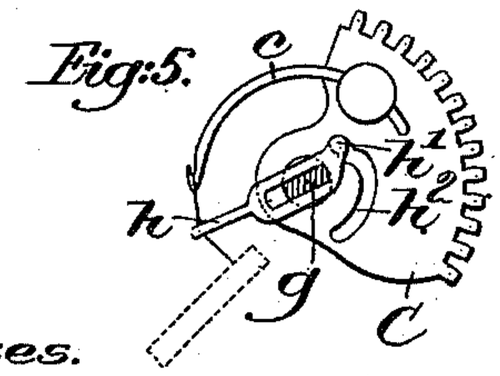


Fig: 5.



Witnesses.
Fred S. Gunlof
Thomas J. Drummond.

Inventor:
Gordon McKay.
by Crosby & Gregory. Attys.

(No Model.) 2 Sheets—Sheet 2.

G. McKAY.

SEWING MACHINE.

No. 540,400. Patented June 4, 1895.

Fig: 6.

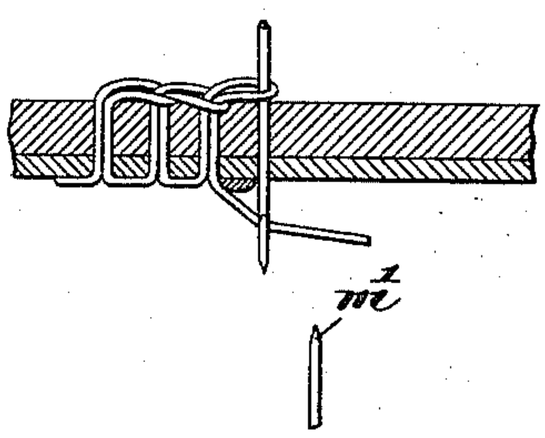


Fig: 7.

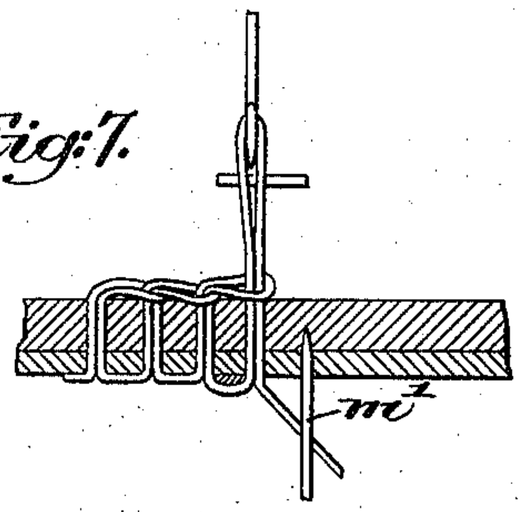


Fig: 8.

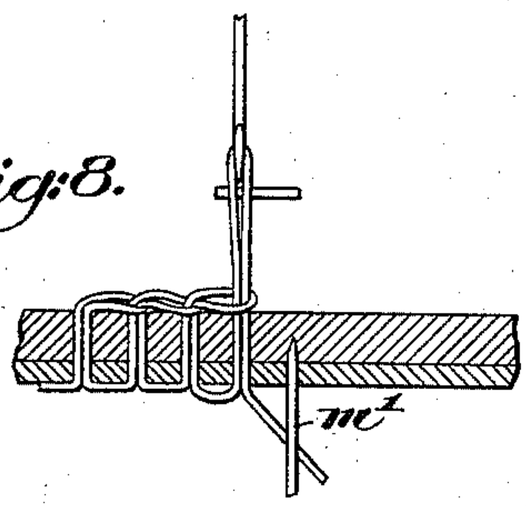


Fig: 9.

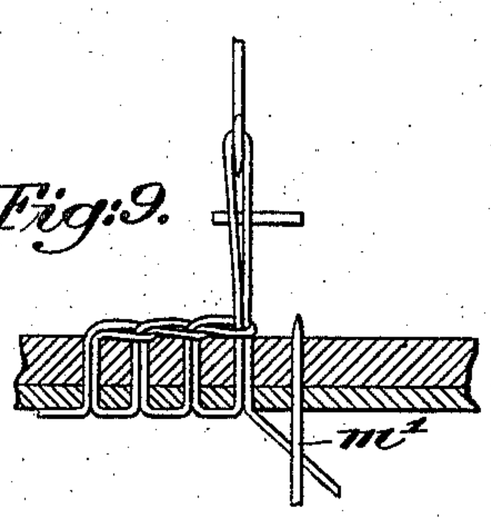


Fig: 10.

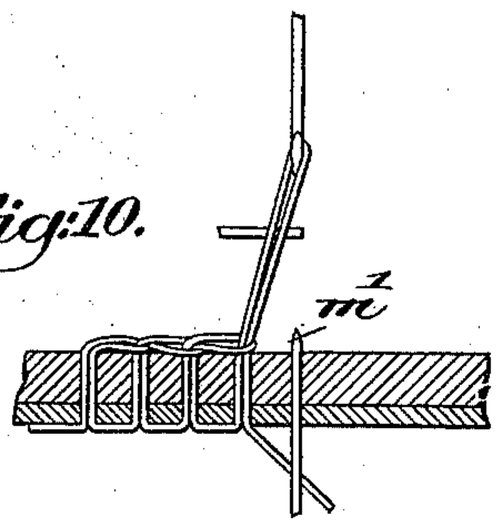
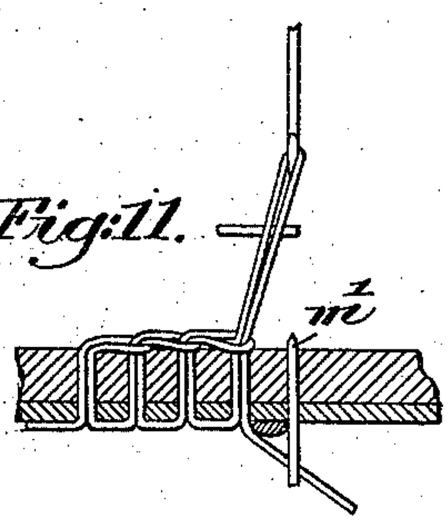


Fig: 11.



Witnesses.
Fred S. Grundof.
Thomas J. Drummond.

Inventor:
Gordon McKay.
by Crosby & Gregory. Attys.

UNITED STATES PATENT OFFICE.

GORDON McKAY, OF NEWPORT, RHODE ISLAND.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 540,400, dated June 4, 1895.

Application filed November 21, 1894. Serial No. 529,443. (No model.)

To all whom it may concern:

Be it known that I, GORDON McKAY, of Newport, county of Newport, State of Rhode Island, have invented an Improvement in Wax-Thread Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

In the use of curved needles great difficulty is experienced in drawing the stitches into the stock with sufficient tightness to insure serviceable work. This is owing to the fact, that the loop, when the eye of the needle is at its extreme stroke, is in the line of a chord of the arc described by the path of the needle and so brings a transverse strain on the eye of the needle in the place where the needle is weakest. I have sought to obviate this trouble by devising and combining with a curved needle a "loop fulcrum" or rest which is adapted to come in contact with the loop after the eye of the needle leaves the stock, and as the loop is drawn up this fulcrum is carried away from the center of motion of the curved needle until just before the needle reaches its extreme stroke; when the outward motion of the fulcrum ceases, while the further movement of the needle tightens the stitch. At this position the loop forms two tangents (or nearly so) to the path of the needle, one touching the curve at the stock and the other at the needle eye.

When sewing such material as leather, and especially when the stitch is short the between-substance or thin dividing wall between the consecutive stitches is liable to be cut or torn through by the strain on the thread necessary to tighten the stitches and thus destroying the integrity of the sewing, or rendering it uneven and irregular. Under another head of my invention I have provided means to obviate the difficulty of breaking down the dividing walls or between-substance, and in accordance therewith I have provided a sustainer for the thread, the latter lying close to the stock at that side thereof showing the fair or unlooped part of the chain stitch, said sustainer being of a width approximately equal to the length of the stitch to be made.

Figure 1 shows a sufficient portion of a sole-sewing machine to enable my invention to be understood. Fig. 2 is a detail showing part of the work-rest and the stitch-sustainer. Fig. 3 is a section looking to the right of the line x, Fig. 2. Fig. 4 is a section in the line x', Fig. 2. Fig. 5 is a detail showing the loop-fulcrum in different position from that shown in Fig. 1. Fig. 5^a shows the loop-fulcrum detached. Fig. 5^b shows the loop-fulcrum provided with a roll over which the thread passes; and Figs. 6 to 11, inclusive, different views of the parts during the formation of a stitch.

In the drawings, let A represent the main or cam shaft of a sole sewing machine, said shaft being supported in suitable standards A′ of the frame-work A^2.

B represents the fulcrum for the segmental lever B′ having at one end a roll B^2, which enters a cam groove B^3 in the cam B^4, said lever in its movements engaging and actuating the needle segment C having an attached hooked needle *c*.

In the drawings, *d*, represents a looper or device to supply the hooked needle with thread, and said device may be such as common to any usual shoe or sole sewing machines using a curved hooked needle, so the devices for actuating it need not be herein further described.

E represents a work-support supported in usual or suitable manner, said work-support, in accordance with my invention, receiving in it a slide *e* having a stitch-sustainer *e′*, made as a finger adapted to extend a little beyond the edge of the work-support so as to lie against the material in which the stitch is being made at one side thereof, and preferably, as herein shown, at that side thereof where the single ply of thread appears. This stitch-sustainer is projected forward to occupy a position between adjacent stitches while the thread is being drawn through the material or is being drawn taut, so that it receives about it the pull of the thread, thus preventing the single ply of thread from crushing in, breaking down, or cutting through the thin wall of leather between adjacent stitches, while drawing the loop side into or closely on the leather.

The slide *e*, as best shown in Fig. 2, is dovetailed in cross-section and is fitted into a corresponding groove e^6 in the work-support, and to enable this slide to be moved at the proper

times to put the stitch-sustainer into and out of position with relation to the needle, I have extended from the slide a rod f, which is embraced by a slide-bar f' extended through a suitable guide f^2 and having at its opposite end a suitable roller or other stud f^3 which enters a cam groove f^4, shown by dotted lines, in the disk B^4.

The stud g, shown in section, and about which moves the needle segment is represented as partially cut away so as to leave an oblong portion to act as a guide for the loop fulcrum h, the latter consisting of an L-shaped slide slotted to be moved back and forth on the stud g, the rear end of the slide having a suitable roller or other stud h' which is adapted to enter a cam groove h^2 which is cut in one side of the needle segment C, said needle segment in its operation moving the said loop fulcrum back and forth.

The machine upon which I have chosen to illustrate my invention is substantially of the character represented in United States Patent No. 412,704, and in practice the machine using my improvement will contain a presser foot, an awl m' to feed the material, and other usual parts found in the said patent or in usual wax thread sewing machines.

In practice the stitch-sustainer will be so moved that it will stand in the line of the seam as the needle is drawing the loop through the stock, the sustainer being retracted just as or just a little before the needle completes its stroke with the loop, said sustainer receiving substantially all the strain put on the thread by the needle in forming and setting the stitch, so that the dividing walls or between-substance is not torn or broken, for just about as the needle is to complete the stroke with the loop, the stitch having been well tightened about the sustainer, the latter is withdrawn from under the thread letting the thread come upon the leather or stock. The needle takes the thread in usual manner from the thread guide and draws the same through the stock, as represented in Fig. 7, about the stitch-sustainer, and as the needle makes its stroke with the loop, the loop fulcrum or rest is moved forward, that is, away from the center of motion of the needle, until the needle reaches nearly the end of its stroke. At this time the fulcrum has advanced sufficiently to bring the loop into a bent state, forming two straight lines, each approximately tangents to the curve of the needle path, one at the stock and the other at the eye of the needle. Then the outward motion of the fulcrum ceases and the tightening of the stitch is made by the completing of the needle stroke, the function of the fulcrum being to take a transverse strain from the needle when tightening the stitch and to substitute a direct strain. To lessen the friction of the loop over the fulcrum there may be a friction roller $h^\times$ put in the end of the loop fulcrum, as shown in Fig. 5^b of the drawings. To facilitate withdrawing the stitch-sustainer from the work it should be made tapering.

While I have herein shown the stitch-sustainer as operating in connection with a curved needle, it will be obvious to those skilled in the art that my invention is applicable for use with any form of hooked needle.

This invention is not limited to the exact means shown for operating the loop fulcrum, as it may be moved in other ways by mere skill of the mechanic without the exercise of invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a curved needle, of a loop fulcrum located substantially as described with relation to said needle and its axis of motion, whereby as the loop is drawn out or elongated in the tightening of the stitch 22, both branches of said loop will be bent over said fulcrum to form two opposite tangents, or nearly so, to the path of the needle, one from the fulcrum to the stock and the other from the fulcrum to the eye of the needle, for the purpose set forth.

2. The combination with a thread-guide, and a hooked needle to make a chain stitch, and a work-support, of a stitch sustainer movable in the face thereof, and means to move said stitch sustainer on said work-support across the line of seam during the formation and finishing of each stitch, and to withdraw it from the fair stitch side of the loop just as the needle is completing the drawing of the loop then in its hook to thus lay the fair stitch part of the loop on the material without cutting into the same.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GORDON McKAY.

Witnesses:
A. O'D. TAYLOR,
HUGH L. TAYLOR.