

(No Model.)

3 Sheets—Sheet 1.

Z. T. FRENCH & W. C. MEYER.  
SEWING MACHINE.

No. 525,047.

Patented Aug. 28, 1894.

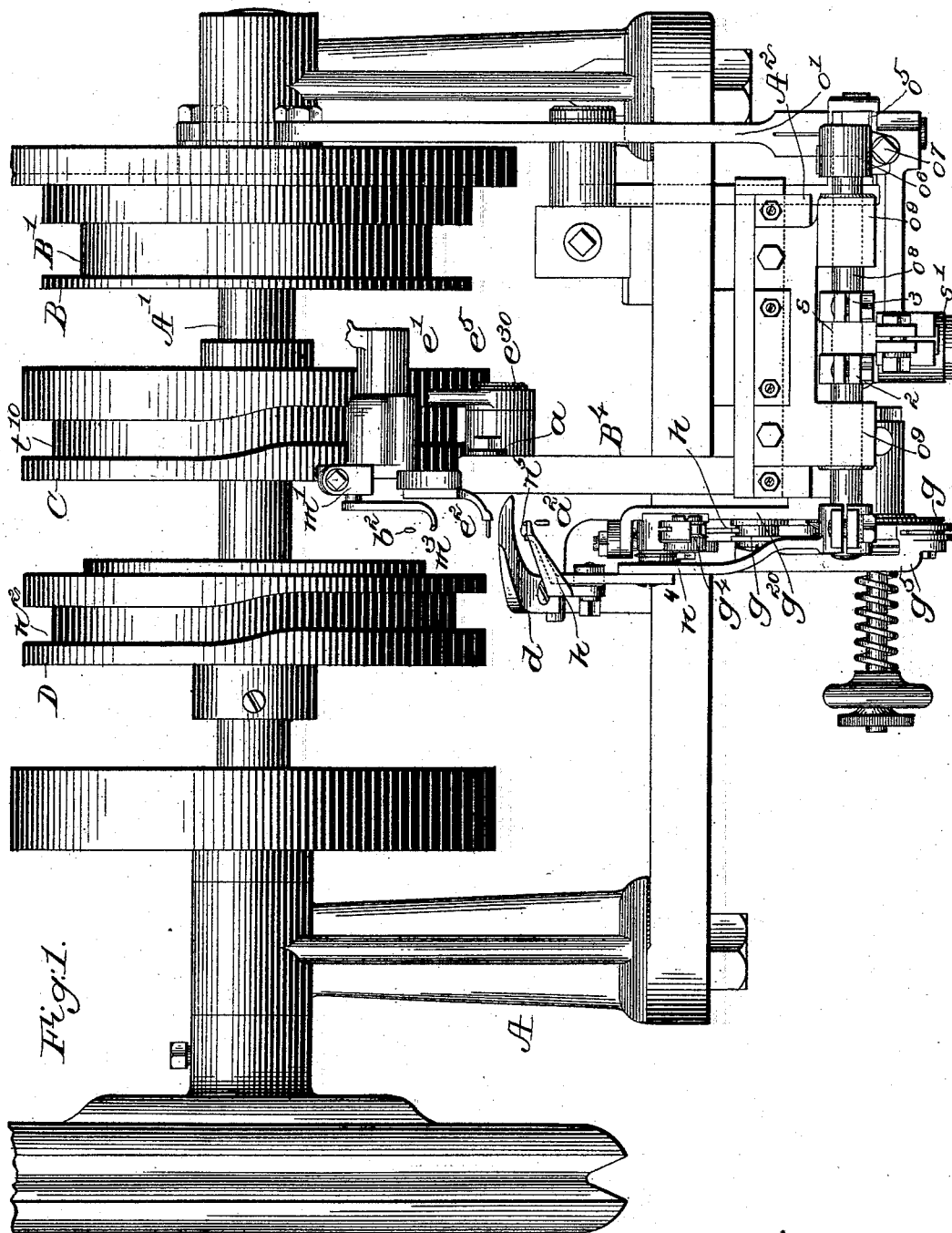


Fig. 1.

Witnesses.  
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Edward F. Allen.

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by Lemby & Hugon Attys.

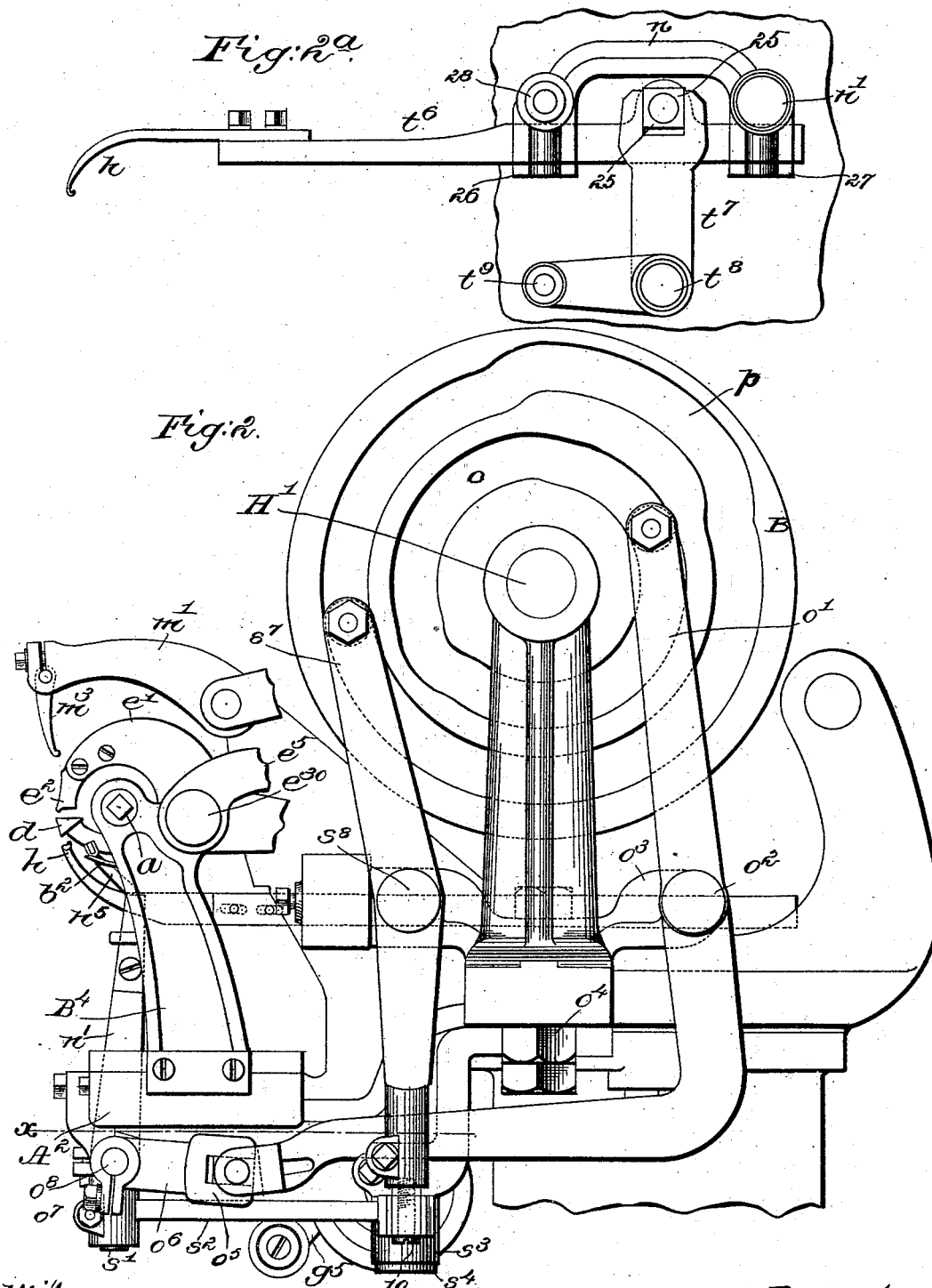
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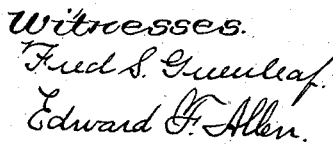
Witnesses.

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3 Sheets—Sheet 3.

Patented Aug. 28, 1894.



Inventors,  
Zachary T. French,  
William C. Meyer,  
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# UNITED STATES PATENT OFFICE.

ZACHARY T. FRENCH AND WILLIAM C. MEYER, OF BOSTON, MASSACHUSETTS.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 525,047, dated August 28, 1894.

Application filed November 16, 1891. Serial No. 412,072. (No model.)

*To all whom it may concern:*

Be it known that we, ZACHARY T. FRENCH and WILLIAM C. MEYER, of Boston, county of Suffolk, State of Massachusetts, 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.

10 This invention has for its object to simplify and improve the mechanism for presenting thread to a hooked needle of whatever form in a wax-thread sewing machine.

In this class of sewing machines it is a great desideratum to so manipulate the thread between the take-up or thread supply and the material, that the thread delivered to the hook of the needle may be of such length between the hook of the needle and the material, that 20 the thread, as the needle draws it through the material, will not rend, or scrape over the hook and thus be frayed and weakened. To overcome this difficulty, Turner and Craig, in United States Patent No. 116,893, dated July 25 11, 1871, combined with the usual thread-eye or thread-guide, which commonly contained the thread between the thread supply and the hook of the needle, what was called by them an auxiliary take-up, the function and purpose of the same being to engage the thread 30 between the eye of the thread-guide and the material, when the thread-eye was in a certain position, and draw through the thread-eye and between it and the material sufficient thread for the effective half of the next stitch to be made, and thereafter the thread-eye or guide in its further movement presented the thread, a bight of which was yet held by the auxiliary take-up, to the hook of 40 the needle, so that the needle, supplied with a measured quantity of thread, might draw the thread in loop form through the material without the thread rending or scraping across the hook of the needle during the formation 45 of the stitch. In this plan the needle thread never left the eye of the thread-guide, and the thread when acted upon by the hooked needle in forming a loop for a stitch, as by the main take-up in completing the stitch, was also drawn through the eye of the thread-guide, and without great care was taken on 50 the part of the operator as to the adjustment

of the parts, the thread would bear on the thread-guide and be drawn over and against it. In this class of machines the thread is 55 waxed, and much trouble is experienced by the wax clogging in and so closing the circular eye, and in a machine wherein the loop formed by the needle through the material is thereafter seized and expanded for the passage through it of a shuttle or other thread-carrier, the thread has to be drawn up for a considerable distance through the said eye, thereby removing the wax and injuring the surface of the thread, and in addition it is 65 often difficult to thread the closed or circular eye.

In this our invention, instead of employing, as always heretofore, a thread-eye having movements to first present its thread to some 70 sort of an arm or measuring device, and then to the hook of the needle, we have devised a thread-taker, and an open-throated thread-deliverer, and have by simple mechanical devices imparted to them simple substantially 75 straightforward movements whereby the thread-taker, immediately after setting the stitch, comes into position, acts on the needle-thread between the material and the take-up, and carries a portion of the said thread 80 aside and places it in the open side of the thread-deliverer, the take-up at such time yielding or giving up thread.

The thread-taker having put the needle thread into the open throat of the thread-deliverer, the needle approaches and enters the 85 material, and as the needle passes through the material the thread-deliverer starts toward it, while the thread-taker remains substantially at rest retaining its engagement 90 with the thread, and while the take-up continues to give up some of its thread, the said thread-deliverer moves and puts the thread held by it into the hook of the needle, the hook of the needle engaging the needle thread 95 at a point distant from the material substantially equal to the length of the effective or active side or half of the thread for the stitch to be made.

The hook of the needle having been supplied with thread, the needle is retracted, taking with it the thread presented to it by the thread-deliverer, and while the hook of the needle is approaching the material the said thread 100

deliverer supports the inactive side of the loop substantially free from tension, and the thread-taker holds a bight of the needle thread between the hook of the needle and the material; but as or about as the hook of the needle enters the material the thread-taker is moved toward the needle, and in its movement retires from engagement with the needle thread thus giving up to the needle the bight of thread held by it, and about as the needle completes its movement in drawing the loop, the thread-deliverer is moved to give up or discharge from its open throat the needle thread, thus leaving the said needle thread, while its loop is being entered by a shuttle or other thread-carrier, and the stitch is being finished, free between the take-up and the material.

Figure 1 in front elevation represents a sufficient portion of a wax-thread sole sewing-machine to enable our invention to be understood. Fig. 2 is a right-hand side elevation of the machine shown in Fig. 1. Fig. 2<sup>a</sup> shows the bar to which the thread-taker is attached, and its operative devices. Fig. 3 is a detail below the section line *x*, Fig. 2. Figs. 4 and 5 show developed the shapes of the grooves in the cams instrumental in imparting movement to the thread-taker. Fig. 6 is a plan view of the thread-taker. Fig. 7 is a plan view of the upper end of the thread-deliverer. Fig. 8 is a diagram to show parts of the work-support, the presser-foot, the needle, awl, thread-lifter or expander, thread-taker, and thread-deliverer, in the positions occupied by them after the awl has entered the material preparatory to feeding the same, the thread-taker and thread-deliverer occupying a position at one side of the awl segment in the direction of the feed. Fig. 9 shows the positions of the needle, and the thread-taker and thread-deliverer as the needle reaches substantially its full throw through the material; and Figs. 10 to 13 show yet other positions of the parts to be described.

The frame A of the head; the main-shaft A'; the slide-bar *t*<sup>6</sup>, having the loose block 25; the elbow lever *t*<sup>7</sup>, having at one end a notch to embrace the said block, and at its other end a roller or other stud *t*<sup>9</sup> to enter a groove *t*<sup>10</sup> in a cam C; the oscillating bar-carrier *n*, pivoted at *n*<sup>1</sup> and having guides 26, 27, for said bar, the roller or other stud 28 on said carrier adapted to enter a cam groove *n*<sup>2</sup> in cam D, are all substantially as in our Patent No. 473,870, dated April 26, 1892, except that the shape of the grooves in the cams D and C is somewhat altered. The bar in our said patent has attached to it a thread-eye, but herein the said bar carries at its outer end our thread-taker *h*, the shape of which is best shown in Figs. 2<sup>a</sup> and 6.

The hooked needle *b*<sup>2</sup>; the awl *a*<sup>2</sup>; the work-support *d*; the thread-lifter *m*<sup>3</sup>; the arm *m*<sup>1</sup> to which it is attached; the shuttle or second thread-carrier D<sup>4</sup>, the point of which is shown in Fig. 13; the main take-up *g*<sup>4</sup>; the auxiliary

take-up *g*<sup>4</sup>; the stand or bracket *g*<sup>20</sup>, on which is pivoted the said auxiliary take-up; the feed-slide B<sup>3</sup>; its upright B<sup>4</sup>, having a stud *a* on which in practice turns the awl segment, not shown; the guideway A<sup>2</sup>, in which the foot of the feed-slide moves as the awl acts to feed the material; the presser-foot *e*<sup>2</sup>; the lever *e*<sup>1</sup> to which it is attached; the lever *e*<sup>5</sup>; and the stud *e*<sup>30</sup>, are and may be all substantially as in our said patent; and in practice the parts referred to will in this our present invention be actuated substantially as and by devices fully described and shown in said patent; except the thread-taker, which in this invention is substituted for the thread-eye, and has given to it a movement differing from the movement of the thread-guide.

We have shown parts of the main and auxiliary take-up levers *g*<sup>4</sup> and *g*<sup>5</sup> see Fig. 1, but in practice we shall employ with said levers a thread pull-off, to pull off thread for the needle according to variations in thickness of the stock, and a thread-clamp; and the feed-slide will in practice be moved to enable the awl to feed the material, all as provided for in the said patent.

The main shaft A' has upon it a cam B, which is like the cam designated by like letter in said application, the peripheral groove B' in said cam acting as in said application to effect the movements of the feed-slide carrying the awl segment. This cam B, in this our present invention, is enlarged and provided at one side with two grooves *p* and *o*; or, if desired, a separate piece bearing such grooves may be applied to the said shaft.

The groove *o* receives in it a roller or other stud at the upper end of a lever *o*<sup>1</sup>, pivoted on a stud *o*<sup>2</sup>, held in a stand *o*<sup>3</sup>, bolted to the head or frame at *o*<sup>4</sup>. The opposite end of said lever *o*<sup>1</sup>, see Fig. 3, is represented as forked, and as receiving a block or roll *o*<sup>5</sup>, which is embraced by the forked end of an arm *o*<sup>6</sup>, represented as clamped by a screw *o*<sup>7</sup> on a rock-shaft *o*<sup>8</sup>, mounted in bearings *o*<sup>9</sup>, represented as attached to the guide-block A<sup>2</sup>. This rock-shaft *o*<sup>8</sup>, at its outer end, has clamped on or attached to it an arm *n*<sup>4</sup>, to which is secured in suitable manner our improved thread-deliverer *n*<sup>5</sup>, shown separately in Fig. 7, the said thread-deliverer as well as the thread-taker having each a sort of open throat or hook, as represented, to engage and retain temporarily the needle thread *r*, shown by dotted lines, Figs. 8 to 13, during the manipulations of the latter, as will be described, and its presentation to the needle in the formation of the stitch, the said thread being taken from a suitable tension device or thread supply, as in said application.

The rock-shaft *o*<sup>8</sup> has clamped on it two collars 2 and 3, preferably by screws. Between these collars, which may be of any suitable form, is a swivel-block *s*, having a stud *s*<sup>1</sup>, which is embraced loosely by the end of a lever *s*<sup>2</sup>, shown as an elbow lever, the hub *s*<sup>3</sup> of which is mounted on a stud *s*<sup>4</sup>, the other end

of said lever, see Fig. 3, being notched or forked for the reception of preferably a block  $s^5$ , mounted loosely on a stud 10 at the lower end of a lever  $s^7$ , pivoted on a stud  $s^8$ , the said lever at its upper end having a roller or other stud which enters the cam groove  $p$ .

From the foregoing description it will be understood that our invention as herein contained lies in the thread-presenting mechanism, the operation of which we will now describe.

Immediately after the stitch has been set, as provided for in the patent referred to, and as is customary in sole-sewing machines, the thread-taker  $h$  comes into position to act upon the needle thread between the material, supposed to be resting on the work-support  $d$ —, and the main take-up,  $g^5$  as in Fig. 8, and carries a portion of the needle thread  $r$  aside, as shown in Fig. 9, placing the needle thread in the open side of the thread-deliverer  $n^5$ , the take-up during this operation yielding or giving up thread. The thread-taker  $h$  having put the needle thread into the open throat of the thread-deliverer  $n^5$ , the needle  $b^2$  approaches and enters the material lying on the work-support  $d$ , as in Fig. 10, and as the said needle passes through the material, the thread-deliverer  $n^5$  starts toward it, while the thread-taker  $h$  remains substantially at rest. As the thread-deliverer starts and moves as described, the take-up  $g^5$  continues to give up the needle thread  $r$  to the thread-deliverer, and the said thread-deliverer in its continued movement puts the thread held by it into the hook of the needle, the hook of the needle engaging the said needle thread, however, at a point distant from the material substantially equal to the length of the effective or active side or half of the thread to be used in the stitch next to be made, as in Fig. 10. The active side of the thread is that connected with the material. The needle having had thread supplied to its hook by the thread-deliverer  $n^5$ , is retracted and takes with it the thread, and while the hook of the needle is approaching the material the said thread-deliverer supports the inactive side of the loop of thread, said thread being substantially free from tension, the thread-taker  $h$  at the same time holding a bight of needle thread, as in Fig. 10, between the needle and the material. As or about as the hook of the needle enters the material, the thread-taker is moved toward the needle, and in so doing retires from engagement with the needle thread, thus giving up to the needle the bight of thread held by it, as in Fig. 11; and about as the needle completes its movement in drawing the loop, the thread-deliverer, see Fig. 12, is moved toward the path in which the needle travels, thus giving up or discharging from it the needle thread to leave the said thread free from tension, while the loop-taker  $m^3$ , see Fig. 13, acts to spread or extend the loop of

needle thread for the entrance of the shuttle  $D^4$ .

Having described our invention, what we claim, and desire to secure by Letters Patent, 70 is—

1. A wax-thread sewing machine containing the following instrumentalities, viz;—a work-support; a take-up located at the back or rear side of said work-support; a hooked needle located at the face side of said work-support; a thread-taker; and an open-throated thread deliverer located between the take-up and the rear side of said work-support; means to actuate said thread-taker and thread-deliverer with relation to the hooked needle in manner substantially as hereinbefore described, whereby the thread-taker is enabled to take the needle-thread between the take-up and the work-support and draw it across and into the thread-deliverer, the latter thereafter presenting the thread held by it to the hook of the needle, the thread-taker and the thread-deliverer operating in succession to give up or retire from the thread as the needle draws the loop presented to it through the material, substantially as described.

2. A work-support; a take-up located at the rear side thereof; a hooked needle located at the face side of said work-support; an open-throated thread deliverer; and a thread-taker normally out of engagement with the needle thread; combined with means to move the thread-taker laterally away from the needle and to cause it to engage the needle thread near the work-support preparatory to the passage of the needle through the material and to put said thread into said open-throated deliverer; and with devices to move the said thread-deliverer laterally in an opposite direction across the path of the needle while the thread-taker continues to hold said needle thread, said thread-deliverer depositing the thread placed upon it by the thread-taker into the hook of the needle; and devices to cause the thread-deliverer and thread-taker to retire from the thread in succession during the operation of forming a loop of needle thread in the material, substantially as described.

3. The rock-shaft  $o^3$ , its arm  $n^4$  and attached thread-deliverer  $n^5$ , combined with levers  $o'$ ,  $s^7$  and intermediate devices to both rock and reciprocate the said rock-shaft; and the thread-taker  $h$ ; the bar  $t^6$  to which it is attached; and devices to reciprocate and oscillate said bar; a hooked needle; and a work-support, the combination being and operating substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ZACHARY T. FRENCH.  
WILLIAM C. MEYER.

Witnesses:

GEO. W. GREGORY,  
EMMA J. BENNETT.