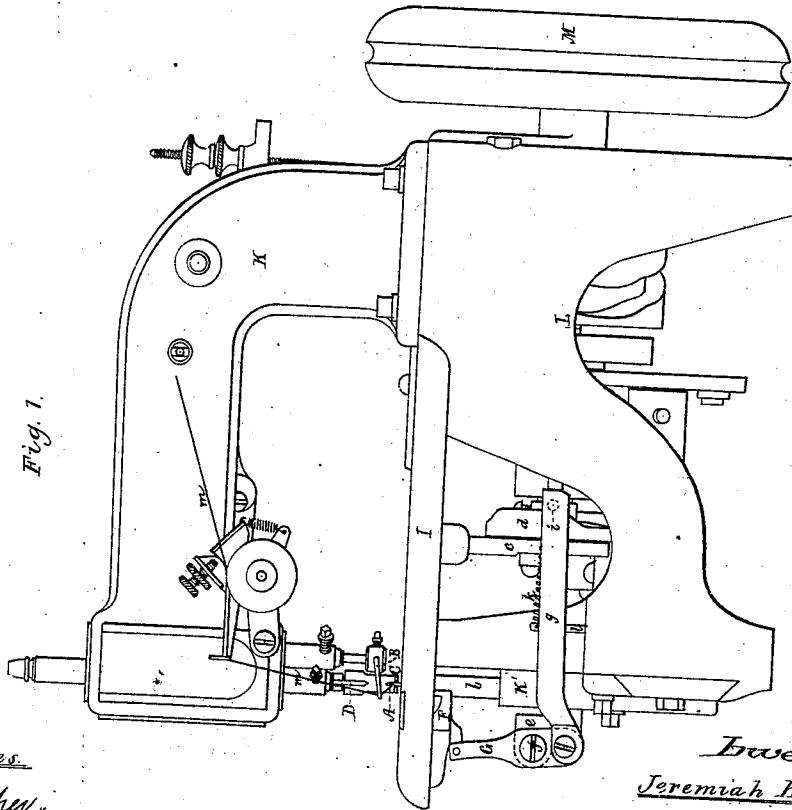
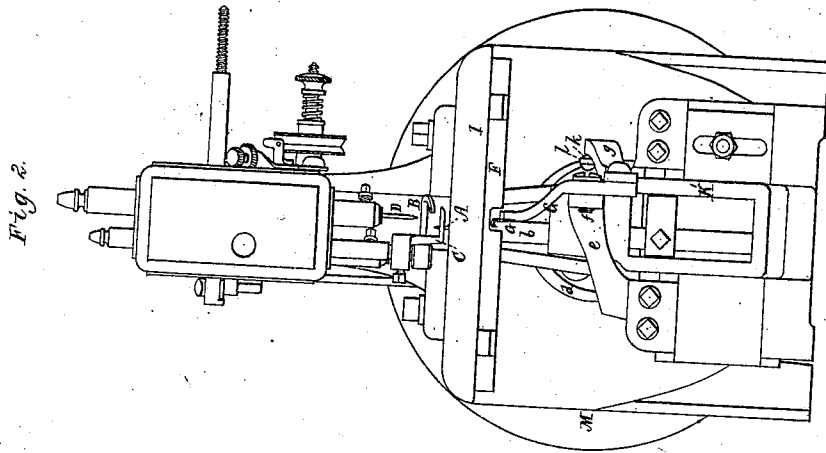


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Witnesses  
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*L. H. Miller.*

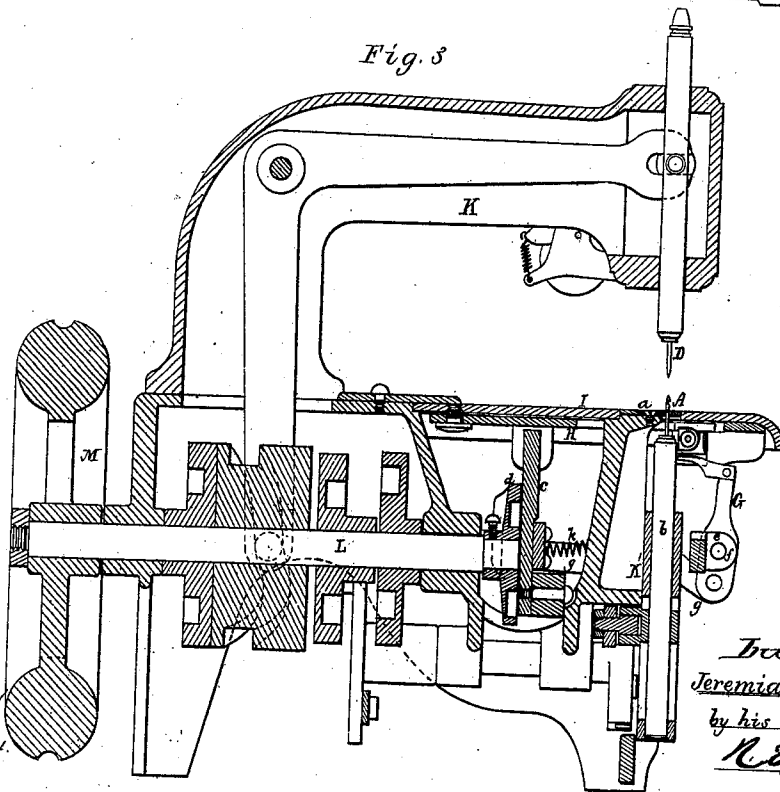
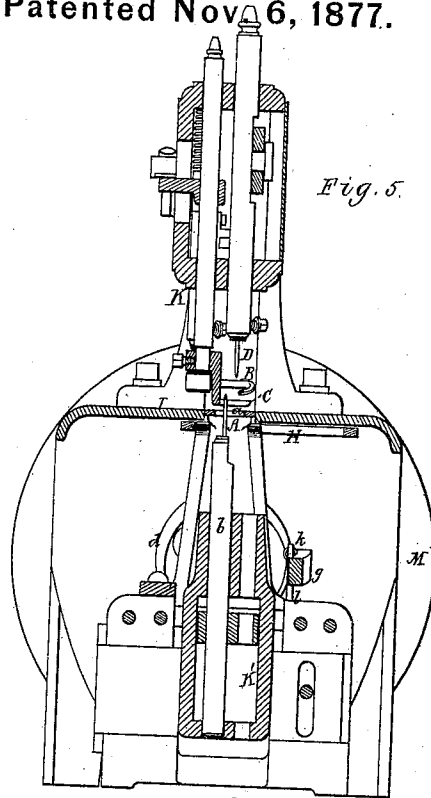
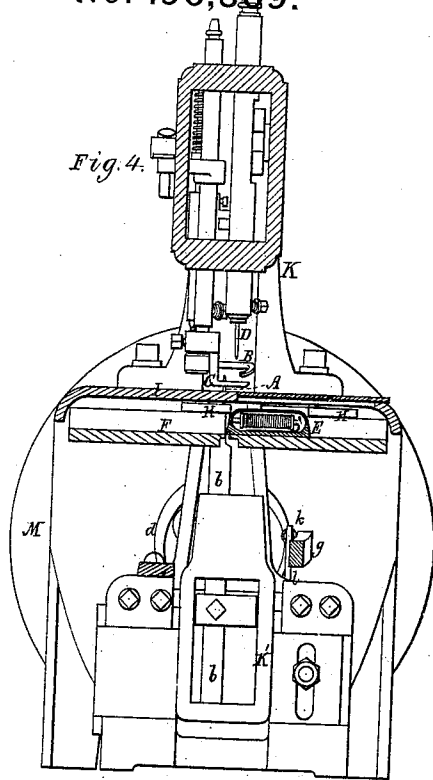
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Fig. 6.

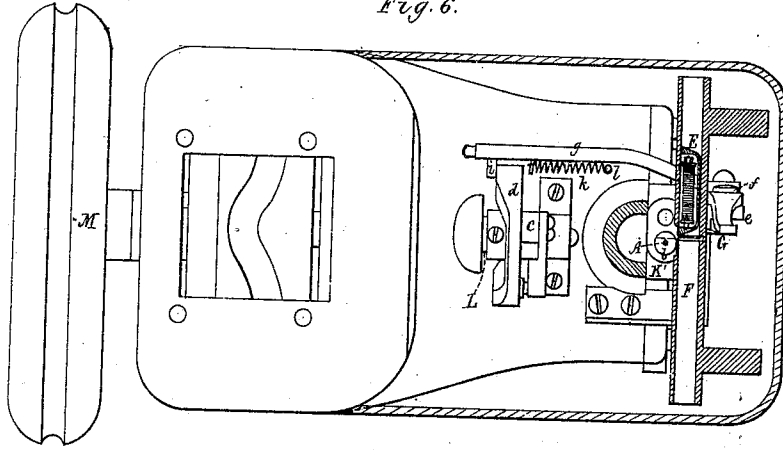


Fig. 8.

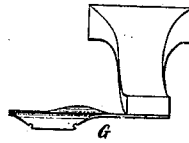
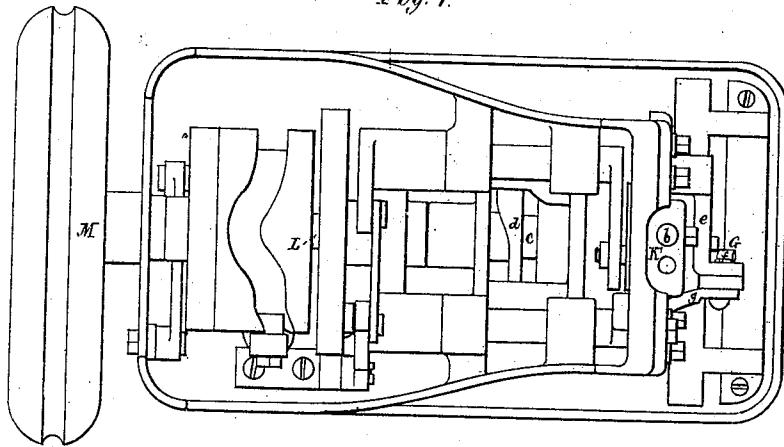


Fig. 7.



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# UNITED STATES PATENT OFFICE.

JEREMIAH KEITH, OF PROVIDENCE, RHODE ISLAND.

## IMPROVEMENT IN WAX-THREAD SEWING-MACHINES.

Specification forming part of Letters Patent No. **196,809**, dated November 6, 1877; application filed June 5, 1876.

*To all whom it may concern:*

Be it known that I, JEREMIAH KEITH, of the city and county of Providence, and State of Rhode Island, have invented a new and useful Improvement in Sewing-Machines; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, Fig. 2 a front-end view, and Fig. 3 a longitudinal section, of one of my improved machines, the plane of section of Fig. 3 being taken through the hooked needle. Figs. 4 and 5 are transverse sections of the machine, one being through the shuttle-race, and the other through the needle. Fig. 6 is a horizontal section taken through the shuttle-race. Fig. 7 is an under-side view of the machine.

This machine is specially adapted to sewing with a waxed thread, and consequently is intended for sewing articles of canvas or leather. It can be used, however, to sew a thread not waxed.

In carrying out my invention I employ a two-nosed shuttle, a "hooked needle" rather than what is termed an "eye-pointed needle," which will not operate well with a waxed thread, on account of the wax collecting in the eye and groove of it to such an extent as to prevent or hinder the free passage of the thread through the needle.

In the drawings, A denotes the hooked needle; B, the looper; C, the presser; D, the awl; E, the two-nosed shuttle; F, the shuttle-race; G, the loop-opener; H, the shuttle-driver, and I the table or frame; and K, the goose-neck of the machine. The main or driving shaft is shown at L as provided with the fly-wheel M. The hooked needle has its point upward, and is to work through the base-plate *a*. The needle projects from a bar or carrier, *b*, that slides vertically in a carriage, *K'*, provided with mechanism for imparting to it reciprocating movements for effecting the feeding of the work by means of the needle.

The mechanism for operating the needle, whether to move it into and out of the work, or to move it to effect the feeding of the work, and the mechanism for operating the awl, the presser, and the threader are such as is ordinarily used in wax-thread sewing-machines

having a hook-needle, and making thereby a chain-stitch. Such is not my invention, and, though shown in whole or in part in the drawings, need not be described.

In carrying out my invention I have applied to such devices or parts of a sewing-machine a two-nosed shuttle—that is, one having a nose or point at each end—and a loop-opener with their operative mechanism. The said shuttle E and its race F are arranged with the base-plate and needle, as shown. The shuttle-driver H is a fork pivoted to the base-plate, and having its prongs extended into the race. An arm, *c*, projecting down from the fork and pivoted at its foot to the frame, has a stud projecting from it into the groove of a cam, *d*, fixed upon the driving-shaft, the whole being constructed and applied so as to impart to the shuttle its necessary reciprocating movements within its race.

The loop-opener G (represented in top view in Fig. 8) is pivoted to and extends below a stationary arm, *e*, projecting from the frame, the pivot being shown at *f*. A slide-bar, *g*, jointed to the lower part of the loop-opener, extends through a guide-hole in the frame. A stud, *i*, projecting from the bar on its inner side rests against the cam *d*, which is to be suitably formed for imparting to the bar its proper movement inward. A spring, *k*, fixed to the slide-bar *g*, and to a foot, *l*, extending up from the frame, serves to move the slide-bar in the opposite direction.

The operation of the machine may be thus described: The thread *m*, after having been duly waxed, passes through the eye of the looper, and thence under the hook of the needle, the needle being then suffered to be in the work with the hook extending above the latter. Next, the needle descends and draws the thread in the form of a loop down through the work. The loop-opener catches into the loop and draws it (while held by the hook) outward into the path of the shuttle, and subsequently away from and off the needle during the ascent of the latter. The shuttle is driven through the loop, and carries into and through it the binding-thread extending from the bobbin of such shuttle. After the formation of each loop it is thus caught by the loop-opener, and, while held by the needle, is drawn open and aside

into the path of the shuttle, such loop being disengaged from the needle while the latter is in the act of ascending, the necessary movements of the awl, the presser, the threader, and the needle, to complete the stitch and effect the feeding of the work, taking place in the order required. The shuttle, during each movement of it, either forward or backward, passes through a loop.

I do not claim an eye-pointed needle in combination with a two-nosed shuttle, as such, when used, requires no threader or loop-opener and cast-off, such as are necessary to a hook-needle when employed with a shuttle and for sewing with a waxed thread. The eye-pointed needle, as hereinbefore stated, cannot be used to advantage for "wax-thread sewing." Furthermore, in my machine the hook-needle performs the function of feeding the material to be sewed, and operates with an awl. With the double-nosed shuttle passing through a loop during each rectilinear movement of the shuttle, sewing with a wax-thread can be accomplished not only in very much less time, but better and stronger than when the shuttle may pass, in the direction opposite to the feed, but once through a loop during every two movements of such shuttle. Thus the double-nosed shuttle, with the accessories necessary to the production of wax-thread sewing, is productive of new and useful effects, as, by causing the binding-thread to be wound entirely around the thread of every other stitch instead of sim-

ply going through each stitch, as it would were a single-nosed shuttle used, as stated, there results a very much greater extent of adhesion of the wax-thread and the binding-thread than follows from the single-nose shuttle, and thus the sewing is much stronger and more durable. By the mechanism for operating the double-nosed shuttle, especially the cam *d* thereof, such shuttle is caused to be thrown forward through one loop and backward through the next one.

I therefore claim as my invention—

A wax-thread sewing-machine having the following elements or instrumentalities in combination, and to operate substantially as set forth, viz: an awl to puncture the material to be sewed, a hook-needle to aid in making the stitches and to feed the material along, a threader to lay the waxed thread into the hook of the needle, a loop opener or spreader and cast-off, a presser to hold the material in place while the needle and the awl may be passing into and out of it, and a double-nosed shuttle, as described, that during each of its reciprocating movements shall carry a binding-thread through a loop formed by the loop opener or spreader, all being arranged essentially in manner, and having mechanism for actuating them, as set forth.

JEREMIAH KEITH.

Witnesses:

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