

(No Model.)

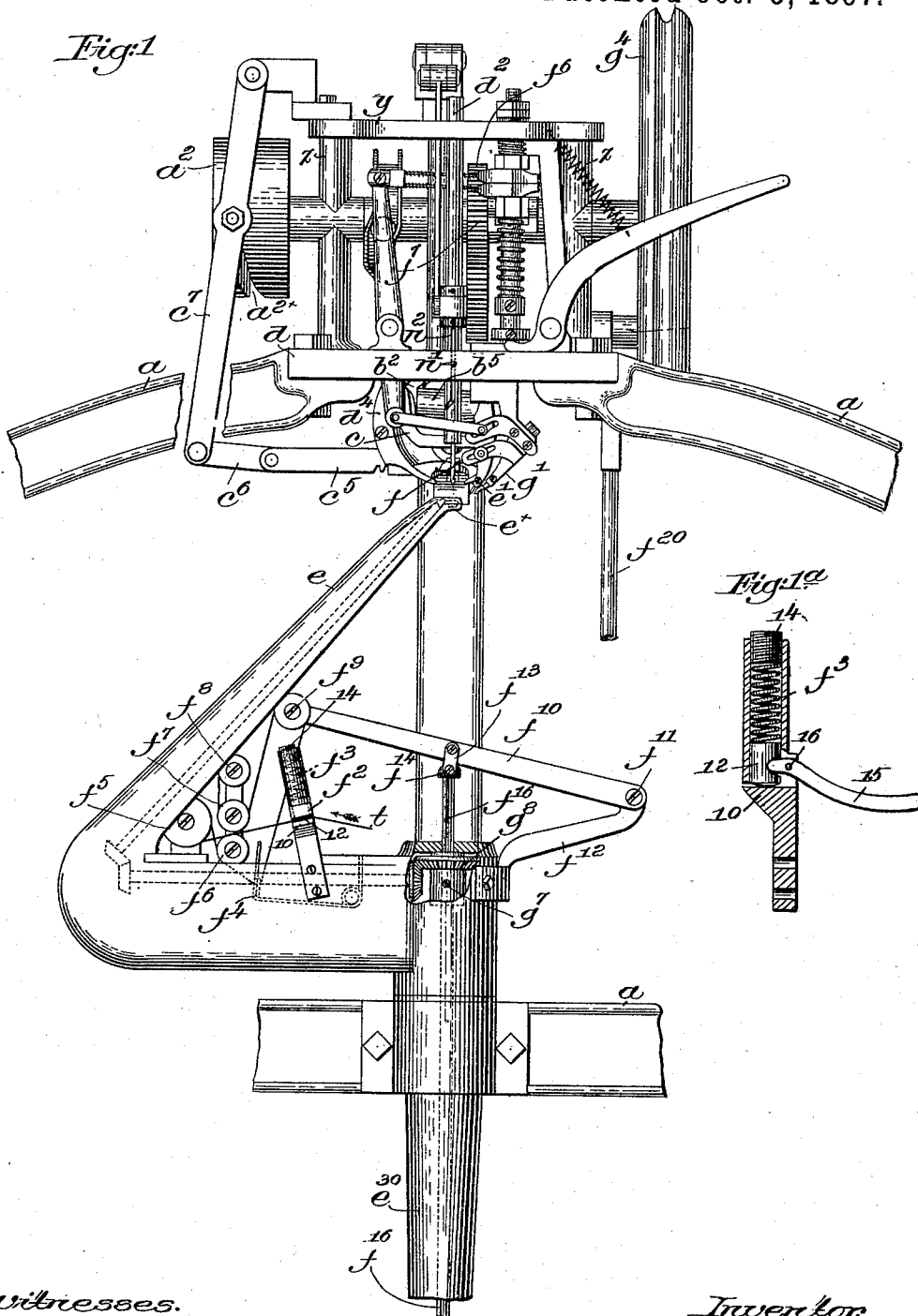
5 Sheets—Sheet 1.

T. K. KEITH.
SEWING MACHINE.

No. 591,044.

Patented Oct. 5, 1897.

Fig. 1



Witnesses.
Fred S. Gifford.
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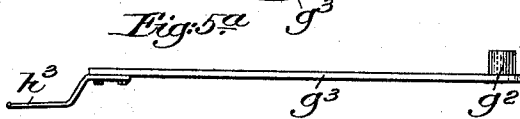
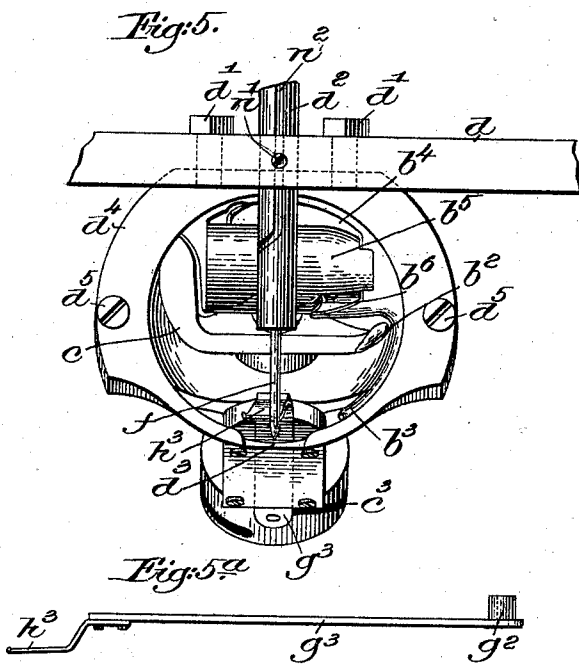
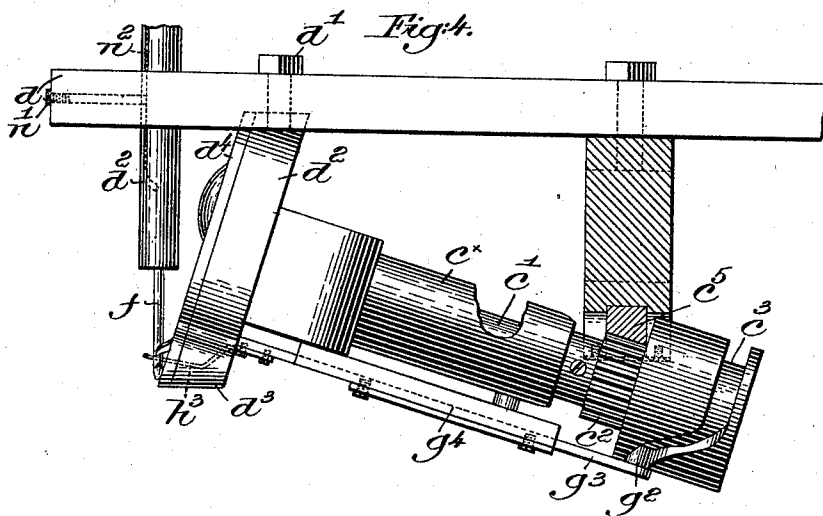
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T. K. KEITH.
SEWING MACHINE.

No. 591,044.

Patented Oct. 5, 1897.



Witnesses

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(No Model.)

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T. K. KEITH.
SEWING MACHINE.

No. 591,044.

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Fig. 6.

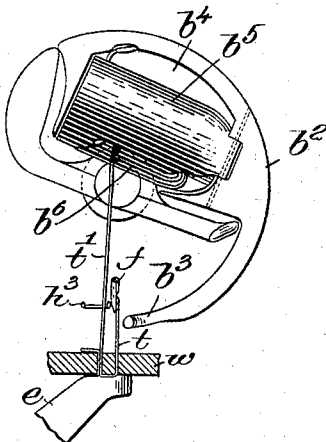


Fig. 7.

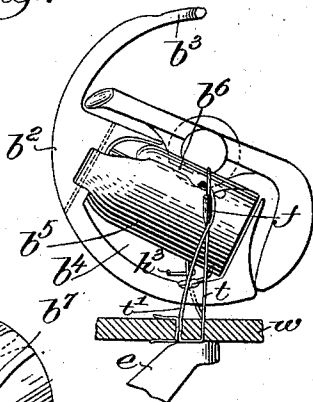


Fig. 9.

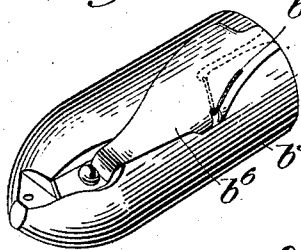
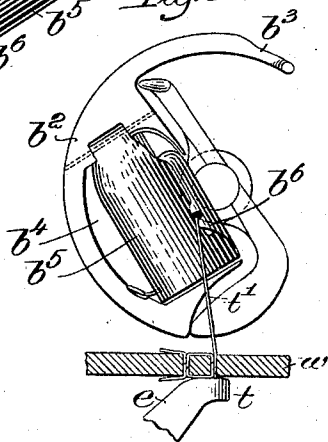


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

THOMAS K. KEITH, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE KEITH
LASTING MACHINE COMPANY, OF KITTERY, MAINE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 591,044, dated October 5, 1897.

Application filed September 16, 1896; Serial No. 606,013. (No model.)

To all whom it may concern:

Be it known that I, THOMAS K. KEITH, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in 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 the production of a novel sewing-machine, it presenting a horn provided with means to supply a thread to a hooked needle, said needle drawing the needle-thread above the top of the horn to form a loop to be entered by a shuttle containing a second or shuttle thread to thus make a lock-stitch, said stitch being used to sew together soles of shoes placed on the horn in usual manner.

15 In my improved machine the horn is provided with a suitable take-up to act on and take up the loop of needle-thread as required, and this take-up operates equally well in whatever position the horn may be placed in the sewing operation.

20 So, also, in this my invention I have shown one of the usual shafts for rotating the usual whirl of the horn as adapted to slide in addition to its usual rotation, it being thereby adapted to cooperate with the take-up herein shown.

25 To enable the loop of needle-thread to be cast quickly from the hook of the needle, I have grooved the needle-bar and placed a pin or stud in said groove to impart a quarter-turn to the said bar and its attached needle as they approach the upward extremity of their movement, thus freeing the needle-loop and letting it escape from the hook and pass off the heel of the shuttle.

30 Figure 1 is a partial front elevation of a sewing-machine embodying my invention, some of the parts being broken out to more clearly illustrate other parts. Fig. 1^a is a detail showing part of the thread-clamp. Fig. 2 is a right-hand side elevation of the parts shown in Fig. 1. Fig. 3 is a right-hand side view and section of the lower part of the frame of the machine and devices supported upon it removed from Fig. 2. Fig. 3^a is a detail showing a part of one of the shafts' instru-

mental in rotating the usual whirl and also employed to actuate the usual take-up. Fig. 4 is an enlarged detail elevation chiefly to show the shuttle-race and means for moving the shuttle and the shuttle-thread pusher. Fig. 5 is a front elevation of the devices shown in Fig. 4; Fig. 5^a, a detail view of the shuttle-thread pusher h^3 and its carrying-bar. Figs. 6, 7, and 8 show different positions of the shuttle in making the stitch; and Fig. 9 is an enlarged detail of the bobbin-case.

The framework, the head composed of the top and bottom plates y d , separated by columns z , used for the support of the main shaft x , the rising and falling presser-foot g' , the feeding device e' , the needle-bar d^2 , and needle f , except as hereinafter described, the horn e , having a hollow shank e^{30} and a whirl e^x in its tip to supply the hooked needle with thread, and the shafts in the rotating horn to rotate the whirl are and may be all as in United States Patent No. 36,163, dated August 12, 1862, and the toothed segmental lever f^x , engaging the pinion f' on the lowermost shaft of the series of shafts for moving the usual whirl, the link f^2 , elbow-lever f^3 , rod f^4 , lever f^5 , and cam-gear f^6 , rotated by a gear f^7 , fast on the shaft x , are all substantially as common in United States Patent No. 107,155, so need not be herein further described.

To the under side of the plate d I have attached, by a screw d' , (shown in Fig. 4,) a shuttle-race d^2 , the same occupying, as shown, an inclined position, (see also Fig. 2,) the lower part d^3 of the said race terminating a little above the work lying on the top or tip of the usual horn.

The shuttle-race has at its right-hand side (see Figs. 2 and 4) a cap d^4 , kept in place by suitable screws d^5 , said cap keeping the shuttle b^2 in the said race. The shuttle shown has a long nose or beak b^3 and is open at b^4 to receive a bobbin-case b^5 , provided with a suitable tension device b^6 , shown as a spring, to bear on the shuttle-thread b^7 , said bobbin-case containing a second thread. This shuttle is engaged by a driver c , fast on a shaft c' , supported by a long bearing c^x , shown as extended backwardly from the shuttle-race, and provided with a pinion c^2 and a grooved cam c^3 , said pinion being engaged by a rack-

bar c^5 , actuated by a link c^6 and lever c^7 , said lever being provided with a roller or other stud which enters a cam-groove a^{2x} of a cam a^3 , fast on the shaft x . The reciprocation of the said rack c^5 imparts an oscillating motion to the shuttle, so that it passes through the loop drawn by the needle f from the tip of the horn and then moves backwardly to its starting-point preparatory to again entering and passing through a second loop of needle-thread.

The whirl e^x , shown partially by dotted lines in the tip of the horn, has, as usual, a hole through which is passed the thread t , which is supplied to the hooked needle, and this thread on its way to the whirl is passed through a clamping device f^2 , it being shown as composed of a stationary jaw 10 and a movable part 12, under the control of a spring f^3 , and from thence the thread passes about a sheave f^5 , back under a roll f^6 , through an eye in a spring-acting take-up f^4 , and thence over a sheave f^9 on the end of a take-up lever f^{10} , and thence under a sheave f^7 and against the side of a sheave f^8 to the whirl in the tip of the horn.

The take-up lever f^{10} is pivoted at f^{11} on an arm or bracket f^{12} , extended from a part of the usual rotating horn, the said lever f^{10} having connected to it by a link f^{13} a socket f^{14} , which receives a screw f^{15} , (see Fig. 3^a,) said screw being inserted in a rod f^{16} , so that said rod may turn freely in said socket, the lower end of said rod being extended down through the hollow shank e^{30} of the horn, where it is provided with a grooved collar f^{17} , said groove receiving the forked end of a lever f^{18} , pivoted at f^{19} and having connected to its opposite end a rod f^{20} , (see Fig. 3,) the upper end of which is attached to a lever f^{21} , pivoted at f^{22} and having a roller or other stud f^{23} , which enters a cam-groove g^3 , (shown only in dotted lines, Fig. 2,) said groove being made in the inner side of the usual driving or balance wheel g^4 , which is removed from Fig. 2 to better show working parts of the machine. The cam referred to through the lever f^{21} raises and lowers the rod f^{16} and actuates the take-up f^{10} , so that its sheave f^9 draws upon the needle-thread to take up the loop of needle-thread after the shuttle has been pressed through it.

The rod f^{16} is provided with a longitudinal groove f^{24} , (see Fig. 3^a,) in which enter suitable pins g^6 g^7 , carried by the gears f' and g^8 , so that said gears may rotate with said shaft f^{16} to rotate the whirl in usual manner and also let the said rod slide up and down in said gears when it is necessary to actuate the take-up, the said shaft f^{16} thus performing two duties.

The cam c^3 on the shaft c' receives a roller or other stud g^2 on a slide g^3 , adapted to be reciprocated in a guideway g^4 , secured to the bearing for the shaft, the forward end of said slide having fixed to it a shuttle-thread pusher h^3 , which, after the needle has drawn

up a loop of needle-thread and preparatory to the beak of the shuttle entering, said loop is moved forward or to the left in Figs. 2 and 4 to act on the shuttle-thread at a point between the shuttle and the surface of the work to push the said shuttle-thread aside out of the path of movement of the beak of the shuttle, so that said beak cannot by any accident catch the shuttle-thread. Immediately after the beak of the shuttle gets into the loop of needle-thread said pusher is retracted out of the way of the shuttle. The shuttle-thread is marked t' and the work or stock w .

The shuttle has imparted to it an oscillating movement. Fig. 6 shows the shuttle in its starting position, and Fig. 8 shows said shuttle as having reached the end of its movement, the loop of the needle-thread through which the shuttle has just passed having been cast off the said shuttle and drawn up by the take-up. As the shuttle enters the loop of needle-thread the bobbin-case approaches the work, and in so doing gives up thread to the loop of needle-thread as the latter is being drawn back through the work by the take-up, the shuttle thread so supplied being sufficient to reach from one to the next stitch, and as the shuttle returns from its position Fig. 8 backwardly into its starting position, Fig. 6, the bobbin-case is moved away from the work, which results in tightening the stitch and also in pulling off a small quantity of shuttle-thread for the next stitch.

This invention is not limited to the exact form of shuttle shown, nor to the particular tension device connected with it, nor to the particular construction of the take-up.

Instead of the usual whirl to be herein used and common to the McKay machine I may use any other thread-presenting mechanism to supply the hooked needle with needle-thread, and hence in the claims I shall designate the said whirl as the "needle-thread-presenting device."

The part 12 of the thread-clamp is shown as a plunger having a notch (see Fig. 1^a) to be entered by the short arm of a lever 15, pivoted at 16, said lever being struck by the take-up in its descent to lift the part 12 and release the needle-thread to supply thread to the rising needle. The part 12 is normally kept closed on the thread by the spring f^3 in the tube 13, said spring being made adjustable by a suitable screw 14.

The needle f (shown in Fig. 6) is represented as having drawn the needle-thread to form a loop thereon for the beak of the shuttle to enter, and this needle continues to rise and hold, draw and enlarge the said loop as the shuttle is passing through it, but just before the needle reaches its highest position an inclined part n^3 of a groove n^2 in the needle-bar reaches the pin or stud n' , held by the plate d , and causes the said needle-bar and its needle to be turned quarter-way around, which turns the hook of the needle aside and frees the loop of needle-thread from it, so that said

loop is left free to pass onto and then be discharged from the shuttle.

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

1. In a sole-sewing machine, the following instrumentalities, viz: a hooked needle, means to actuate it; a rotating horn; a needle-thread-presenting device; a take-up lever mounted on said horn, a rod extended through the shank of said horn and loosely connected with the said take-up lever, a gear keyed on said rod to actuate said needle-thread-presenting device, a shuttle, and means to actuate said shuttle to pass it through the loop of said needle-thread, substantially as described.

2. In a sole-sewing machine, the following instrumentalities, viz: a hooked needle, means to move it; a rotating horn, a needle-thread-presenting device; a take-up carried by said horn, means to actuate said take-up and said needle-thread-presenting device, a shuttle and means to actuate said shuttle to pass it through the loop of said needle-thread, and a pusher to act on the shuttle-thread and push it aside to prevent the point of the shuttle from catching said shuttle-thread, substantially as described.

3. A hooked needle, means to move it, a rotating horn provided with thread-presenting mechanism, a take-up lever mounted on said horn, a rod connected therewith loosely and extended through the shank of the horn, and means to reciprocate said rod in said spindle to actuate said take-up lever, com-

bined with a shuttle-race occupying a diagonal position above and at the rear of the tip of said rotating horn, a shuttle and means to actuate it in said race, substantially as described.

4. The rotating horn having a hollow shank, a thread-presenting device or whirl in the tip of said horn, a rod inside the shank of the horn, means to rotate and slide said rod, a gear splined on said rod, gears and shafts intermediate the gear loose on said rod and the whirl to rotate the latter, combined with a take-up lever connected loosely to one end of said rod, whereby the said rod is adapted to not only operate the take-up but also the whirl, substantially as set forth.

5. The hooked needle, means to actuate it, the rotating horn having a thread-presenting device to cooperate with said needle, and a shuttle-race located at one side and above the center of motion of the tip of said horn, a shuttle in said race, a driver having an attached shaft provided with a pinion, and a grooved cam, means to rotate said driver-shaft, and a shuttle-thread pusher, combined with means between said grooved cam and said pusher to actuate the latter, substantially as described.

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

THOMAS K. KEITH.

Witnesses:

MARGARET A. DUNN,
ADDIE F. DANIELS.