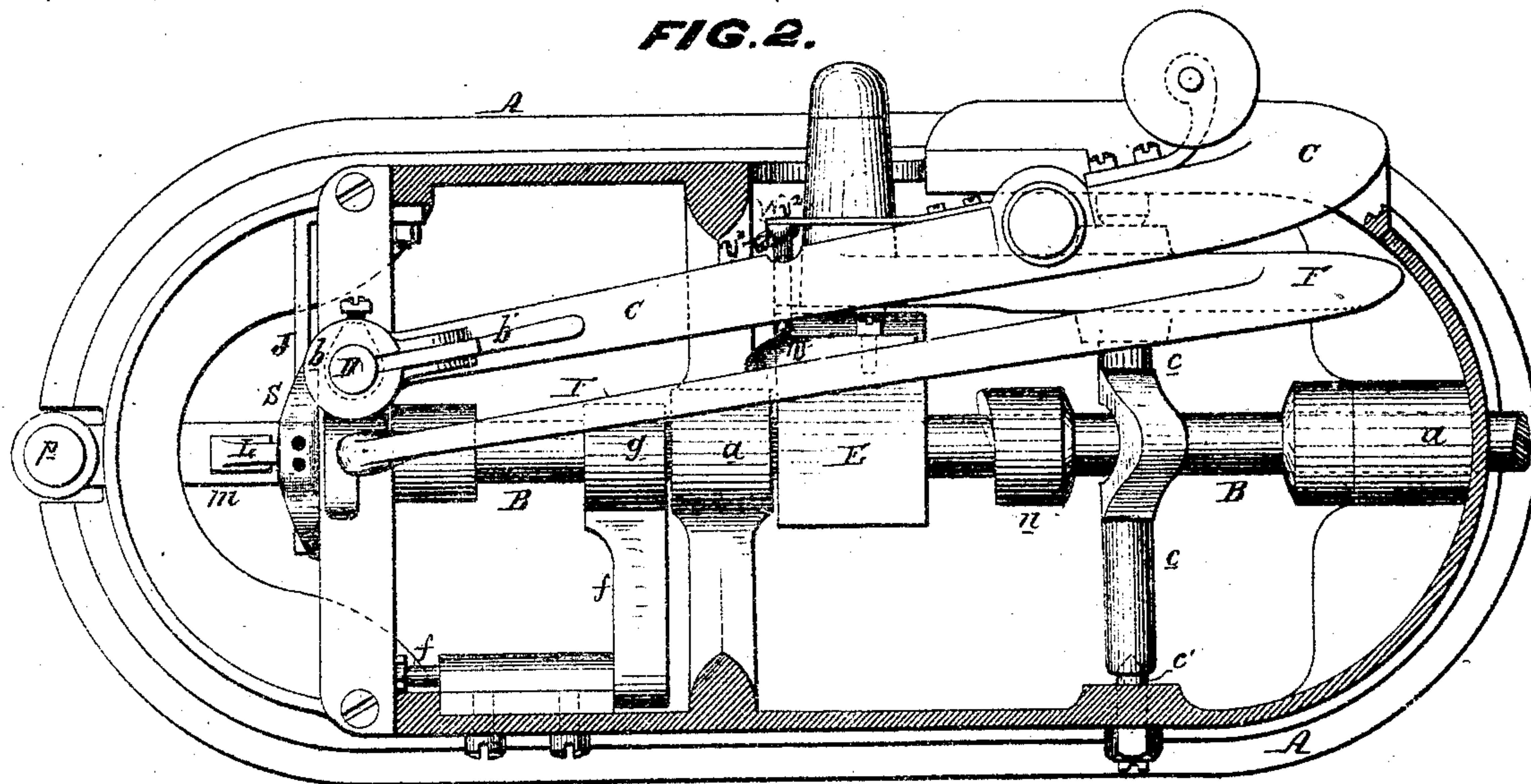
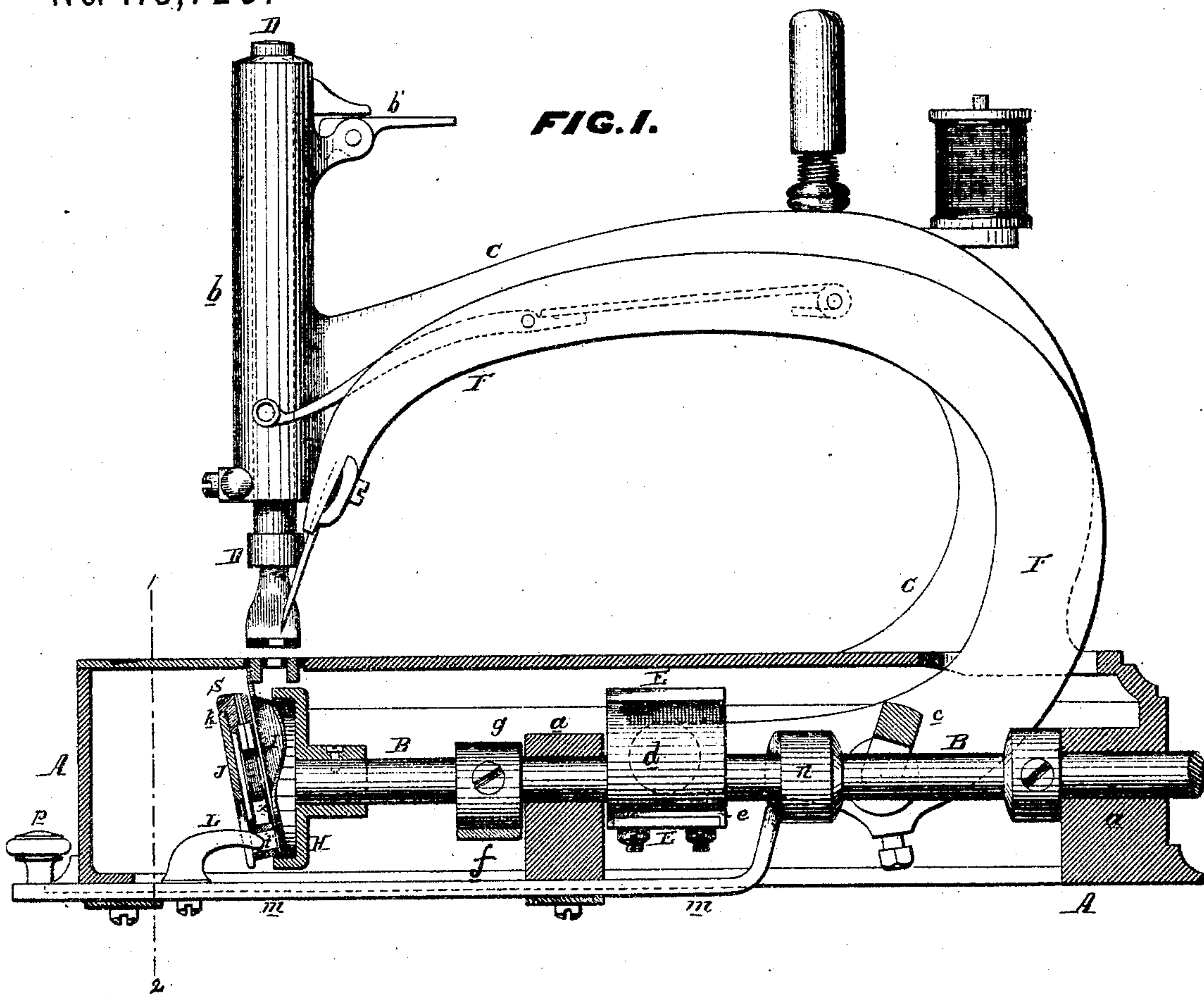


Improvement in Sewing Machines.

No. 118,728.

Patented Sep. 5. 1871.



WITNESSES

*John Parker*  
*Mr. B. Harding.*

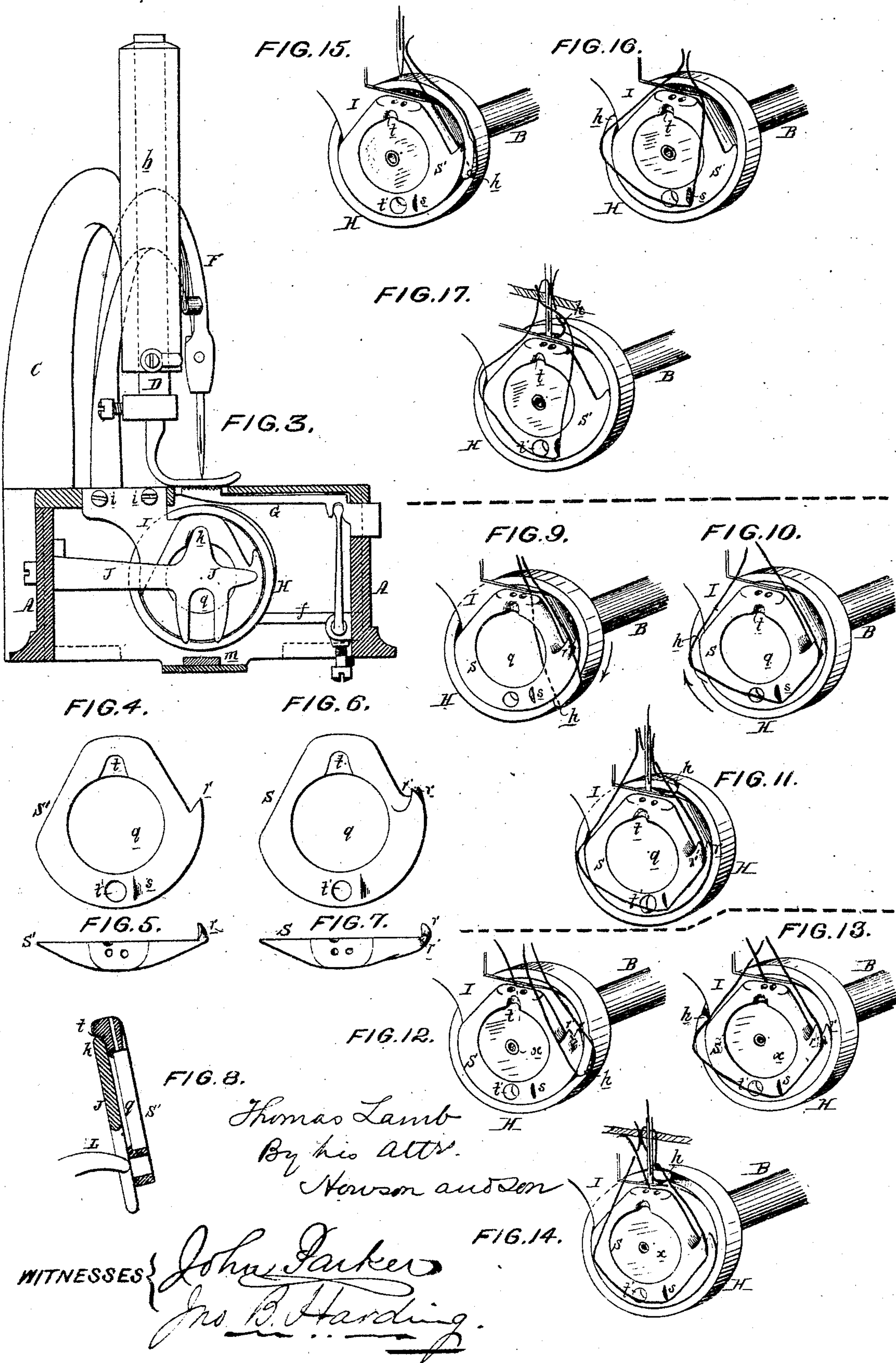
*Thomas Lamb*  
*by his attys.*  
*Howson and Son*



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# UNITED STATES PATENT OFFICE.

THOMAS LAMB, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 118,728, dated September 5, 1871.

*To all whom it may concern:*

Be it known that I, THOMAS LAMB, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improved Sewing-Machine, of which the following is a specification:

My invention consists of a sewing-machine fully described hereafter, the main peculiarity and advantage of which is its adaptability to the formation of three distinct kinds of stitches without requiring any tedious and complicated adjustment, or removing and replacing of its parts.

Figure 1, Sheet 1, is a vertical sectional view of my improved sewing-machine; Fig. 2, a plan view of the same with the top or work-plate removed; Fig. 3, Sheet 2, a transverse section on the line 1 2, Fig. 1; Figs. 4, 5, 6, 7, 8, detached views of parts of the machine; Figs. 9, 10, 11, 12, 13, 14, 15, 16, and 17, detached perspective views illustrating the method of forming the different stitches.

A represents the frame or bed-plate of the machine; B, the longitudinal driving-shaft, turning in bearings *a a* of the frame; and C, the fixed arm bolted to or forming part of the frame, and having at its outer end a tubular enlargement, *b*, on which slides the spring presser-bar D, the latter being provided with the usual cam-lever *b'* for raising it above the work-plate. The curved needle-arm F is hung to a transverse rock-spindle, *e*, which turns upon set-screws *e'* passing through the opposite sides of the bed-plate, and the said needle-arm receives its motion from a cam, *d*, on the driving-shaft, through the medium of a forked swivel-bar, E, hung to a tubular projection of the arm and embracing the cam. A detachable plate, *e*, is interposed between the lower forked end of the swivel-bar and the operating-cam, and is arranged to be raised by its set-screws close up to the cam when the parts become worn and begin to work loosely. The feed-bar G is arranged beneath the work-plate and is operated by a cam, *g*, on the driving-shaft, and bell-crank lever *f* hung to one side of the bed-plate. To the extreme inner end of the driving-shaft, at a point directly beneath or slightly to the rear of the path of the needle, is secured a cup-shaped plate or disk, *h*, upon one edge of which is formed a looping-hook, H. Into this looper H extends an inclined curved plate, I, which is firmly secured at its upper edge by screws *i i*, or otherwise, to the bed-plate of the

machine. (See Figs. 1 and 3.) An arm, J, secured to one side of the bed-plate, extends across the face of the looper at a short distance outward from the plate I, the said arm having at the top a rounded projection, K, and being forked at the bottom, as best observed in Fig. 3, so as to permit the passage, between the forked portions, of a curved finger, L, secured to or forming part of a bar, *m*, which slides in suitable guides in the bed-plate, and is acted on by a spring and by a cam, *n*, on the driving-shaft in such a manner as to impart an intermittent reciprocating movement to the said finger L toward and from the plate I and looper H. The bar *m* is also provided at its outer end with a knob, *p*, by which it can, together with the finger, be drawn outward, the spring which acts upon the bar yielding sufficiently to permit such movement. The course of the loop of needle-thread and the character of the stitch formed by the machine are determined, in the manner fully described hereafter, by an annular plate or loop-distender and bobbin-holder, S or S', Figs. 4, 5, 6, 7, and 8, which is adapted to the space formed for its reception between the plate I and arm J in front of the looper H. The annular plate S' is of the peculiar shape best observed in Figs. 4 and 5; has a circular opening, *q*, in the center for the reception of a bobbin, a projection, *r*, at one side, and an abrupt shoulder, *s*, on its front face close to the bottom. The said annular plate has also, near the top, a recess or shoulder, *t*, by which it is suspended from the projection *k* of the arm J when fitted into its place, and a hole, *t'*, at the bottom, into which extends the curved finger L, the latter holding the said annular plate in place, and serving, also, under the circumstances described hereafter, to lift the same clear of the projection *k* of the arm J, in order to permit the passage of the loop of needle-thread. The annular plate S is precisely similar to the plate S', except that it has, in addition to the projection *r* and in front of the latter, a hook, *r'*.

The machine is adapted to the formation of three distinct kinds of stitches, viz.: the ordinary lock and chain-stitches, and a third, which I have termed a "lock-chain stitch," formed by interlocking an under or bobbin-thread with the loops of an ordinary chain-stitch.

To form the chain-stitch, the annular plate S, unprovided with a bobbin, is dropped into its



place between the plate I and arm J, the finger L being drawn and held back by means of the knob *p* until the said annular plate hangs suspended from the projection *k*, and being then permitted to spring forward until it enters the hole *t'* in the plate, and thus retains the latter. The machine is then set in motion, the needle reciprocating as usual and extending downward through the hole in the work-plate to a point between the plate I and looper H, and the latter being simply rotated in the direction of the arrow, while the annular loop-distender, owing to the manner in which it is held, remains stationary. When the needle has reached the limit of its downward movement and commences to rise the hook *h* of the looper catches the thread and carries the same around with it and away from the needle, so as to form a loop, as shown in Fig. 9. One portion of the loop is carried behind the distending-plate S, and the other portion in front of the same and between the hooks *r* and *r'*, the thread being retained by the latter and by the shoulder *s* of the plate until the loop has been carried entirely around and withdrawn from the rear of the plate by the looper, as shown in Fig. 10, the said hooks and shoulders serving, in other words, to distend the loop so that the needle, on descending a second time, may pass through the said loop, as shown in Fig. 11, carrying with it the thread which is to form the second loop. As the looper continues to turn, the distended loop of needle-thread is disengaged from its hook *h* by means of the inclined face of the plate I, and the needle then descends through the said loop, as above mentioned, the looper next catching and carrying with it the thread which is to form the second loop simultaneously with the raising of the needle. As the needle rises the thread forming the first loop is drawn upward over the face of the distending-plate S, the finger L being first drawn back out of the hole *t'* in the said plate, as shown in Fig. 8, so that it may offer no obstruction to the lifting of the loop, and the said finger then moving forward into the holes so as to lift the plate clear of the projection *k*, and thus enable the loop to pass the latter. It will be apparent without further description that by thus distending the loop as it is passed around and over the face of the annular plate, so that each new loop may be carried down through the one thus distended, the ordinary chain-stitch may be formed.

To form what I have termed the lock-chain stitch, a bobbin, *x*, Figs. 12, 13, and 14, is introduced into the opening *q* of the distender S and its thread carried upward through one of the holes in the top of the latter, so that as the chain-stitch is formed with the needle thread in the manner above described the said bobbin-thread may be interlocked with the same on the under side of the fabric. This lock-chain stitch is of an ornamental character, and will be found chiefly suitable for embroidery-work, &c.

To form the ordinary lock-stitch, the distending-plate S is removed and the plate S' furnished with a bobbin and thread, substituted for the

same, as shown in Figs. 15, 16, and 17. The hook *h* of the looper carries the loop of needle-thread around and on both sides of the plate S', as before, the projection *r* serving merely to direct one portion of the loop to the rear of the plate while the remaining portion passes over the face of the same. The loop, however, instead of being distended, as with the chain-stitch, is, owing to the absence of the hook *r'*, drawn laterally across the face of the guide-plate, as shown in Fig. 16, so that the bobbin-thread only shall be drawn up through the same as the work is fed forward, the second loop of needle-thread being carried downward to one side of the first loop instead of passing through the same, as shown in Fig. 17.

In carrying out my invention the loop-distender, or loop-distender and bobbin-holder, might be retained between and held in a proper position in respect to the needle and looper by wire holders bent to a suitable shape and secured to the bed-plate of the machine in place of the plate I and arm J.

For the purpose of preventing the unwinding of the needle-thread from its spool, except at the proper moment, I use, in addition to the usual tension devices, a brake, *w*, consisting of a sliding rod adapted to a transverse opening in the fixed arm C and acted on by a cam, *v*, on the needle-arm. When this cam forces the rod outward the thread is pressed and held between the rounded head *v*<sup>1</sup> of the said rod, and a spring, *v*<sup>2</sup>, secured to the fixed arm; but when the cam no longer acts upon the rod this pressure is relieved and the thread can then be unwound from the spool, and fed to the needle, and work as usual.

The principal advantages of my improved machine are its simplicity and the fact that the changes necessary in altering the stitch can be made instantaneously and without requiring any tedious adjustment or manipulation of the parts.

I claim—

1. A loop-distender, or loop-distender and bobbin-holder, S, having a limited vertical motion only, held in a proper position beneath the work-plate of a sewing-machine in respect to the needle and to a rotating looper, so as to act in conjunction with the said needle and looper in forming a chain or lock-chain stitch, substantially in the manner described.

2. A loop-distender and bobbin-holder, S', having a limited vertical motion only, held in a proper position beneath the work-plate of a sewing-machine in respect to the needle and to a rotating looper, so as to act in conjunction with the said needle and looper in forming a lock-stitch, substantially in the manner described.

3. The plate I and arm J, secured to the bed-plate in respect to the needle, to the looper, and to each other, and arranged for the reception and retention between them of either of the annular plates S or S'.

4. The movable finger L, acted on by a spring or otherwise held in position and adapted to a hole, *t'*, in either of the annular plates S or S', for the purpose of retaining said plates in position.



5. The said finger L, to which an intermittent reciprocating motion can be imparted, in combination with the projection  $x$  of the arm J, from which the loop-distending and bobbin-holding plates are suspended, all substantially as and for the purpose specified.

6. The brake  $w$ , operated by a cam,  $v$ , of the needle-arm, and acting, in conjunction with a

spring,  $v^2$ , to retain and release the needle-thread, substantially in the manner described.

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

Witnesses:

THOS. LAMB.

WM. A. STEEL,

JOHN H. RUPERTUS.