No. 50,297. PATENTED OCT. 3, 1865.

F. D. BALLOU.

SEWING MACHINE.

Fig. 1.

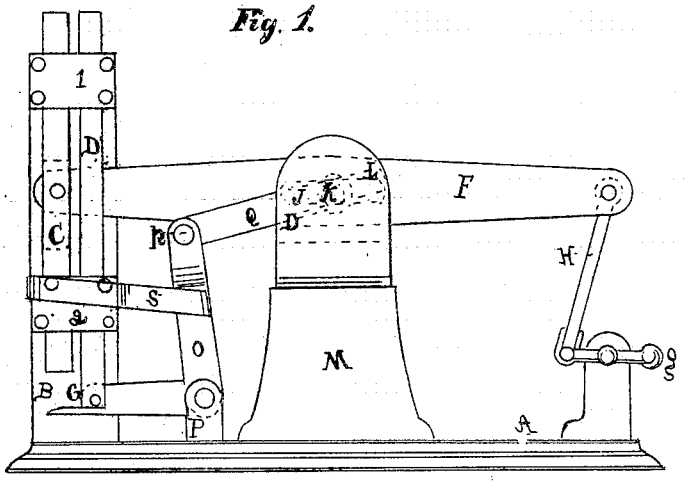


Fig. 2.

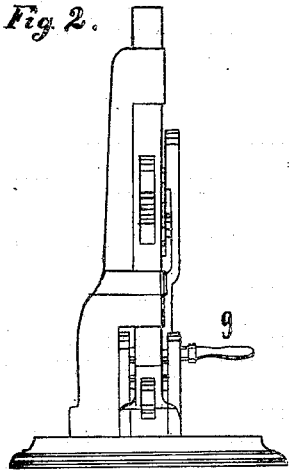
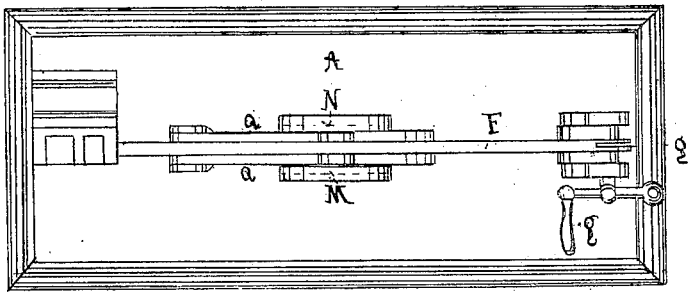


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANCIS D. BALLOU, OF ABINGTON, ASSIGNOR TO ALFRED B. ELY, OF NEWTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 50,297, dated October 3, 1865.

To all whom it may concern:

Be it known that I, FRANCIS D. BALLOU, of Abington, in the county of Plymouth and State of Massachusetts, have invented a new and useful Improvement in the Presser-Foot for Sewing-Machines; and I do hereby declare that the following is a full, clear, and accurate description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a view in elevation of one side of the machine. Fig. 2 is a front elevation thereof, and Fig. 3 is a plan view of the same.

To cause the descent of the eye of the needle in sewing-machines always to the same point, to permit the shuttle or hook to enter its loop and let the needle have its proper upward throw to draw the stitch and permit the feed to operate, it has hitherto been found necessary to use a varying hand adjustment when sewing materials of varying thickness; and it is the object of my invention to insure the descent of the eye of the needle always to the same point in sewing materials of varying thickness and automatically change the distance of its upward throw; and to this end my invention consists in the employment of a presser-foot which, in accommodating itself to the varying thickness of materials to be sewed, shall change the fulcrum of the needle-lever automatically, so as to vary its upstroke to suit the varying thickness of material and always leave its downstroke the same, that the loop of the needle-thread may always receive the shuttle or looper at the same point to secure uniform stitching, while the varying ascent of the needle shall draw each stitch with equal force when sewing materials of varying thickness under a continuous and uniform feed.

Upon the horizontal table A, of the usual form for sewing-machines, I place a fixed standard, B, to support and guide the needle-bar C and the stock D of the presser-foot E, both of which can slide vertically through properly-placed mortises covered by the plates 1 and 2. The needle-bar receives its vertical reciprocating motion from the lever F, which is actuated by the crank G, to which it is connected by the rod or pitman H, the crank being rotated either by a driving-belt or the handle *g*.

In this example of the application of my invention the presser-bar is slotted for a sufficient distance to permit the needle-lever F to vibrate in the slot; but I by no means desire to be limited to such arrangement.

The lever F has a central longitudinal slot, J, that permits it a free longitudinal motion on its fulcrum K, and this fulcrum K moves forward and back in the inclined slots or grooves L in the standards M and N, the slots I and L and the fulcrum K being shown in dotted lines in Fig. 1.

The stock D of the presser-foot is attached at its lower end by a loose slot and pin to the short arm of the crank-lever O, so as to permit the lever to vibrate, and the lever is supported by and vibrates on a pin in the short standard or step P. The long arm of the lever is attached by straps Q and Q′ to the fulcrum K, with which they have a rigid connection; but the straps have a free movement on the pin *p*, by which they are connected to the upper end of the long arm of lever O.

A spring of any kind may be attached to the long arm of the lever O to keep it in its normal position, and this spring may be adjustable to regulate the degree of force with which the presser-foot is kept upon the material to be sewed. In the drawings I have shown a simple elastic band, S, though, of course, a spring of any form may be used.

The operation is as follows: The material of varying thickness, being placed under the presser-foot and regularly fed, will vary the height of the presser-foot above the table—as, for example, in sewing the sole of a shoe onto the upper—and every change of position in the presser-foot through the lever O and straps Q and Q′ moves the fulcrum K in the inclined slot L in the standards M and N, and also changes the position of the fulcrum K in the slot I of the needle-lever F, and this change in the position of the fulcrum K causes the needle-lever F to give the needle-bar C a greater or less elevation without causing the slightest variation in the point to which the eye of the needle uniformly descends, but varying the rising motion alone, and thus gives automati-

cally the necessary pull on the needle-thread and the proper time for the feed to operate properly without the possibility of the shuttle or looper missing a stitch, however numerous the variations of thickness of the material being sewed may be, and without the least interruption to the regular continuing of the sewing.

My invention is of easy adaptation to other uses; but in this connection I only claim it when applied to a sewing-machine. Nor do I limit myself to this mechanism alone, for my invention may be rendered useful in various changes of mechanical adaptations.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Automatically controlling the throw of the needle, in sewing materials of varying thickness, by the presser-foot, substantially in the manner and for the purpose set forth.

2. The combination of a needle-lever with a presser-foot, substantially in the manner and for the purpose set forth.

FRANCIS D. BALLOU.

Witnesses:

W. M. PARKER,

FRANCIS L. CLARKE.