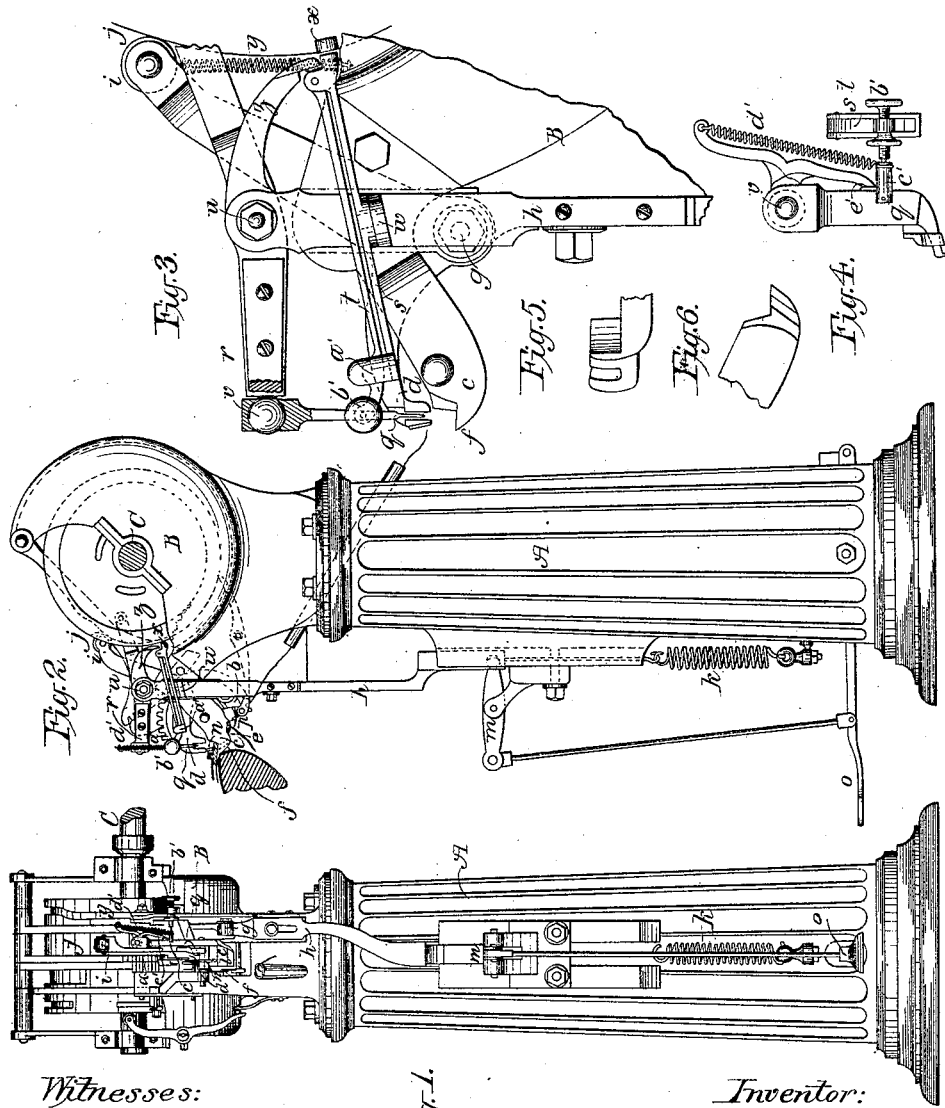


D. MILLS.

Sewing Machine for Boots and Shoes.

No. 96,944.

Patented Nov. 16, 1869.



Witnesses:  
A. Bailey  
D. Mills

Fig. 1.

Inventor:  
Daniel Mills by  
his atty  
A. Power

# UNITED STATES PATENT OFFICE.

DANIEL MILLS, OF NEW YORK, ASSIGNOR TO CHARLES GOODYEAR, JR.,  
OF NEW ROCHELLE, N. Y.

## IMPROVEMENT IN SEWING-MACHINES FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. 96,944, dated November 16, 1869.

*To all whom it may concern:*

Be it known that I, DANIEL MILLS, of New York, in the county and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of a machine made in accordance with this invention. Fig. 2 is a side elevation thereof. Fig. 3 is a sectionalside view of the feed and clamping mechanism detached, on a larger scale than the previous figures. Fig. 4 is a front view of the feed mechanism detached. Figs. 5 and 6 are, respectively, a plan view and side elevation opposite that shown in Fig. 3 of the supporting-jaw C.

Similar letters indicate corresponding parts.

This invention relates to a sewing-machine which is intended, particularly, to sew the outer sole of boots or shoes to the welt.

The invention consists, partly, in a clamp composed of a stationary and of a movable jaw, said stationary jaw serving to support the work, and being provided with a lip, which serves as a guard to prevent the needle and awl from injuring the upper of the boot or shoe, and having, also, a guide groove or channel for the purpose of steadying the awl and needle (both of which are curved) while in the operation of sewing.

The movable jaw serves to press the work down upon the stationary jaw, adjusting itself automatically to the thickness of the stock, and is provided with a slot or mortise through which the feed-dog works, the motion of said movable jaw and of the feed-dog being so adjusted that the movable jaw releases the work at the moment the feed-dog begins to act, and after the feed-motion has taken place, and before the feed-dog rises from and releases the work the movable jaw resumes its former position, clamping the work and retaining it firmly in position during the action of the awl and needle.

The feed-dog is connected with its lever by a ball-and-socket joint, so that it is free to swing in either direction and to accommodate itself to the various motions of a compound

feed-lever. This compound feed-lever is composed of two parts, the upper or top lever being pivoted to the lower or bottom lever, which has its fulcrum on a pin secured in a lug projecting from a rising and falling bar that serves to lift the feed-dog and the upper jaw, the bottom lever being actuated by a cam which imparts to it an oscillating motion in a lateral direction which the top lever is compelled to share, while said top lever is also free to rise and fall with the feed-dog. The length of the stitch—or, in other words, the length of movement of the feed-dog—is varied by the adjustment of the connections which connect the feed-dog to the upper part of the compound feed-lever.

In the drawing, the letter A designates a column, of cast-iron or any other suitable material, which supports the frame B, in which are the bearings for the main shaft C of the sewing mechanism. This mechanism consists, chiefly, of a needle, *n*, and an awl, *p*, which are secured to independent stocks *a b*, each of which receives an oscillating rotary motion from toothed segments and cams, or by any other suitable means. The work to be sewed is retained or supported by the stationary jaw *c* and movable jaw *d*, as shown in Fig. 2 of the drawing.

In the side of the stationary jaw is a groove or channel, *e*, which forms a guide and protector for the awl *p* and needle *n*, and in front of this groove is a lip, *f*, which bears against the side of the upper when the machine is used for sewing the outer sole of the boot or shoe to the welt, and which, while serving as the sewing-gage to regulate the distance of the line of stitches from the upper, serves also to prevent the needle and awl from coming in contact with and injuring the upper. The movable jaw *d* is composed of a three-armed lever, which has its fulcrum on a pivot, *g*, secured to the perpendicular sliding bar *h*, and one arm of which is provided with a roller-stud, *i*, bearing against the periphery of a cam-disk, *j*. The bar *h* slides up and down in a suitable guideway secured to the column A, and it is subjected to the action of a spring, *k*, which has a tendency to pull said bar down and to bring the movable jaw to bear upon the work held between it and the stationary jaw.

The bar *h*, together with the movable jaw *d* and feed, can be raised altogether by the action of a lever, *m*, which is actuated by the treadle *o*, or by hand, if desired.

The movable jaw is provided with a slot, through which passes the feed-dog *q*, which receives an up-and-down and back-and-forth movement by the combined action of the lever *r* and the compound levers *s t*. The lever *r* has its fulcrum on a pivot, *u*, secured in the upper end of the bar *h*, and its inner end is provided with a roller-stud, which works in the cam-disk *j* on the main shaft, so that the feed-dog is raised or lowered at the proper intervals. The feed-dog is secured to the outer end of the lever *r* by means of a ball-and-socket joint, *v*, which allows said feed-dog to oscillate freely in either direction. The oscillating motion of the dog *q* (part of the feed movement) is produced by the compound levers *s t*, which consist of the bottom lever *s* and top lever *t*.

The bottom lever *s* has its fulcrum on a pivot, secured in a bracket or lug, *w*, which projects from the side of the bar *h*, and its rear end is provided with a roller-stud, *x*, which works in a cam-groove, *y*, in the periphery of the disk, mounted on the main shaft *C*. This cam-groove *y* is so shaped that it imparts to the bottom lever *s* an oscillating motion in a lateral direction at the proper intervals, and an arm, *z*, which extends from the bar *h* and bears on the inner end of the bottom lever, prevents the same from being forced upward by the action of the cam *y*. The outer end of the bottom lever *s* is provided with a forked guide, *a'*, which straddles the top lever *t*, this lever being hinged at its inner end to the bottom lever *s*, while its outer end carries a set-screw, *b'*. (Best seen in Fig. 4 of the drawing.) This set-screw stands opposite a recess in the rear of the feed-dog, and from which extends a spring, *d'*, that has a tendency to pull the feed-dog back against the stop *e'*. This stop is rigidly secured to the lever *r*, and extends up to such a position that it affords a convenient place for the purpose of attaching the upper end of the spring *d'*. If the cam *y* acts on the bottom lever *s* it imparts to the same, together with the top lever *t*, an oscillating motion in a lateral direction, and as the end of the set-screw *b'* strikes in the recess *e'* this lateral motion is transmitted to the feed-dog, and the work is pushed forward in the proper direction. This feed motion takes place when the feed-dog is depressed by the action of a suitable cam on the lever *r*, and at a period when the pressure of the movable jaw upon the work is momentarily released, and, as soon as the feed motion has taken place, the movable jaw reassumes its pressure upon the work, and the feed-dog is raised and carried back to its original po-

sition by the spring *d'*, while the top lever *t*, being hinged to the bottom lever *s*, is capable of partaking of the rising and falling motion of feed-dog independently of said bottom portion *s*.

By this arrangement the work is prevented from dropping off from the stationary jaw, being held alternately by the movable jaw and by the feed-dog, aided by the hands of the operator.

The length of the stitch is regulated by the set-screw *b'*, since the feed motion of the dog does not begin until the end of said set-screw is brought in contact with the recess *e'*; and if said screw is turned back the levers *s t* will have a certain dead motion before it commences to act on the feed-dog, and by turning the set-screw back and forth the dead motion of the levers *s t* is increased or decreased, and the stitches become longer or shorter in proportion.

Having described this invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. In combination with a mechanism for sewing boots and shoes of otherwise ordinary or suitable construction, the stationary and movable jaws, arranged for operation substantially as herein shown and described, the movable jaw being actuated positively by a cam or its equivalent, to hold and firmly clamp the outer sole to the welt while in process of being sewed together, the pressure between said jaws being released while the feed is performing its function.

2. The combination of the movable positively-actuated jaw and the feed mechanism with the stationary jaw and sewing mechanism, under the arrangement and for operation substantially as herein shown and set forth, so that the former may be raised bodily in relation to the latter, to admit of the introduction of the material to be sewed; and also that the said upper or movable jaw and feed may adjust themselves automatically to various and unequal thicknesses of stock while in the operation of sewing.

3. The arrangement of a ball-and-socket joint, forming the connection between the feed-dog and the feed-lever, substantially as described.

4. The combination of the parts constituting the adjustable feeding device, substantially as described, and for operation as set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

DANL. MILLS.

Witnesses:

A. POLLOK,  
WM. H. MCCABE.