No. 616,314.

Patented Dec. 20, 1898.

# J. B. HADAWAY.

## SHOE SEWING MACHINE.

(Application filed June 12, 1896.)

(No Model.)

3 Sheets—Sheet 1.

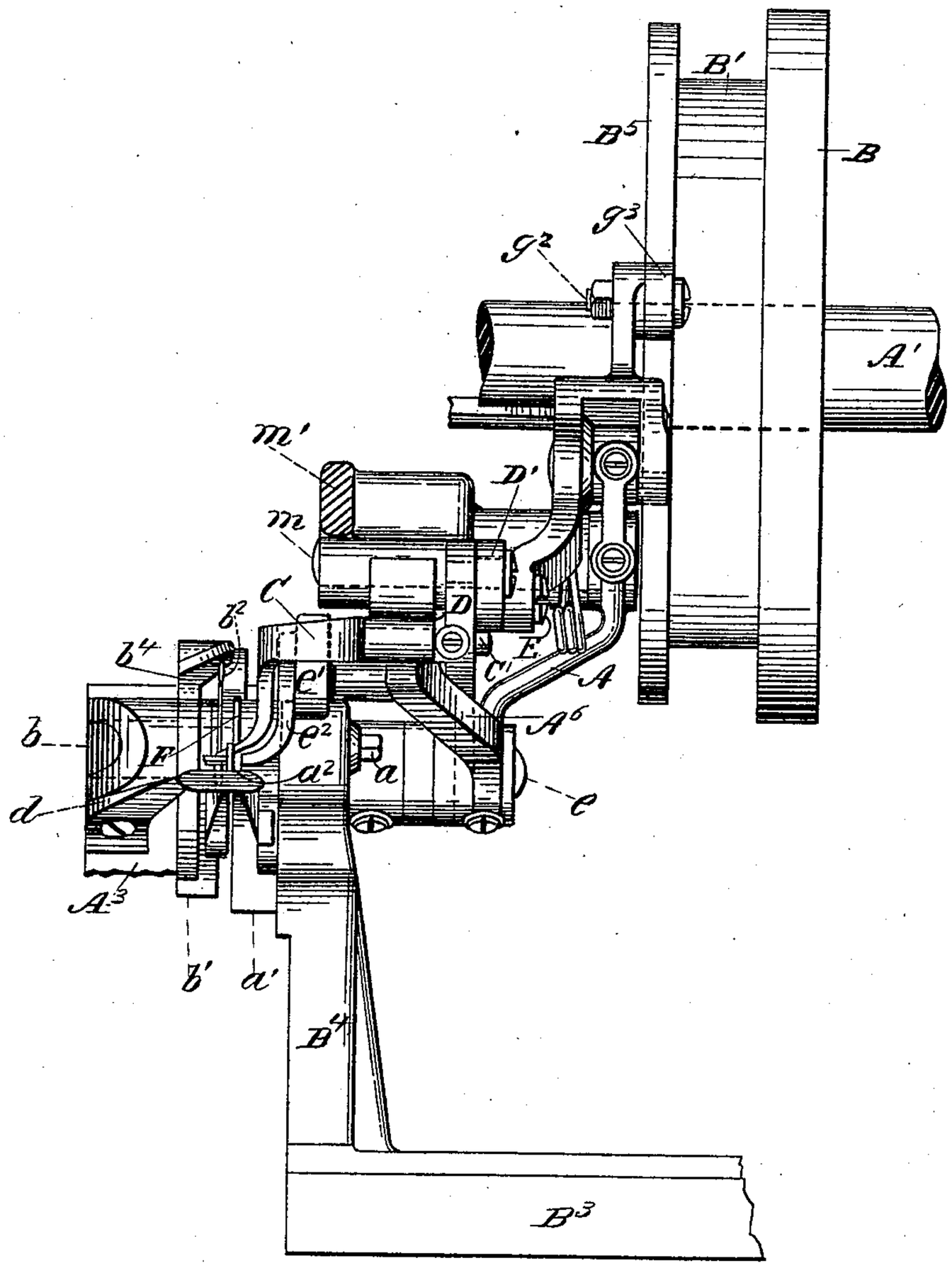


Fig. 1.

Witnesses.
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H. E. Kenrick Jr.

Inventor.
John B. Hadaway.
By his Attorney
Benjamin Phillips

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## SHOE SEWING MACHINE.

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(No Model.) 3 Sheets—Sheet 2.

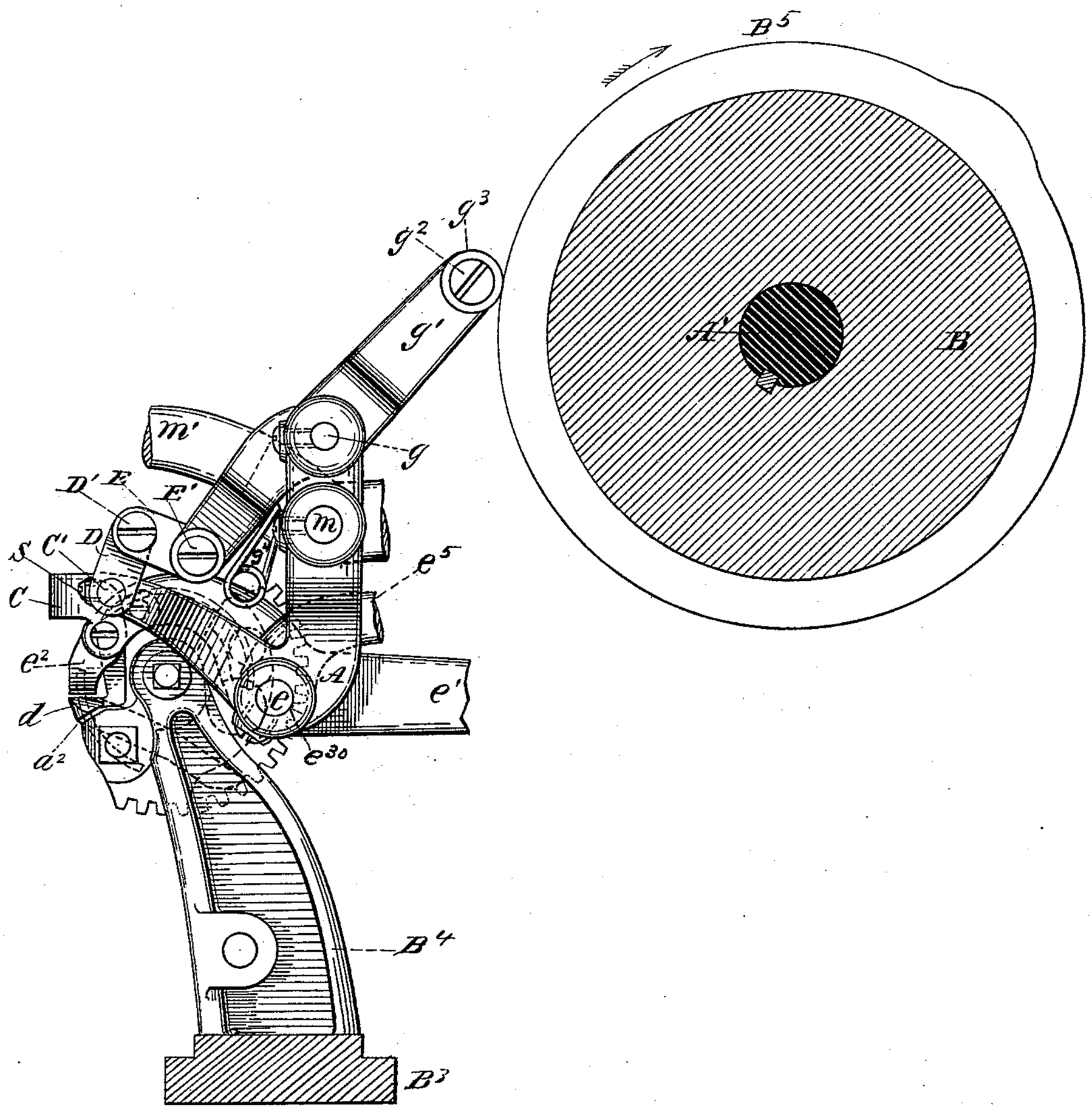


Fig. 2.

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## SHOE SEWING MACHINE.

(Application filed June 12, 1896.)

(No Model.) 3 Sheets—Sheet 3.

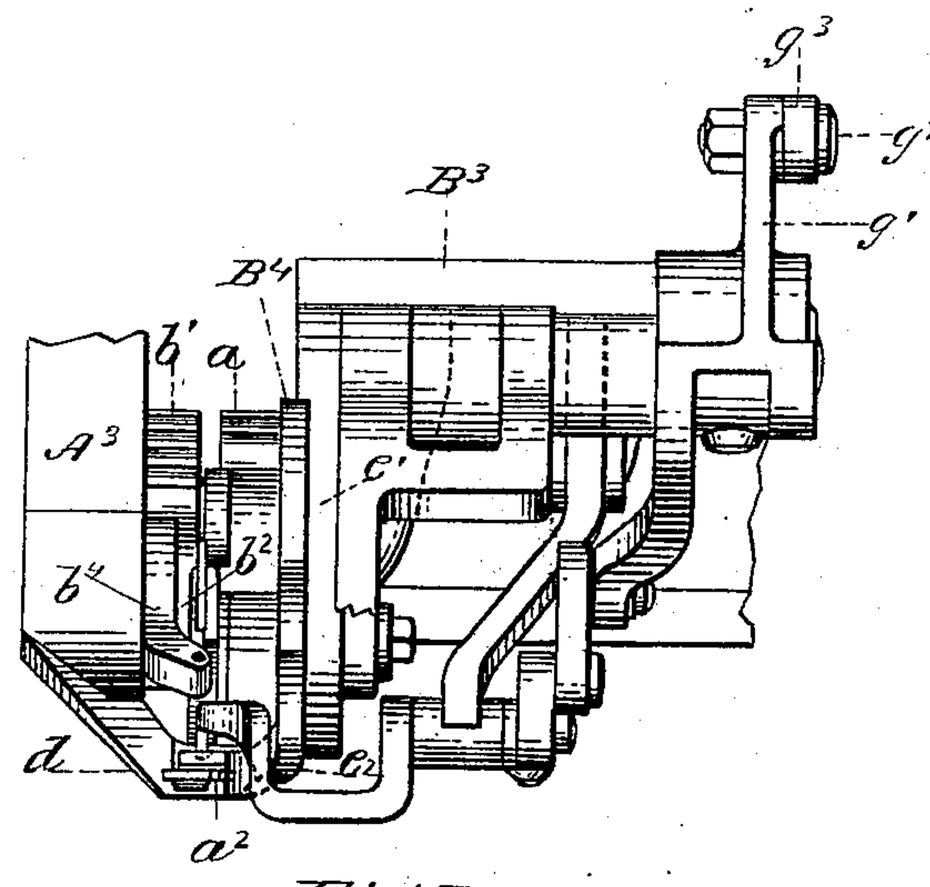


Fig. 3.

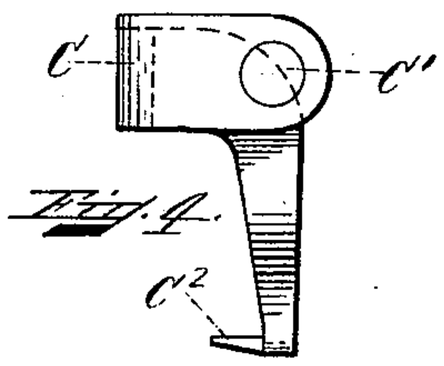


Fig. 4.

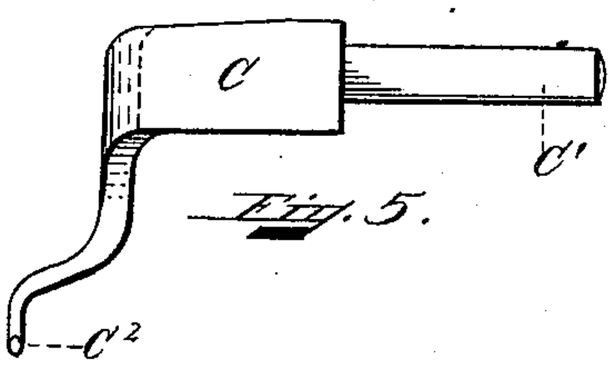


Fig. 5.

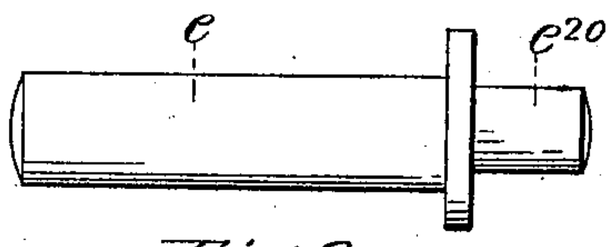


Fig. 9.

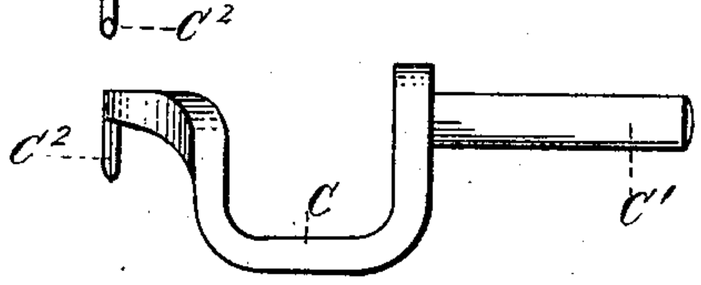


Fig. 6.

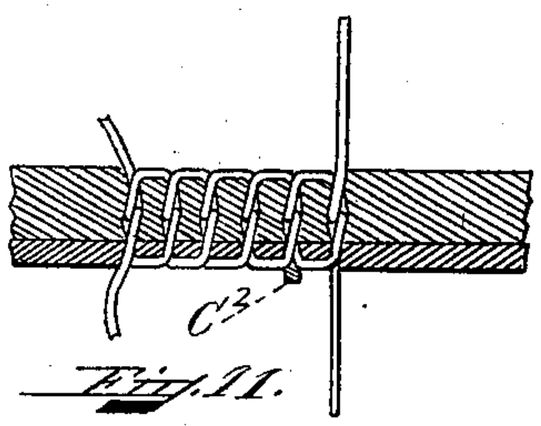


Fig. 11.

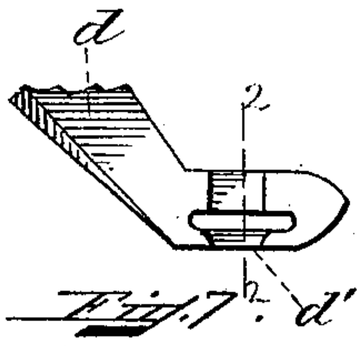


Fig. 7.

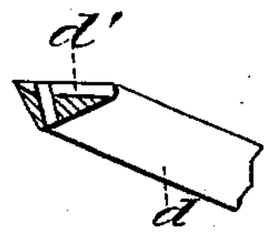


Fig. 8.

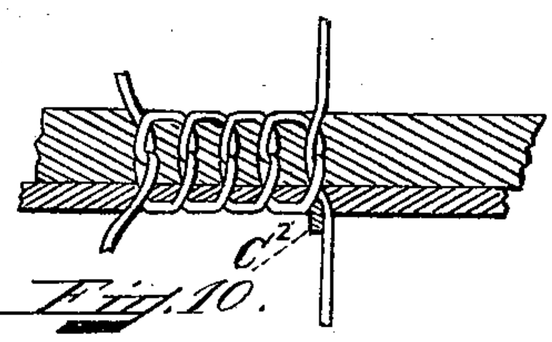


Fig. 10.

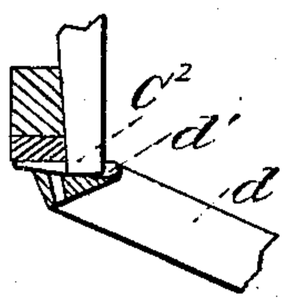


Fig. 12.

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By his Attorney
Benjamin Philips

# UNITED STATES PATENT OFFICE.

JOHN B. HADAWAY, OF BROCKTON, MASSACHUSETTS.

## SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 616,314, dated December 20, 1898.

Application filed June 12, 1896. Serial No. 595,281. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN B. HADAWAY, a citizen of the United States, residing at Brockton, in the county of Plymouth and Commonwealth of Massachusetts, have invented a new and useful Improvement in Shoe-Sewing and Seam-Finishing Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to shoe-sewing machines, and more particularly to such machines having means for separating or separating and indenting the stitches during the operation of sewing the sole to the welt.

It has heretofore been proposed to provide sewing-machines employing a straight needle with a stitch separating and indenting attachment; but in such machines the stitch separating and indenting attachment is carried by and derives its motion from the regular movements of the stitch-forming mechanisms or the presser-foot, thereby adding increased strain and wear to the parts of such mechanisms, rendering them liable to get out of order and decreasing the capacity of the machine.

The objects of the present invention are to remove the objections above noted, to provide a construction by means of which it is rendered practical to combine a stitch-separating or stitch separating and indenting mechanism with stitch-forming mechanism embodying a curved needle, and, further, to generally improve this class of machines and increase the accuracy and speed of their operation.

To the above ends my present invention consists of shoe-sewing mechanism comprising a needle, presser-foot, and feed as combined with a stitch separating and indenting mechanism and mechanism operating independently of the actuating means for the shoe-sewing mechanism to actuate the stitch separating and indenting mechanism.

My invention further consists of the combination, with a stitch-forming mechanism comprising a curved needle, of a stitch-separating or stitch separating and indenting mechanism, as hereinafter set forth, and of the several devices and combinations of devices hereinafter set forth and claimed.

A preferred form of the present invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a machine embodying the same. Fig. 2 is a side elevation thereof, looking toward the left of Fig. 1. Fig. 3 is a plan view of a portion of said machine. Figs. 4, 5, and 6 are respectively a side elevation, a front elevation, and a plan of the stitch-separating or stitch separating and indenting tool. Fig. 7 is a plan of the work support or table. Fig. 8 is a transverse section of the work support or table on the line 2 2 on Fig. 7. Fig. 9 shows one of the studs which sustains the stitch-separating or stitch separating and indenting attachment. Fig. 10 is a diagram illustrating a section of stitched material cut parallel to the line of stitching, showing the position of the stitch-separator or stitch separator and indenter between the finished and the partially-formed stitches in the work. Fig. 11 is a similar view illustrating the stitch-separator or stitch separator and indenter in the material between the last two completed stitches in the work. Fig. 12 is a transverse section of the work support or table and the work, showing the stitch-separator or stitch separator and indenter in the position it occupies when in the work.

The stitch-forming mechanism shown in the drawings, except as hereinafter noted, is substantially the same as that embodied in the Goodyear sole-sewing machine shown and described in United States Patent No. 473,870, issued to the Goodyear Shoe Machinery Company as the assignee of Z. T. French and William C. Meyer, dated April 26, 1892, to which patent reference may be had for any information relative to parts of the sewing-machine not shown in the accompanying drawings.

In the drawings, $A^3$ represents a small portion of the fixed frame of the head of the machine, in which is set the stud $b$, upon which is mounted loosely the needle-carrying segment $b'$, to which is secured the curved hooked needle $b^2$ in the same manner as shown and described in the patent before referred to.

$B^3$ is a slide fitted to a suitable guideway, (not shown,) so as to be movable horizontally to feed the work and provided at its inner end

with the upright or arm $B^4$, having set in its upper end the fixed stud $a$, upon which is mounted loosely the awl-segment $a'$, to which is secured the curved awl $a^2$, and $d$ is the work-support, secured to the frame $A^3$ in a fixed position and provided with the usual throat for the passage of the awl and needle.

$e$ is a bearing-stud, upon which is mounted loosely the elbow-shaped lever $e'$, to which is secured at its front end the presser-foot $e^2$ and at $e^{30}$ the arm $e^5$.

The framework of the machine has a suitable stud $m$, upon which is mounted the thread-lifter lever $m'$, only a portion of which is herein shown.

A′ is a portion of the main shaft, having secured thereto the cam-wheel B, in which is formed the cam-path B′.

The parts so far described are or may be constructed and operate substantially as shown and described in the patent before referred to, the work-support, the studs $e$ and $m$, and the cam-wheel B being slightly modified to adapt them to the new function performed by the machine.

In the patent hereinbefore referred to the presser-foot lever $e'$ was mounted upon a stud in a boss on the stand $B^4$ and moved laterally with the said stand; but in the Goodyear machine as now constructed said lever is mounted upon a stud set in some fixed portion on the frame of the machine and has only an up-and-down movement and clamps the work firmly when the stand $B^4$, the awl-segment, and the awl are being moved backward after having fed the work preparatory to puncturing the work for a new stitch and feeding it another step. The presser-foot lever $e'$ as embodied in said Goodyear machine as now constructed is shown in Fig. 2. It has secured thereto the presser-foot $e^2$, which is constructed and operates substantially as in the patented machine hereinbefore referred to, except that it has no lateral movement and is arranged to clamp the work firmly while the needle is in the work and the feed mechanism is being retracted, as above described.

While I have described the stitch-forming mechanism of my machine as being substantially the mechanism of the patent referred to herein, I wish it to be distinctly understood that my invention is not limited thereto, for the reason that it is broadly new, so far as I am now aware of the state of the art, to combine a stitch-separating or stitch separating and indenting mechanism with a stitch-forming mechanism comprising a curved needle, or, further, to combine a stitch-separating or stitch separating and indenting mechanism with any shoe-sewing mechanism, whether employing a curved needle or a straight needle with its presser-foot and feed, in such a manner that the stitch-separating or stitch separating and indenting mechanism shall derive its movements entirely independently of the shoe-sewing mechanism.

The stitch-forming mechanism having been sufficiently described, I will now proceed to describe the mechanism for separating or separating and indenting the stitches. As shown in the drawings, this mechanism comprises the bracket A, which may conveniently be fixed to the machine by the studs $e$ and $m$, which studs are elongated or provided with extensions, such as $e^{20}$, (shown in Fig. 9,) the bracket A being provided with suitable apertures or bearings, which are fitted to and suitably secured upon the said projecting ends of the studs. Bracket A at its upper end is provided with bearings, in which is fixed the stud $g$, upon which is mounted the cam-lever $g'$. Bracket A at its lower end carries an arm $A^6$, which may be secured thereto or formed integrally therewith. In the end of arm $A^6$ is formed a suitable bearing for the shank of the stitch-separating tool C, which is adapted to be freely oscillated therein. As shown in the drawings, the tool is oscillated or given its stitch-separating movements by the following mechanism: The shank of the stitch-separating tool is projected beyond its bearing in the arm $A^6$, and to the end thereof is fixedly secured by means, such as the set-screw $s$, the arm D, in the end of which is secured the stud D′, upon which is mounted loosely one end of the link E, the opposite end of the link E being connected loosely by stud E′ to the cam-lever $g'$. The cam-lever may be provided with the stud $g^2$, upon which is mounted the roll $g^3$, which bears against and is acted upon by the peripheral cam $B^5$, formed upon the cam-wheel B, to impart motion to said cam-lever, the end of the lever being held against the cam $B^5$ by the spring $g^4$, one end of which bears against some fixed part of the frame and the other end thereof against the lever $g'$. The stitch-separating tool C, as shown, is preferably yoke-shaped and has formed thereon at one end the round shank C′, which fits in a bearing in arm $A^6$ of the bracket A, as before described, the other end of the yoke carrying a downturned arm, upon which is formed the stitch-separating point $C^2$.

The yoke-shaped form of the tool C is desirable in connection with the stitch-forming mechanism hereinbefore referred to in order to give necessary clearance to the several parts of the said stitch-forming mechanism; but it is obvious that the form of said tool will be controlled by the character and mode of operation of the particular stitch-forming mechanism with which said tool is employed.

The work-support $d$ is fixed in suitable position for coöperation with the presser-foot in clamping the work during the formation of a stitch and the separation of the stitches. The support $d$ has the usual throat or aperture for the passage of the needle and awl, and upon its upper surface it is provided with a recess $d'$ of sufficient length and depth to allow for the necessary adjustment of and the free passage of the point $C^2$ of the separating-tool C when in operation. The recess $d'$ also

accommodates the point $C^2$ of said tool and permits it to find a resting-place below the work-bearing surface of the work-support *d*, where it temporarily dwells during the time in which the work is fed and the stitch is being formed.

The operation of my invention is as follows: The several parts of the machine being in the positions as shown in the drawings—that is, with the awl in the work in a position to feed—the first movement caused by the revolution of the cam-shaft in the direction of the arrow in Fig. 2 is the feeding of the work a distance equal to the desired length of a stitch. The presser-foot is then depressed upon the work and locked in position and the awl withdrawn from the work and returned to a position preparatory to puncturing the work for another stitch, during which time the needle enters the work. The next movements in order are the forming of a stitch and drawing it into position in the work. Directly after the stitch is set the action of the cam $B^5$ against the roll $g^3$ of the cam-lever $g'$ will cause the opposite end of said lever to be moved downward, and by its link connection with the arm D, secured to the separating-tool, will cause the wedge-shaped point of said tool to move outwardly and upward in a path at right angles to the line of feed and oblique to the surface of the work and indent the interval between the stitch last formed and the next partially-formed stitch in advance. When it is desired to separate the interval between the last two completed stitches, it may be performed by releasing the grip of the set-screw *s* in arm D against the shank of the separating-tool C, whereupon the tool C may be adjusted laterally to the desired position in order that its end $C^2$ may be brought in line with the interval between the last two completed stitches and fixed in such adjusted position, when the desired result will be accomplished. The separating-tool is next withdrawn from the work, and the awl again engages therewith preparatory to feeding it another step corresponding to the length of a stitch, which operations are continued until the sewing of a piece of work is completed and the intervals between each two contiguous stitches have been separated or separated and indented.

I have throughout the preceding specification and following claims made use of the terms "stitch-separating mechanism" and "stitch-separating tool," and by such terms I desire to be understood as including any mechanism, tool, or device which will separate the stitches only or any mechanism, tool, or device which will separate the stitches and indent the welt.

I desire, further, to say that in such types of sewing-machine as embody a presser-foot I consider such presser-foot as a part of the stitch-forming mechanism, and my improved stitch separating and indenting tool, as shown in the drawings, is actuated independently thereof.

Having fully described my invention and its mode of operation, what I claim as novel, and desire to secure by Letters Patent of the United States, is—

1. The combination with shoe-sewing mechanism, of stitch-separating mechanism, and means independent of the parts for operating the sewing mechanism, for operating the stitch-separating mechanism upon the intervals between the stitches to separate the stitches, substantially as described.

2. The combination with shoe-sewing mechanism, of stitch-separating mechanism, and automatic means for operating the stitch-separating mechanism upon the intervals between a finished and a partially-formed stitch in the work and intermittently with the forming of said stitch, substantially as described.

3. The combination with shoe-sewing mechanism comprising a presser-foot, of stitch-separating mechanism independent of said presser-foot or other part of the shoe-sewing mechanism, and means for automatically operating the stitch-separating mechanism upon the intervals between the stitches during the dwell of the work in the position in which the stitch is set, substantially as described.

4. The combination with shoe-sewing mechanism comprising a work-support formed and arranged to engage the crease between the upper and welt, of a stitch-separating tool, the working end of which is normally below the surface of the work-support, and means for intermittently projecting said end above the surface of the work-support, substantially as described.

5. The combination with shoe-sewing mechanism comprising a work-support formed and arranged to engage the crease between the upper and welt, of a stitch-separating tool, and automatic means for intermittently projecting the working end of said tool from a position below to a position above the work-support without contact with the upper, substantially as described.

6. The combination with shoe-sewing mechanism comprising a work-support formed and arranged to engage the crease between the upper and welt and having a recess in its work-bearing surface, of a stitch-separating tool, and means for entering and withdrawing the tool from said recess, substantially as described.

7. The combination with shoe-sewing mechanism comprising a work-support formed and arranged to engage the crease between the upper and welt and having a laterally-elongated recess in its work-bearing surface, of a stitch-separating tool, and means for entering and withdrawing the tool from said recess, substantially as described.

8. The combination with shoe-sewing mechanism, of a stitch-separating tool comprising

a yoke-shaped body provided with a down-turned arm on which is mounted the working end of the tool, substantially as described.

9. The combination with stitch-forming mechanism, comprising a curved needle, of a stitch-separating mechanism and automatic means for operating the stitch-separating mechanism upon the intervals between the stitches to separate the stitches, substantially as described.

10. The combination with stitch-forming mechanism comprising a curved needle, of stitch-separating mechanism, and independent actuating means for the stitch-separating mechanism, substantially as described.

11. The combination with stitch-forming mechanism comprising a curved needle, of stitch-separating mechanism, and means for actuating the stitch-separating mechanism to cause it to act upon the interval between a finished and a partially-formed stitch, substantially as described.

12. The combination with shoe-sewing mechanism and a driving-shaft actuating said mechanism, of a stitch-separating tool, a cam on said driving-shaft, and independent connections between said cam and tool for actuating the said tool, substantially as described.

In testimony whereof I have hereunto set my hand, in the presence of two attesting witnesses, this 8th day of June, 1896.

JOHN B. HADAWAY.

Witnesses:
BENJAMIN PHILLIPS,
GEO. H. WILLIAMS.