

**No. 609,103.**

**Patented Aug. 16, 1898.**

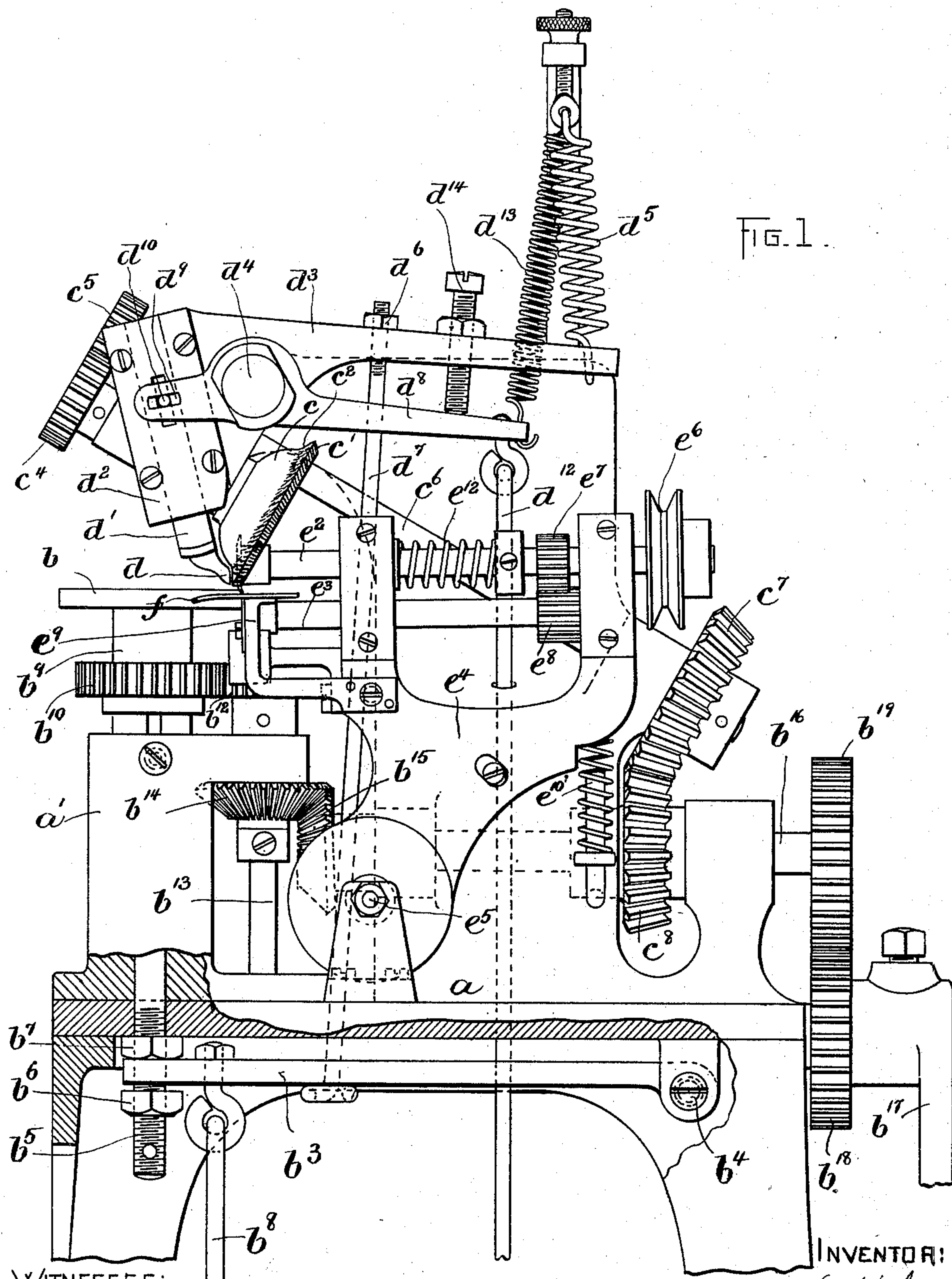
**M. L. KEITH.**

## MACHINE FOR REINFORCING INNER SOLES.

(Application filed Nov. 2, 1896.)

(No Model.)

**3 Sheets—Sheet 1.**



WITNESSES:

A. D. Harrison.

P. W. Pezzutto

INVENTOR:

M. L. Keith  
by Knight, Bonni & Quinby  
Attys.



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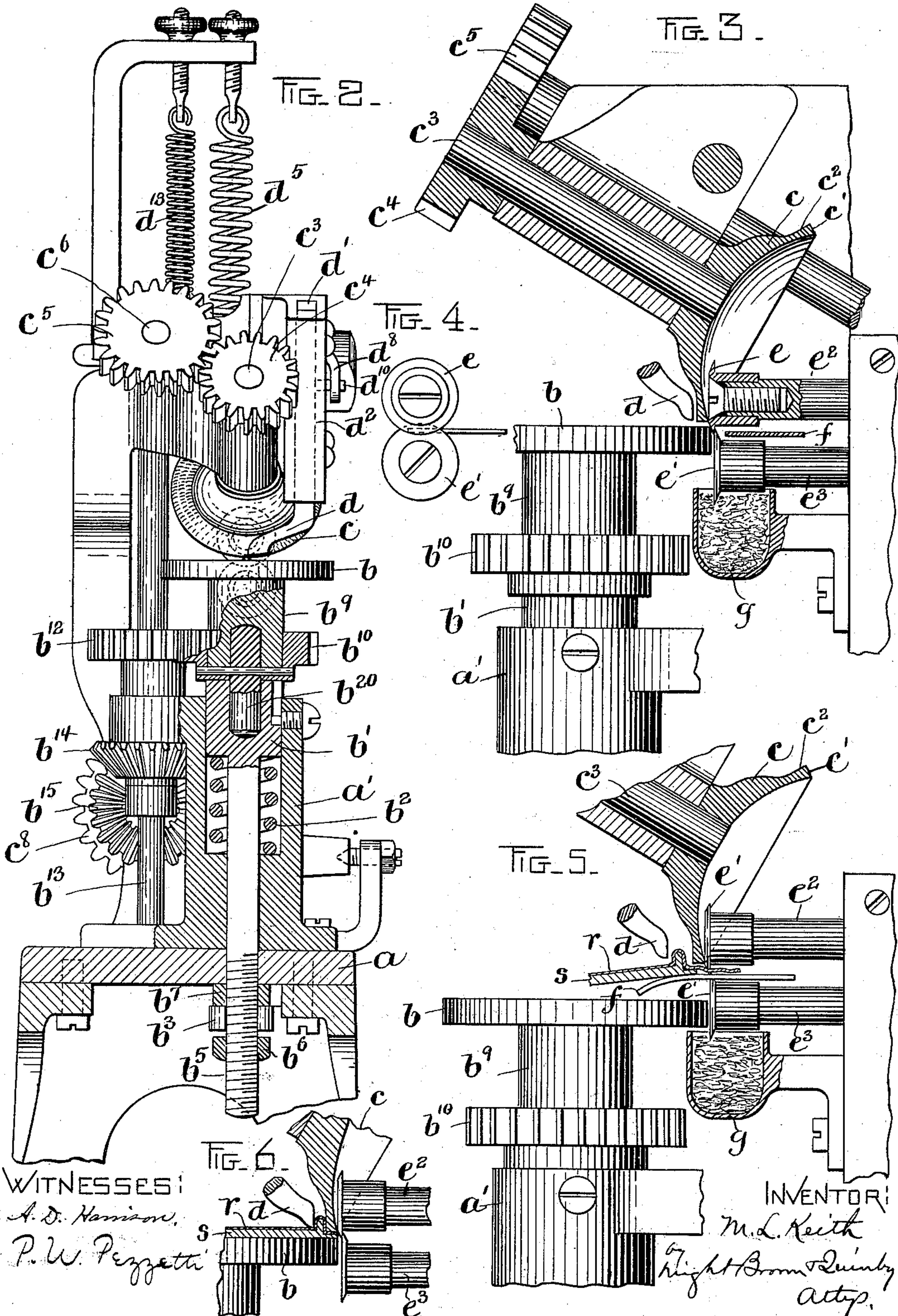
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

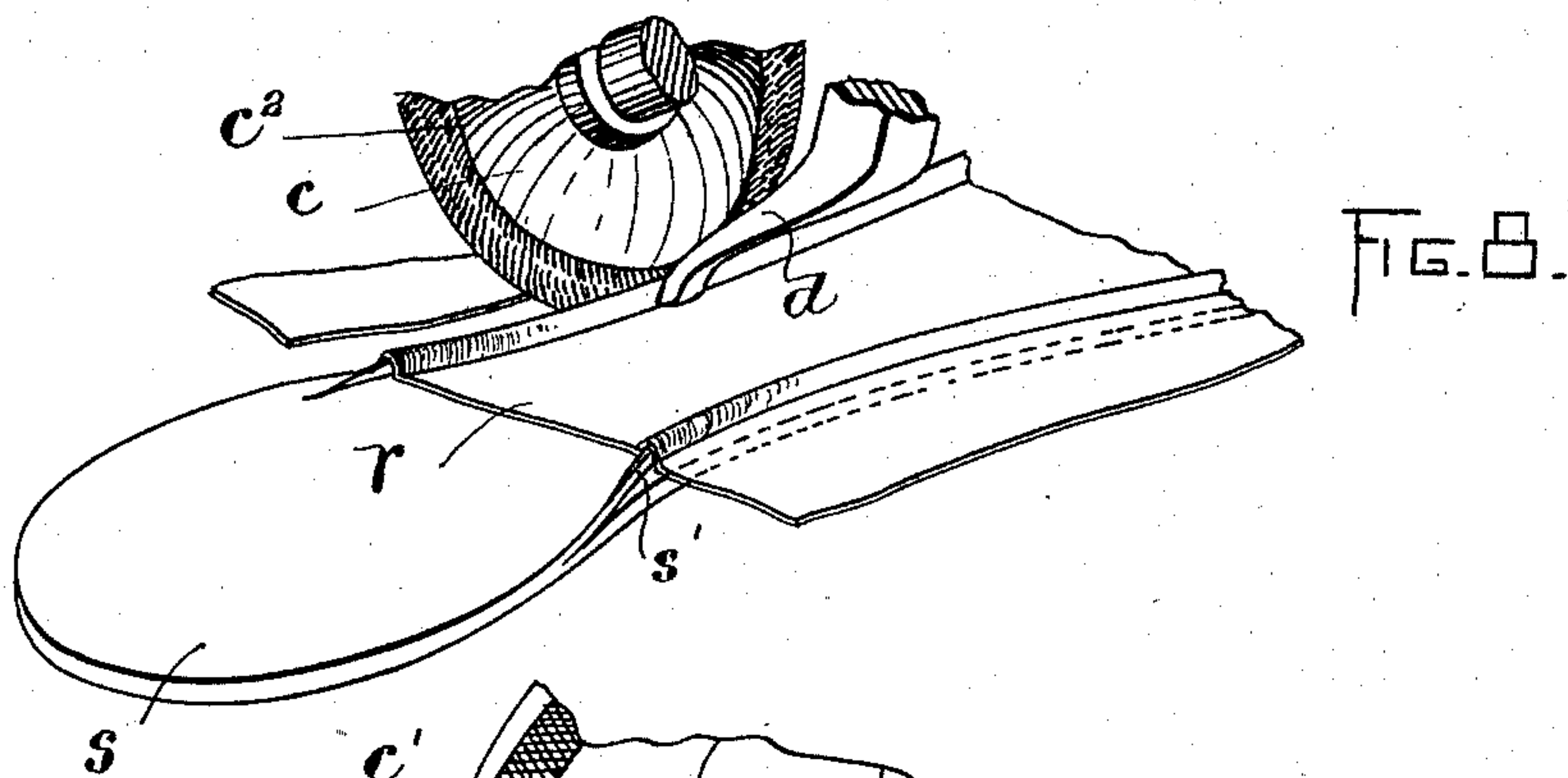


FIG. 6.

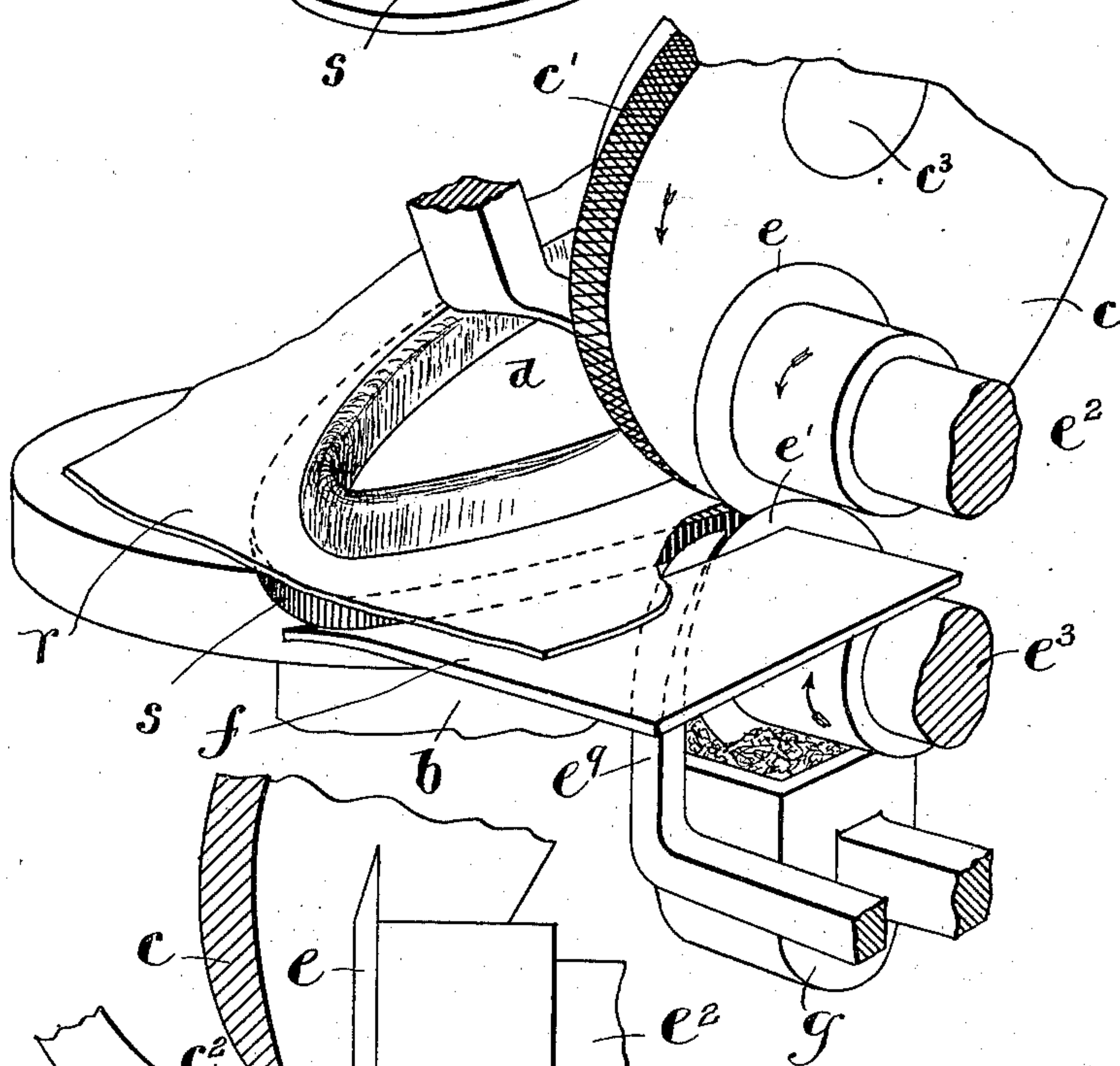


FIG. 7.

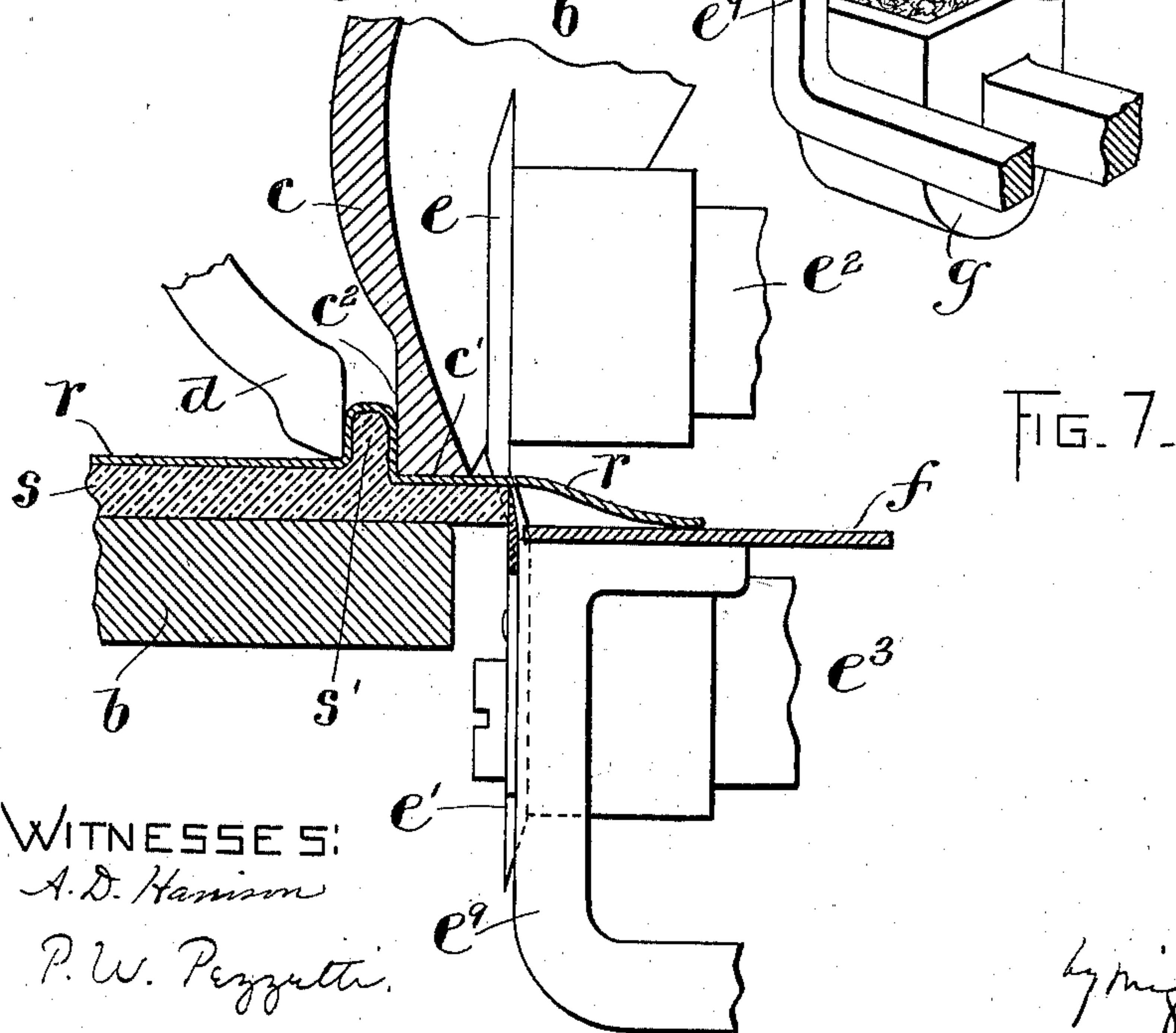


FIG. 7.

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# UNITED STATES PATENT OFFICE.

MYRON L. KEITH, OF BROCKTON, MASSACHUSETTS.

## MACHINE FOR REINFORCING INNER SOLES.

SPECIFICATION forming part of Letters Patent No. 609,103, dated August 16, 1898.

Application filed November 2, 1896. Serial No. 610,856. (No model.)

*To all whom it may concern:*

Be it known that I, MYRON L. KEITH, of Brockton, in the county of Plymouth and State of Massachusetts, have invented certain  
5 new and useful Improvements in Machines for Reinforcing Inner Soles, of which the following is a specification.

This invention relates to apparatus for making inner soles for boots and shoes, and  
10 particularly welted boots and shoes, in which the leather portion of the sole is reinforced by a sheet or layer of fabric, the said leather portion being split around its edge to form a  
15 flange which is bent upwardly from one side of the sole and is covered by a sheet of fabric, the fabric being cemented to the side of the sole from which the flange or lip projects and covering the lip also, so that both the sole and  
20 lip are reinforced.

The invention has for its object to provide  
a machine for conforming the reinforcing  
layer to the sides of the flange or lip and for  
trimming said layer in conformity to the edge  
of the leather body of the sole.

To these ends the invention consists in the  
25 improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a  
part of this specification, Figure 1 represents  
30 a side elevation of my improved machine, parts being shown in section. Fig. 2 represents a front elevation of the machine, parts being shown in section. Fig. 3 is a view of  
35 a portion of the machine, showing the forming and feeding wheel and other parts in longitudinal section. Fig. 4 represents a side view of the circular trimming-knives. Figs.  
5, 6, and 7 represent sectional views illustrating the operation of the machine. Figs. 8  
40 and 9 are perspective views showing parts of the machine and of a sole being operated on by the machine.

The same letters of reference indicate the  
same parts in all the figures.

45 In the drawings, *a* represents the supporting-frame of the machine.

*b* represents a rotary work support or table  
which is supported by a vertically-movable  
slide or carrier *b'*, fitted to move in a holder  
50 or socket *a'*, affixed to the frame *a*, said holder *b'* being yieldingly supported by means of a  
spring *b<sup>2</sup>*. A lever *b<sup>3</sup>*, pivoted at *b<sup>4</sup>* to the

supporting-frame, is engaged at its swinging  
end with a stud *b<sup>5</sup>*, affixed to and projecting  
downwardly from the carrier *b'*, said stud 55  
having nuts *b<sup>6</sup> b<sup>7</sup>*, between which the lever *b<sup>3</sup>*  
is located. The lever *b<sup>3</sup>* is connected by a  
rod or link *b<sup>8</sup>* with a treadle, (not shown,) said  
treadle, rod, lever, stud, and carrier enabling  
the operator to depress the work-table *b* when- 60  
ever it is desired to insert the work between  
it and the combined forming and feeding  
wheel *c*, hereinafter described.

The work-table *b* is provided with a shank  
*b<sup>9</sup>*, to which is affixed a gear *b<sup>10</sup>*, meshing with 65  
a gear *b<sup>12</sup>*, affixed to a vertical shaft *b<sup>13</sup>*, which  
is journaled in bearings on the supporting-  
frame and provided with a bevel-gear *b<sup>14</sup>*,  
which meshes with a similar gear *b<sup>15</sup>* on a  
driving-shaft *b<sup>16</sup>*, to which motion may be 70  
communicated in any desired manner, such  
as by a crank *b<sup>17</sup>*, having a gear *b<sup>18</sup>* meshing  
with a gear *b<sup>19</sup>*, affixed to the shaft *b<sup>16</sup>*. The  
shank *b<sup>9</sup>* of the work-table *b* has a down-  
wardly-projecting stud *b<sup>20</sup>*, which rotates in a 75  
socket or bearing formed for its reception in  
the carrier *b'*, the work-table being thus  
adapted to rotate, while the carrier has no  
rotary movement.

*c* represents a forming and feeding wheel, 80  
which is preferably cup-shaped, as shown in  
Fig. 3, and has a beveled milled edge or face  
*c'*, formed to rest squarely on a sole supported  
by the work-table *b*, and a milled inner face  
*c<sup>2</sup>*, which is substantially at right angles with 85  
the beveled face *c'* and is arranged to act as  
one of the flange-reinforcement-forming  
parts. The wheel *c* is affixed to a shaft *c<sup>3</sup>*,  
which is journaled in a fixed bearing on the  
frame of the machine and is provided with 90  
a gear *c<sup>4</sup>*, meshing with a gear *c<sup>5</sup>*, affixed to an  
inclined shaft *c<sup>6</sup>*, journaled in bearings on  
the supporting-frame. To the shaft *c<sup>6</sup>* is  
affixed a bevel-gear *c<sup>7</sup>*, meshing with a simi-  
lar gear *c<sup>8</sup>* on the shaft *b<sup>16</sup>*. Rotary motion 95  
is communicated to the wheel *c* from the  
shaft *b<sup>16</sup>* through the gears *c<sup>8</sup>* and *c<sup>7</sup>*, shaft *c<sup>6</sup>*,  
and gears *c<sup>5</sup> c<sup>4</sup>*. The wheel *c* and work-table  
*b* are thus rotated simultaneously and in the  
same direction, so that the edge of a sole in- 100  
serted between them will be fed or moved  
progressively by the rotation of said parts.

*d* represents a presser-foot which is formed  
on or affixed to a slide *d'*, movable in an in-



clined guide  $d^2$ , which is affixed to a lever  $d^3$ , pivoted at  $d^4$  to the supporting-frame, and normally held by means of a spring  $d^5$  against a stop  $d^6$ . Said stop, as here shown, is a nut  
 5 on a rod  $d^7$ , which is connected with the lever  $b^3$ , the arrangement being such that when said lever is moved to depress the work-table  $b$  the lever  $d^3$  will also be moved to swing the  
 10 presser-foot  $d$  away from the forming and feeding wheel  $c$ . Provision is thus made for releasing the work from pressure between the presser-foot and forming and feeding wheel and for accommodating any desired thick-  
 15 ness of material between said parts. The slide  $d'$  is longitudinally movable in the guide  $d^2$  to move the presser-foot toward and from the work-table  $b$ . A lever  $d^8$ , which is mounted upon the pivot  $d^4$  beside the lever  $d^3$ , has in one arm a slot  $d^9$ , which receives a stud  $d^{10}$   
 20 on the slide  $d'$ , the other arm of the lever  $d^8$  being extended rearwardly and connected by a rod  $d^{12}$  with a treadle. (Not shown.) A spring  $d^{13}$  holds the lever  $d^8$  against a stop-screw  $d^{14}$ , which determines the normal po-  
 25 sition of the foot  $d$  relatively to the work-table. A downward movement of the rod  $d^{12}$  causes an upward movement of the presser-foot, as will be readily seen.

$e$  and  $e'$  represent rotary disk-shaped trim-  
 30 ming-knives which are arranged to trim off the surplus portions of the reinforcing-sheet  $r$ , which is shown in Figs. 5, 6, 7, 8, and 9 cemented upon one face of the leather inner sole  $s$ . Said cutters are affixed, respectively,  
 35 to shafts  $e^2$   $e^3$ , which are journaled in bearings in an oscillatory frame or cutter-holder  $e^4$ , the latter being pivoted at  $e^5$  to the supporting-frame. The frame  $e^4$  is adapted to swing toward and from the work-table  $b$ , its  
 40 cutters being in close proximity to the point where the forming and feeding wheel  $c$  and presser-foot  $d$  bear upon the work. The cutter  $e$  projects into the concave side of the wheel  $c$ , as shown in Figs. 3, 5, 6, and 7. The  
 45 shaft  $e^2$  is rotated by power communicated in any suitable way, preferably through a belt (not shown) running upon a pulley  $e^6$ . The shafts  $e^2$   $e^3$  are connected by gears  $e^7$   $e^8$ , so that the cutters are simultaneously rotated  
 50 in opposite directions and are thus caused to trim the material presented to them. The cutter-holder  $e^4$  is provided with an arm  $e^9$ , which is arranged to bear against the edge of the sole  $s$  under the reinforcing layer  $r$ , and  
 55 thus determine the line along which the projecting portion of the layer  $r$  is trimmed by the cutters, the edge of the sole  $s$  acting as a gage. The cutters are arranged so that when the work is in place and the arm  $e^9$  bears  
 60 upon the edge of the sole the cutters will trim the reinforcing layer along a line which is flush with the edge of the sole. The cutter-holder and its cutters are pressed yieldingly toward the work-table  $b$  by means of a spring  
 65  $e^{10}$ , Fig. 1. The longitudinal movability of the shaft  $e^2$  and the spring  $e^{12}$ , arranged to press the cutter  $e$  yieldingly against the cut-

ter  $e'$ , automatically compensates for wear of the meeting faces of the cutters and keeps them always in operative contact with each other. 70

The operation of the machine is as follows:  
 A sole  $s$ , which has been previously split at its edge to form two lips, one of which has been turned upwardly, forming a rib or  
 75 flange  $s'$ , is covered on one side, excepting at its heel portion, with a sheet  $r$  of canvas or other suitable reinforcing fabric, the canvas being cemented to the sole and to the sides of the flange or rib  $s'$ . The reinforcing layer  
 80  $r$  may be applied by hand, the operator manipulating and pressing the reinforcing-sheet to cause it to conform approximately to the rib or flange  $s'$ . The sole is now placed upon  
 85 the work-table  $b$ , the operator depressing the latter to permit the insertion of the sole and reinforcing layer between the work-table and the forming and feeding wheel  $c$ , this depression of the work-table also separating the  
 90 presser-foot from the portion of the wheel  $c$  with which it coöperates, all as shown in Fig. 5. The operator then inserts the rib or flange  $s'$  and its partially-formed covering between the face  $c^2$  of the wheel  $c$  and the presser-  
 95 foot  $d$ . The work-table  $b$  and presser-carrying lever  $d^3$  are then released, the table  $b$  being forced upwardly by its spring  $b^2$  and the presser-foot at the same time forced toward  
 100 the wheel  $c$  by the spring  $d^5$ , as shown in Fig. 6. These springs are sufficiently strong to cause a considerable compression of the rib or flange  $s'$  and its cover between the form-  
 105 ing and feeding wheel and the presser-foot. The operator then rotates the work-table and wheel  $c$ , thus feeding the sole progressively and causing the presser-foot and the wheel  $c$  to progressively compress and form the rib or flange  $s'$  and its cover throughout the en-  
 110 tire length thereof. At the same time the projecting edges of the reinforcing layer  $r$  are presented to the cutters  $e$   $e'$  and trimmed off flush with the edge of the sole.

The longitudinal movability of the presser-foot slide  $d'$  in its guide  $d^2$  enables the presser-foot to conform automatically to the thick-  
 115 ness of the material interposed between it and the table  $b$ .

The cutter-holder or frame  $e^4$  is preferably provided with a plate  $f$ , arranged to support the portion of the reinforcing layer which is  
 120 removed by the cutters and prevents said portion from becoming entangled in the cutter-shafts and other moving parts adjacent thereto.

In Figs. 3, 5, and 9 I show a cup or holder  
 125  $g$ , containing cotton or other absorbent material which is saturated with oil and arranged to bear against the lower portion of the cutter  $e'$ , thus keeping the cutters properly lubricated. 130

I do not limit myself to the particular form and arrangement of the several parts of the machine here illustrated, and the same may be variously modified without departing from



the spirit of my invention. For example, the work support or bed may be a roll or cylinder instead of a flat table. It is obvious that any suitable work-support may be used in conjunction with the forming and feeding wheel and presser-foot, the work-support holding a sole so that an upwardly-projecting rib thereon will be properly presented to the said wheel and foot.

10 I claim—

1. A machine of the character specified, comprising a work-supporting bed, a rotatable forming and feeding wheel, and a presser-foot arranged to cooperate with said wheel in compressing a sole flange or rib.

2. A machine of the character specified, comprising a work-supporting bed, a rotatable forming and feeding wheel supported in fixed bearings, a presser-foot which is movable toward and from said wheel, and means for yieldingly maintaining the foot in its operative relation to said wheel.

3. A machine of the character specified, comprising a work-supporting bed, a rotatable forming and feeding wheel supported in fixed bearings, a presser-foot guide movable relatively to said wheel and yieldingly held in its normal relation thereto, a presser-foot slide movable independently in said guide and provided with a presser-foot arranged to cooperate with said wheel, and means for yieldingly holding the said slide in its normal position relatively to the guide.

4. A machine of the character specified, comprising a rotary work-supporting bed, a rotary forming and feeding wheel adjacent thereto, a presser-foot arranged to cooperate with said wheel as described, and means for simultaneously rotating said bed and wheel.

5. A machine of the character specified, comprising a yieldingly-supported rotary work-supporting bed, means for depressing the same, a rotary forming and feeding wheel mounted in fixed bearings above the said bed, and a presser-foot arranged to cooperate with said wheel.

6. A machine of the character specified, comprising a yieldingly-supported rotary work-supporting bed, a rotary forming and feeding wheel mounted in fixed bearings above the bed, a presser-foot movable toward and from said wheel and yieldingly maintained in its operative relation thereto, and means for simultaneously displacing said bed and presser-foot.

7. A machine of the character specified, comprising means for pressing a sole-rib, sole-feeding mechanism, and a yieldingly-supported trimming mechanism movable toward and from the edge of the sole to conform automatically to the edge of the sole.

8. A machine of the character specified, comprising a work-supporting bed, rib or

flange compressing devices adjacent to the bed, a cutter-holder mounted to move toward and from said bed and yieldingly maintained in its operative relation thereto, cutters carried by said holder, and an abutment on said holder arranged to bear on the edge of a sole.

9. In a machine for reinforcing insoles, the combination of a rotary forming and feeding wheel, and presser-foot arranged to engage the reinforcing material and conform the same to the lip on an insole, substantially as described.

10. In a machine for reinforcing insoles, the combination with a rotary forming and feeding wheel, of a presser-foot, said wheel and foot arranged to engage the reinforcing material upon opposite sides of the lip on the insole to conform said material to the lip, and said forming and feeding wheel having a peripheral bearing-face to lay the edge of the reinforcing material upon the feather of the insole, substantially as described.

11. In a machine for reinforcing insoles, the combination with a presser-foot arranged to press and conform the reinforcing material to one side of the lip of an insole, of a forming and feeding wheel arranged to conform the reinforcing material to the opposite side of the lip, and to feed the insole beneath the presser-foot, substantially as described.

12. In a machine for reinforcing insoles, the combination with a rotary work-support, of a rotary forming and feeding wheel arranged to conform the reinforcing material to one face of the lip on the insole and means to cause the insole to be gripped between the forming and feeding wheel and work-support to feed the insole, substantially as described.

13. In a machine for reinforcing insoles, the combination with a work-support arranged to support the insole, of means to conform the reinforcing material to the insole and cutters movable toward and from the edge of the insole arranged to automatically follow the edge of the insole and trim the edge of the reinforcing material, substantially as described.

14. In a machine for reinforcing insoles, the combination with a work-support, of means comprising a presser-foot to form a bead or crimp in the reinforcing material, and means for simultaneously moving the work-support and presser-foot to release the insole, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 31st day of October, A. D. 1896.

MYRON L. KEITH.

Witnesses:

WENDELL S. HOWES,  
DAVID PERKINS.