2 Sheets—Sheet 1.

G. BRYDEN.

MACHINERY FOR MANUFACTURING HORSESHOES.

No. 172,383. Patented Jan. 18, 1876.

Fig. 9.

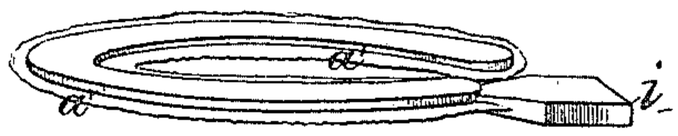


Fig. 1.

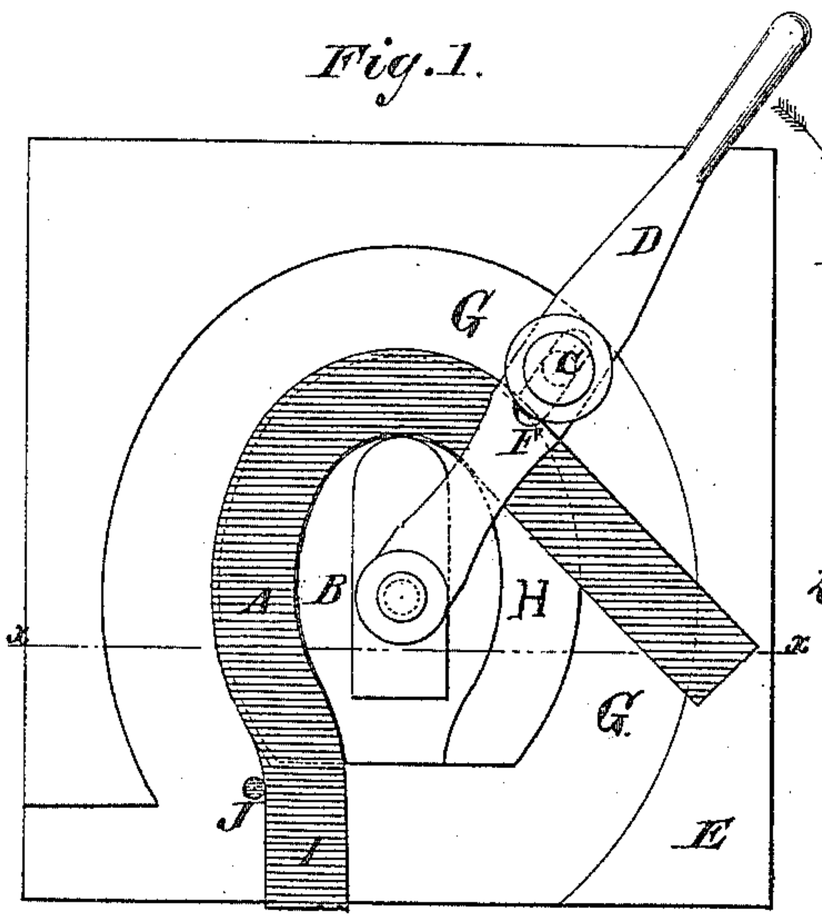


Fig. 4.

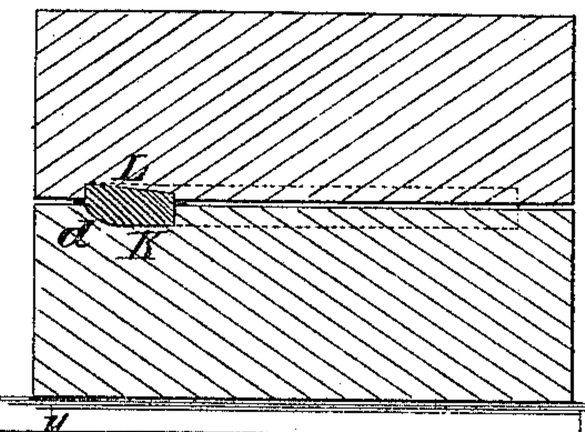


Fig. 3.

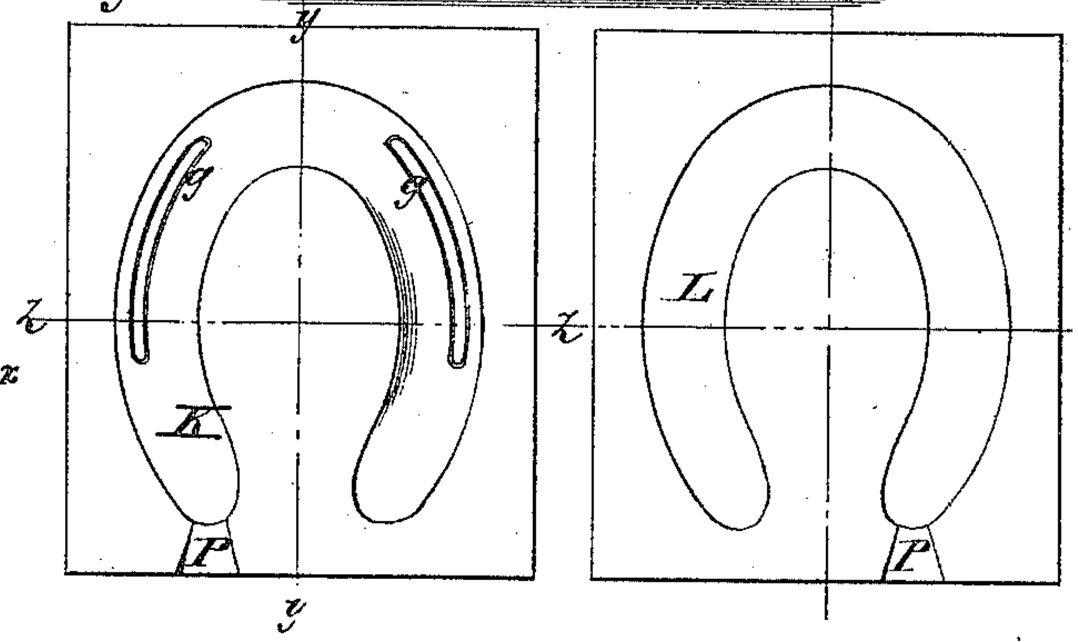


Fig. 5.

Fig. 2.

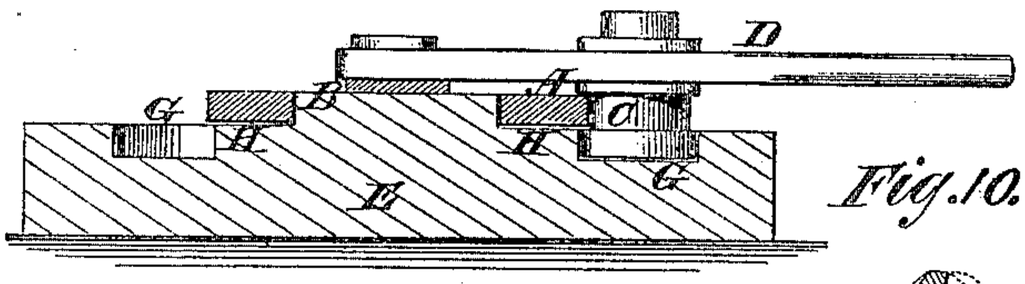


Fig. 10.

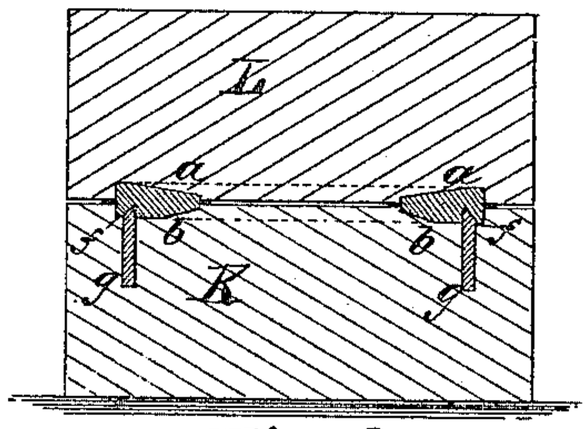
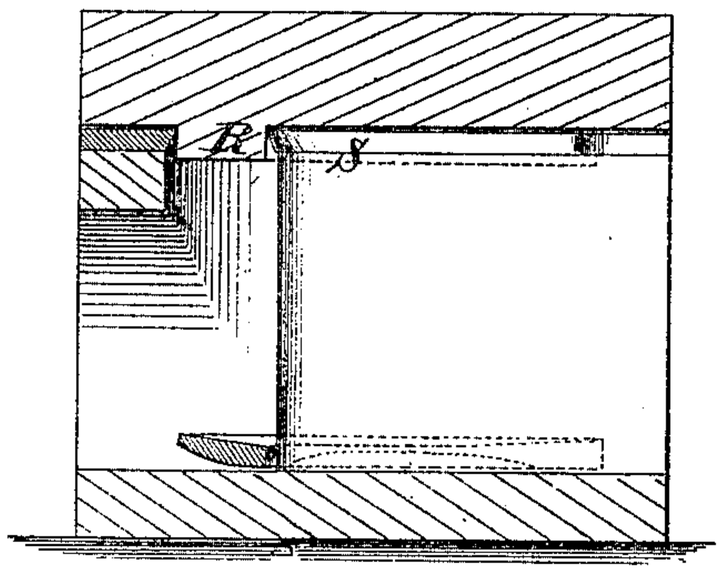
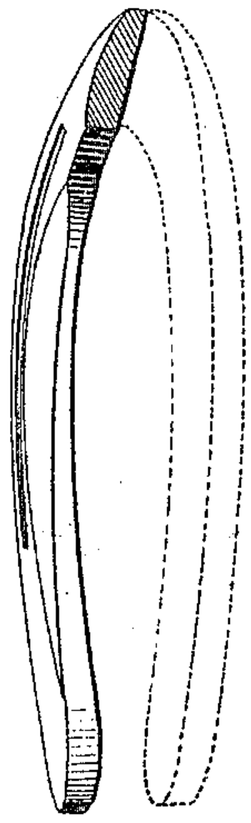


Fig. 6.

Fig. 8.





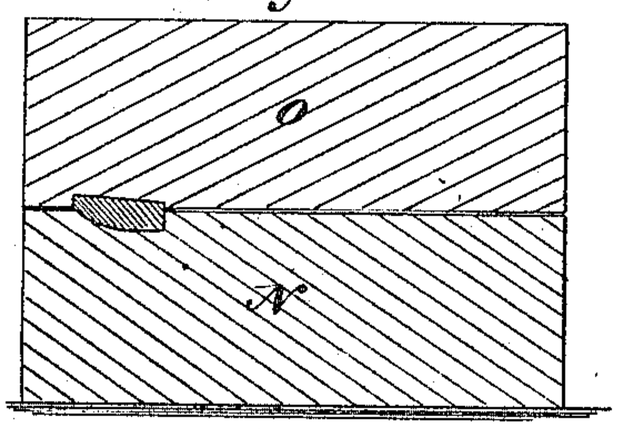


Fig. 7.

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2 Sheets—Sheet 2.

G. BRYDEN.

MACHINERY FOR MANUFACTURING HORSESHOES.

No. 172,383. Patented Jan. 18, 1876.

Fig. 11.

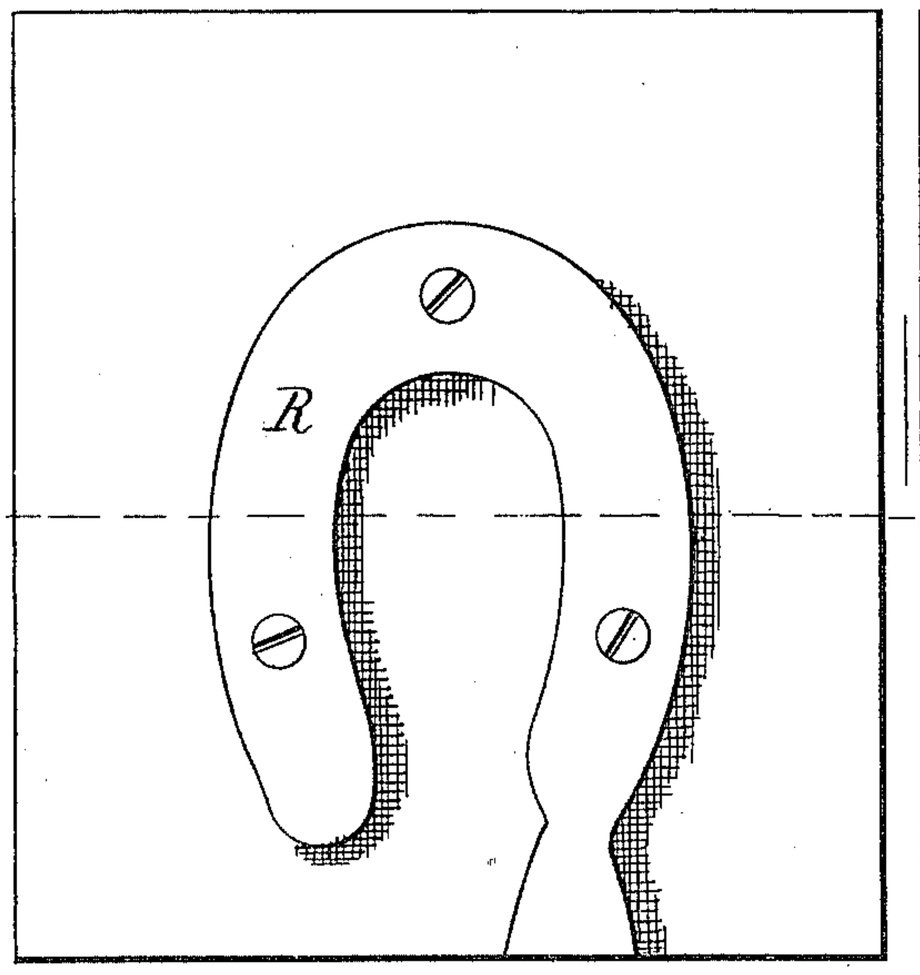


Fig. 12.

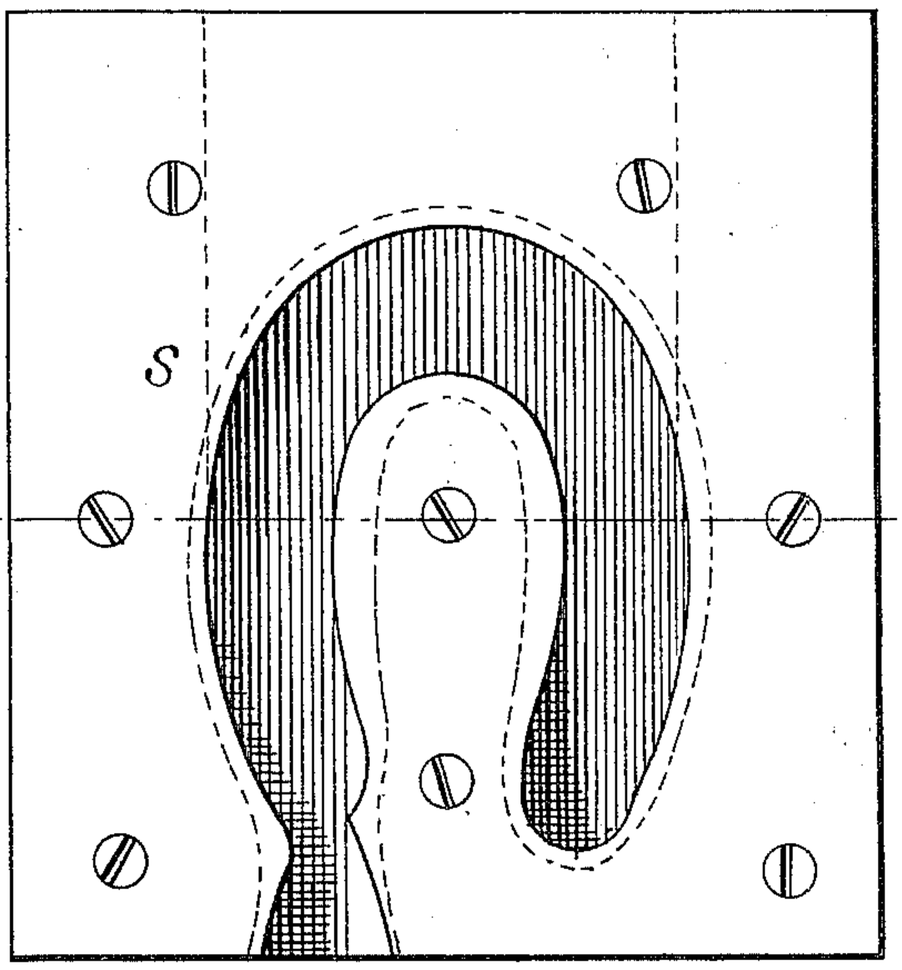
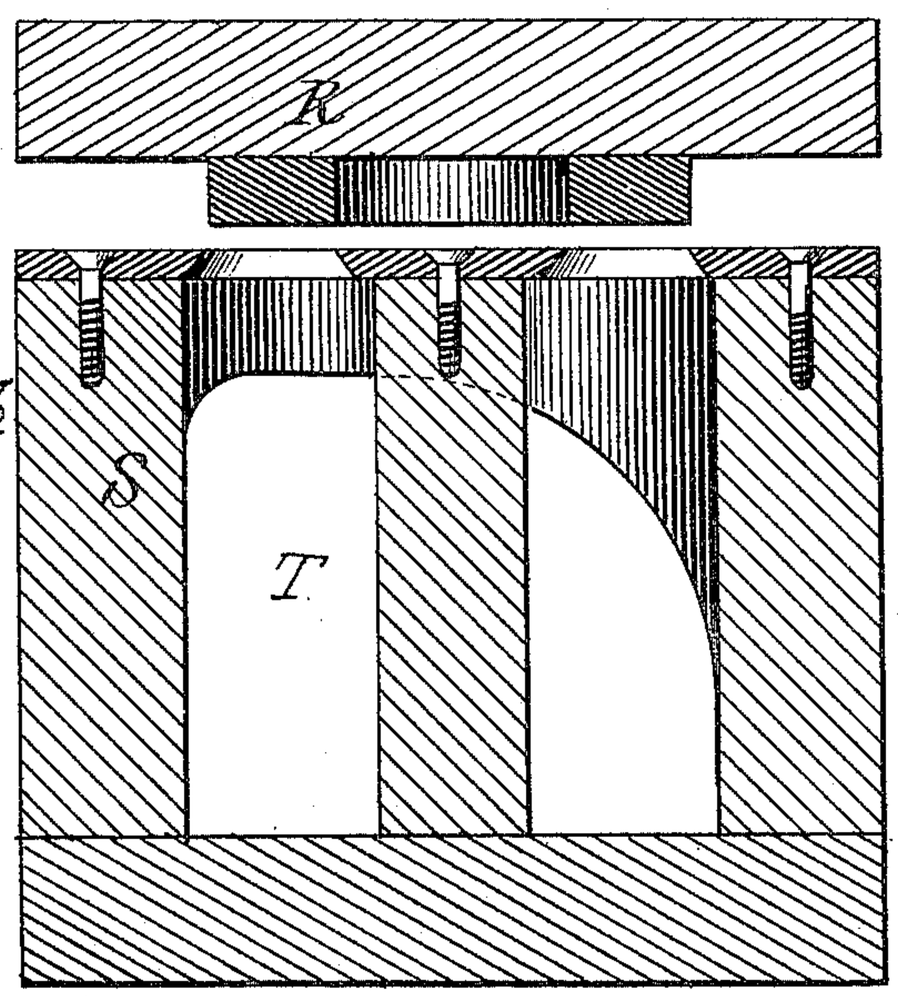


Fig. 13.



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UNITED STATES PATENT OFFICE.

GEORGE BRYDEN, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN MACHINERY FOR MANUFACTURING HORSESHOES.

Specification forming part of Letters Patent No. **172,383**, dated January 18, 1876; application filed May 5, 1873.

To all whom it may concern:

Be it known that I, GEORGE BRYDEN, of Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in the Manufacture of Horseshoes, of which the following is a specification:

The object of my invention is to produce horseshoes of hard condensed metal, capable of sustaining more wear and possessing greater stiffness than the shoes in common use, which are very soft and lack stiffness, so that they wear out fast and break and bend after being reduced in thickness by wear, and before being worn as thin as they might be.

In producing shoes according to my invention I first bend a short bar, enough longer than is required for the shoe, to form a shank by which to handle it, around a former to form it in the shape of the shoe; then subject it to the action of a drop-press in dies constructed to give the requisite shape to the upper and lower sides, also the edges, and condense and harden the metal, and to form the creases for the nail-holes, using a preparatory set and a finishing set of dies, and subjecting it to two operations, and then finishing it in a pair of trimming-dies, to turn off the fins at the edges produced by the shaping and condensing dies. The bending apparatus which I use consists of a stationary former of the form of the inner edge of the finished shoe, a bending-lever pivoted to the former at the center, a roller on the lever to force the bar against the former, and a guide and guide-roller for keeping the bending-roller at a uniform distance from the face of the former, which, being an irregular curve, requires the bending-roller to be fixed to the lever by a movable pivot, so as to shift on it toward and from the pivot, according to the irregularities of the curve of the former.

In the dies of the drop-presses I employ detachable curved plates or creasers for forming the creases in the shoes, in order that I may remove them when worn out or broken, and put in others as they wear out or become disabled, while the other portions of the dies remain serviceable, so that I save the waste of dies that would be involved if they were made solid with the dies.

Figure 1 is a plan view of the bending apparatus which I employ for bending the bar into the form of a horseshoe. Fig. 2 is a section of Fig. 1 on the line of *x x*. Fig. 3 is a plan view of the first pair of condensing-dies, which I use for shaping, creasing, and hardening the previously bent blanks. Fig. 4 is a transverse section of the said dies and the blank taken on the line *y y*, Fig. 3. Fig. 5 is a transverse section of said dies and the blank, taken on the line *z z*, Fig. 3. Figs. 6 and 7 are sections of the finishing-dies on lines corresponding to *y y* and *z z* of Fig. 3. Fig. 8 is a sectional elevation of the trimming-dies. Fig. 9 is a perspective view of the shoe before being subjected to the action of the trimming-dies. Fig. 10 is a perspective view of the finished shoe, partly in full lines and partly in dotted lines; it also shows a section of the shoe at the toe. Fig. 11 is a plan or face view of the upper, and Fig. 12 a similar view of the lower, trimming-die. Fig. 13 is a vertical cross-section of the two dies.

A represents a short bar, such as I take for making a shoe, partly bent against the former B by the bending-roller C and lever D. The former is arranged in the middle of the block E, or thereabout, the lever is pivoted at the center of the former, and the roller is pivoted to the lever in a slot, F, and extends into a guide-groove, G, surrounding the former and the bed H for the bar. The outer wall of this groove is at a uniform distance throughout from the face of the former, and keeps the roller the requisite distance from the former, to press the bar against it at all points while being carried around by the lever. I is a prolongation of the bar at one end beyond the length required for the shoe, for a shank by which to handle it to shift it from one to the other of the several devices used in the process of making the shoe. J is a pin for holding the bar against the former at the point where the operation begins. K and L represent the first or preparatory set of shaping and condensing dies, to which the blank is subjected after being bent, to condense and harden the metal, bevel the upper and lower sides *a b* at the inner edge, bevel the under side *d* at the toe, and form the creases *f*. These dies are shaped to correspond with the former B, so that the blank formed on it will

be received in them, and they are constructed in depth so as to partially form the bevels *a b d* and the creases *f*. These creases are formed by creasing ribs or punches *g*, which I propose to construct separately from the die-blocks, and fit them in so that they can be removed and others substituted, as before stated. N and O are the finishing-dies. They are similar in all respects to dies K and L, except the beveling parts and the creases, which are adapted to complete the form of the shoe in these respects, which are only partly wrought to this required shape in the others.

The notches P are for the shank or handle piece I. These dies are used in powerful drop-presses to condense, harden, and stiffen the metal in the process of shaping it by them. These operations produce fins *a'* on the edges of the shoe, as represented in Fig. 9, which I trim off with a male and female die, R S, Fig. 8. The die S has its edges sharpened by being beveled or otherwise, and is made with a cavity, T, opening outward at one end, so that as the shoes are trimmed they fall into this cavity, and may be withdrawn through said opening. Then I trim off the shank by any suitable means, and thus complete the shoe. The shaping of the sides and condensing and hardening process may be effected by one set of dies, by either one or two operations; but it is better to use two sets, and more if preferred.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with former-block B, having blank-bed H and guide-groove G, of the pivoted and slotted lever D and the grooved roller C, that changes its distance from the center of motion at the times and in the manner described.

2. The dies R S, constructed and applied to trim and finish the shoe, substantially in the manner specified.

GEORGE BRYDEN.

Witnesses:

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