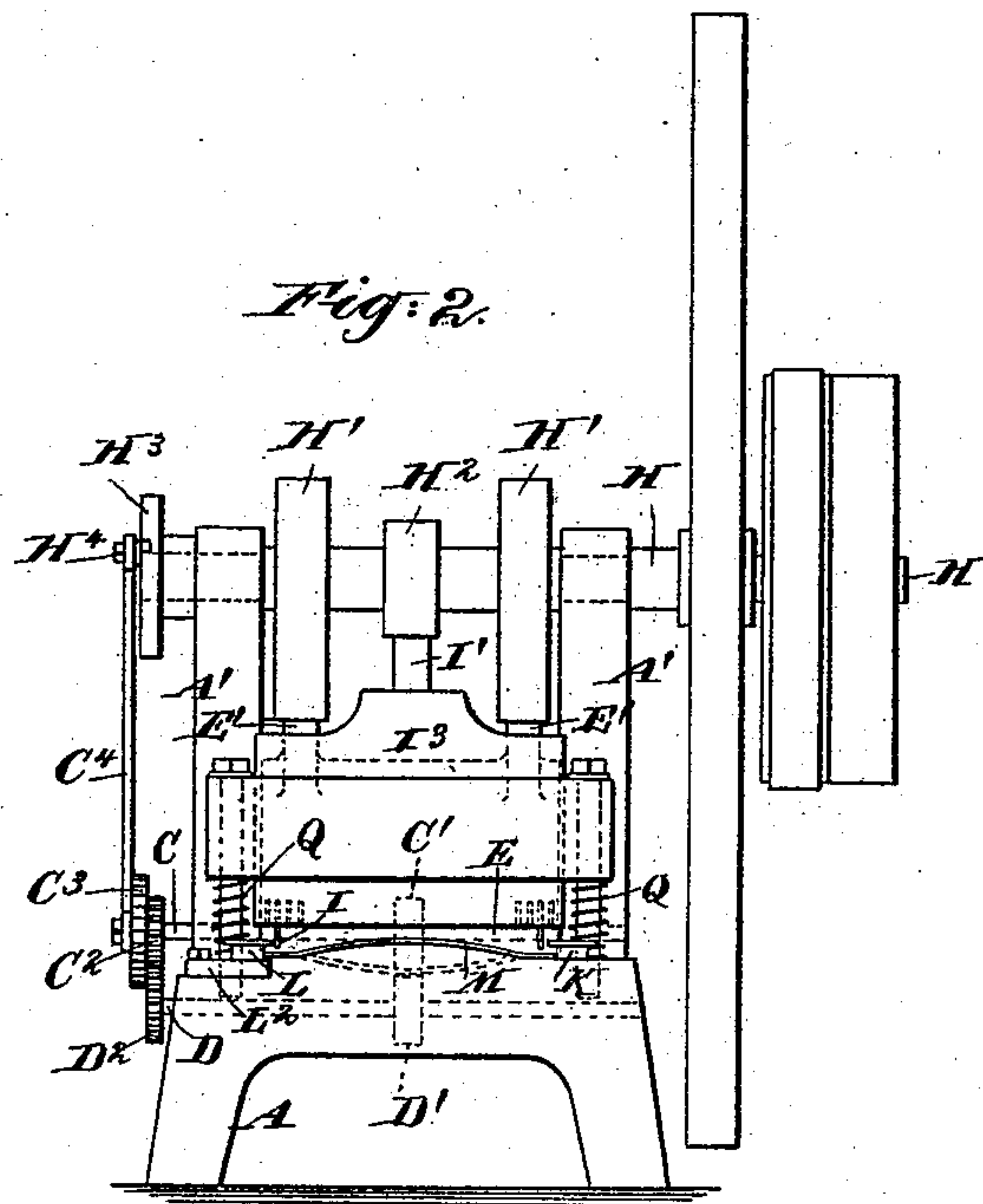
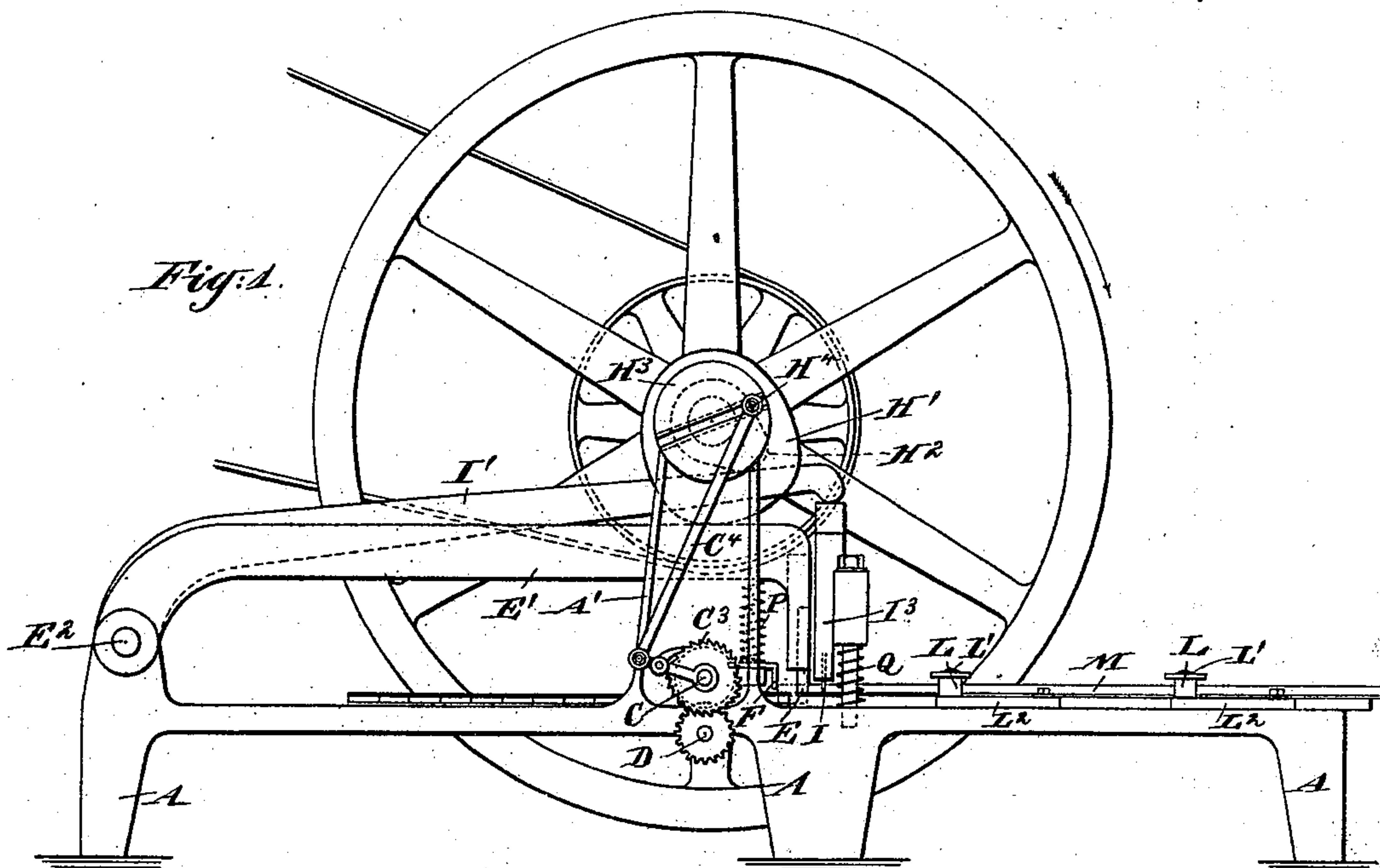


(No Model.)

2 Sheets—Sheet 1.

G. D. BARTLETT.  
MACHINE FOR MANUFACTURING SHOE SHANKS.  
No. 516,696. Patented Mar. 20, 1894.



Witnesses:

Charles R. Searle.  
H. A. Johnstone.

Inventor:

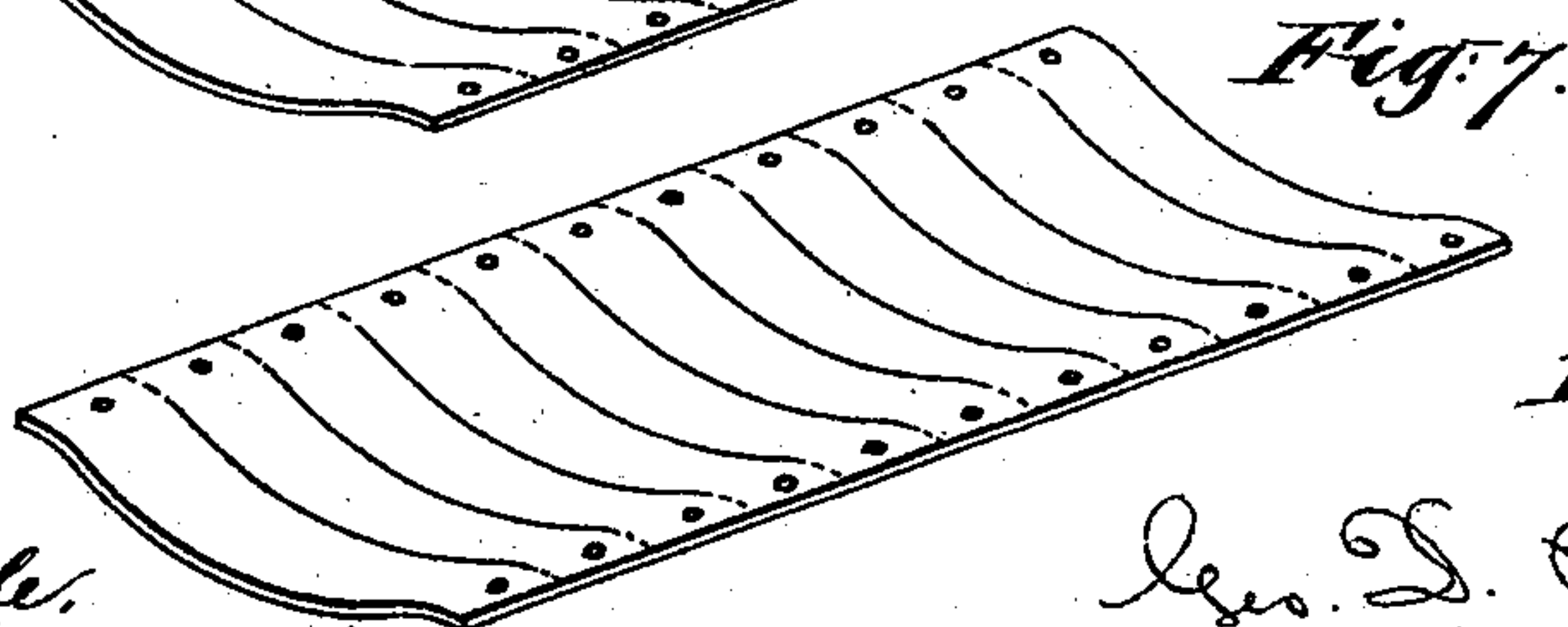
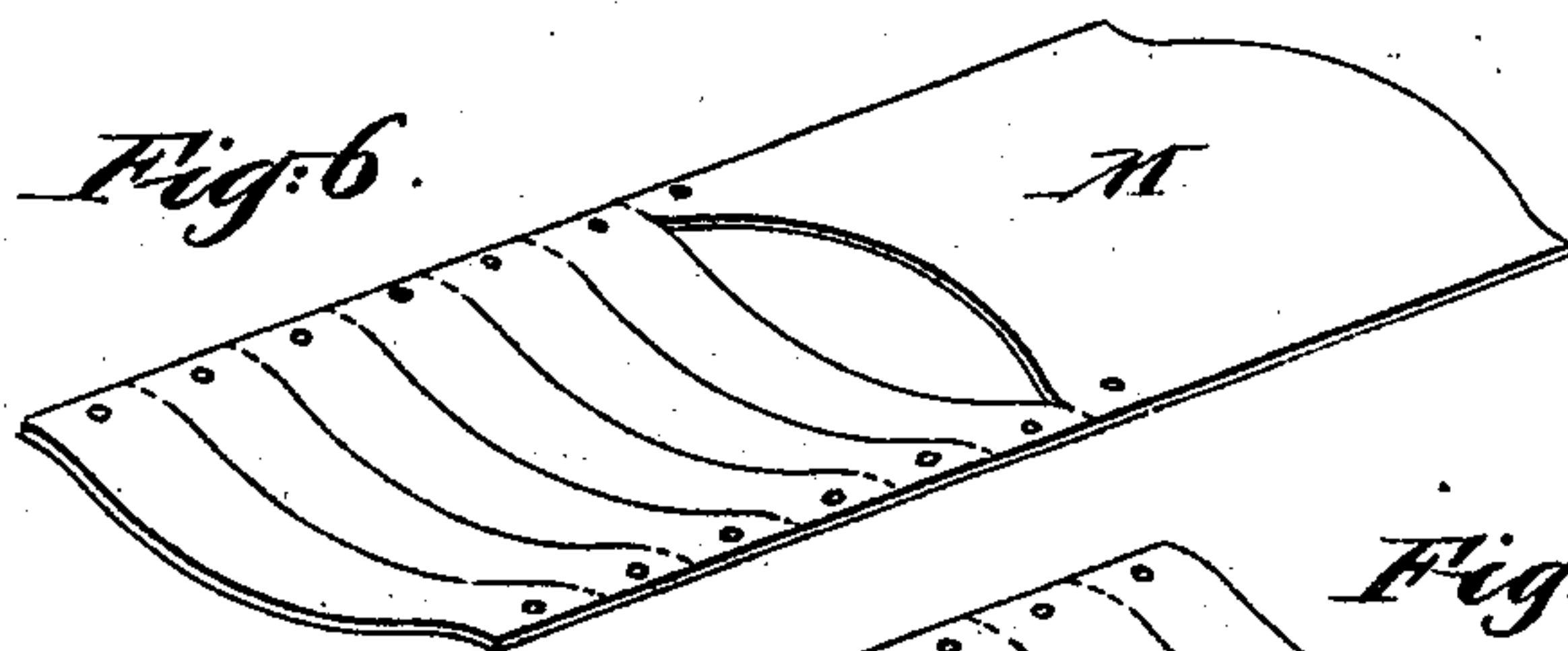
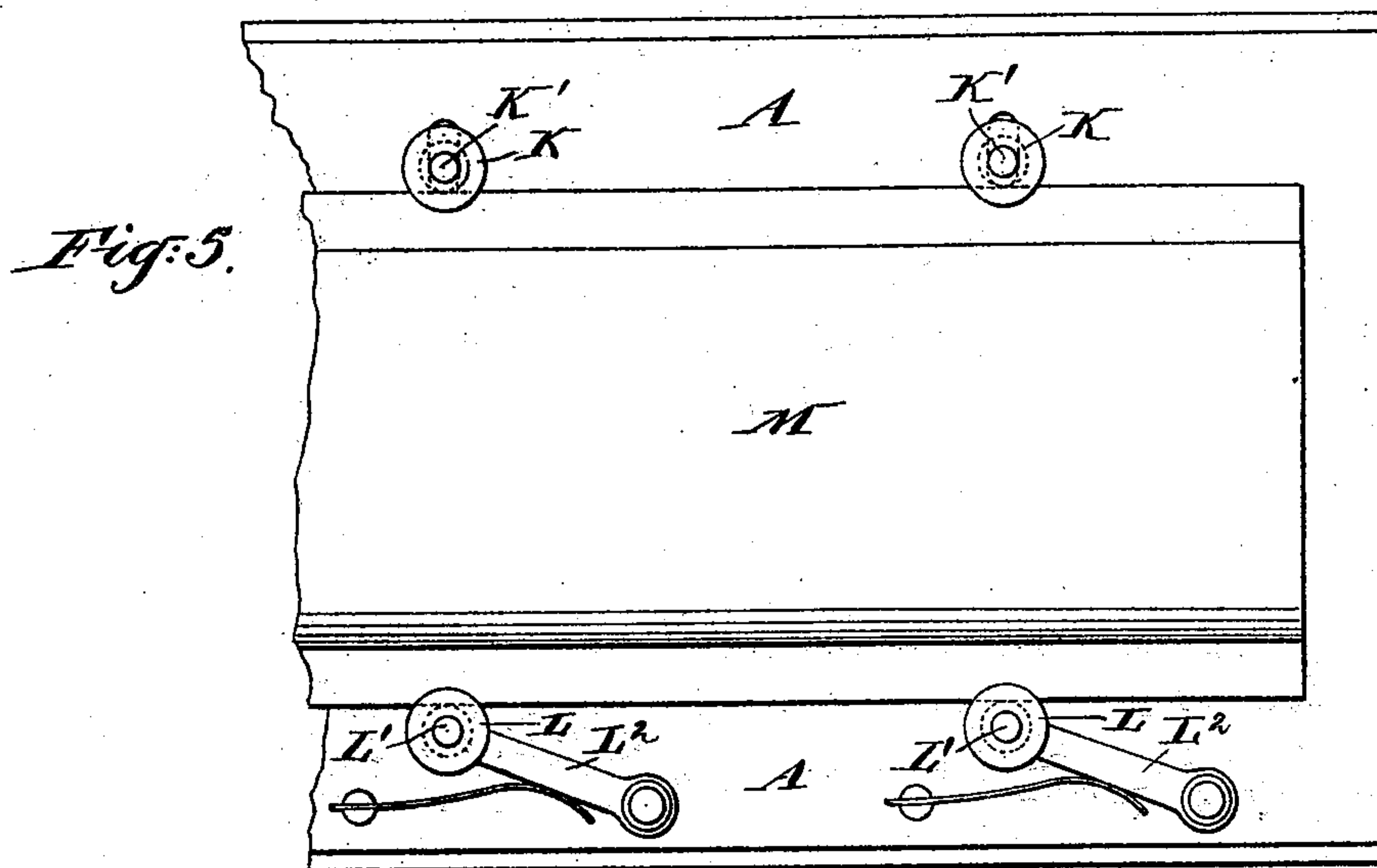
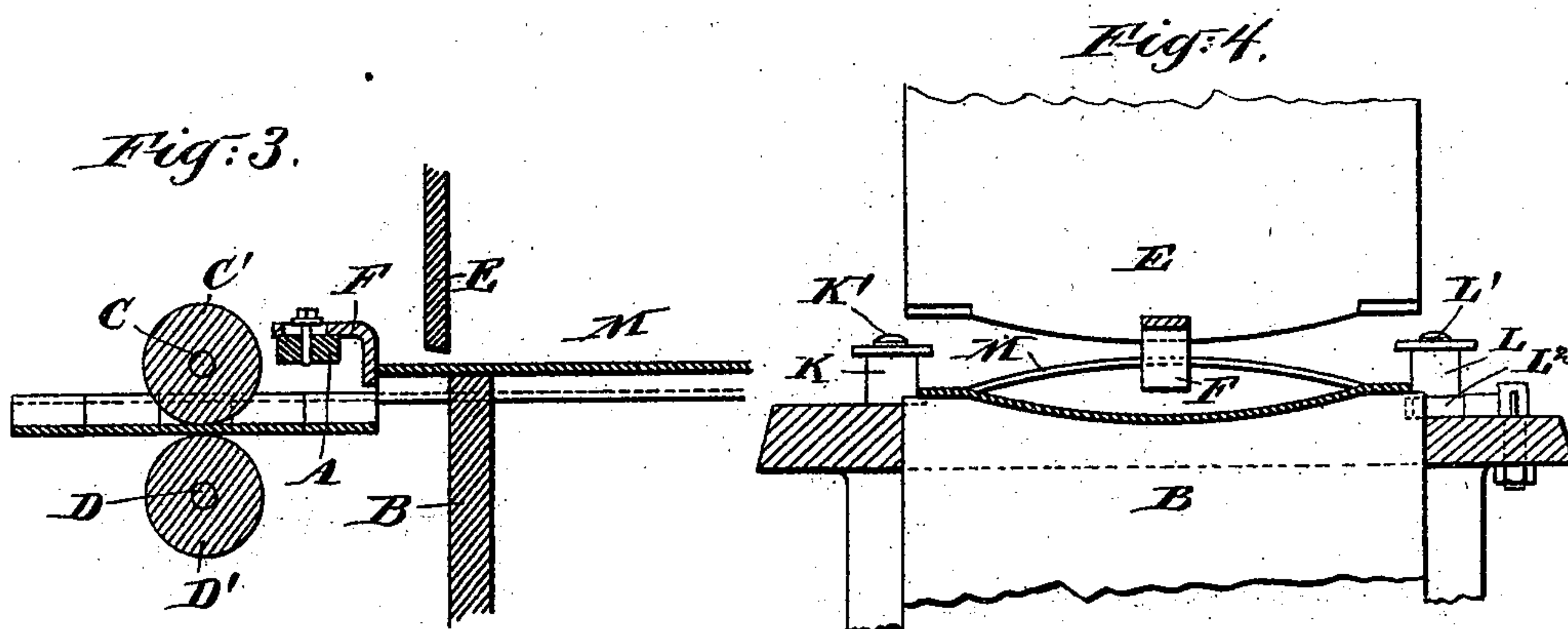
Geo D. Bartlett  
by his attorney  
Thomas Drew Sutton

G. D. BARTLETT.

MACHINE FOR MANUFACTURING SHOE SHANKS.

No. 516,696.

Patented Mar. 20, 1894.



Witnesses:  
Charles R. Searle,  
H. A. Johnston.

Inventor:

G. D. Bartlett  
by his attorney  
Shuman & Sons, Boston



# UNITED STATES PATENT OFFICE.

GEORGE D. BARTLETT, OF PLYMOUTH, MASSACHUSETTS.

## MACHINE FOR MANUFACTURING SHOE-SHANKS.

SPECIFICATION forming part of Letters Patent No. 516,696, dated March 20, 1894.

Application filed November 3, 1893. Serial No. 489,902. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE D. BARTLETT, a citizen of the United States, residing at Plymouth, in the county of Plymouth, in the State of Massachusetts, have invented a certain new and useful Improvement in Machines for Manufacturing Shoe-Shanks, of which the following is a specification.

What are here termed "shoe-shanks" are slightly curved springs of sheet steel, hardened or partly hardened and tempered, which are placed in the shanks of boots and shoes to aid in maintaining the shape. It has long been common to use such, and there have been various machines to facilitate the manufacture. In the manufacture, the several shanks have been separated by successive cuts across a strip of sheet steel of the proper width, the bending being approximately imparted in the act of cutting and subsequently corrected by pressure between dies. One or two holes are punched near each end to facilitate the fastening. All the shaping is completed before the hardening and tempering. So far as I am aware, all machines heretofore have cut the several shanks completely apart. My improved machine is adapted for leaving them connected, cutting across the mid-width of the strip nearly but not quite across to each edge, and simply creasing or indenting the material at the edge. This leaves the several shanks attached together, and facilitates the subsequent operations by allowing a number to be handled in a single sheet. I have made the improved product the subject of a separate application for patent, filed January 20, 1892, Serial No. 418,641. The machine which I have devised for executing this work easily and rapidly may be varied in details within wide limits. The strip of sheet steel having a width equal to the length of the shank is moved step by step forward in the machine, and is partially separated after each movement by knives so operated as to curve downward the central portion which is cut, while the part which remains to be cut is equally curved upward, thus maintaining the required coincidence in the length during each stage of the cutting to avoid straining of the metal. At each forward movement the portion remaining to be cut strikes fairly against a gage

which determines exactly the width of the several shanks. The motion of the moving knife is arrested in the position when the metal is separated nearly but not quite across, leaving sufficient at each side of the strip remaining attached to allow the whole sheet to be handled at once in hardening and tempering. I can feed the strip forward by hand. In what I esteem the most complete form of the invention, it is fed mechanically.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation and Fig. 2 an end elevation. Figs. 3, 4 and 5 show portions on a larger scale. Fig. 3 is a central longitudinal section. Fig. 4 is a transverse section and Fig. 5 is a plan view. Fig. 6 represents a sheet of steel partly treated. Fig. 7 shows the same after it has been fully treated.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is a stout fixed frame of cast iron or other suitable material, having uprights A' which support a shaft H having a fly-wheel and a pulley revolved by a steam-engine or other suitable power.

H', H', are cams adapted to depress the moving cutter, and having a form which gives a waiting period in the most depressed position of the cutter.

H<sup>2</sup> is a cam adapted to operate the slight punches required for punching the holes near the ends.

B is a stout stationary knife held in the framing, with its edge arched or curved upward.

E is the moving knife or cutter carried in a stout lever E', turning on firmly mounted centers E<sup>2</sup>, having its cutting edge in the form of an inverted arch. The curvature of these edges may be varied, but they should correspond each with the other so that the length of the metal each side of the slit lying in the curved condition each on the edge of its respective knife shall be equal one to the other at all stages of the cutting movement.

C and D are transverse shafts carrying feed-rolls C', D'. They are connected by gear-wheels C<sup>2</sup>, D<sup>2</sup>, and rotated step by step by a



ratchet C<sup>3</sup> operated by a connection C<sup>4</sup> from a crank-pin H<sup>4</sup> set adjustably in a radial slot in a wheel H<sup>3</sup> in the end of the main shaft H. This crank-pin H<sup>4</sup> should be adjusted to give  
 5 a feed movement at the proper moment slightly in excess of that required for the width of a shank.

F is a gage firmly set on the framing and presenting a proper face to receive the edge  
 10 of the portion remaining uncut at each feeding movement. The act of cutting by the depression of the moving knife E depresses the metal for this shank, carrying it below the gage. As the knife rises it leaves the partially severed shank in the depressed position  
 15 so that at the next feeding movement this metal passes under the gage and allows the edge of the portion still remaining uncut to strike the gage and thus determine the breadth for the next cut and so on.  
 20

K are rollers mounted on upright pins K' set adjustably in the required positions to serve as a guide for one edge of the sheet M. A corresponding series of rollers L are mounted on pins L' carried on spring actuated levers L<sup>2</sup>. The sheet M is steadied, and its position laterally is determined by these rollers, the springs allowing the series L to yield to accommodate roughnesses in the edges or  
 25 variations in the width of the sheets. The several rollers have each a flange on its upper edge which applies over the sheet M and prevents its being displaced upward by any contortion of the metal when it is subjected  
 30 to the considerable force in being cut.  
 35

The punches I are set in the slide I<sup>3</sup> moved by the lever I' turning on the centers E<sup>2</sup> and are depressed by the cam H<sup>2</sup> and allowed to rise again during the period while the moving knife E is held in its extreme depressed position. The pressure of the knife E serves to hold the sheet M reliably during the brief period required for the punching and for the withdrawal of the punches.  
 40

A perforated die, not shown, is mounted in the proper position to support the sheet adjacent to each punch and allow the punches to descend through and remove the small portions required, making clean holes.  
 45

P are springs exerting a proper lifting force on the stout lever E' which carries and guides the moving cutter. Q, Q, are springs which perform the same functions for the slide I<sup>3</sup> which carries the punches I.  
 50

I have shown the slide I<sup>3</sup> as provided with holes which allow the punches I to be changed in position for different sizes or styles of shanks.  
 55

Modifications may be made without departing from the principle or sacrificing the advantages of the invention. I can use a greater or less number of the guide rolls K and L. I can dispense with these rolls and use stationary guides. Other means than the spiral  
 60 springs P and Q may be employed for lifting the levers E' and I'. The arrangement of the parts may be varied so that the punching of

any given shank shall be effected after instead of before the cutting. I have shown the punches larger than is required for the correct proportions. Ordinary shanks are about  
 70 four and one-half inches long, five-eighths of an inch wide and something less than a thirty-second of an inch thick. The holes produced by the punches are about or a little more than a sixteenth of an inch in diameter.  
 75

The sheets produced by my machine, composed of a number of the shanks completely formed and nearly but not quite separated, are afterward separated by hand or by power.  
 80 The temper may be drawn to the required amount by subsequently heating in melted lead, or otherwise, either before or after the shanks are separated. They may be finished by tumbling in a rattler.  
 85

I claim as my invention—

1. The process of making shoe shanks or strips by cutting or slitting a sheet at intervals nearly across the width of the same, arching or shaping the partially severed strips  
 90 thus formed, and hardening the partly severed arched strips in sheet form, substantially as described.

2. The process of making shoe shanks or strips by forming a sheet of arched strips  
 95 partly severed from one another by slits or cuts nearly across the sheet, indenting or compressing the attaching portions, and hardening such sheet of partly severed arched strips with weakened attaching portions, substantially as described.  
 100

3. The combination of a stop or gage, with bending and cutting means, the cutting edges extending part way across the sheet and the bending means being adapted to bend the  
 105 partly severed strips out of the path of the suitably fed sheet, substantially as described.

4. The combination of a stop or gage, cutting and bending means, and a mechanical feed, the cutters having cutting edges part  
 110 way across the sheet and the bending means being adapted to bend the partly severed strips out of the path of the sheet, substantially as described.

5. The combination of a stop or gage, with bending cutters having cutting edges extending part way across the sheet and being adapted to bend the strip in the cutting operation out of the path of the uncut sheet, for partly severing the strips successively from a suitably fed sheet, substantially as described.  
 120

6. The process of making shoe-shanks or strips, by cutting or slitting a sheet at intervals nearly across the width of the same, bending the partly severed strips out of the  
 125 path of said sheet, feeding the latter until arrested by a stop, arching or shaping the partially severed strips thus formed, and hardening the partly severed arched strips in sheet form, substantially as described.  
 130

7. The method of cutting metal sheets into partly severed strips, by cutting or slitting the sheet in the middle leaving the ends attached, bending such middle portion out of



the path of said sheet, feeding the latter until arrested by a stop, and then repeatedly cutting, bending and feeding against the stop, substantially as described.

5 8. The reversely curved cutters provided with indenting or compressing edges outside the cutting edges, substantially as described.

10 9. The combination of the reversely curved cutters, provided with indenting or compressing edges, and a stop or gage, substantially as described.

10. The combination of the reversely curved cutters, a stop or gage, and a mechanical feed, substantially as described.

15 11. The combination of the reversely curved cutters, provided with indenting or compressing edges, a stop or gage, and a mechanical feed, substantially as described.

20 12. The process of making shoe-shanks or strips, by cutting or slitting a sheet at intervals in the middle leaving the ends attached, bending such middle portions out of the path of said sheet, feeding the latter against a stop, arching and shaping the partly severed strips thus formed, and hardening the partly severed arched strips in sheet form, substantially as described.

13. The process of making shoe-shanks or

strips, by cutting or slitting a sheet at intervals in the middle leaving the ends attached, 30 bending such middle portions out of the path of said sheet, feeding the latter against a stop, indenting or compressing the attaching portions, arching or shaping the partially severed strips thus formed, heating such sheets 35 of partially severed strips singly or two or more sheets in a pack but always in such small number as to insure uniform heating, and then rapidly cooling and hardening the said sheets, substantially as described. 40

14. In a machine for manufacturing shoe-shanks, the combination of the knife E and its operating means, adapted for effecting the cutting, and the punches I and their operating means adapted for effecting the punch- 45 ing arranged as specified so that the pressure of the knife shall hold the metal firmly during the punching operation, all substantially as herein specified.

In testimony that I claim the invention 50 above set forth I affix my signature in presence of two witnesses.

GEORGE D. BARTLETT.

Witnesses:

GEORGE S. DYER,  
BENJ. F. WARD.