(No Model.) 2 Sheets—Sheet 1.

N. C. RUBERG.

SHANK STIFFENER MACHINE.

No. 548,225. Patented Oct. 22, 1895.

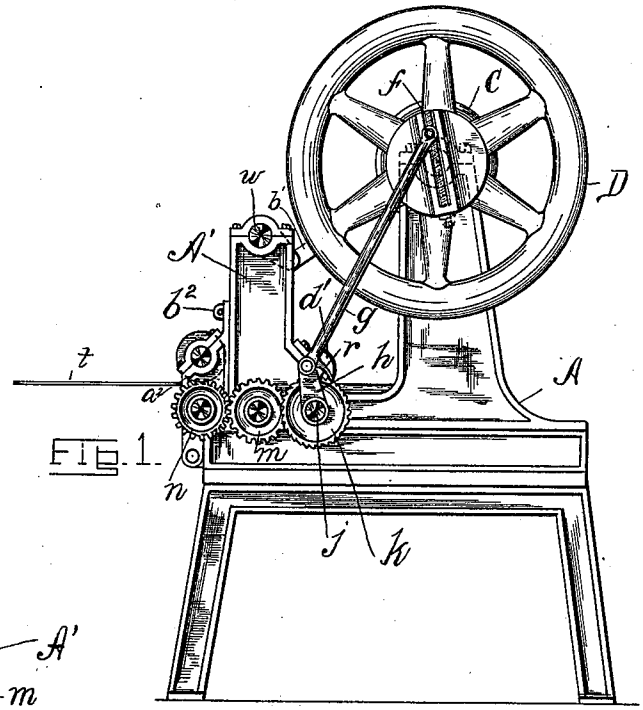

FIG. 1.

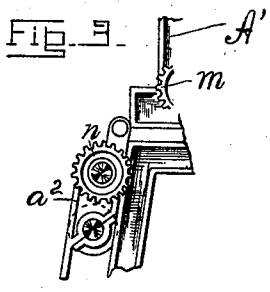

FIG. 3.

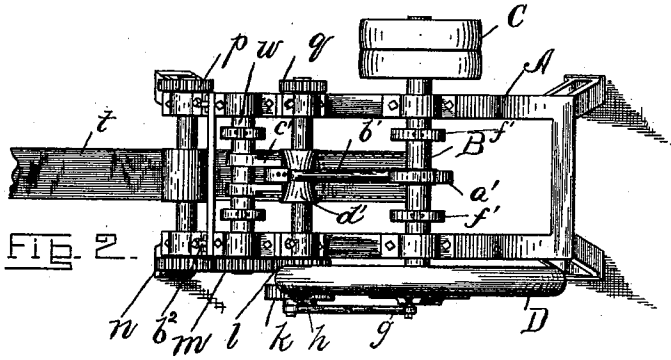

FIG. 2.

Witnesses.
Arthur F. Randall.
Robert Wallace.

Inventor.
Nelson C. Ruberg
By Macleod Calver & Randall
his attorneys

(No Model.) 2 Sheets—Sheet 2.

N. C. RUBERG.

SHANK STIFFENER MACHINE.

No. 548,225. Patented Oct. 22, 1895.

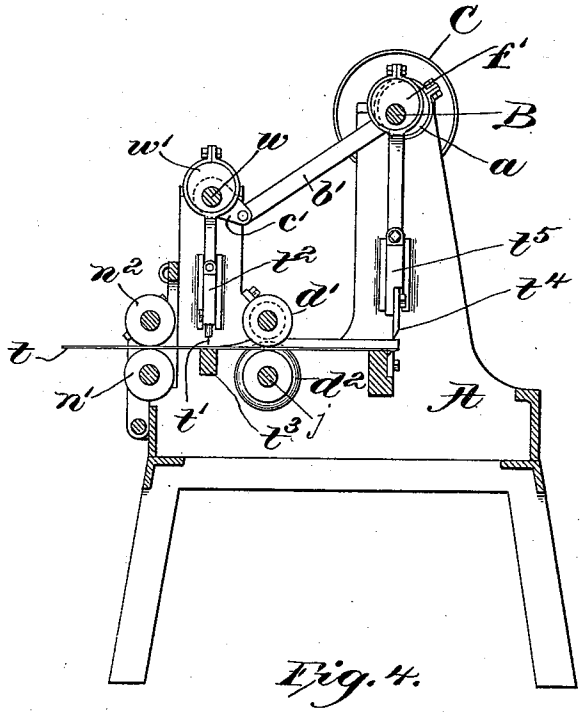

Fig. 4.

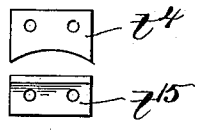

Fig. 5.

Witnesses.
Arthur F. Randall
Robert Wallace.

Inventor.
Nelson C. Ruberg
by Macleod Calver & Randall
his Attorneys

UNITED STATES PATENT OFFICE.

NELSON C. RUBERG, OF EAST BRIDGEWATER, MASSACHUSETTS.

SHANK-STIFFENER MACHINE.

SPECIFICATION forming part of Letters Patent No. 548,225, dated October 22, 1895.

Application filed October 14, 1892. Serial No. 448,845. (No model.)

To all whom it may concern:

Be it known that I, NELSON C. RUBERG, a citizen of the United States, residing at East Bridgewater, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Metal Shank-Stiffeners, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object to provide an improved machine for manufacturing metal shank-stiffeners for boots or shoes.

Metal shank-stiffeners, or "shanks," as they are commonly called, are formed from a strip of metal which is curved lengthwise and which is usually provided near each end with a hole, by means of which the shank may be secured in place. These shanks have been produced by machines; but the machines employed so far as known to me are either slow in operation or difficult to keep in adjustment and repair. By the employment of my improved machine the operation of manufacture is continuous and shanks are produced with greater rapidity and more continuously than on any machine now known to me and at less cost.

The novel features of my invention are pointed out in the claim which is appended hereto and made a part hereof.

In the accompanying drawings, to which reference is made in the following description, I have shown my invention in the best form now known to me.

In said drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a detail hereinafter referred to. Fig. 4 is a view of the machine in transverse section. Fig. 5 is a detail of the knives.

A is the frame of the machine, which may be of any suitable form. B is a shaft which is journaled in the upper part of the frame, and which is provided with belt-pulleys C and a balance-wheel D. The hub of the balance-wheel D is provided with a slot, (shown at *f*, Fig. 1,) in which is placed a sliding block, which may be set and secured at any point in the slot. The sliding block is provided with a crank-pin, to which is pivoted a connecting-rod *g*, which at its lower end is pivoted to an arm *h*, which is loosely mounted on the end of the shaft *j*. The shaft *j* is provided with a ratchet-wheel *k*, which is fast thereon, and is also provided with a gear *l*, which is in mesh with an intermediate gear *m*, set on a stud on the side of the frame.

The intermediate gear *m* is in mesh with the gear *n* on the shaft of the lower feed-roll *n'*, which is journaled in the frame of the machine and which is connected with the shaft of the upper feed-roll n^2 by gears, one of which is shown at *p*. The shaft *j* carries the lower bending or forming roll d^2, and the shaft of the upper forming-roll *d'* is geared thereto by means of gears, one of which is shown at *q*. As the main shaft B revolves, the arm *h* is reciprocated and the ratchet *k* is turned at each reciprocation by means of the pawl *r*, which is mounted on the arm *h* and which is held in the usual manner in contact with the ratchet-teeth. This intermittent rotary movement of the shaft *j* is communicated through the connecting-gears to the feed-rolls, and the strip of metal *t*, from which the shanks are cut, is therefore fed forward intermittently.

The strip *t* is of a width equal to the length of the shank desired, and the shanks are formed therefrom by transverse cuts in the well-known manner. After the strip *t* leaves the feed-rolls it passes under punches *t'*, which are mounted in a cross-head t^2, arranged to slide vertically as the shaft *w* rocks by means of eccentrics *w'* on said shaft in the well-known manner. The shaft *w* is caused to rock by means of an eccentric *a'* on the main shaft B, with which the said shaft *w* is connected by means of a connecting-rod *b'*, which is pivoted between arms *c'*, which are rigidly secured to said shaft *w*. As the strip of metal from which the shanks are cut is comparatively thin, the necessary vertical movement of the punches is small. The punches *t'* are so set with reference to the strip *t* as to form holes in the strip at any point desired. The holes are usually placed near the sides of the strip *t*, so that they will be near the ends of the finished shanks, and are so spaced that they will be in the center of each shank formed. The strip *t* is supported underneath the punches by a suitable bed or cross-piece t^3, secured in the frame. The feed-rolls are so timed as to feed forward

the strip t at each movement a distance equal to the width of the shank which is being cut. The punch-operating mechanism is to timed that when the strip has been fed forward and has stopped the punches descend and cut the holes. After the strip has passed the punches it passes between the forming-rolls, the upper of which is shown at d'. One of the forming-rolls is a convex roll and the other thereof is a concave roll, as shown, and the lengthwise curve of these rolls may be varied and will depend, as will be obvious, upon the amount of lengthwise curve desired in the shank. As the strip t passes between these forming-rolls it is curved to correspond to the lengthwise curve of the rolls, which is also the curve desired in the finished shank. It then only remains to sever the shanks from the end of the strip t, and to this end a vertically-reciprocating knife t^4, of the usual construction, having a curved cutting-edge, as shown in Fig. 5, is provided and is mounted on a cross-head t^5, which slides vertically between the upright portions of the frame and which is given its vertical reciprocating movement from eccentrics, which are shown at f', Fig. 2. The knife t^4 co-operates with the stationary straight-edged lower knife t^{15}. The knife, as will be clear, is so timed as to sever the shanks from the strip t while the strip is at rest—that is, at each forward feed movement a shank is cut, and at the same time the punches are operated to punch a succeeding shank.

For the purpose of more easily getting at the punches in case it is necessary to examine or repair them the shafts of the feed-rolls may be journaled in movable blocks a^2, Fig. 3, which are pivoted to studs secured to the frame, as shown, and which may be swung back and down by unloosening a securing device, (indicated at b^2,) and which serves to hold the blocks a^2 in position when the machine is in use.

It will be noted that in my machine the punches are located in front of the forming or bending dies. This is an important feature of the machine, since it allows the punches to be set at any distance from the edge of the strip t and yet do their work effectively, and consequently permits the securing-holes to be cut at any desired distance from the end of the shank. To cut the metal easily and properly, the punches should strike it at right angles to its surface or substantially so. If they were located behind the bending-rolls and were set in from the edges of the strip, they would strike the surface of the bent strip obliquely and would not perform their work effectively or well.

What I claim is—

A machine for manufacturing metal shanks from a strip of metal, of a width equal to the length of the shanks to be manufactured, having intermittently operating feed rolls to feed forward the metal strip, vertically reciprocating punching dies, a pair of co operating concave and convex forming rolls and suitable cutting mechanism beyond the rolls for severing the shanks from the strip, after being shaped by the action of said rolls, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

NELSON C. RUBERG.

Witnesses:
WM. A. MACLEOD,
A. H. MORRISON.