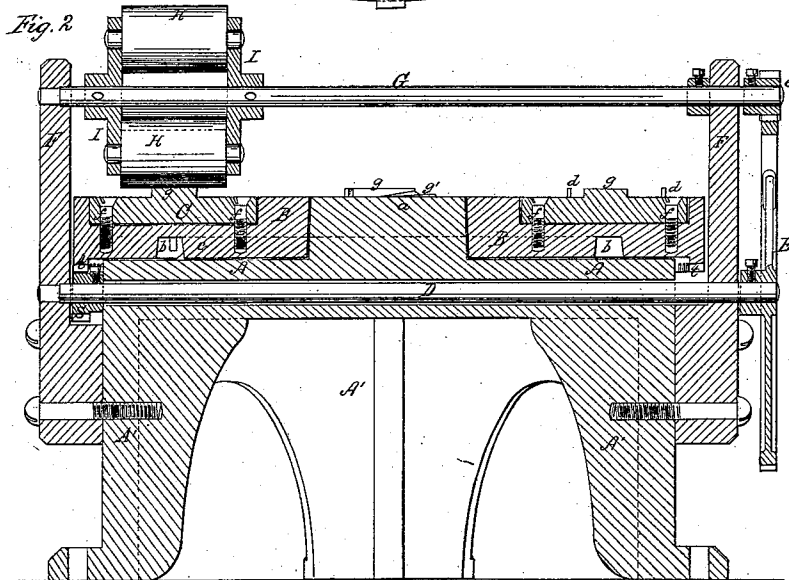
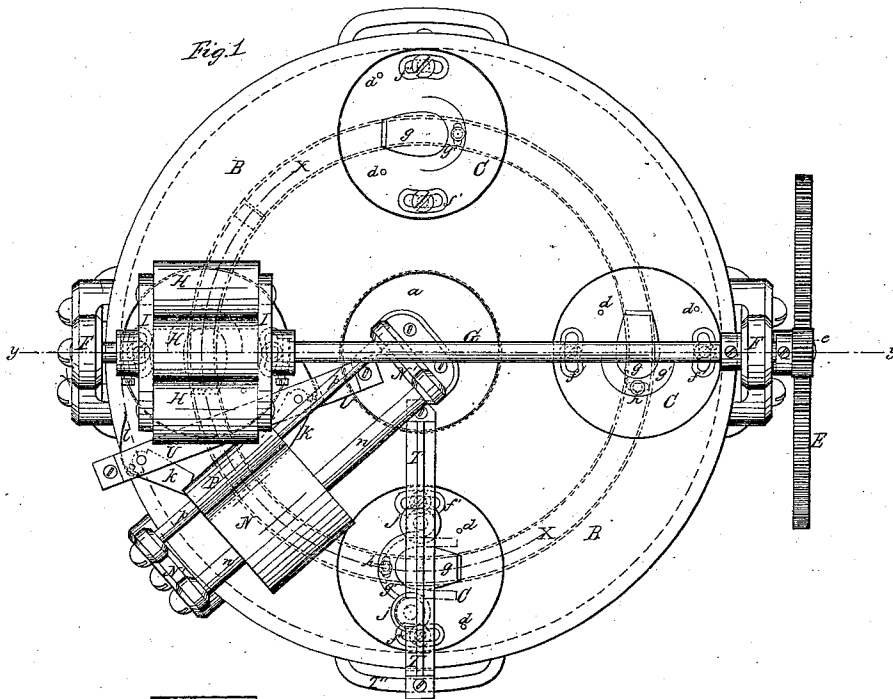


W. Morehouse,
Horseshoe Machine,

N^o 85,119.

Patented Dec. 22, 1868.



Witnesses,
R. Thompson
J. F. Campbell

Inventor:
W. Morehouse
Wm. Smith & Co.

UNITED STATES PATENT OFFICE.

WILLIAM MOREHOUSE, OF BUFFALO, NEW YORK.

IMPROVEMENT IN MAKING HORSESHOES.

Specification forming part of Letters Patent No. **85,119**, dated December 22, 1888.

To all whom it may concern:

Be it known that I, WILLIAM MOREHOUSE, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements on Machinery for Making Horseshoes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, Sheet 1, is a top view of the improved machine adapted for bending, pressing, and rolling the metal. Fig. 2, Sheet 1, is a diametrical section through the improved machine, taken in the vertical plane indicated by red line *yy* in Fig. 1. Fig. 3, Sheet 2, is a top view of the machine with the pressing and hammering devices broken away, showing by the aid of red lines the horseshoe metal in the act of being bent, and also in the act of having the heels of a shoe formed. Fig. 4, Sheet 2, is a vertical section through the bending, pressing, and hammering devices, taken in the course indicated by red line *xx* in Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention is designed for the production of rolled or hammered horseshoes, ready for punching and calking upon the flat surface of a rotary table.

Prior to my invention bars of metal were bent so as to produce horseshoe-blanks to be wrought into proper shape for shoes, upon the flat surface of a rotary table; but in this case the machine was not adapted for shaping horseshoes, nor was such machine so constructed as would admit of the production of pressed or hammered shoes upon its rotary table. I am also aware that it is not new to shape and roll horseshoes upon the periphery of a circular rotary bed, nor to shape and roll shoes upon the flat surface of a rectilinear reciprocating bed, and to none of these features do I make claim of invention.

The main object of my invention is to provide for producing rolled or hammered horseshoes upon the flat surface of a rotary table by supporting such table upon a solid foundation or bed in such manner that the bottom of the table shall lie flatly upon the top surface of the bed, and slide thereon during the operation of producing the shoes. By this means I am enabled to properly condense and

harden the metal of the shoes, without liability of injury to the rotary table, and without causing the same to vibrate or tremble during said operation, and at the same time to obtain a continuous rotary motion of the table, and to produce the shoes ready for calking and punching, as will be hereinafter explained.

Another object of my invention is to adapt a horizontal rotary table for the reception of the formers or pattern-blocks about which the shoes are produced, which blocks are adjustable and removable, and are so made as to admit of the formation of a perfect shoe upon them, as will be hereinafter explained.

Another object of my invention is to provide, in conjunction with a horizontal continuously-rotating table, certain devices which will compress the metal at and near the heels of a shoe, and give the proper vertical thickness to the heels during the passage of the shoe from the first bending devices to the point for its discharge from the machine, as will be hereinafter explained.

Another object is to combine in a practical manner with a horizontal rotary table certain means whereby straight bars of iron of proper length and thickness can be bent in the form of horseshoes, and condensed and shaped both laterally and vertically, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents a horizontal bed or foundation of a circular form, and leaving its upper surface evenly dressed for the reception upon it of a circular table, B.

The bed A is mounted upon legs or standards A', and constructed with a circular elevation, *a*, in the center of its upper surface, which rises as high as the top surface of the table B, and is designed for keeping this table in place, but allowing it to revolve freely during the operation of producing shoes.

The table B, which carries the formers or pattern-blocks *g*, about which the shoes are made, is a circular plate having a hole through its center for receiving the elevation *a* on bed A, and also having its bottom surface properly dressed, so as to lie flatly upon the top surface of the bed A, and slide evenly thereon

while revolving around the elevation *a*. This table is also constructed with an annular toothed rack, *t*, upon the overhanging portion of its bottom surface, as shown in Fig. 2, into the teeth of which rack a pinion, *S*, engages, which pinion is keyed on a horizontal shaft, *D*, that passes diametrically through the bed *A*, and carries on one end a large spur-wheel, *E*, which gives motion to the hammer-shaft *G* through the medium of the pinion *e*, as shown. By these means the hammers upon the hammer-shaft will make a great many rotations while the table *B* is revolving once around its axis.

When it is desired to produce rolled or hammered shoes upon the table *B*, this table, as well as its bed, should be made of sufficient thickness of metal to insure great strength and firmness; otherwise the pressure of the condensing-roll or the concussions of the hammers, or both combined, would not only produce the shoes imperfectly, but soon break and destroy the machine. The table *B* must rest directly upon the top surface of the bed *A* and slide thereon, to produce good work when rolling or hammering is required.

At proper distances apart, and concentric to the axis of motion of the table *B*, circular depressions are made vertically in the table *B*, in which circular plates *C* are fitted, having the pattern-blocks *C* formed upon their upper surfaces. These plates *C* have short concentric slots *f f* through them, through which screws *f f* are passed, that secure the plates down in place to prevent them from turning. By loosening the screws *f f* the plates *C* can be adjusted so that the blocks *g* will be moved properly up to and from the work of bending and condensing.

Just in front of the toe of each block *g* is a vertical clearing-pin, *h*, which passes freely through the table *B*, and at proper time is lifted by a cam-elevation, *c*, on the top of the table-bed *A*. The annular groove *b* in the bottom of table *B* receives the fixed cam *c*, as shown in Figs. 2 and 4.

The top surface of each pattern-block *g* is in a plane parallel to the top surface of the table *B*, and elevated above this table-surface the thickness of the shoe to be made. The surface upon which the shoe is formed is higher at the toe *g'* than it is at the heels. This is for the purpose of allowing the proper vertical thickness to a shoe at its heels, and to reduce a shoe to the proper thinness at and near the toe portion. The slight inclined surface at the bed *g'* of the toe portion of the block *g* is designed to produce the bevel on the inner edge of the bottom side of a shoe.

In constructing the forming or pattern blocks *g* they should be made of the exact shape required for the inner edge of the shoes to be produced; and in order to adapt the machine for making shoes of different sizes and shapes, I shall have form or pattern blocks adapted for every size of shoe which it may be required to make. By removing the set-

screws *f* the plates *C*, with their pattern-blocks, can be lifted out of their depressions in the table, and other plates and pattern-blocks substituted in their stead. If at any time it is found necessary to raise a pattern-block, to allow the condensing devices to operate more efficiently upon a shoe or shoe-blank, a plate of steel of proper thickness is introduced beneath the plate *C*, which will afford this plate an unyielding bed upon the table *B*.

The shoes are made from rods of proper thickness and length, which may be cut from long rods by means of a rotary cutter applied to the bed of the machine and located just in front of the first bending-rollers; or other suitable means may be adopted for cutting from a long bar blanks of the proper length. The long rods may be creased for punching nail-holes previously to cutting up into blanks, so that the work of creasing can be performed during the rolling out of the bars.

For the purpose of bending the straight rods or blanks around the toe portions of the pattern-blocks *g*, I employ two flanged rollers, *j j*, having their bearings in a horizontal bridge-bar, *T*, and arranged at such a distance apart as to allow the pattern-blocks *g* to pass between them and bend the blanks, as indicated in red in Fig. 1. The bridge-bar *T*, carrying bending-rollers *j j*, has one of its ends secured to the central elevation, *a*, of the bed *A*, and the other end secured to a bracket, *T'*, rising from the circumference of the said bed, as shown in Figs. 1 and 3. The rollers *j j* are flanged so that their flanges will overlap a bar or blank being bent and prevent it from rising from its bed during this operation. The next operation is to reduce the thickness of the toe portion of the shoe-blank, and at the same time compress and condense the front portion of the shoe-blank. This is partially done by means of a roller, *N*, upon a horizontal shaft, *n*, which is supported by fixed bearings *N' N'*. This roller alone would cause the metal to curl up while condensing and reducing it, to prevent which I arrange in front of roller *N* a small roller, *P*, the shaft *p* of which is supported in the fixed bearings *N'*, as shown. This small roller *P* is so arranged with relation to roller *N* and the top surface of the table *B* that it performs the office of holding down the shoe-blank while the roller *N* is reducing it vertically. The next operation is to condense the heel portions of the shoe-blank laterally, and at the same time give the final shape to the shoe by bending and pressing it snugly in contact with the edge of the pattern *g*. The effect of condensing the heel portions of the shoes, as above stated, is to thicken these portions vertically and reduce their width, thus giving the varying thickness required in every properly-made horseshoe. The heel bending and compressing is effected by means of two vibrating cams, *k k*, which are pivoted to a horizontal bridge-bar, *U*, so as to be acted upon by studs *d d* upon each one of the pattern-carrying plates *C*, as shown in

Fig. 3. As the shoe-blanks successively leave the holding-down roller P and move between the cams *k k*, the studs *d d* will cause the free ends of said cams to approach each other and act upon the heel portions of the shoe-blanks, so as to force them up against the pattern *g*, and at the same time gradually thicken the metal vertically by lateral pressure upon it. These squeezing-cams *k k* are acted upon to effect their return by springs *l l*. The cams should be arranged with relation to the rotary hammers H, if hammers be used, that the heels of the shoes will be firmly held between the cams until the operation of hammering ceases.

The hammers H H, which finish the shoes so far as the operation of the machine upon the shoes is concerned, consist of cylinders applied to heads I I upon shaft G, so as to rotate freely. These hammers are rotated rapidly about the axis of shaft G in a direction with the rotation of the table B, and they also rotate about their own axes when they strike the surface of the shoes.

I have described and represented in the drawings a compressing-roller, and also a series of hammers arranged so as to operate consecutively upon the shoe-iron for the purpose of hardening it, reducing it to the proper thickness vertically, and leaving the upper surfaces of the shoes flat and flush with the top surfaces of their respective pattern-blocks. I do not, however, confine my invention to the use or combination of both the hammers and the roller, as the hammers may be used without the roller; or this roller may be used without the hammers.

The last operation upon the shoes while on

the machine is to lift their toes sufficiently high to allow of the removal of the shoes by means of an inclined plane arranged so as to receive the raised shoes upon it as the table rotates. This I effect by means of pins *h* and the fixed cam *c*. (Shown in Figs. 2 and 4.)

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

1. The arrangement of the series of removable horseshoe-pattern beds C C around the central hub, *a*, of the horseshoe-bending table, and in the relation shown to the mechanism specified for bending and condensing horseshoe-blanks, all substantially as set forth.

2. The arrangement of the cams *k k*, bending devices *j j*, horizontal bed A, horizontal rotary table B, and patterns *g g'*, substantially in the manner and for the purpose described.

3. The combination of the cams *k k*, bending devices *j j*, horizontal bed A, horizontal rotary table B, patterns *g g'*, and rollers N P, substantially in the manner and for the purpose described.

4. The two rollers N P, rotary table B, and bridge U, arranged and operating substantially as described.

5. The percussive or condensing finishing mechanism G H, or the equivalent thereof, in combination with the guiding and bending mechanism, substantially as described.

Witness my hand in matter of my application for a patent for improved machinery for making horseshoes.

WM. MOREHOUSE.

Witnesses:

A. HOERMANN,
J. V. CAMPBELL.