E. Gale,

Rolling Horse Shoe Bars.

No. 113,255. Patented Apr. 4, 1871.

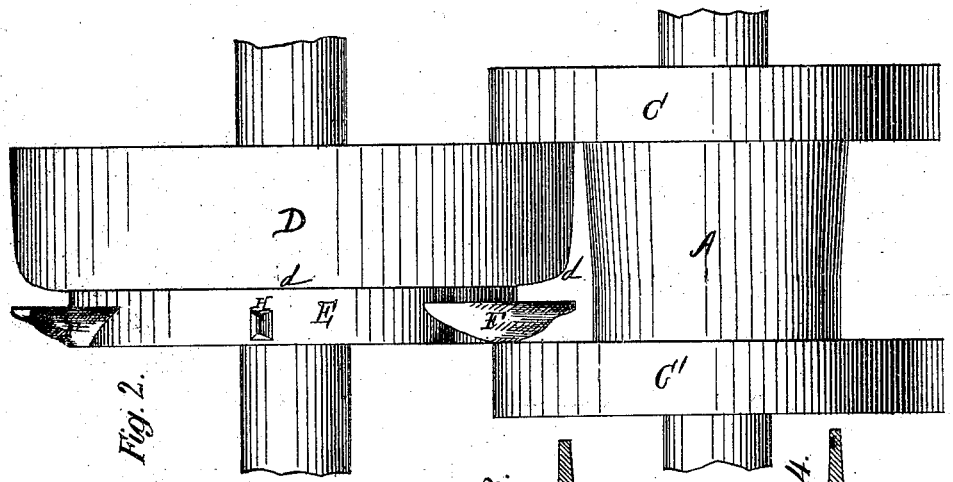

Fig. 2.

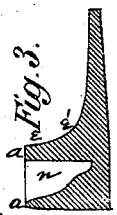

Fig. 3.

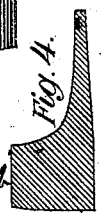

Fig. 4.

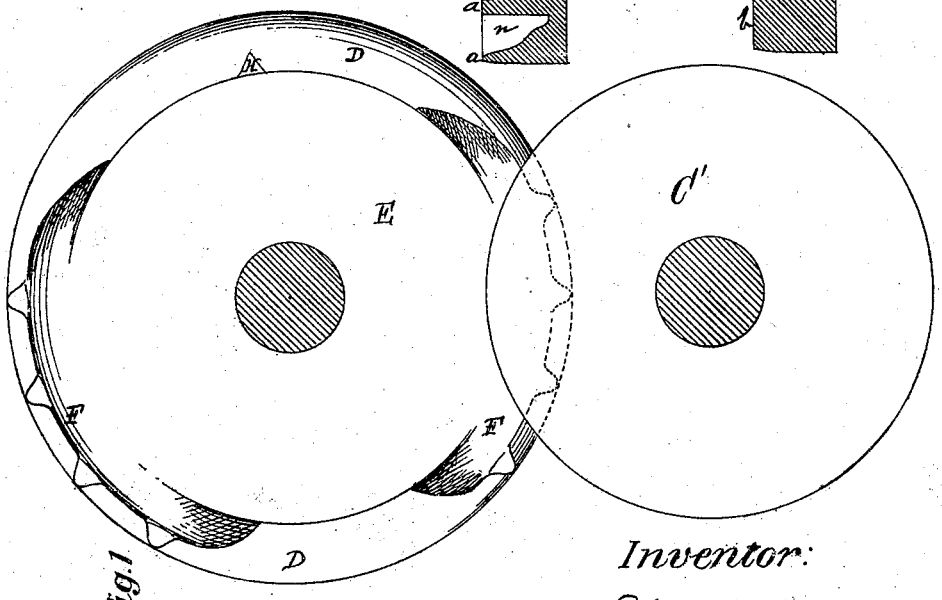

Fig. 1

Inventor:

Ebenezer Gale

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UNITED STATES PATENT OFFICE.

EBENEZER CATE, OF EAST WOBURN, MASSACHUSETTS.

IMPROVEMENT IN ROLLS FOR ROLLING HORSESHOE-BARS.

Specification forming part of Letters Patent No. **113,255**, dated April 4, 1871.

To all whom it may concern:

Be it known that I, EBENEZER CATE, of East Woburn, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Machine for Rolling Horseshoe-Iron; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is an end view of the rollers. Fig. 2 is a side elevation of the same; and Figs. 3 and 4 represent cross-sections of the rolled iron, the former taken midway between the toe and heel of the shoe that is to be made, and the latter across the toe or heel.

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

Letters Patent were granted to me April 5, 1870, No. 101,581, for an improved horseshoe, and May 10, 1870, No. 102,775, for an improved bar for manufacturing said shoe.

The peculiarity of my horseshoe consisted in such a construction that a cross-section taken through the toe or either extremity of the heel would show the form represented in Fig. 4, while a similar section taken midway between the toe and heel on either side would show the form represented in Fig. 3; in other words, the inner edge of the shoe was formed thin and flat, while the nail-groove in the under side only extended along the sides of the shoe, and was cut deep, leaving a narrow ridge of metal, *a a*, Fig. 3, on either side of it. My theory was, that inasmuch as greater wear comes upon the toe and heel of a horseshoe than along the sides, the tendency to wear unevenly should be counteracted by making the parts *a a* thin, so that they would wear away more rapidly than the heel or toe, where the metal is left flat and smooth. Practical experiment having demonstrated my theory to be correct, I applied for and obtained Letters Patent, as aforesaid, both upon the shoe and the manufactured bar, which, when bent into the proper curve, forms the shoe.

My present invention relates to a machine for rolling said bar so as to properly form the short nail-grooves and the thin ridges on either side of them with the flat thin inner edge of the shoe, as already patented.

The invention consists, not in combining two rollers for rolling horseshoes, nor in constructing rollers with dies or projections for cutting the nail-grooves of a horseshoe, but in the specific form and combination of rollers and dies shown in my drawing and hereinafter described, for the purpose of obviating certain insuperable difficulties which have been experienced in attempting to apply any of the old horseshoe-rolling machines to the manufacture of my improved shoe or bar.

The main difficulty to which I refer results from the fact that to carry out my theory the combined surface of the two ridges *a a* must be relatively less than the surface of the flat ungrooved portion of the shoe at *b*, Fig. 4; in other words, it does not answer to simply cut the groove by means of a die on the roller D E, for that would only split the surface in two, leaving the sum of the two equal to the ungrooved surface *b*. A form of die or roller must therefore be employed that will firmly brace the raised metal at the points *e e'*, so that it cannot be displaced laterally, leaving the die to plow out the deep nail-groove *n* by pushing the displaced metal before it until, by the elongation of the bar, or the compression of the metal, room is found to receive it.

In the drawing, A represents a cylindrical or slightly-tapering roller having two flanges, C C'. D E is another roller, formed with a cylindrical surface, E, on which are arranged the dies F F, that cut the nail-grooves, and also, if thought desirable, a marker, H, midway between the dies, for the purpose of indicating where the rolled bar should be cut to separate the shoe-blanks.

The parts D E fit accurately into the groove between the flanges C C', so as to prevent the escape of the metal laterally. The part D is made with curved outline, as clearly shown in Fig. 2, which projects beyond the perimeter of the part E and molds the thin flat inner edge of the shoe, while at the same time the shoulder *d* braces firmly against the raised portion constituting the outer edge of the shoe, and effectually prevents the slightest lateral displacement of the metal while the dies F F are plowing through it.

The whole bar is held in place during its passage through the machine not only by the flanges C C', but also by the shoulder *d* and the curved form of the part D.

The form of the rollers is such as, while in

operation, to force the metal toward that side of the shoe which is to be its bearing-surface, and compress it to a condition of great compactness along that part, whereby it lasts much longer than if it were formed otherwise.

Having thus described my invention, what I claim as new is—

The roller consisting of the parts D E F F, each constructed in the form and arranged in the manner herein set forth, when combined with the roller A C C′, constructed as described, for the purposes herein specified.

EBENEZER CATE.

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