

J. E. WHEELER & D. B. LORING.
Machine for Finishing Horseshoe Nails.

No. 201,727.

Patented March 26, 1878.

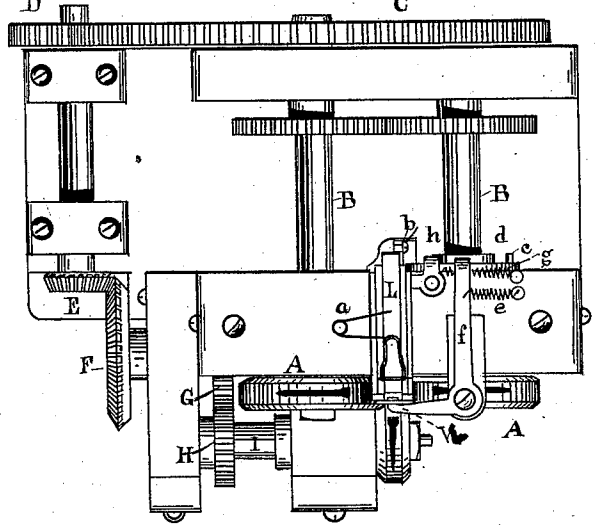


Fig. 1.

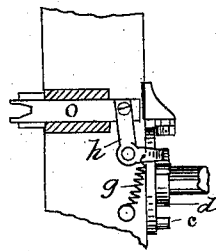


Fig. 4.

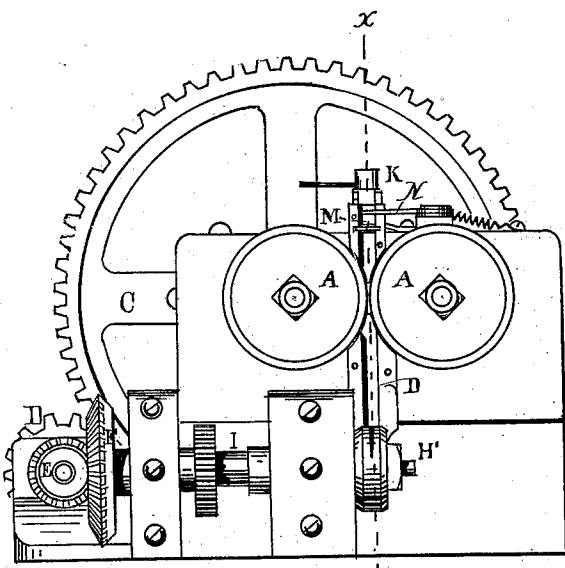


Fig. 2.

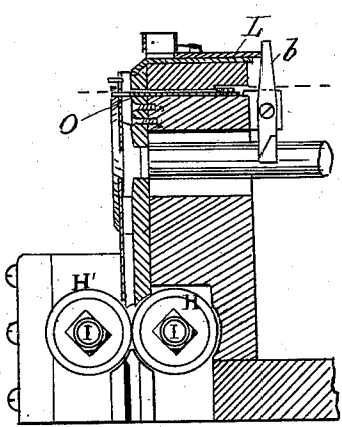


Fig. 3.

WITNESSES

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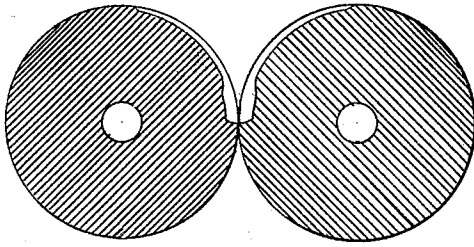


Fig. 5.



Fig. 6.

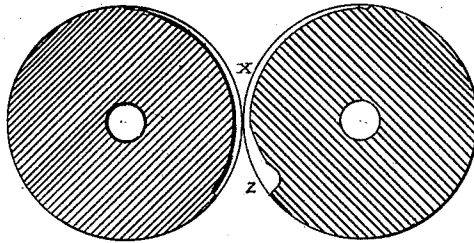


Fig. 7.

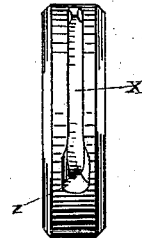


Fig. 8.

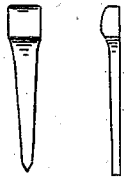


Fig. 9.

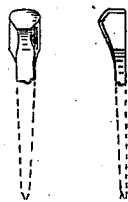


Fig. 10.

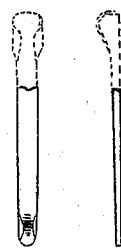


Fig. 11.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN E. WHEELER, OF LYNN, AND DAVID B. LORING, OF BOSTON, MASS.;
SAID WHEELER ASSIGNOR TO HIMSELF, JOHN E. RUSSELL, OF LEICESTER,
MASS., AND CHARLES W. RUSSELL, OF NEW YORK CITY, TRUSTEES.

IMPROVEMENT IN MACHINES FOR FINISHING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 201,727, dated March 26, 1878; application filed July 13, 1877.

To all whom it may concern:

Be it known that we, JOHN E. WHEELER, of Lynn, in the county of Essex, and DAVID B. LORING, of Boston, in the county of Suffolk, and State of Massachusetts, have invented an Improvement in Horseshoe-Nail Machines, of which the following is a specification:

This invention consists, first, in the arrangement of one pair of rolls, with dies for upsetting the head-forming portion of a blank and finishing the shaping of the head, over and transversely to another pair for drawing down the shank of the blank and beveling the end of the shank, or forming a beveled indentation near the end, for the purpose of facilitating the pointing of the rolled blank, and in mechanism for operating said rolls; and, second, in mechanism for feeding the blank and centering the same in the rolls.

Reference is made to the accompanying drawing in explaining the nature of our invention, in which—

Figure 1 is a plan of our machine; Fig. 2, an end elevation; Fig. 3, a cross-section on the line *xx* of Fig. 2, and Fig. 4 a detail view of the means for operating the centering device. Fig. 5 is a vertical section of the upper pair of dies, more particularly showing the shape of the die-recesses. Fig. 6 shows, in plan, the shape of the upper set of die-recesses. Fig. 7 is an enlarged vertical section of the lower set of dies, also showing especially the shape of the die-recesses. Fig. 8 represents, in plan, the shape of the larger recess of the two lower dies. Fig. 9 is a view, in section and plan, of the blank operated upon. Fig. 10 represents that part of the nail completely finished in the first pair of dies in plan and section, and the incomplete portion in dotted lines. Fig. 11 is a view of that section of the nail finished in the second set of dies, showing in dotted outline the part previously shaped.

The particular process of manufacturing horseshoe-nails for which this invention is intended is described in the patent granted David B. Loring, August 7, 1877, No. 193,975. It is also applicable in reducing the flat or T-shaped blank to a rolled blank, in which it

is also necessary to upset the head-forming portion of the blank by rolling the edges of the blank, and to complete the reduction of the shank of the blank by rolling the face and back of the blank.

To effect these two operations or rollings in one machine, so that the blank shall be fed automatically to the rolls, be subjected to two rollings, one transverse to the other, and leave the machine a completed rolled blank (which is made a finished nail simply by clipping,) we arrange the rolls A upon the shafts B, and by the gear-wheels C D, the bevel-gear E F, and the gear G H, we operate the two rolls H' H', which are fastened to the ends of shafts I, and revolve at right angles to the line of revolution of the rolls A.

The blanks are fed from the supply-box K by the reciprocation of the plate L into the tunnel M, and the detent N is operated to successively hold and release the blank, and, in connection with the forked sliding plate O, it centers the blanks in the dies in the rolls as the dies converge. A short intermediary tunnel, P, conveys the blanks from the first to the second set of revolving dies in the rolls H' H'.

The beveled indentation at the point of the nail is formed by raising a projection near the end of the die, in shape the reverse of the indentation.

The spring *a*, lever *b*, and pins *c* on the disk *d* reciprocate the sliding plate L. The disk *d* is fastened to either of the shafts B, and the pins *c* with the spring *e* also operate the bent lever *f*, whose end serves as the detent, and, with the spring *g* and bent lever *h*, the forked sliding plate O.

In operation the blanks are automatically fed from the supply-box by the reciprocation of the sliding plate L head first into the feed-tunnel, from which they are dropped upon the rolls slightly in advance of the converging of the dies. The forked end of the plate O then advances into the tunnel, and, assisted by the end of the detent, the shank of the blank is supported vertically while being drawn into the rolls.

It will be observed that the sliding plate O

is arranged somewhat below the detent, and that it advances after the head of the blank has lodged in the dies, and remains until the blank is wholly drawn into the rolls, the blank being supported vertically between the forked end of the sliding plate and the end of the detent. After the shank of the blank has been drawn in by the dies, the sliding plate *O* recedes from and the detent advances into the tunnel.

If the shank of the blank is tapering, the sliding plate is arranged to advance gradually during the centering of the blank, in order that it may constantly be held vertically with as little freedom to oscillate or tip as it is possible, with due regard to the fact that the contact on the sides of the blank by the centering device must not be sufficient to develop a friction that would arrest its dropping or drawing into the rolls freely.

In the first set of dies the head-forming portion of the blank is the part principally operated upon by the lateral pressure exerted by the dies upon the edges of the blank; and the head is completely shaped by being upset, the surplus metal, if any, being forced into the shank. From the first set of rolls the blank drops vertically through tunnel *D*, which is somewhat wider than the blank, but not deep enough to permit of its turning, to the second set of revolving dies, which exert a compression at right angles to the line of compression first employed, and consequently act upon the face and back of the shank of the blank, as the head is completely shaped by the first rolling. In addition to drawing down the shank, the beveled indentation is formed at or near its end.

If necessary, a centering device similar to the one described or to the one patented to said David B. Loring, November 28, 1876, may be employed in the intermediary tunnel between the two pairs of rolls in feeding and centering the blank to the second set of revolving dies.

It will be seen, on reference more particularly to the views represented in the second sheet of the drawings, that the dies in the two sets of rolls are peculiarly adapted to each other and to the blank, for the purpose of shaping the head and shank of the nail; that the first pair of dies is shaped more especially to completely finish the head of the nail, and lengthen and thicken its shank, as shown in Fig. 10; that the second pair of dies is provided with head-forming recesses *z*, sufficiently large to receive the head of the nail, (already completed in the first set of dies,) but not to compress it, and with shank-forming recesses *x*, arranged and adapted to complete the shaping of the shank, operating only upon that part of the shank shown in Fig. 11, to lengthen and indent it.

It will be observed that by the above-described construction the blank is subjected substantially to but one rolling throughout, although it passes through two pairs of rolls; that one pair of rolls is arranged in relation to

the other, to first shape the head and then the shank of the blank; that the shaping of the head is obtained by a lateral pressure exerted upon the edges of the blank which upsets the head-forming portion of the blank; and that the drawing down of the shank is accomplished by a lateral pressure brought upon the face and back of the shank of the blank; and that the last operation automatically succeeds the first.

Although in the drawing we show the centering device somewhat removed from the rolls, yet we do not confine ourselves to that location; but, if necessary, place the same as near the periphery of the rolls, at the point of the convergence of the dies, as possible.

The product of this machine, when completed by clipping the end of the shank to finish the pointing, possesses a density of such compactness and tenacity that, while the point is sufficiently stiff to drive easily, it is not brittle or liable to lamination; that while the shank is stiff, it is also tenacious; that while the head is comparatively hard, it will not easily fracture.

We are aware that, broadly speaking, it is common in the state of the art to shape metal in one pair of revolving dies.

We are also aware that revolving dies have been placed at right angles to each other, to operate alternately on the edges and face and back of the work in forming it, as shown and described in the Putnam and Dwelley Patent, No. 62,684, granted March 5, 1867; but we are not aware that one pair of revolving dies, or the Putnam and Dwelley combination of six pairs, can shape a blank as we have described, for our invention requires the use of two pairs of revolving dies, one pair at right angles to and above the other, so arranged in relation to the work they perform that the first pair completely shapes the head only of the blank by upsetting and thickening the edge, and the second pair completely shapes the shank only by rolling its face and back, so that the blank is finished in sections, and but one pressure exerted in shaping it, although given in two operations, whereby peculiar properties are given when the metal is subjected to the laminating action of two or more compressions from cold-rolling the same surface.

We are also aware that two pairs of dies working at right angles to each other, but acting simultaneously upon the blank, with the intention of making a nail at a single operation, have been used; and we are further aware that a series of traveling and revolving dies, operating on three sides of a stationary blank, in combination with a stationary former, have been used.

We claim and desire to secure by Letters Patent of the United States—

1. In a horse-nail machine, the combination of one pair of revolving dies, shaped to completely form the head, and to somewhat thicken and lengthen the shank by a lateral pressure

exerted upon the edges of a blank, another pair of revolving dies at right angles to and immediately below the first pair, shaped to operate upon the face and back of the shank of the blank, either with or without means for indenting the end of the blank, and means for simultaneously operating said dies, whereby the head and shank of a cold blank are successively completed by their joint adaptation and operation, but one direct pressure successively exerted upon the sides and edges of the blank, whereby substantially a uniform

density is given the completed part, substantially as described.

2. The combination of the feed-tunnel M with the centering device described, the same consisting of reciprocating plate O and detent W, all arranged to feed substantially as described, and for the purpose set forth.

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DAVID B. LORING.

Witnesses:

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ADOLPH J. OETTINGER.