G. L. HALL.

MANUFACTURE OF HORSESHOE NAILS.

No. 189,031. Patented April 3, 1877.

Fig.3.

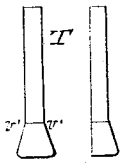



Fig.4.



Fig.1.




Fig.5.

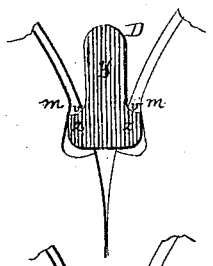



Fig.6.

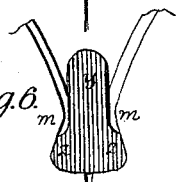
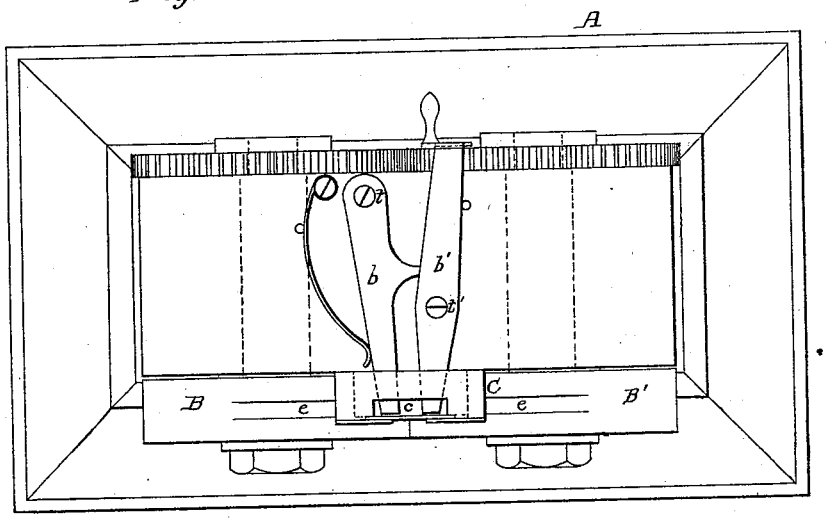



Fig.7.


Fig.2.




Witnesses.
Fred Benjamin
F. M. Greene

Inventor.
Geo. L. Hall
By Charles E. Foster atty.

# UNITED STATES PATENT OFFICE.

GEORGE L. HALL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO NARRAGANSETT HORSE NAIL COMPANY, OF HARTFORD, CONNECTICUT.

## IMPROVEMENT IN THE MANUFACTURE OF HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **189,031**, dated April 3, 1877; application filed December 13, 1876.

*To all whom it may concern:*

Be it known that I, GEORGE L. HALL, of Boston, Suffolk county, Massachusetts, have invented Improvements in Horseshoe-Nail Making, of which the following is the specification:

The object of my invention is to manufacture horseshoe-nails from T-shaped blanks by means of two revolving dies, adapted to said blanks, as fully described hereafter, and shown in the accompanying drawing, in which—

Figure 1 is an exterior elevation of a horseshoe-nail machine constructed in accordance with my invention. Fig. 2 is a plan view, and Figs. 3 to 7 diagrams, illustrating the operation of the machine.

A represents part of the frame of a horseshoe-nail machine, having bearings for two shafts, *a a'*, which are geared together, and carry at their outer ends the two cylindrical dies or disks B B', revolving with their peripheries in contact. In the edge of each disk is a recess, *e*, corresponding longitudinally to one-half of the partly-finished nail T, Figs. 3 and 4, to be formed by the dies, and into the space between the dies extends the lower end of the feeding-tube C, the channel *c'* in which is of a width to receive the blanks D, of the form shown in Fig. 5.

The tube C is slotted at one side to receive the ends of two or more levers or rods, *b b'*, pivoted at *t t'*, Fig. 2, and one bearing on the other, so that when a stop, *d*, on one end of the shaft bears against the end of and operates one of the levers, the other will be vibrated in the reverse direction.

The ends of the levers within the tube, when in the position shown in Fig. 2, serve as a rest on which the blank is supported, as shown in dotted lines *w*, Fig. 1, and the stop *d* is so arranged that a blank falling through the channel will be arrested until the recesses in the dies are in a proper position to receive it, when the levers will separate and permit it to descend to the position shown in dotted lines *w'*, Fig. 1.

I, however, make no claim to the use of the two levers or detents.

Great difficulty has been experienced in forming the heads and drawing out the shanks of the nails, it being found that blanks, as ordinarily formed when passed between the usual dies, produce nails with imperfect heads, or greatly weakened at the junction of the heads and shanks. I have found that, by forming the blanks with wide heads, and so proportioning the recesses *e* in the dies that the ears will be compressed laterally, so as to spread the head downward and forward before any pressure on the shank, a solid, shapely, and finished head would be produced before any material elongation of the shank, which begins to be operated on as the head begins to leave the dies, the stem being then drawn or rolled longitudinally without drawing on the head or distending the metal in the least. Thus the dies are formed with shoulders *m m*, which bear upon the ears or lugs *z z* of the blank, while the said shoulders are on radial lines at an angle of from ten to twenty degrees from a horizontal line drawn through the shafts, and pressure is applied laterally by said shoulders to compress the lugs, and thereby force the metal downward and forward, forming the head before the shoulders materially compress the shank, by which time they reach (or nearly reach) the horizontal line, when the edges of the dies will act with a rolling action to draw out or lengthen the shank without any draw on the head or tendency to pull it away from the shank.

This result is due to the adaptation of the blank and dies to each other, so that the lugs *z z* will be pressed or molded into the head before any material force is applied to draw out the shank, and by only applying this force as the head crosses the horizontal line drawn through the shafts.

By forming the blanks with inwardly-curved edges *v v*, corresponding very nearly to the inclination to be imparted to the side edges *v' v'* of the nail-head, Fig. 3, the weakening of the metal, which in ordinary blanks results from forming deep angular indentations at these points in rolling, is effectually prevented.

I claim—

As an improvement in the art of manufacturing horseshoe-nails, the particular adaptation herein described of the dies to the nail-

blank, which latter is of an uniform thickness, but of a shape otherwise, as represented and set forth, in virtue of which the head metal, instead of being first forced laterally and upwardly into the shank, is at first forced laterally and downwardly toward the apex of the head, thus completely filling all the angles of the head-die, and after this forcing any surplus metal toward and into the shank, to be succeeded immediately by the reduction of the shank itself, which latter operation commences about the time the head is passing across the plane of the axis of the die-rolls.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. L. HALL.

Witnesses:

M. M. TIDD,

NATHAN BROWN.