J. M. LAUGHLIN.

Manufacture of Horseshoe Nail Plates.

No. 233,357. **Patented Oct. 19, 1880.**

Fig. 1

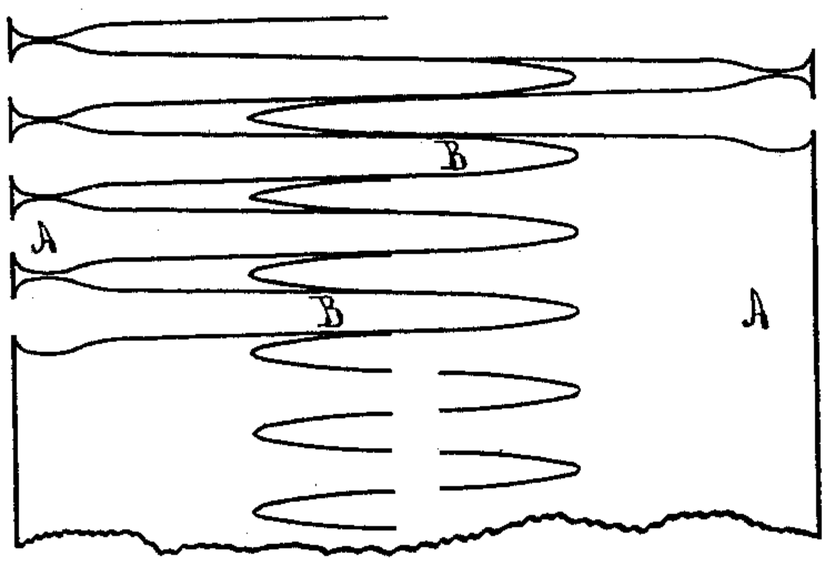

Fig. 2

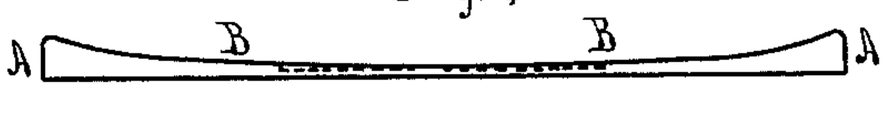

Fig. 3

Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

JOSEPH M. LAUGHLIN, OF BRIDGEWATER, MASSACHUSETTS, ASSIGNOR TO BRIDGEWATER IRON COMPANY, OF SAME PLACE.

MANUFACTURE OF HORSESHOE-NAIL PLATES.

SPECIFICATION forming part of Letters Patent No. 233,357, dated October 19, 1880.

Application filed July 8, 1878.

To all whom it may concern:

Be it known that I, JOSEPH M. LAUGHLIN, of Bridgewater, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Horseshoe-Nail Plates, of which the following is a description.

My invention relates to the plates from which horseshoe-nails are to be manufactured by a machine substantially similar to that shown in my Letters Patent No. 189,108, dated April 3, 1877; and it consists in putting such a finish upon the surface of the plate that when it is cut into horseshoe-nails by said machine such nails will be substantially perfect and ready for the market without applying any other finishing process thereto.

Heretofore the process of cold-rolling horseshoe-nail plates on certain parts of the plates has been resorted to for the purpose of hardening or condensing the material of the plate in those parts of it which are to form the pointed end of the nail and the shank immediately adjacent thereto, as is described in the patent of Harrington, No. 159,410; but it was not known that such cold-rolling could be applied to the parts of the nail-plate which are to produce the head and softer part of the shank of the nail without materially injuring the softness of the metal when such cold-rolling was applied with sufficient pressure to finish the surface of the nail-plate; and hence, when horseshoe-nails have been punched from such a nail-plate previous to my invention, it has been found necessary to finish the heads and adjacent portions of the separated nails by stamping, pressing, or grinding and polishing them separately, which proves to be an expensive and tedious process. Besides this, the cold-rolling of the nail-plates as described by Harrington could never produce a finished horseshoe-nail plate such as my invention does, because Harrington rolls his plate with a pressure of great intensity at the central and thinnest part of the plate longitudinally and a diminished pressure toward the thicker edges of the plate, as he describes. The effect of thus rolling the plate is to not only expand the plate sidewise, but also to increase its length at the central part of the plate in a greater degree than toward the edges, which are not cold-rolled under such pressure. This causes the nail-plate to curl or buckle all along its surface from just within the edges, and makes its surface rough and corrugated and unfit for the surface of a finished horseshoe-nail without further manipulation. Hence the cold-rolling of the plate as described by Harrington produces just the opposite effect from that effected by it when applied by my method.

My invention consists in the discovery that a certain amount of pressure may be applied to the rolls used in cold-rolling nail-plates of homogeneous iron upon the parts of such plates from which the heads and adjacent shank parts of the nails are to be formed, sufficient to give a smooth and perfect finish to the surface of the plate suitable for the nails, without at the same time so compressing and hardening these parts of the metal in the nail-plate as to injure the head and shank part of the nail, which are required to be left soft and pliable for efficient use; and, further, in producing by this method of cold-rolling a finish upon nail-plates in those parts intended to form the head and soft shank of the completed nail without materially injuring their soft and pliable condition.

By means of this improvement I am able to produce a cheap and perfect finish upon all parts of the nail-plate without impairing its value for the purpose of forming horseshoe-nails, because, the point of the nail and its adjacent parts being finished and hardened by a rolling process like that of Harrington, or the cold-stamping process set forth in my patent of November 7, 1876, and the remainder of the surface of the nail-plate being finished by my present invention or discovery, the horseshoe-nails may be punched therefrom by my machine, as first mentioned, without any further preparation, and when the horseshoe-nails are punched from my improved plate they require no further process of stamping, pressing, or polishing upon the heads or adjacent shank part, but are ready to be immediately packed for the market.

In the drawings, Figure 1 represents a plan or top view of a section of the plate having

some of the nails punched therefrom. Fig. 2 represents an end view of the same. Fig. 3 represents a plate of double width.

A A represent the ribs on the plate, which form the heads of the nails when cut therefrom, and B B is the central portion of the plate which forms the shanks of the nails. This plate is of homogeneous iron, and in order to produce the finish upon it by my process of cold-rolling without injuring the softness and pliability of the iron it is necessary to take it, after it has been reduced to shape by hot-rolling and before it is subjected to the cold-rolling process of Harrington or cold-stamping process of my own, as above mentioned, to pass it through a pair of rolls whose configurations correspond, respectively, to the opposite sides of the plate, the pressure of such rolls upon the plate being carefully adjusted to the degree which will produce a substantially smooth and perfect finish upon both surfaces of the plate without such pressure being much greater than is absolutely requisite to produce such finish.

Should the pressure upon the finishing-rolls be greater than is necessary substantially, it may be readily discovered by testing one or more of the nails produced from such plate, for in that case the shank of the nail at, say, one-third of the distance or more from its point will be found to have lost its soft and pliable condition in a material degree, which is its chief value. If, however, the pressure of the finishing-rolls be adjusted properly, the value of the nails, as above described, will not be perceptibly impaired, and a suitable finish will be at the same time produced upon the nail-plate.

From this description the practical operator can readily determine how to adjust his finishing-rolls, and although the adjustment must be made within somewhat narrow limits, by observing due care it can be accomplished without great difficulty. It is necessary to perform this finishing process upon the head and shank parts of the nail-plate at a separate operation from the hardening process by cold-rolling of Harrington or from the hardening process by cold-stamping of myself, before referred to, for forming the parts of the plate intended for the points of the nails and the parts immediately adjacent thereto, because while compressing the metal to harden it by one part of the roll or stamper it is not possible, so far as I have discovered, to graduate the pressure of the instrument so as to produce a finish upon the other parts of the plate without injuring the softness and pliability of their metal materially.

I do not claim the art of cold-rolling metal generally, nor the same however it may be applied to horse-nail plates; but

What I claim as new and of my invention is—

1. As a new article of manufacture, a horse-shoe-nail plate of proper form for producing the completed nails therefrom, and having its parts which are designed to produce the head and adjacent shank parts of the nail finished by cold-rolling uniformly without material injury to the softness and pliability of the metal therefor, substantially as described.

2. The described process of finishing horse-shoe-nail plates by cold-rolling the same uniformly with a pressure graduated to produce a finish upon their surfaces without impairing materially the requisite softness and pliability of the metal thereof, substantially as described.

JOSEPH M. LAUGHLIN.

Witnesses:

CHARLES ED'D PRATT,

A. K. GARLAND.