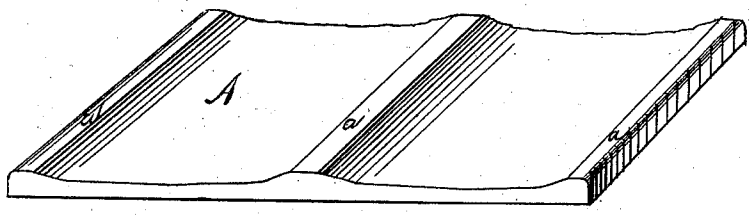
D. B. LORING.

MANUFACTURE OF HORSESHOE-NAILS.

No. 193,975. Patented Aug. 7, 1877.



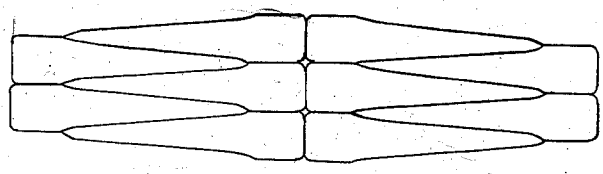


Fig. 1.

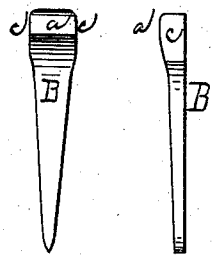


Fig. 2.

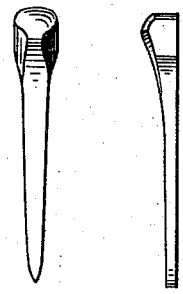


Fig 3

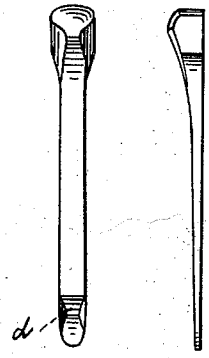


Fig. 4.

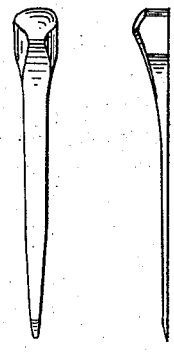


Fig. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

DAVID B. LORING, OF BOSTON, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN E. WHEELER, OF LYNN, MASSACHUSETTS.

IMPROVEMENT IN THE MANUFACTURE OF HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **193,975**, dated August 7, 1877; application filed June 15, 1877.

To all whom it may concern:

Be it known that I, DAVID B. LORING, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in the Process of Manufacturing Horseshoe-Nails, of which the following is a specification:

This invention has for its object the following-described improvement in the process of manufacturing horseshoe-nails, consisting, first, in punching a blank from a metal plate provided with head-forming ribs of a thickness somewhat less than that of the head of the nail to be formed; second, in completing the formation and shaping of the head of the blank by lateral pressure exerted upon the sides, preferably by revolving dies; third, in reducing the shank of the blank and forming the beveled recess at the point by cold-rolling.

The blank thus prepared is finished into a nail by being clipped in any ordinary way.

Figure 1 is a view of the nail-plate; Fig. 2, a view of the blank punched from the plate. Fig. 3 shows the shape of the blank after the second stage of the manipulation, its head having been perfected by upsetting in the dies, and its shank remaining unfinished. Fig. 4 represents the blank after the third stage of the process, and Fig. 5 shows the completed nail.

The nail-plate A is rolled from homogeneous metal with longitudinally-extending head-forming ribs *a*, of a thickness equal to about two-thirds that of the head of the completed nail. From this plate is punched the blank B, with heads about a third wider than that of the finished nail, and shanks preferably gradually tapering on their sides toward the end of the blank.

The blank thus shaped and prepared is next operated upon by revolving dies, which upset and shape the head by a pressure exerted upon its sides *c*. This operation disposes the metal substantially as shown in Fig. 3.

The next step in the process is the reduction of the shank to the shape shown in Fig. 4 by a pressure exerted upon the front and back of the blank, or more particularly transversely to that previously exerted upon the sides *c* of the blank *a*, which also forms the beveled indentation *d*.

The blank after this last operation is clipped in any customary or desirable way.

The advantages of this process of construction are the saving in waste and the peculiar properties given the nail.

It is desirable that the head of the nail should not be as soft as it is when the ribbed plate furnishes the completed head and it is not upset by cold-rolling, as it wears faster than the shoe, and the iron is not worked sufficiently to secure the best results; and it is also important that the head should not possess the brittleness which is the fault of nails made from a flat blank, in which the entire shaping and formation of the head is accomplished by upsetting in two operations, wherein an immense pressure is first exerted upon the sides to reduce the flat head-forming portion to the desired shape, and a secondary pressure is exerted upon the front and back to further the reduction to a correct form.

By the last-named process it is impossible, without subjecting the dies to a great strain, to form a head of the thickness required for some nails.

It is also necessary that the head should be joined to the shank by a portion sufficiently stiff to prevent the head from drawing away from the shank when under a heavy pressure, or, in fact, giving at all; as it would result in the loosening of the shoe, which would soon destroy the nail, yet not so stiff as to be brittle, so that a fracture would result from a sudden blow. The first of these last-named difficulties occurs when the head has not been upset by cold-rolling, and the shank only reduced by it, and the second when the entire head and shank are formed from a flat blank by upsetting.

It is also necessary that the shank should be sufficiently stiff not to draw or give, and yet not so brittle as to fracture, and the point must be firm and hard, yet not liable to crumble, split, or flake in heading.

The defects I have mentioned are all more or less apparent and fatal in the present

method of manufacturing horseshoe-nails, and it is to remedy these defects that I give the nails the peculiar properties I have named.

It will be observed that the nail is finished in sections, that first the head is shaped and then the shank drawn, and that no part of the nail is subjected to two rollings; therefore the metal is of one density throughout, more tenacious and ductile and less brittle than a nail made from a flat blank and having every part subjected to and shaped by two rollings, and not so liable to draw or give at the head and in the shank, or to chip or flake at the point as a nail whose head is not shaped by cold-rolling, and whose shank possesses varying densities, and terminates in a hard brittle point.

I am aware that heretofore horseshoe-nails have been made by first punching from a ribbed metal plate a blank, with the head-forming portion perfectly formed, and which, in the reduction of the shank by two rollings upon the face and back, is unshaped by the action of the dies; and I am also aware that nails have been rolled from flat blanks, in which the heads are entirely formed by upsetting in the dies, and both head and shank subjected to two or more "rollings" or reductions in dies; also that nails have been rolled to shape from continuous rods, in which, in the reduction, every portion of the nail has been subjected to two or more rollings in the process of manufacture; but nails made by these processes are subject to the defects I have mentioned, either of being too soft at the head and hard at the point, or too brittle throughout, and it is only by the above-described process that I am able to secure a cold-rolled nail that has tenacity and ductility combined with a uniform stiffness, which are the advantages of a hand-wrought nail.

I am aware that Letters Patent No. 137,762 describe and claim a process for manufacturing a horseshoe-nail from a nail-plate having thick edges or margins from which to form the heads and an intermediate portion, reduced in thickness and shape to or nearly to what is required in the finished nail, and of twice the length of the shank and point of the finished nail; and a point-forming groove rolled in the plate midway between and parallel to the head-forming ribs, and that two blanks are cut from the plate at one operation, arranged point and point, and that the heads are then staved up, and double blanks divided at the center of its length.

I am also aware that the Patent No. 124,411 describes a mechanism for cutting a complete nail from a metal plate; and I do not claim either the process described in said first-named patent, or the mechanism, or the result of the mechanism, described in said last-named patent, as neither the process nor the mechanism can produce a horseshoe-nail with the properties which are found in the product of my invention.

I claim—

The following-described process in the manufacture of horseshoe-nails, consisting, first, in punching from a ribbed metal plate a blank having a head-forming portion wider and thinner than the head of the finished nail; second, in upsetting the head-forming portion of the blank by a lateral pressure exerted upon its edges; third, in reducing the shank by a pressure exerted upon its front and back transversely to that exerted in forming the head, whereby the head and the shank are successively formed by cold-rolling, and but one pressure exerted upon the completed blank, as described.

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Witnesses:

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