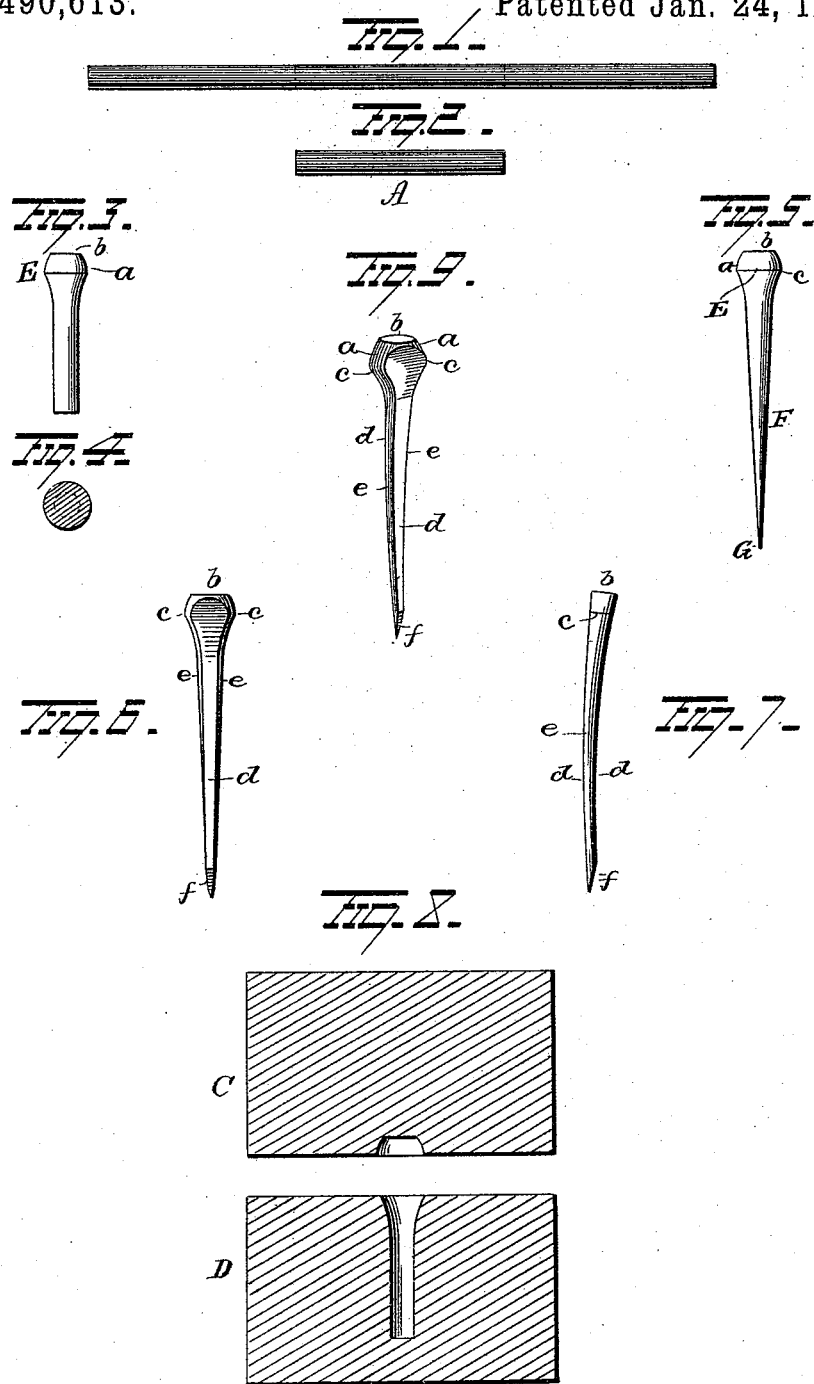


(No Model.)

W. W. MINER.
HORSESHOE NAIL.

No. 490,613.

Patented Jan. 24, 1893.



Witnesses
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WILLIAM W. MINER, OF NEW HAVEN, ASSIGNOR TO THE NEW PROCESS NAIL COMPANY, OF TORRINGTON, CONNECTICUT.

HORSESHOE-NAIL.

SPECIFICATION forming part of Letters Patent No. 490,613, dated January 24, 1893.

Application filed May 26, 1892. Serial No. 434,494. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. MINER, of New Haven, in the county of New Haven and State of Connecticut, have invented certain
5 new and useful Improvements in Horseshoe-Nails; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and
10 use the same.

My invention relates to an improvement in horse shoe nails.

The object of the invention is to provide a horse-shoe nail perfectly homogeneous in its
15 structure; not liable to split or sliver, sufficiently stiff and hard to adapt it to be driven without buckling and soft and ductile enough to be easily clinched and having smooth and rounded corners and a highly finished surface.
20 face.

With these ends in view my invention consists in an improved horse shoe nail having the features of form and construction hereinafter described and pointed out in the
25 claims.

In the accompanying drawings Figure 1 represents a length of wire from which the nail blanks are severed. Fig. 2 is a severed blank. Fig. 3 is a view in side elevation of
30 the blank shown in Fig. 2 after a rounded head has been formed thereon by swaging or upsetting. Fig. 4 is a cross-section taken through the rounded head of Fig. 3. Fig. 5 is a view in side elevation of the blank after its
35 body or shank portion has been reduced and a tapered form imparted thereto. Fig. 6 is a view in side elevation and Fig. 7 an edge view of the finished nail. Fig. 8 is a view in vertical section of the heading dies. Fig. 9 is
40 an enlarged view in perspective of my improved horse-shoe nail.

In manufacturing nails by my improved process, I first take round wire—preferably of Bessemer steel—and by any suitable machinery cut the same into suitable short
45 lengths and thereby produce blanks like those represented in Fig. 2, the dotted lines in Fig. 1 showing the length of the blanks as cut from the wire. The blank A as thus formed, is
50 then placed in suitable dies, which may be of

the form represented by C D in Fig. 8. The heading die C acting upon that portion of the blank which projects from the die D, serves to swage or upset a head E, on one end of the blank as represented in Figs. 3 and 4. As
55 represented in the drawings, the head is cylindrical in cross-section and has rounded sides *a* and flattened top *b*. The pressure exerted in forming the head, by which it is made of greater diameter than that of the body of
60 the blank is sufficient to render it exceedingly tough and homogeneous in structure. The headed blank of Figs. 3 and 4 is then subjected to the action of a suitable machine
65 which operates to elongate the body or shank and impart a tapering form to it from the head to its point, and render it circular in cross-section throughout its length.

The operation of reducing the body or shank to a tapering form having a circular cross-
70 section throughout its length may be performed by any suitable machinery though I prefer to perform this step in the operation by what is known as a wire pointing machine and for this purpose, may use the well known
75 Hopson and Brooks or the Dayton wire pointing machines, which are adapted to deliver against the periphery of the body of the blank a multiplicity of blows substantially equal in
80 number and force upon every portion of the surface of the shank throughout its length, whereby the density of the shank is rendered practically uniform and has imparted thereto a perfectly smooth and highly polished surface. The blank thus produced is illustrated
85 in Fig. 5, in which E represents the head having rounded sides *a* and flattened top *b*, while F represents the tapered body or shank and G the point. The head, as will be observed, is gradually enlarged from its flattened upper
90 end to the point *c* of its greatest diameter from which it is gradually contracted in diameter until it merges into or joins with the body of the shank. The blanks after having
95 been formed as illustrated in Fig. 5 are then annealed and the following process is preferably employed. The blanks are placed in a muffle from which the air is expelled by the introduction of illuminating gas under pressure. After the air has been expelled and the
100

muffle is filled with gas, the latter is placed in a suitable furnace and heated to a temperature sufficient to impart red heat to the blank. The muffle is then removed from the furnace and allowed to cool gradually, and when the blanks have become sufficiently cool, they are removed from the muffle. By being subjected to this annealing process, the blanks are rendered quite ductile, but by the final process, by which they are flattened, the finished nail will be sufficiently hardened and stiffened to insure its being driven without buckling while it will be sufficiently soft and ductile to enable it to be easily clinched. By annealing the blanks in an air tight muffle, I prevent the oxidation of the outer surface and hence preserve the brightly polished surface produced by the heading and reducing process and by gradually cooling them, I prevent the color from flowing. If, desired, the blanks may be annealed, subsequently to their being flattened, and, a blue color may be imparted to the finished nail in the process of annealing. However, I prefer to anneal them before the final pressing operation by which they are flattened, because by so doing, I am enabled to impart to the finished nail by the final operation of pressing and flattening the requisite degree of hardness and stiffness to the shank and point which will insure the nails being driven without bending or buckling.

The blanks of the form represented in Fig. 5 and after having been annealed, are then subjected to a pressing process by which they are flattened as represented in Figs. 6 and 7. This step in the process may be performed by machinery of the character set forth in Letters Patent No. 415,818, granted to me November 26, 1889, or any other suitable machinery may be used for this purpose. The flattening of the blank operates to transform it into the shape of a completed nail having flattened sides *d d*, rounded side edges *ee* and beveled point *f*. While the blank by the final pressing process is transformed into the desired shape of the completed nail, its entire surface is rendered perfectly smooth and has imparted thereto a highly finished appearance.

By reference to Figs. 6, 7 and 9 it will be observed that the nail head is provided with a flat top *b*, and is gradually enlarged to the point *c* of its greatest width, at which point the shoulder commences and is gradually contracted until it merges into the shank.

The opposite sides of the nail are flattened from the point of the shank to the flat top *b* of the head, while the side edges of the nail are rounded from the point of the shank to the top *b*. Hence the entire surface of the nail is completely finished and rendered smooth and uniform throughout its length, while every portion of its surface is polished and presents a highly finished appearance.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A horse shoe nail flattened on its opposite sides and having rounded edges the head of the nail being formed with a flat top and gradually enlarged from the top to its juncture with the tapering shoulder or underside of the head, substantially as set forth.

2. A horse shoe nail having flattened sides, rounded side edges and a head formed with a flat top and gradually enlarged in width from its flat top to a point substantially midway between its upper and under sides, the side edges of the head being rounded, substantially as set forth.

3. A horse shoe nail having flattened sides, and rounded edges extending the length of the nail, the head of the nail being of greatest width at or substantially at its vertical center, substantially as set forth.

4. A horse shoe nail having its head and shank flattened on opposite sides, and rounded on their opposite edges, the head being formed with a flat top, and gradually contracted in width above and below a line taken through its widest portion, substantially as set forth.

5. A horse shoe nail having a head formed with a flat top, flattened sides, and rounded edges, the latter being curved to form a convex shoulder connecting the head and shank; the shank of the nail having flattened sides and rounded edges, substantially as set forth.

6. A horse shoe nail having a head formed with a flat top flattened sides and rounded edges, and a shank gradually tapering from the head to the point, the sides of the shank being flattened and its edges rounded, substantially as set forth.

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

WILLIAM W. MINER.

Witnesses:

S. G. NOTTINGHAM,
C. S. DRURY.