J. M. ESTABROOK.
Shoe-Nail.

No. 219,238. Patented Sept. 2, 1879.

Fig. 3

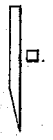

Fig. 4.

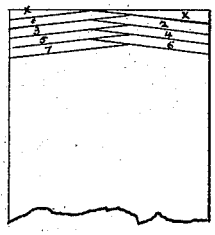

Fig. 6.

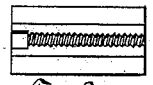

Fig. 2.

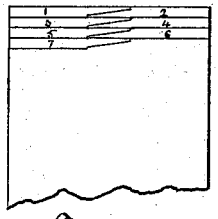

Fig. 7.

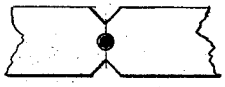

Fig. 1.

Fig. 5.

Witnesses:

Geo. O. Coale
J. E. Knox

Inventor:

Joseph M. Estabrook
by J. E. Maynadier
his atty.

UNITED STATES PATENT OFFICE.

JOSEPH M. ESTABROOK, OF MILFORD, MASSACHUSETTS, ASSIGNOR OF ONE HALF HIS RIGHT TO EPHRAIM L. WIRES, OF SAME PLACE.

IMPROVEMENT IN SHOE-NAILS.

Specification forming part of Letters Patent No. **219,238**, dated September 2, 1879; application filed November 6, 1876.

To all whom it may concern:

Be it known that I, JOSEPH M. ESTABROOK, of Milford, in the county of Worcester and State of Massachusetts, have invented an Improved Shoe-Nail, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, making a part hereof.

My new nail is a shoe-nail made up of three parts—the head, the body or shank, and the point. The body or shank is covered with projections, preferably in the form of a screw-thread, and is of the same size from end to end. The head is of larger diameter than the body, and the point is a short wedge. It is this nail as a whole which constitutes my invention.

In the drawings, Figure 4 shows my improved nail. Figs. 5, 6, and 7 show several modes of cutting the blank from the nail-plate. Fig. 3 shows the blank, and Figs. 1 and 2 the dies in which the blank is compressed and held under the action of the header.

The best mode known to me for manufacturing my improved nail is to form the blanks as shown in Fig. 3. This blank, when swaged in the die and struck by the header, will be brought to the shape shown in Fig. 4.

To save waste, the blanks are best cut as shown in Figs. 5, 6, and 7. In Fig. 6 the blanks are cut by a straight-edged cutter as numbered; but in Figs. 5 and 7 the odd-numbered blanks are cut by a cutter whose working-edge is the same as the angular edge of the blank, while the even-numbered blanks are cut with a straight-edged cutter.

It will be understood by all skilled in the art that the apex of the wedge-shaped part of each blank cut, as illustrated in Figs. 5 and 6, will be irregular—that is, like the point of a common tack. If it is desired to make the apex of the wedge-shaped point more perfect, the blanks should be cut as shown in Fig. 7. The griping and heading of the blanks require no description, as these are matters well known to all skilled in the art.

I am aware that headed nails with tapering serrated shanks are well known, and that the entering ends of these nails will clinch when driven into the soles of boots and shoes against the iron plating of the last, thus clamping the outer and inner surfaces of the sole between the head and the clinched part of the nail; but as the body of the nail—and by "body" here I mean all that part of the nail between the head and the clinched part of the nail—is tapering, it is obvious that a very slight yield of the clinch and a very slight outward motion of the nail will greatly decrease the hold of the leather along the whole body of the nail, leaving the nail practically loose, except as it is held by the head and clinch; but the moment the nail is thus loosened, even to a microscopic extent, it becomes gradually looser at every step of the wearer of the shoe, especially at those parts of the shoe (along each side) where the greatest strain on the nail and motion of the sole take place, and this is because the clinch and head are not sufficient to hold the tapering body, which readily yields more and more after once started, and also because the tapering body is very much more easily started than a body of the same size from end to end.

The main object of my invention is to remedy this defect, and I accomplish this by combining in a nail not only the head and clinching-point, to act as clamps to hold together the outer and inner surfaces of the sole, but, in addition, a body which is of the same size throughout, with slight projections over its surface. Consequently, in my nail the body aids the head and clinch in holding the surfaces of the sole together, and they aid the body, all three acting together, and effectually preventing any motion of the leather on the nail or of the nail on the leather.

My nail, when in place in the sole, acts in a materially-different manner from the old nail, (for instance, that described in Letters Patent to Whidden, No. 90,902, of 1869, and No. 164,889, of 1875,) by reason of the fact that the body, or that part between the head and the clinch, is of the same size throughout, and therefore aids both the head and clinch in doing their work—that is to say, all three act at the same time to prevent any motion of any part of the leather immediately surrounding the nail, each aiding both the others; and the nail cannot be even slightly started outward

without overcoming both the resistance of the clinch and the resistance of all the projections on the body, nor inward without overcoming the resistance of the head and the resistance of all the projections on the body.

A slight microscopic starting of the nail or motion of the leather on the nail occurs in all nailed boots and shoes when in wear, but has no ill effect whatever in boots and shoes nailed with my nail. In addition to these advantages, the tapering part of my nail occupies only a small part of the whole length of the nail, and as the entering end of the nail is cut thin, the clinch is on a curve of a much shorter radius than is the clinch of the old nail, and therefore forms, in conjunction with the head, a much firmer clamp, especially as my nail thickens from its entering end very much more rapidly than the old nail. The tapering body of the old nail acts with the head to throw an undue strain on the clinch, while in my nail the body, of the same size throughout, equalizes the strain and distributes it over the head, the body, and the clinch.

Various other forms of shoe-nails are well known, (see, for example, patent to Sturtevant, No. 159,777;) but, except my own, I know of no headed clinching-nail—that is, a nail possessing the necessary clamping action when driven, the head holding the outer surface of the sole and the clinch the inner surface as the stock is settled—in which the head and the clinch are connected together by a body or shank of the same size from end to end. The projections on the body are essential, as, if the body were smooth, it could not, in any great degree, assist the head and clinch in holding the parts of the sole from moving.

Having thus fully described my improved nail, and explained its principle and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions, I distinctly disclaim, severally and specifically, the several elements that go to make up the nail shown by me, as my invention consists solely in the improvement in the nail due to the superior diameter of the head relatively to the shank or body produced by upsetting; but

What I claim as my invention is—

My improved shoe-nail, consisting of the head, the body, and the point above described, the head being larger than the body, the body being of the same size from end to end and covered with slight projections, and the point being wedge-shaped.

JOS. M. ESTABROOK.

Witnesses:

J. E. MAYNADIER,

GEO. O. G. COALE.