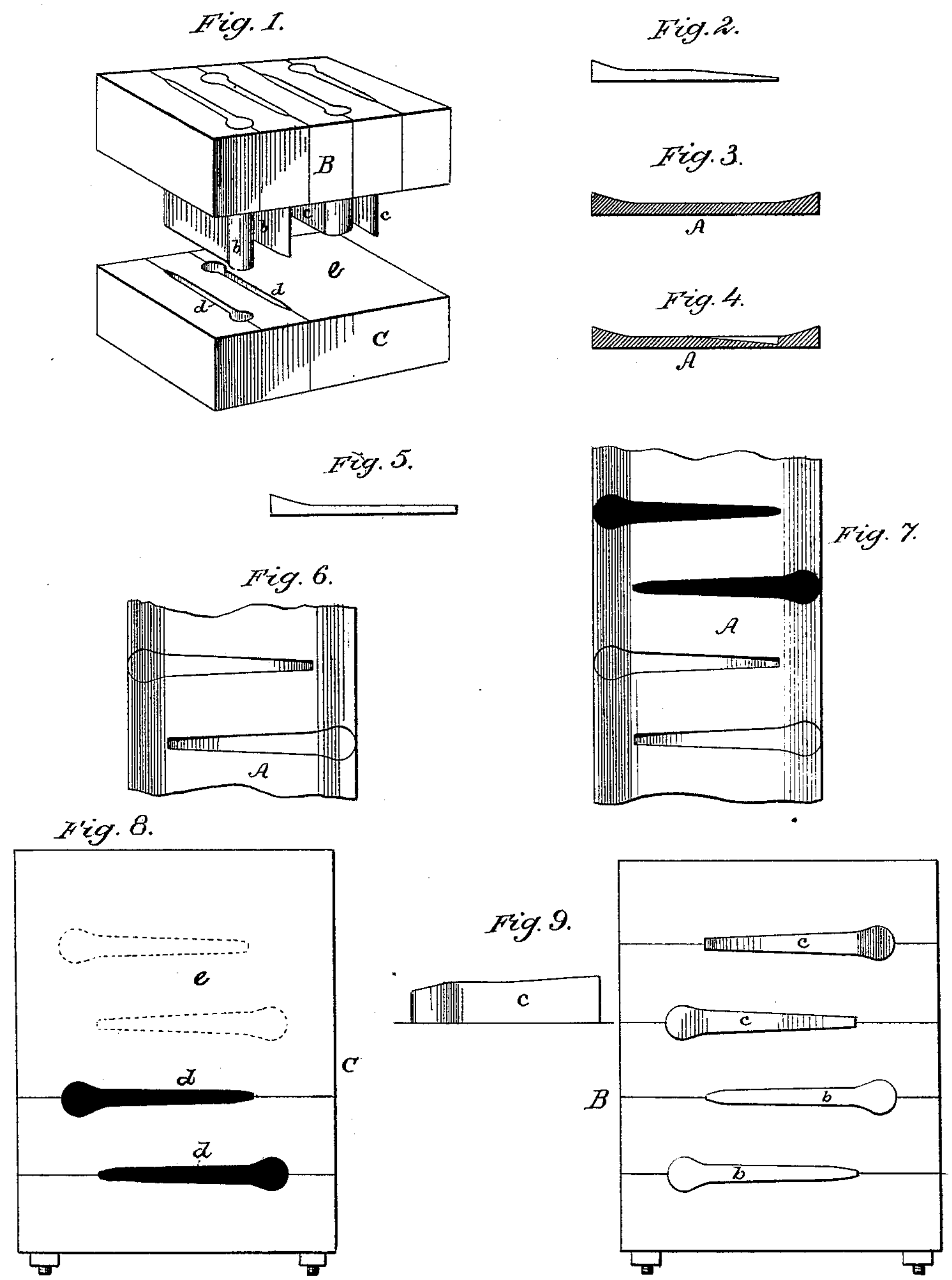
I. C. TATE.

MANUFACTURE OF HORSESHOE NAILS.

No. 189,586. Patented April 17, 1877.



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IMPROVEMENT IN THE MANUFACTURE OF HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **189,586**, dated April 17, 1877; application filed March 6, 1877.

To all whom it may concern:

Be it known that I, ISAAC C. TATE, of New London, in the county of New London and State of Connecticut, have invented a new and useful Improvement in the Process and Apparatus for Manufacturing Horseshoe-Nails, of which the following specification is a full and clear description:

Heretofore iron for horseshoe-nails has been rolled with the edges thick and central part thin, so that the nails could be cut out with punch and die, heads and points, from said bar; but after such cutting it has been necessary to remove the rough scale-marks of the iron, and taper, temper, and finish each nail separately.

Iron has also been rolled while hot with indentations corresponding to the face form of the nails, which indented portions were subsequently punched out; but by this latter method the nails were left soft, and required to be subsequently tempered and finished.

The tempering of horseshoe-nails is accomplished by compressing and condensing the metal by punch and die, or by hammering or rolling, and requires the employment of costly machinery. When the nail is subjected to this operation the temper is unequal, because the metal at the edges yields more readily than that at the center, having lateral support, and it also impairs the form of the nail, which can only be restored by trimming.

I propose to obviate the defects of the methods above described by tempering, tapering, and finishing the nails before cutting, so that when once cut they are finished nails, requiring no handling or subsequent manipulation, except beveling the point.

My invention, therefore, consists, first, in the manufacture of horseshoe-nails, as above described, of cold metal, in virtue of which the tempering and finishing the said nails takes place prior to punching them from the bar of rolled iron by means of suitable dies working against a bed or anvil; second, in the structure of the dies and punches used for tempering, finishing, and punching my said nails.

That others may fully understand my invention I will more particularly describe it, having reference to the accompanying drawing, wherein—

Figure 1 is a perspective view of the punch and die block in operative position. Fig. 2 is a side view of a horseshoe-nail, showing the taper from head to point. Fig. 3 is a transverse section of a ribbed bar of iron, from which said horseshoe-nails are cut. Fig. 4 is a transverse section of the same through the line of compression, showing the form and taper of the nail-blank before punching. Fig. 5 is an edge view of a horseshoe-nail punched without being previously tempered, tapered, and finished. Fig. 6 is a plan view of a ribbed bar of iron, showing the indentations made by the tempering and finishing dies. Fig. 7 is a plan view of a ribbed bar of iron, showing two cuts and indentations. Fig. 8 shows in plan my die and anvil-block. Fig. 9 shows in plan my punch and compressor-dies.

A is the rolled strip or bar of iron from which the horseshoe-nails are to be punched. It is rolled in this form with thick edges for the heads of the nails, and a thin central web, while the iron is hot, and consequently it has, when cold, a temper nearly or quite uniformly soft. Before being submitted to the punches its surface is cleansed from scale. My punch and die blocks B and C may be mounted upon and operated by any suitable press, and the bar A may be fed by any proper mechanism. The punch-block is provided with one or more punches, *b b*, having the exact size and configuration of finished horseshoe-nails, and in exactly corresponding positions two additional similar but shorter punches, *c c*, whose faces correspond to the face of the finished nail, as shown in the elevation attached to Fig. 9, and the die-block C has a number of dies, *d d*, corresponding to the number of punches *b b*, but opposed to the punches *c c*. It has a solid blank surface, *e*, the dotted lines on which indicate the position of the stroke of the punches *c c*. When the blank strip A is fed between the punch and die blocks B C, it should be so entered that the first stroke shall only be with punches *c c*. Two nails are thereby compressed, tempered, tapered, and finished, as shown in Fig. 6. The next stroke feeds the

blank forward, so that these tempered nails are severed from the blank by punches *b b*, and two more are simultaneously tempered, tapered, and finished, as shown in Fig. 7, and so on to the end.

I find it convenient and effective to construct my punch and die block in sections, as shown. The punches are formed from strips of steel, formed with cross-sections exactly corresponding with the form of the nail, and these strips are cut into suitable lengths and separately tempered. The blocks in which they are held are grooved to correspond exactly to the form of said punches, as shown, so that they may be readily taken apart and a broken punch removed and replaced with a fresh one, &c. The operation of preparing the parts of punches and dies in this way is one familiar to mechanics, and is susceptible of the utmost accuracy. For this purpose it possesses great advantages, as the punches and dies can have a much better temper imparted to them than by the old method, and they can also be more cheaply and expeditiously made.

Having described my invention, what I claim as new is—

1. As an improvement in the art of making horseshoe-nails by stamping impressions of nails upon or into a sheet of metal, and then cutting out said impressed portions by punching, in the usual manner, I claim so operating upon the metal while cold, in virtue of which the same is tempered and finished, as set forth, before being punched.

2. In combination with the cutting-dies *b b*, the compressing and finishing dies *c c* and the die and anvil block C, substantially as set forth.

ISAAC C. TATE.

Witnesses:

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PELEG WILLIAMS.