(No Model.) 2 Sheets—Sheet 1.

E. E. ANGELL & S. PORTER.

METHOD OF MAKING SPIKES.

No. 454,696. Patented June 23, 1891.

Fig 1.

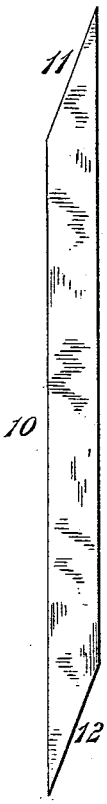
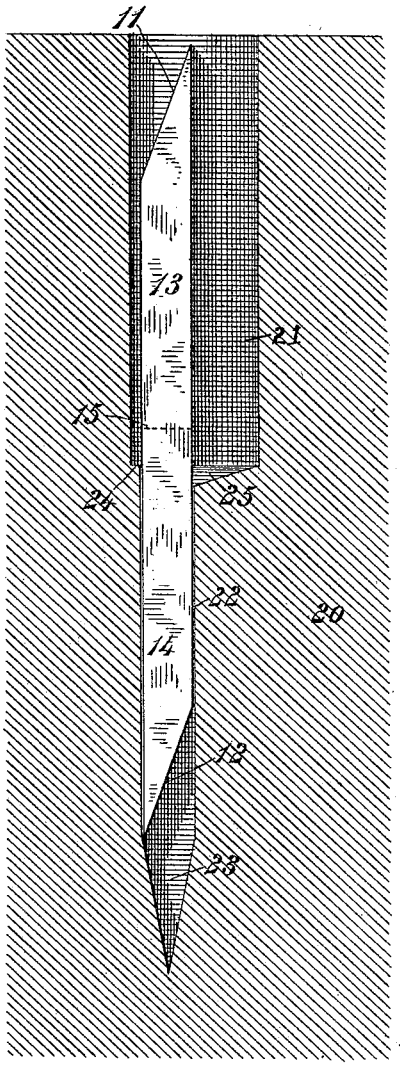


Fig 2.

Fig 3.



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(No Model.) 2 Sheets—Sheet 2.

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Fig 4.

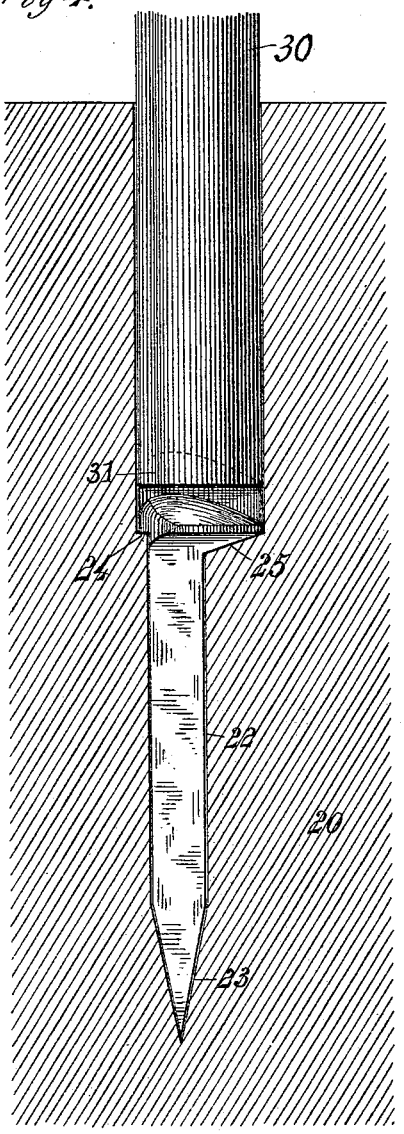
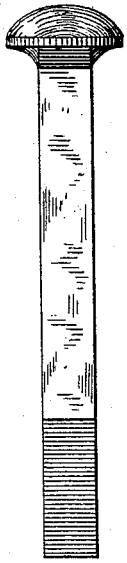


Fig 7.

Fig 5.

Fig 6.



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UNITED STATES PATENT OFFICE.

EDWIN E. ANGELL, OF SOMERVILLE, AND STEPHEN PORTER, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO THE ELECTRICAL FORGING COMPANY, OF MAINE.

METHOD OF MAKING SPIKES.

SPECIFICATION forming part of Letters Patent No. 454,696, dated June 23, 1891.

Application filed December 30, 1890. Serial No. 376,274. (No model.)

To all whom it may concern:

Be it known that we, EDWIN E. ANGELL, residing at Somerville, in the county of Middlesex, and STEPHEN PORTER, residing at Boston, in the county of Suffolk and State of Massachusetts, citizens of the United States, have invented certain new and useful Improvements in Methods of Making Spikes, of which the following is a specification.

The object of this invention is to produce in an economical manner railroad-spikes and similar articles of superior strength and penetrating qualities.

The invention consists in forming a blank of a proper length to produce a spike of the required size, the opposite ends of said blank being cut on parallel diagonal lines, then heating to a welding heat the upper portion only of said blank, then simultaneously bending the cool beveled end of said blank into the central axial line thereof to form the point of the spike, and upsetting the heated end thereof into a spike-head, substantially as hereinafter set forth.

In the accompanying drawings, Figure 1 represents a side elevation of a prepared blank to be made into a spike under this improved method. Fig. 2 represents a front elevation thereof. Fig. 3 represents a longitudinal section of a die and a blank disposed therein preparatory to being forged pursuant to this improved method. Fig. 4 represents the completed operation, showing the die, the spike as formed therein from the blank, and the plunger which operates upon the blank in conjunction with the die to form the spike. Fig. 5 represents a side elevation of a complete spike. Fig. 6 represents a front elevation thereof. Fig. 7 represents a top view thereof.

Similar numerals of reference indicate corresponding parts in the different figures.

In carrying out this process blanks similar to the blank 10 are cut from a bar of steel or other suitable metal of the cross-section required for the spikes to be produced, and of a length nearly twice that of such spike. In severing a blank the bar is cut diagonally in parallel lines, forming beveled points 11 and 12, inclined in opposite directions at the opposite ends of the blank, and no waste of stock occurs. The upper portion 13 of the blank above the dotted line 15 is then heated by an electric current or other suitable means of heating to a welding temperature, and the lower portion 14 is left cool, in the metallurgical sense of the term, below said dotted line. The blank so heated is then placed in a die 20. This die has an elongated chamber 22, of a length equal to the finished spike minus its head, the lower end of said chamber being tapered on two opposite sides, forming a pointed socket 23 of a shape corresponding to the point of the finished spike. The die is also provided with a chamber 21, in line with the chamber 22. This chamber 21 is of an area in cross-section equal to the area of the head to be formed on the spike, and corresponds in shape to said head. A narrow shoulder 24, formed on one side at the lower end of the chamber 21, and a wide shoulder 25 is formed on the opposite side at the lower end of said chamber. The shoulder 25 has a concave recess inclined downward toward the chamber 24. A plunger 30 is adapted to fit closely and slide within the chamber 21. This plunger is provided at its lower end with a concave recess 31, adapted to form the convex top of the head on the spike.

In placing the blank in the die the lower cool portion 14 of the blank extends partially into the chamber 22, the beveled end thereof resting against the angle formed by one of the tapered sides of the socket 23, and the heated portion 13 stands in the larger chamber 21 with its beveled face toward the side of said chamber which has the narrow shoulder 24. After the blank is placed in the position aforesaid, as represented in Fig. 3, the plunger 30 is forced into the chamber 22 into contact with the softened portion of the blank, and drives said blank downward until its beveled lower end swings into the pointed socket 23 at the lower end of the chamber 22, whereby said beveled end is bent into a central spike-point, and at the same stroke said plunger,

acting in conjunction with the sides and the bottom of the chamber 21, upsets and shapes the soft metal into a spike-head.

We claim as our invention—

The method of making a spike, which consists in forming a bevel-ended blank longer than the spike to be produced, then heating the upper portion only of said blank, the lower portion being left cool, and then by a single stroke swaging the lower beveled end of the blank in a cool state into a spike-point and upsetting the heated and softened portion of said blank into a spike-head, substantially as described.

EDWIN E. ANGELL.
STEPHEN PORTER.

Witnesses:
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