

No. 768,517.

PATENTED AUG. 23, 1904.

I. COPELAND.  
RAILROAD SPIKE.

APPLICATION FILED FEB. 9, 1904.

NO MODEL.

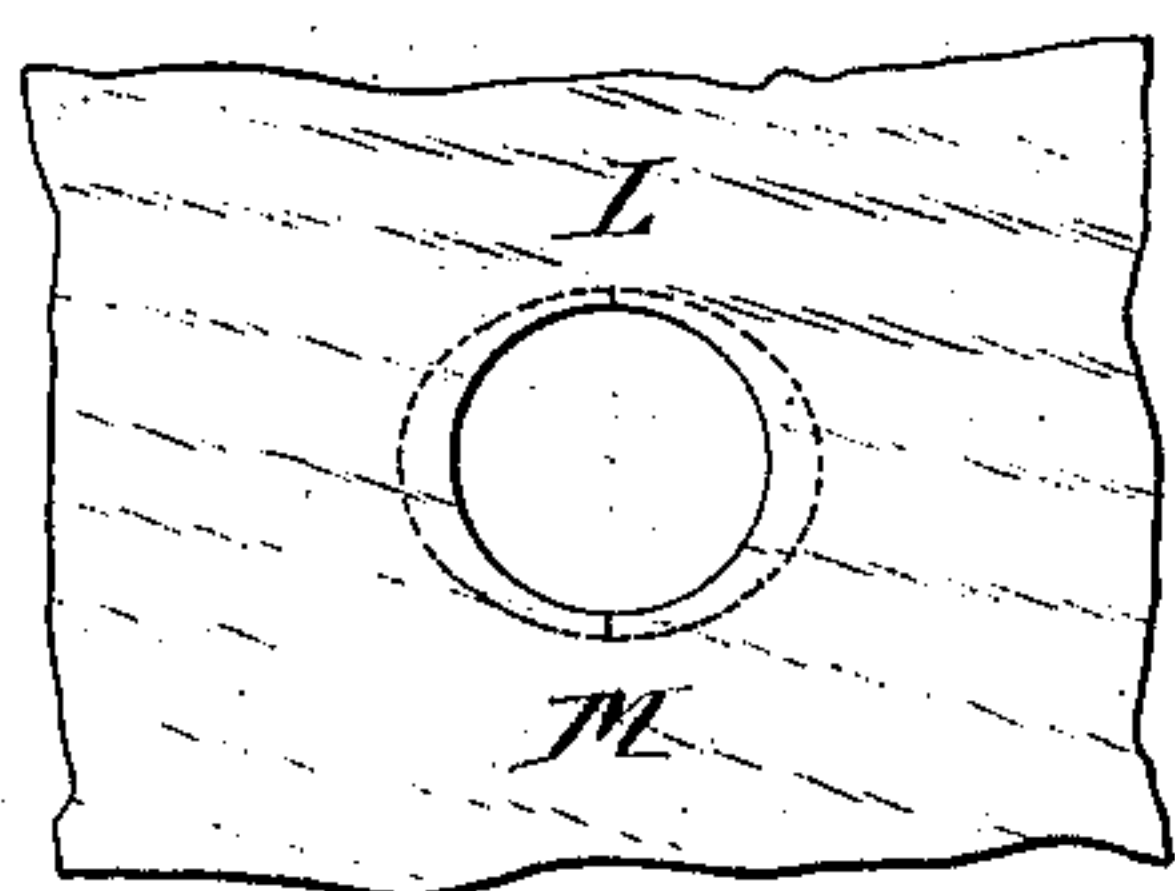
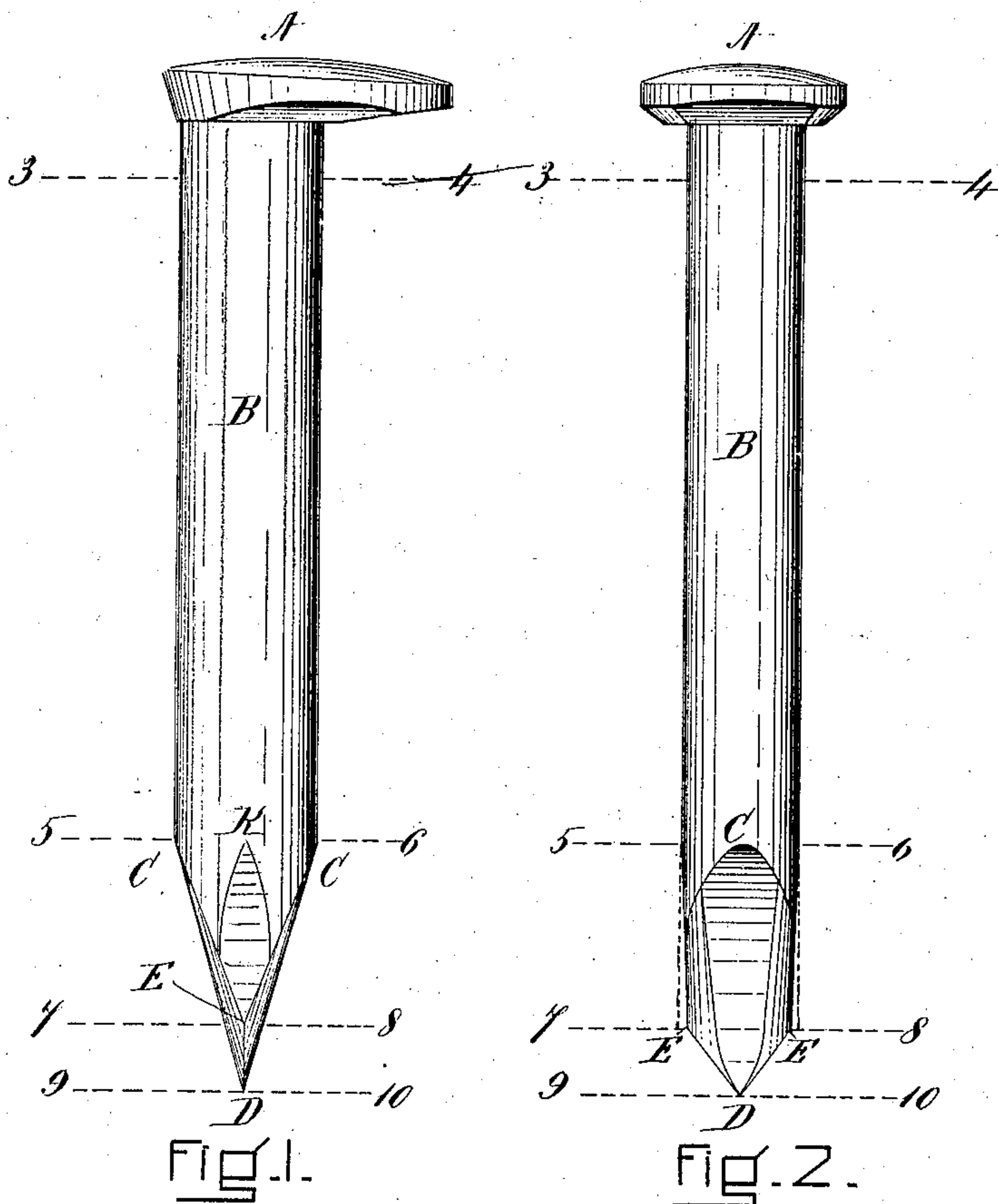


Fig. 3.

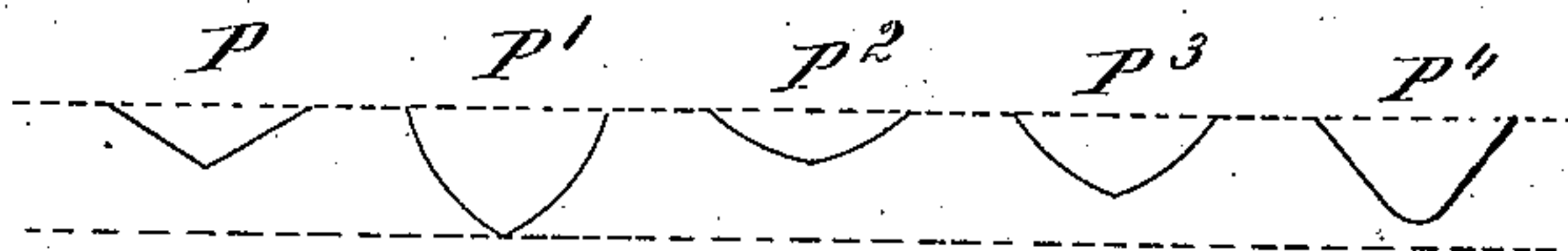


Fig. 4.

WITNESSES:

*Anna Kingbury*  
*William Edison*

INVENTOR:

*Ira Copeland.*

# UNITED STATES PATENT OFFICE.

IRA COPELAND, OF NEWTON, MASSACHUSETTS.

## RAILROAD-SPIKE.

SPECIFICATION forming part of Letters Patent No. 768,517, dated August 23, 1904.

Application filed February 9, 1904. Serial No. 192,818. (No model.)

*To all whom it may concern:*

Be it known that I, IRA COPELAND, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Railroad-Spikes, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to spikes such as are used to fasten the rails to the wooden ties upon railroads, but may be used for other purposes.

It relates especially to said spikes, which are to be driven into holes bored in the ties for their reception, but may also be driven into unbored wood.

The object of my invention is to produce a spike which when driven into a bored hole in the tie will improve the texture of the wood surrounding the spike by simple compression of the wood fiber and effectually close its socket against storm-water, and thus materially prolong the life of the tie, increase the safety of transportation, and reduce the cost of maintenance of track.

To assist in forming a clear and distinct comprehension of my improved spike and its use, I refer to the accompanying drawings, in which—

Figure 1 shows my spike in side elevation. Fig. 2 shows the same in front elevation. Fig. 3 represents a piece of wood bored to receive my spike. Fig. 4 shows in outline a variety of shapes for the severing edges of the point of the spike.

For convenience in describing the spike I have called that part that is above the line 3 4 the "head portion," that part between the lines 3 4 and 5 6 the "body portion," that part between the lines 5 6 and 7 8 the "compressing portion," and that part between the lines 7 8 and 9 10 the "severing portion." First, a head portion A, embracing all that portion of the driven spike which remains above the surface of the tie and whose function is to engage with the rail to hold it in place; second, a body portion B, comprising that portion of the driven spike which occupies the enlarged bored hole, (the hole having been bored to a depth corresponding substantially with the length of this portion of the spike,) its func-

tion being to furnish the main portion of the holding power of the spike and its resistance to the lateral thrust of the wheels and to effectually close the spike-socket against storm-water; third, a wedging and compressing portion whose primary function in my spike is to enlarge the bored hole for the reception of the body portion of the spike as the spike is being driven; fourth, a severing portion whose special function in my spike driven into a bored hole does not become operative until it reaches the bottom of the bored hole, when it begins to sever the wood fibers transversely with the length of the tie, admitting itself and preparing the way for the compressing portion of the spike into the unbored wood below the bottom of the bored hole. In many railroad-spikes hitherto used this fourth portion is lacking, its severing function being accomplished by a severing edge occupying a straight line across the lower end of the wedging portion.

The first or head portion of my spike may be given any desired form. The second or body portion should be of uniform cross-section throughout its length. The drawings show a spike of elliptical cross-section, as I consider it to be preferable to other forms; but I do not confine myself to it, as my improvement is applicable to others. The third or compressing portion ordinarily should occupy a length of an inch to an inch and a half. It should be wedge-shaped, tapering downward from the body portion in planes transverse to the length of the tie. These transverse planes C D and C D begin at the lower end of the body portion and extend downward to and into the severing portion. These planes may be called the "major tapering planes." This compressing portion of the spike at its lower end is made slightly, and but slightly, less in width than the thickness of the body portion, so as to produce on its sides minor tapering planes, one of which is shown at E K extending upward through a part or the whole of its length. Either or all of these tapering planes may be made flat or convex, as the exigencies of manufacture or use may dictate. This form of construction results in a spike which will enter the bored hole at its top and



stand alone therein without striking with the hammer and when forced downward by hammering will compress the wood fibers all around it by bending them somewhat outward and downward. (See Fig. 3, wherein the circle indicates the bored hole in the wood, the ellipse the enlarged bored hole, and the space between these two the stratum of compressed wood, and the short vertical lines M L indicate the severing of longitudinal wood fibers by the use of the ordinary spike.) This operation actually improves the texture of the wood all around the body of the spike, as it surrounds it with a stratum of compressed wood smoother, harder, and more resistant than uncompressed wood and still more so than the fragmentary wood which surrounds the ordinary spike driven in unbored wood. The fourth or severing portion E E will have a width at its upper end equal to the width of the lower end of the third portion. Its lower end should terminate in an advance point D, so that as it is forced into the unbored wood below the bottom of the bored hole the resulting severing of wood fibers will not be in a single horizontal plane, but simultaneously in many planes, thus greatly reducing the danger of disintegrating the lower portion of the tie. The length and thickness of this portion may be varied according to the character of the wood into which the spikes are to be driven. The contour of its edges may be varied, as illustrated in the drawings, P P' P<sup>2</sup> P<sup>3</sup> P<sup>4</sup>, Fig. 4. These last two portions should be so constructed that the advance point will as nearly as prac-

ticable always be in the center of the final spike-socket.

While I do not confine myself to any exact dimensions in the proportions of the spike, the following have given satisfactory results. Let the short diameter of the spike be twenty thirty-seconds of an inch and the long diameter twenty-four thirty-seconds of an inch, as shown in dotted line, Fig. 3, and the width at E E seventeen thirty-seconds of an inch, or one thirty-second of an inch less than the diameter of the bored hole, which is eighteen thirty-seconds of an inch in diameter.

I claim—

A spike having a body portion of uniform cross-section throughout its length, and having a compressing portion tapering downward in major planes, and also tapering downward in minor planes which are transverse to said major planes; and having a severing portion whose severing edges, beginning at the sides of the compressing portion at its lower end, where its width is less than the thickness of the spike, continues downward in converging lines terminating in a point coincident with an extension of the central axis of the body portion, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 8th day of February, A. D. 1904.

IRA COPELAND.

Witnesses:

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WILLIAM EDSON.