No. 786,548. PATENTED APR. 4, 1905.

I. COPELAND.

RAILROAD TIE.

APPLICATION FILED SEPT. 27, 1904.

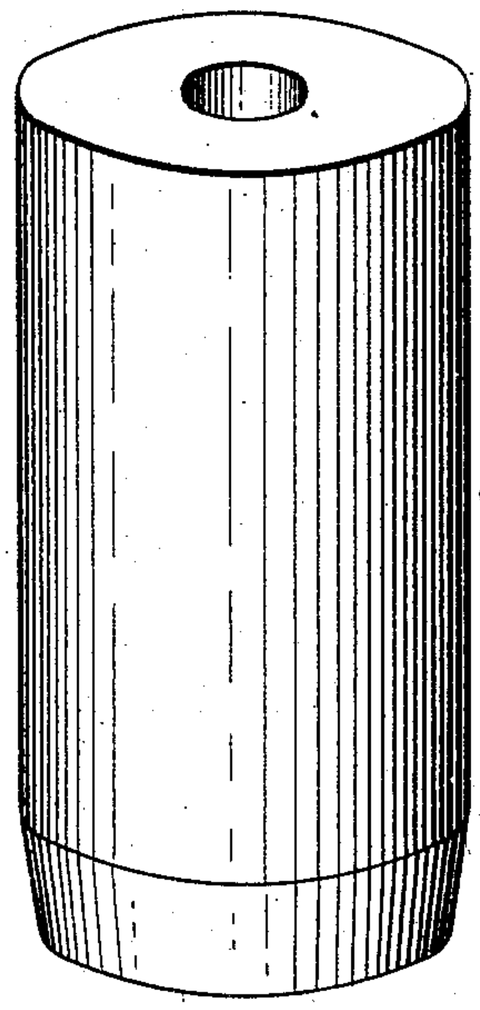


Fig. 1.

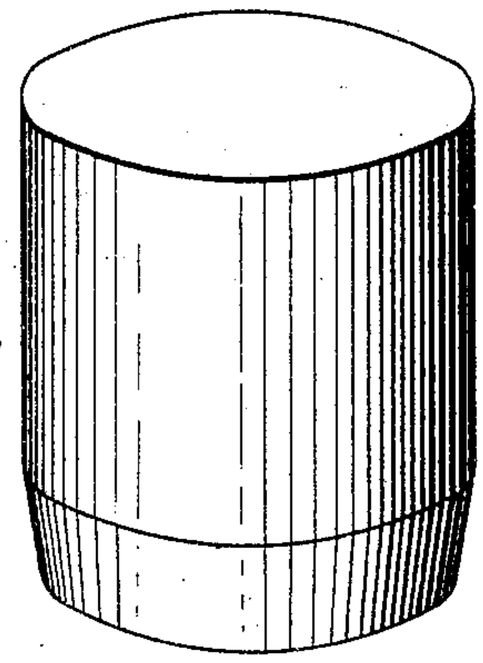


Fig. 2.

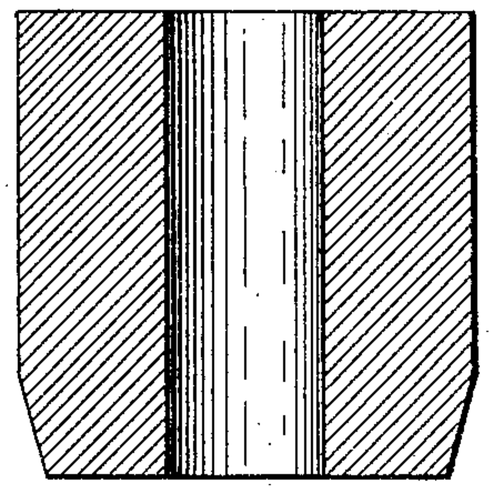


Fig. 3.

Fig. 4.

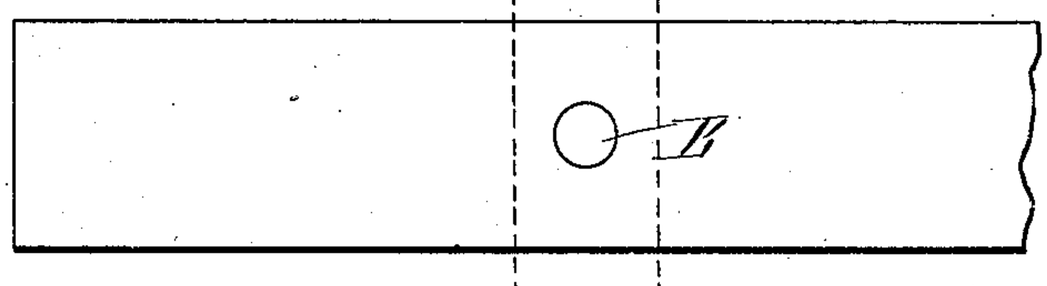


Fig. 5.

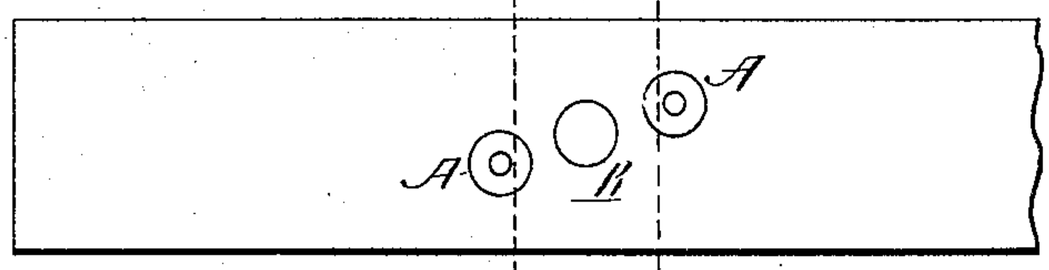
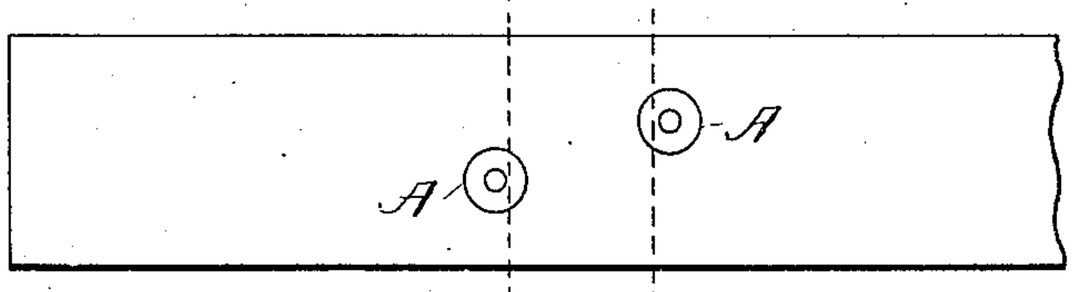


Fig. 6.



WITNESSES.

Frank G. Parker.

John Buckler,

INVENTOR.

Ira Copeland.

No. 786,548. Patented April 4, 1905.

UNITED STATES PATENT OFFICE.

IRA COPELAND, OF NEWTON, MASSACHUSETTS.

RAILROAD-TIE.

SPECIFICATION forming part of Letters Patent No. 786,548, dated April 4, 1905.

Application filed September 27, 1904. Serial No. 226,209.

To all whom it may concern:

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

My invention relates to the wearing and spike-holding capacity of wooden ties for railroads; and it consists in adding to the durability of the tie, both as to its wearing and spike-holding properties, by inserting in its upper surface a number of wood dowels, said dowels being placed wholly or partly in the subrail portion of the tie.

The object is to add to the length of time that the tie will maintain its usefulness. This object I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a dowel intended for use in connection with a spike, it being bored and prepared for insertion in the tie in position to receive the rail-holding spike. Fig. 2 is a perspective view showing a dowel prepared for insertion in the tie in its subrail portion. Fig. 3 shows in vertical section a dowel prepared for the insertion of a metal core and is intended to be placed in the subrail portion of the tie. Fig. 4 is a plan view, on a small scale, of a tie having a single dowel located wholly in its subrail portion. The location of the rail is indicated by dotted lines. Fig. 5 is a plan view, on a small scale, of a tie having a solid dowel wholly in the subrail portion of the tie and having spike-dowels partly in its subrail portion. Fig. 6 is a plan view, on a small scale, of a tie having two spike-dowels.

My improvement is applicable to railroad-ties made from all kinds of wood; but is more especially desirable for those made from the softer varieties, cedar, pine, &c. Its object is to fortify the tie against spike-pulling, spike-killing, and rail-cutting. By "spike-pulling" I mean the tendency of traffic to pull the spike upward from its normal position. By "spike-killing" I mean the destructive effects caused by the use of inferior spikes and by improper driving and by the wear and tear of traffic tending to enlarge the spike-socket, permitting the entrance of air and water and consequent rapid decay. By "rail-cutting" I mean the effect of traffic tending to cause the rail gradually to depress itself and wear its way into the tie, thereby reducing the firmness with which the rail is clamped to the tie, which tendency acts with accelerated speed when once the effect is fully under way. The object is accomplished by the use of dowels—hollow dowels and solid dowels. Both kinds are inserted in the ties in vertical bored holes. They are made somewhat larger than the hole, so as to be forced into the tie much as a bung is forced into a barrel or a cork into a bottle, thus making an air and water tight joint.

The bored dowel A should be of hard wood with grain running vertically, so as to present end of grain at the surface of the tie when in place. Its length should correspond to the depth of the bored hole. Its interior spike-hole should be slightly less in diameter than the thickness of the spike to be driven therein. These bored dowels are especially designed to receive such spikes as are described and patented in United States Patent No. 768,517, issued to me August 23, 1904, but are also well adapted to receive others. When in service, a portion of their upper ends lies under the rail-flange and will tend to diminish rail-cutting, inasmuch as the end grain of its harder wood will wear more slowly than the longitudinal grain of the softer wood of the tie. The spikes being driven into wood harder than the wood of the tie gives them much greater tenacity and much greater resistance to lateral displacement, thus prolonging the life of the tie, reducing cost of track maintenance, and increasing safety of transportation. The sole function of the solid dowel B is to prevent rail-cutting, one or more of them being inserted in the subrail portion of the tie, much in the same manner as described for the insertion of the hollow dowel. They should be made of hard wood or metal or a combination of both. The wood of both kinds of dowels may be improved by chemical treatment by methods which need not be described here.

Ties may be dowel-fortified by different methods. In the illustrations I have shown three methods, viz: In Fig. 4 a solid dowel is shown, (in practice more than one of such dowels may be used;) in Fig. 5 a solid dowel and two spike-dowels are used; in Fig. 6 two spike-dowels alone are used. These dowels may be used in a variety of ways that will readily suggest themselves to one skilled in the art of track-laying. The section view, Fig. 3, illustrates a dowel prepared for a metallic core of about the diameter of an ordinary spike or of any desired size. I prefer to use for a core a metal rod having an oval section and adapted to be forced into the hole in the dowel, said hole being round and having a diameter slightly less than the smallest diameter of the metal core, the said metal core to have its larger diameter parallel to the length of the tie.

In some applications of the dowels to ties it may be useful to place a flat metallic plate between the lower end of the dowel and the wood at the bottom of the dowel-recess.

The dowel A, as shown in the drawings, Fig. 1, is of wood, cylindrical in form, and is uniform in cross-section throughout its length except near its lower end where its cross-section gradually diminishes, thus forming a tapering portion whose uppermost diameter is slightly greater than the diameter of the hole in the tie designed for its reception and whose lowermost diameter is slightly less than the diameter of said hole, thus constituting a portion of the dowel having a function peculiar to itself and active during the process of being driven into the bored hole in the tie, its function being first to allow the lower extremity of the dowel to readily enter the upper end of the bored hole preparatory to being driven, then as the dowel is driven downward to compress the wood fibers constituting the walls of the bored hole, so as to admit the main shaft of the dowel and make a perfect fit, with intense impingement between the harder wood of the dowel and the softer wood of the tie. This tapering and compressing lowermost portion of the dowel is common to all the different forms of dowels shown in the drawings. The spike-hole in dowel A, Fig. 1, should extend through its whole length for the reason that the grand object of the hole is to avoid doing violence to the wood of the dowel by cracking or splitting the same, as would be inevitable in case the spike should be driven into an unbored dowel. Driving a spike into a bored hole of proper dimensions will simply compress the wood of the dowel without cracking or splitting the same, thus giving great tenacity to the spike and increasing the tenacity of the dowel to the walls of its socket. It greatly improves the texture of the wood of the dowel for its function without leaving openings therein for the admission of water.

I claim—

1. A railroad wooden tie fortified by one or more dowels inserted wholly in the subrail portions thereof; substantially as set forth.

2. A railroad-tie dowel of wood, cylindrical in form and having a cross-section uniform throughout its length except a minor portion at its lower end where its section gradually diminishes, forming a tapering portion whose uppermost diameter is slightly greater than the diameter of the hole in the tie designed for its reception and whose lowermost diameter is slightly less than the diameter of said hole, and having a central hole, of circular cross-section, throughout its length, for the reception of a spike.

3. A railroad-tie dowel of unbored wood cylindrical in form and having a cross-section uniform throughout its length except a minor portion at its lower end where its section gradually diminishes, forming a tapering portion whose uppermost diameter is slightly greater than the diameter of the hole in the tie designed for its reception, and whose lowermost diameter is slightly less than the diameter of said hole.

4. A railroad-tie dowel wholly of metal, cylindrical in form, and having a cross-section uniform throughout its length except a minor portion at its lower end where its section gradually diminishes, forming a tapering portion whose uppermost diameter is slightly greater than the diameter of the hole in the tie designed for its reception, and whose lowermost diameter is slightly less than the diameter of said hole.

5. A railroad-tie dowel of wood, cylindrical in form, and having a cross-section uniform throughout its length except a minor portion at its lower end where its section gradually diminishes, forming a tapering portion whose uppermost diameter is slightly greater than the diameter of the hole in the tie designed for its reception, and whose lowermost diameter is slightly less than the diameter of said hole, and having a central hole of circular cross-section throughout its length, designed to receive a metal core whose cross-section is somewhat larger than that of said central hole.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 23d day of September, A. D. 1904.

IRA COPELAND.

Witnesses:

FRANK G. PARKER,

JOHN BUCKLER.