Nov. 3, 1925. 1,560,221

J. H. DOWNEY

RAILWAY SPIKE

Filed June 25, 1924

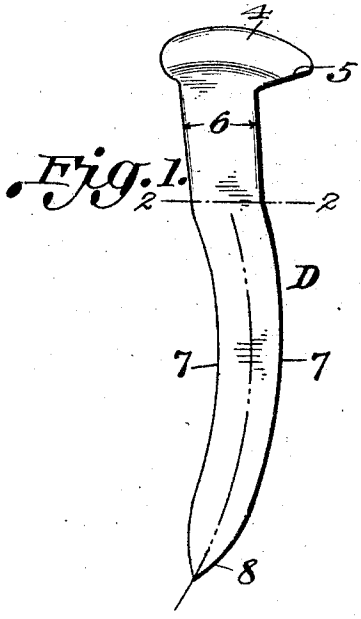


Fig. 1.



Fig. 2.

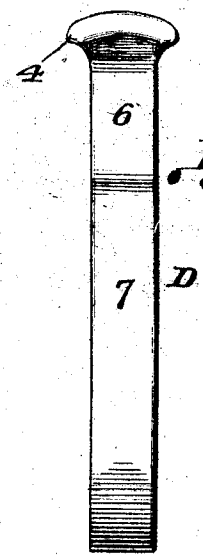


Fig. 3.

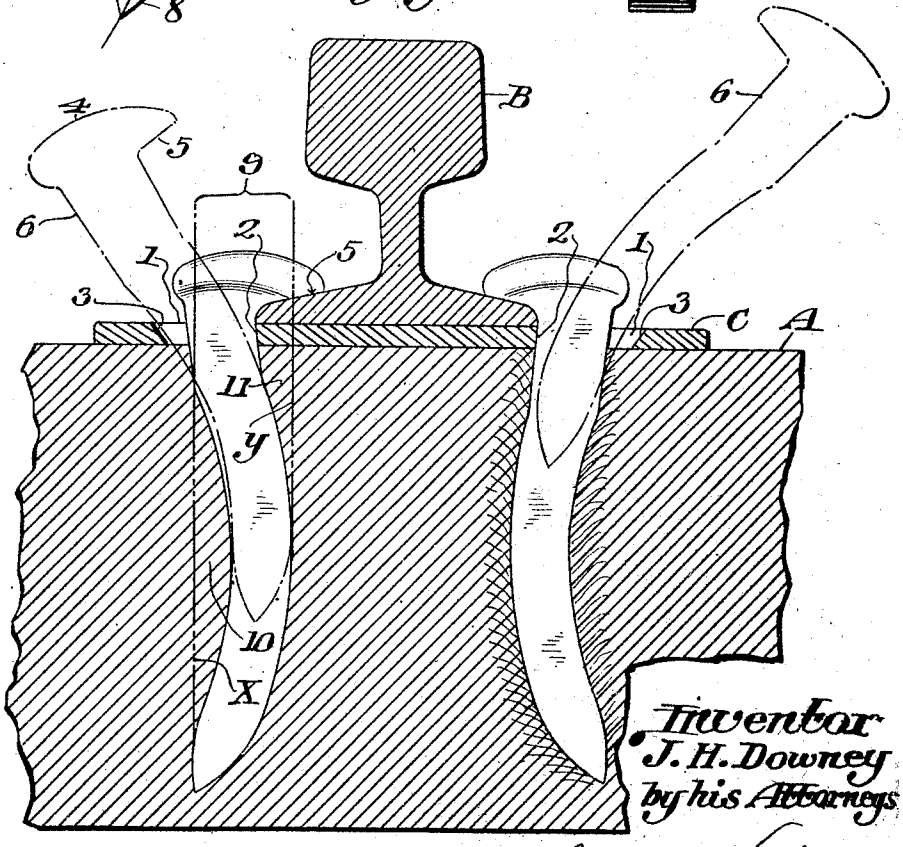


Fig. 4.

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UNITED STATES PATENT OFFICE.

JAMES H. DOWNEY, OF GAINESVILLE, GEORGIA.

RAILWAY SPIKE.

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To all whom it may concern:

Be it known that I, JAMES H. DOWNEY, a citizen of the United States, and resident of Gainesville, in the county of Hall and State of Georgia, have invented certain new and useful Improvements in Railway Spikes, of which the following is a specification.

This invention relates to railroad or similar spikes of the type that are driven into wooden ties or retaining members, preferably through openings in a tie plate that underlies the rail. If the usual form of straight spike is employed, the resistance to its withdrawal is merely that resulting from the frictional engagement of the wood with the spike. To add to this retaining force and render the spikes more difficult of removal, it has been suggested to make one or both edges of the spikes with notches or projections which will engage the wood more strongly. This practice is objectionable in various ways, as it renders the manufacture of the spike more difficult and expensive and gives rise to various unsatisfactory features in its use.

An object of my invention is to provide a spike that will be simple of construction and which will afford a very much greater resistance to withdrawal than does the ordinary straight spike.

Another object is to provide such a spike which can be readily driven without difficulty but will present much greater resistance to withdrawal when in use.

Other objects will be apparent from the following detailed description and appended claims.

In the drawings:

Figure 1 is a side elevation of a spike constructed according to my invention.

Figure 2 is a cross section on the line 2—2 of Figure 1 thereof.

Figure 3 is an edge elevation thereof.

Figure 4 is a vertical cross section of a portion of tie, rail and tie plate, with spikes shown in full lines in fully driven position and in dotted lines in different positions which they occupy while being driven.

The drawings disclose a section of a tie A, rail B, and tie plate C, all of the usual type. The openings 1 in the tie plate for the passage of the spikes have straight inner sides 2 and inclined outer sides 3 for a purpose which will be hereinafter apparent.

The spike D has the usual head 4 provided at one side with a rail engaging lip 5. The shank immediately below the head has straight sides 6 for approximately one quarter of the length of the spike, and these sides are slightly inclined when the spike is in position instead of being at right angles to the tie plate. The remainder of the body 7 of the spike has its sides formed as arcs of circles, preferably concentric and so formed that the convex side of the spike is on the same edge as the lip 5. The spike terminates in the usual chisel point 8, or may have other sharpened end as desired. The body of the spike will preferably be approximately square in cross section but may have other sectional forms. The particular curvature of the extreme end of the spike may vary.

When the spike is to be driven it is started as shown in dotted lines at the right of Figure 4, the outer edge being substantially guided by the inclined edge 3 of the opening in the tie plate. Upon being driven further it will pass through the dotted line position on the left of Figure 4 and into either of the full line positions of this figure. The lip 5 thereupon engages the rail in the usual manner and the two spikes hold it snugly in place.

Any pull exerted by the rail on the spikes which tends to withdraw the latter will be a right line pull on the head and straight shank of the spike, and along the lines indicated by dot-and-dash lines X and Y and bracketed at 9 in Figure 4. This pull will be resisted not only by the usual frictional engagement between the spike and the wood, but by the portion of material lying between the line X and the outer curved edge 7 of the spike and indicated by 10, and by the material lying between the line Y and the inner curved edge and designated by 11.

In other words, in driving the spike it is forced into a curved passage in the wood, while the pull of the rail tends to withdraw it only in a straight path. Tests have shown that while the ordinary spike requires a pull of some 3000 pounds to withdraw the same, the spike which is here disclosed will require a pull of some 7400 pounds when exerted in a straight line as would be the case in use. The dimensions of the spike will preferably diminish slightly from head to point, so that when being driven, no part of the spike will make an opening in the

wood larger than any succeeding portion of the spike. There will always be close engagement between the spike and the material into which it is driven at all points throughout its length.

In order to give a concrete example of the relation of the parts, and referring to full sized constructions, the distance between the inner edges 2 of the openings in the tie plate C will be about 4½ inches. The distance between the two spikes at their nearest points will be about 3½ inches, while the distance between the extreme ends of the spikes is about six inches. The thickest portion of the section 10 will therefore be about ½ inch and its length about 4 inches. Obviously this will offer a great resistance to a straight line pull.

The precise form of the spike may be varied somewhat in shape without departing from the spirit of the invention, which is to be regarded as limited only by the scope of the appended claims.

I claim as my invention:

1. A railway spike having a head provided with a rail engaging lip, a shank having straight edges but inclined slightly toward the side provided with the lip, and a body portion having smooth edges each forming an arc of a circle.

2. A railway spike having a head provided with a rail engaging lip, a shank having straight edges but inclined slightly toward the side provided with the lip, and a body portion having a concave outer edge and a substantially smooth concentric convex inner edge.

3. A railway spike having a head provided with a rail engaging lip, a shank having straight edges but inclined slightly toward the side provided with the lip and a body portion having substantially smooth edges forming arcs of circles, a line subtending the arc on the concave side passing through the head and a parallel line tangent to the outer point on the convex side passing through the lip, said lines being substantially perpendicular to the surface of the rail.

In testimony whereof, I have hereunto subscribed my name.

JAMES H. DOWNEY.