H. STEPHENS.

TRACK SPIKE.

APPLICATION FILED NOV. 17, 1910.

996,893. Patented July 4, 1911.

Fig. 1.

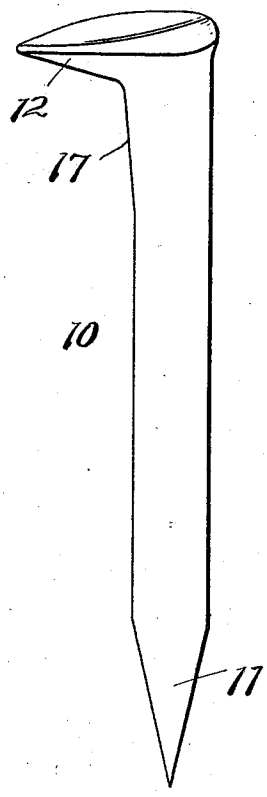
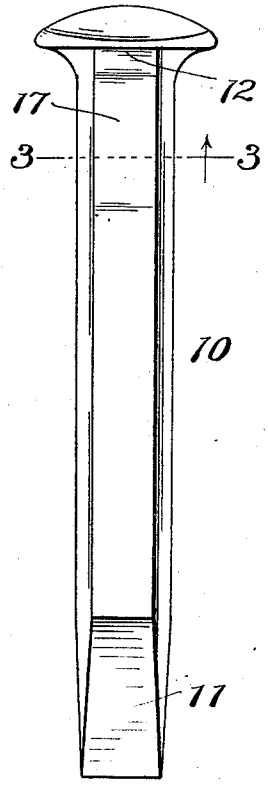


Fig. 2.



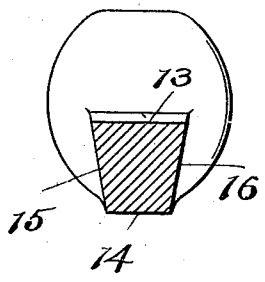


Fig. 3.

Witnesses,
E. B. Gilchrist
H. R. Sullivan

Inventor.
Henry Stephens
by Thurston & Kerr
Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY STEPHENS, OF CLEVELAND, OHIO.

TRACK-SPIKE.

996,893. Specification of Letters Patent. Patented July 4, 1911.

Application filed November 17, 1910. Serial No. 592,756.

To all whom it may concern:

Be it known that I, HENRY STEPHENS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Track-Spikes, of which the following is a full, clear, and exact description.

It is a well known fact that the ordinary track spike, *i e.*, square in cross section, is used exclusively at least in this country, although its life is in fact quite short. The great majority of spikes fail after they have been used for a short time for the reason that the flange of the rail pressing against the throat of the spike cuts the latter, this cutting being commonly known as throat cutting. The life of a spike is further limited by reason of the fact that they frequently bend and are rendered useless when withdrawn from the timber by a claw bar. In spite of these disadvantages or weaknesses, the square spike has not been supplanted by a spike of any other form or design for the reason that the latter are either too costly, or if more advantageous in one respect are seriously defective in one or more other respects, and consequently when the first cost and also the general efficiency is considered, are not the equal of the square spike. For example, the use of spikes triangular in cross section has been proposed, but such spikes although able to resist throat cutting to a greater extent than a rectangular spike, are obviously unsuitable for the reason that the rear edge of the spike whether sharpened or slightly rounded cuts the fibers of the timber, and has little holding power in the wood, and is therefore unable to resist the side pressure of the rail. Furthermore, the extreme fiber stresses of the spike are too great to withstand bending, not only because of the side pressure of the rail but under the action of the claw bar. Circular and elliptical spikes have been proposed, but these also are not efficient for the reason that unless the cross section is changed at the throat so as to present a flat face to the rail, the throat cutting is much more serious than with the square spike, and again they do not have strength to resist bending, unless the area of cross section, and consequently the amount of material, is considerably greater than that of the square spike. Furthermore, the spikes if circular or elliptical in cross section have not the holding power in the wood that is required, or is necessary, and consequently are less efficient in this respect than the rectangular spike. It has also been proposed to employ circular or elliptical spikes having at the throat a cross section which is changed so as to present a flat face to the rail flange. With such a construction, while the flat face renders the throat cutting less than would otherwise exist, the spike does not answer the other requirements, that is, resistance to bending and holding power in the timber, and is furthermore too costly for the reason that two operations at least are required in its manufacture, whereas in a spike having the same form of cross section from the point to the head, a single operation only is necessary for its complete formation.

The object of the present invention is to provide a spike which answers the requirements with greater efficiency than the square spike or any other spike which has been proposed or tried out, and particularly to provide a spike of a shape in cross section such that the throat cutting is minimized or at least considerably less than with the square spike; which is better able to resist bending; has greater holding power in the wood; is no more expensive to manufacture than the cheapest spike which has been made up to the present time, and employing the same amount of material; which can be withdrawn from the timber more easily than the square spike, and with less marring of the timber. These and other objects are accomplished by my improved spike which, as will be explained more fully is trapezoidal in cross section.

In the drawings which illustrate my invention, Figure 1 is a side view of a spike constructed in accordance with my invention; Fig. 2 is a rear view of the same; and Fig. 3 is a cross section substantially along the line 3—3 of Fig. 2.

The spike which is shown at 10 is trapezoidal in cross section throughout or at least from the chisel point 11 to the head 12, the front face 13 being parallel to and slightly wider than the rear face 14, and the side faces 15 and 16 being inclined or on a slight taper. The front, rear, and side faces are preferably flat and the cross sectional area of the spike is preferably that of the stand-

ard and commonly employed so-called "square" track spike.

While I do not desire to be confined to the exact proportions shown or hereinafter referred to, I find that a spike of greater efficiency than anything which has been used heretofore is obtained by making the distance from the front face to the rear face the same as in an ordinary standard square spike, and by making the front side or face 13 slightly greater and the rear face 14 slightly less in width than the side or face of the square spike. More specifically I prefer that the depth of the spike or distance between the front and rear faces be equal to the average width or average distance between the sides which may be termed the median line.

It will be seen that by increasing the width of the front face of the spike over that of the square spike, there is a greater bearing surface presented to the rail, and consequently the throat cutting is decreased. At the same time because of the flat rear face and the inclined sides, the holding power of the spike or the total effective surface resisting sidewise movement of the rail is greater than that of the square spike or of other spikes which have been used or proposed for use,—the flat rear face being of sufficient width to avoid cutting of the fibers, as would result from the use of spikes triangular in cross section with the flat face presented to the rail and the apex of the triangle at the rear of the spike. Furthermore, the modulus of elasticity is greater, and consequently the extreme fiber stresses are with this cross section less than with spikes circular, elliptical or triangular in cross section, and the modulus of elasticity is greater than that of the square spike after the latter has been used a very short time and has been subjected to the throat cutting action of the rail. Furthermore, by employing the trapezoidal cross section from end to end, or from the chisel point to the head and by using the same amount of metal as in the square spike, my improved spike can be manufactured just as easily and is no more expensive than the ordinary spike. This is a matter of no little importance when it is considered that the number of spikes which are used is extremely great.

Aside from the fact that the cost is no greater than that of the rectangular spike, my trapezoidal spike is superior to the square spike by reason of the fact that it is more efficient in resisting bending; in its holding power and therefore in the prevention of sidewise movement of the rail; in the matter of ease of withdrawl from the timber; and has considerably greater life than the square spike because of the fact that the throat cutting is less, and for the further reason that it is less susceptible to bending. To further offset the detrimental effect of throat cutting, I may if desired increase the front to the rear width or depth of the spike at the throat by inclining the front face forward slightly from a point a short distance from the head, as shown at 17. This, however, I consider desirable, but not essential.

Having thus described my invention, what I claim is:

1. A track spike having a body portion, a head, and a chisel point, the body portion being trapezoidal in cross section throughout, and from the throat of the spike to the chisel point being of uniform cross sectional area, the front and rear faces being flat and parallel, the side faces being inclined, and the front face being of greater width than the rear face.

2. A track spike having a body portion, a head, and a chisel point, the body portion being trapezoidal in cross section and from the throat of the spike to the chisel point being of uniform cross sectional area, the front and rear faces being flat and parallel the side faces inclined, the front face being wider than the rear face, and the depth or distance from the front face to the rear face being substantially equal to the mean width or mean distance between the side faces.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HENRY STEPHENS.

Witnesses:
H. R. Sullivan,
A. F. Kwis.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."