April 2, 1957 A. BROGIOTTI 2,787,186

SCREW SPIKE WITH COMPRESSION PRODUCING THREAD FORM

Filed March 28, 1952

FIG.1

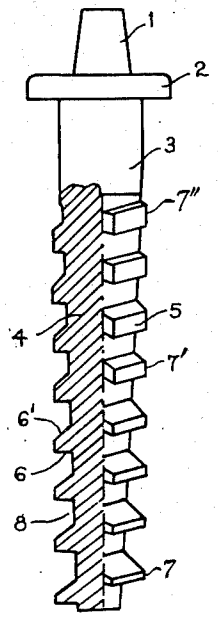


FIG.2

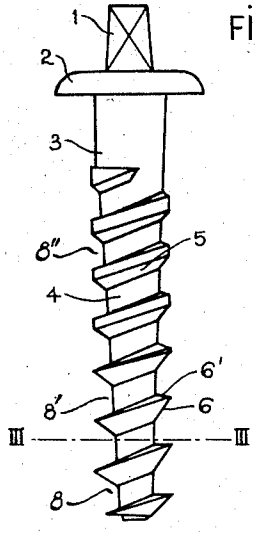
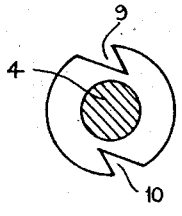


FIG.3



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SCREW SPIKE WITH COMPRESSION PRODUCING THREAD FORM

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1 Claim. (Cl. 85—46)

The invention relates to a railroad tie and fastening means.

The problem of anchoring the rails of railways poses complex problems, which, from a technical and economic point of view, are difficult to solve.

A principal object of the invention is to provide a screw spike which is particularly suitable for firmly securing the tie assembly to the sleeper.

The following description, made with reference to the accompanying drawing which is given by way of non-limitative example, will clearly illustrate the use and operation of the invention.

Figs. 1–3 show the screw spike of the invention in front and side view and in longitudinal and cross section.

The screw spike used according to the invention for fastening the tie assembly comprises a square head 1, a circular collar 2, an unthreaded shank portion 3 and a threaded core 4 which is tapered while the outer circumference of the thread 5 is circumscribed by a cylinder of uniform diameter so that the crest of the thread has a constant diameter. The crest of the thread is progressively truncated from the end to the top of the spike so that the width of the thread crest, measured along a generatrix of the cylindrical surface limiting same, increases from the end to the top of the spike progressively from 7 over 7^1 to 7″, whereas the width of the thread root 11 is substantially uniform, when measured along a generatrix of the conically tapered core, and the width of the groove of the thread measured along the same generatrix decreases from the end to the top of the spike gradually from 8 over 8^1 to 8″. The core may also be composed of successive cones, being tapered in different degrees whereby the slightly tapered neck of the spike may pass first into a cone of more inclined taper, which is followed by a still more tapered end section.

The thread flanks are angularly related to each other and radially outwardly converging. The profile of the thread of the new screw spike has not the usual form of an isosceles triangle but is given the form of a scalene triangle. One of the sides of this scalene triangle (lower flank 6 in Fig. 1 and upper flank 6^1 in Fig. 2) is perpendicular to the general axis of the spike or comes at least close to that direction. The scalene profile is arranged either above or below said side in accordance with the use given to the spike.

It will be noted that the very wide thread of the lower part of the spike will exert a powerful gripping action on the heart of the tie; in the upper part of the sleeper, the expanding core of the spike and the increasing thickness of the thread cooperate to effect a strong compression on the fibers in the spaces between the turns of the thread.

The lower scalene, gripped by the heart of the tie, exerts a powerful counterforce against the raising of the tie under the vertical stresses in the straight track, and the horizontal compression between the upper part of the thread and the conical core of the spike prevents

pulling the wood fibers out of the upper part of the sleeper and avoids the ovalization which frequently is observed when conventional spikes are used. In curved sections of the track, where the stresses generated by the passage of the trains are generally horizontal, the upper scalene of the thread profile effects a lateral compression of the fibers over the whole length of the spike.

This compression increases the resistance of the fibers and acts against the forces tending to pull out the spike and decreases the lateral play of the spike.

The practice has shown that the described design renders the new screw spikes by far superior to the conventional types. Even though they are screwed in and out, or re-tightened repeatedly in the same bore of the sleeper, the cohesive power of the fibers is maintained, while, under the same conditions, it disappears very quickly with the known spikes.

In order to reduce further the necessity of frequent re-tightening of the spikes, the thread may be provided with a series of notches 9, 10 (Fig. 3), which increase the grip of the spike screw on the sleeper. Such triangular notches are cut along the generatrices or helices in such a manner that one of their flanks presents a sharp edge; for this purpose it is sufficient that the line constituting said flank passes from the same side of the axis as the line constituting the other plane. This side of the axis is so determined that on tightening the spike the obtuse angle of the notch comes into engagement before the acute angle. As a result, the acute angle will, on loosening the spike, abut against the wedge of the wood which by expansion of the fibers has lodged in said notch, thereby preventing the untimely loosening of the spike, without, however, blocking it.

In addition, the complete removal of the spike will not cause any damage to the sleeper, and it is possible to secure the spike again in the same bore.

The screw spike of the invention produces, by means of the scalene thread, which is progressively truncated towards the top, a strong grip of the turns of the thread on the wood inside the sleeper and not at its surface, which prevents a tearing and rising of the fibers which causes damage and favors rot. The conical core of the spike provides for an increasing radial compression in conjunction with the increasing axial compression of the wood fibers produced by the increasingly truncated thread. The construction allows of clamping the fibers of the sleeper at the most favorable points of engagement and of increasing the resistance offered to a vertical displacement of the thread; the largest metal section of the spike is at the point of its largest bending stress.

The triangular notches in the thread are so located and arranged as to produce a partial gripping of the wood of the sleeper in the unscrewing direction; this gripping action insures against loosening of the spike by vibrations but can readily be overcome by conventional tools used for replacing the spikes.

The tie assembly of the invention allows of a precise replacement of the rail on the sleepers by the use of adapters or intermediate spacers of suitable thickness which are not used to hold the rail by themselves but have only the function of adjusting the position of the rail. Therefore, they are not subjected to the various vibrations and stresses of the rail, particularly not to its creep or flow. By a selection of suitable sizes, these replaceable and interchangeable parts allow to obtain a rigorous and constant positioning and spacing of the rails.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown but that details may be widely modified within the scope of the attached claims.

What I claim is:

A screw spike for fastening rails on wooden railroad ties comprising an unthreaded shank portion and a threaded conically tapered core provided with a thread having a constant crest diameter, the thread flanks being angularly related to each other and radially outwardly converging, the crest being progressively truncated from the end to the top of the spike so that the width of the thread crest, measured along a generatrix of the cylindrical surface limiting same, increases from the end to the top of the spike, whereas the width of the thread root, when measured along a generatrix of the conically tapered core, is substantially uniform, and the width of the groove of the thread, measured along the said generatrix, decreases from the end to the top of the spike.

References Cited in the file of this patent

UNITED STATES PATENTS

4,704	Sloan	Aug. 20, 1846
19,805	Whiting	Mar. 30, 1858
45,133	Bonwill	Nov. 22, 1864
65,651	Davies	June 11, 1867
74,489	Bidwell	Feb. 18, 1868
635,297	Caldwell	Oct. 24, 1899
1,336,773	Caldwell	Apr. 13, 1900
1,465,148	Rosenberg	Aug. 14, 1923
1,788,040	Yseboodt	Jan. 6, 1931
1,872,166	Muhlig	Aug. 16, 1932
1,933,332	May	Oct. 31, 1933
2,057,963	Maney	Oct. 20, 1936
2,132,571	Maney	Oct. 11, 1938
2,132,572	Maney	Oct. 11, 1938
2,231,771	Murphy	Feb. 11, 1941
2,267,923	Johnson	Dec. 30, 1941
2,466,283	Stackhouse	Apr. 5, 1949

FOREIGN PATENTS

7,975	Great Britain	June 1, 1891
170,244	Great Britain	Oct. 20, 1921