

Feb. 18, 1969

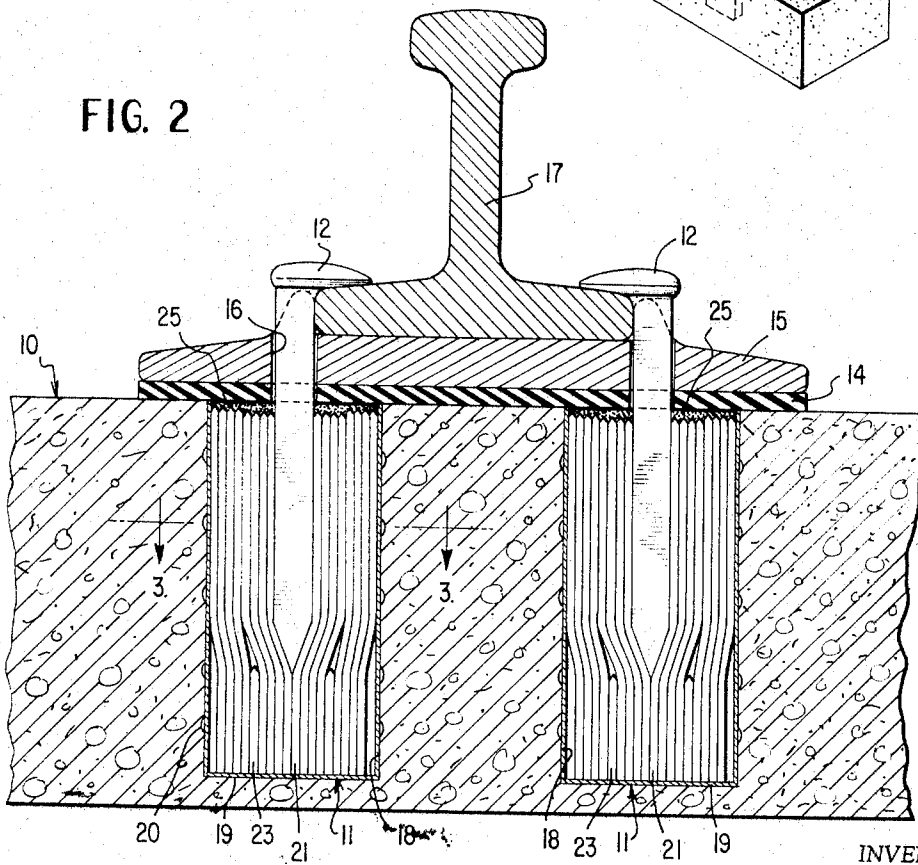
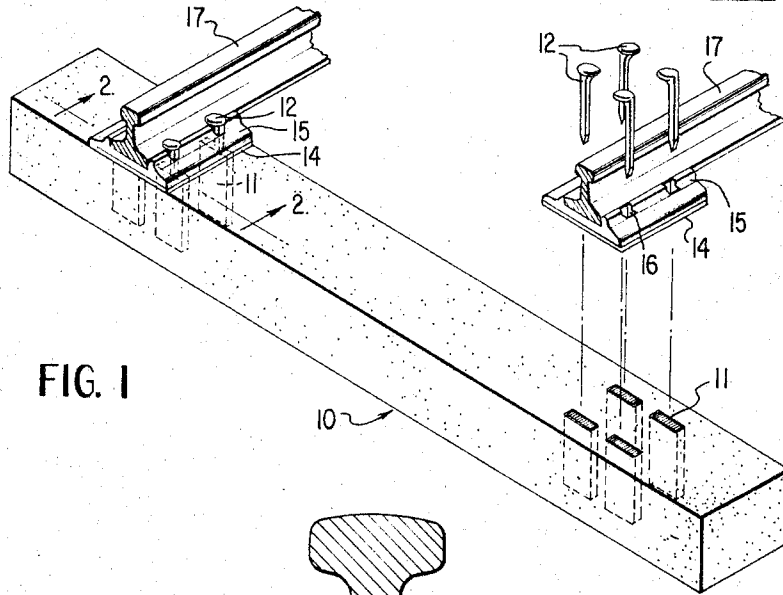
C. R. AUSTIN

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RAILROAD CROSS-TIE AND NOVEL UNIT AND INSERT THEREFOR

Filed Aug. 21, 1967

Sheet 1 of 2



INVENTOR

CURTIS R. AUSTIN

BY *L. S. Lanningham, Jr.*

ATTORNEY

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C. R. AUSTIN

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FIG. 3

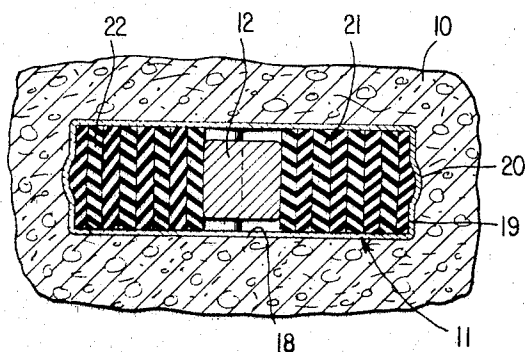


FIG. 4

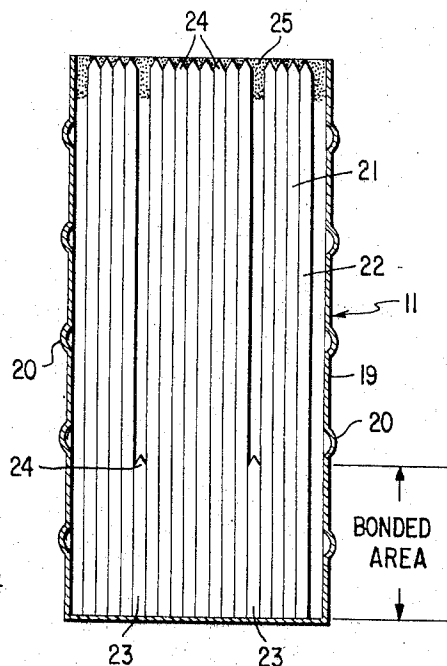


FIG. 5

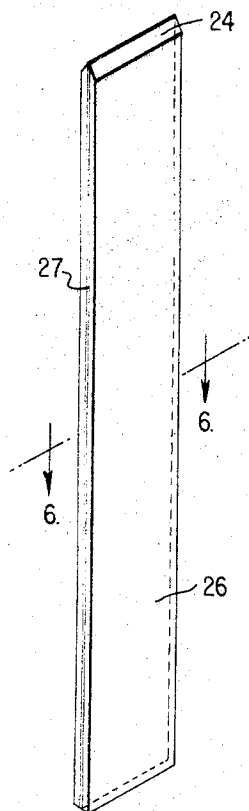


FIG. 7

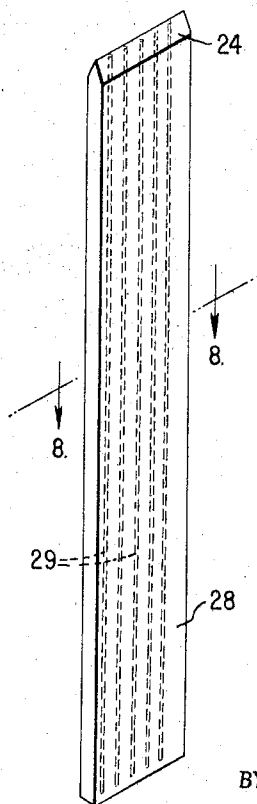


FIG. 6

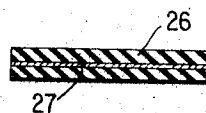


FIG. 8



INVENTOR

CURTIS R. AUSTIN

BY *Is Van Linschoten, Jr.*

ATTORNEY

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## RAILROAD CROSS-TIE AND NOVEL UNIT AND INSERT THEREFOR

Curtis R. Austin, % Austin and Austin, Inc.,  
Moselle, Miss. 39459

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18 Claims

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### ABSTRACT OF THE DISCLOSURE

An improved railroad cross-tie is provided. The cross-tie has embedded therein novel units and inserts therefor which are capable of securely retaining rail spikes and thereby anchoring rails in place.

This invention relates to an improved railroad cross-tie. The invention further relates to a novel unit and insert therefor which may be embedded in the cross-tie for the purpose of securely retaining rail spikes.

Heretofore a wide variety of inserts have been proposed for embedding in railroad cross-ties for the purpose of retaining rail spikes. The prior art inserts have not proved to be entirely satisfactory for a number of reasons. For instance, the prior art inserts had a relatively short life, were difficult to install and replace, and/or did not allow gauge changes or different weights of rails to be used after installation in the cross-tie. These disadvantages, among many others, are overcome by the present invention.

It is an object of the present invention to provide a novel unit and/or insert for a railroad cross-tie.

It is a further object to provide an improved railroad cross-tie which includes the novel unit and/or insert of the invention.

Still other objects and advantages of the invention will be apparent to those skilled in the art upon reference to the following detailed description and the drawings, wherein:

FIGURE 1 is a perspective view of a railroad cross-tie and rails with the novel units and inserts therefor of the invention for anchoring rail spikes embedded in place in the cross-tie, and including an exploded view further illustrating the manner in which the units and inserts therefor are used to securely hold the rail spikes in place and thereby anchor the rails in desired positions;

FIGURE 2 is a cross-sectional view in elevation, with portions thereof being broken away, taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a cross-sectional plan view, with portions thereof being broken away, taken along the line 3—3 of FIGURE 2;

FIGURE 4 is a view in elevation, partially in cross section, illustrating the novel unit of the invention, with one side of the casing being removed to more clearly illustrate the insert therefor;

FIGURE 5 is a perspective view illustrating a modified strip which may be used in constructing the insert of the invention;

FIGURE 6 is a cross-sectional plan view taken along the line 6—6 of FIGURE 5;

FIGURE 7 is a perspective view illustrating still another modified strip which may be used in constructing the insert of the invention; and

FIGURE 8 is a cross-sectional plan view taken along the line 8—8 of FIGURE 7.

Referring now to the drawings, the railroad cross-tie 10 is preferably constructed of concrete to meet railroad specifications including desired dimensions and beveled edges to prevent undue damage due to chipping. The cross tie 10 has embedded therein near each end four units 11

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which are properly spaced for receiving and securely retaining rail spikes 12. Resilient plastic or neoprene pads 14 are positioned on the upper surface of cross-tie 10 above each group of four spaced units 11, and steel rail plates 15 having openings 16 therein for receiving rail spikes 12 rest thereon. Rails 17, in turn, rest on the upper surfaces of rail plates 15 and are anchored in their proper positions on cross-tie 10 by means of rail spikes 12.

The units 11 are positioned within openings 18 in cross-tie 10 in a tight fitting relationship. As is best seen in FIGURES 2—4, the units 11 include a rectangular casing 19 which is open at its upper end and provided with outwardly extending indentations 20 that engage the surface of opening 18 and aid in retaining the casing 19 in place.

An insert 21 is positioned within casing 19, which includes a series of flat elongated strip-like members 22 that extend substantially the length of casing 19, and a pair of shorter but otherwise similar spacer strips 23. The strips 22 and 23 are arranged in an adjacent or side-by-side relationship and are glued or bonded together at their lower ends as is shown in FIGURE 4. The upper ends of strips 22 and 23 are tapered on either side to form points 24 which deflect the spike 12 sufficiently to cause it to slip between adjacent strips 22 and thereby prevent buckling.

The spacer strips 23 have a thickness such as to assure that there is sufficient free space in the upper portion of the insert 21 and unit 11 to allow the spike 12 to be driven therein and held tightly by frictional contact with the highly compressed strips 22 adjacent thereto. As is best seen in FIGURES 2 and 3, the spike 12 compresses the strips 22 in casing 19 and forces them into the internal surfaces of indentations 20, thereby securely anchoring the insert 21 in place.

If desired, a layer of resin 25 or other suitable tackifying agent, such as dressings for power belts, may be placed on the top of insert 21 in unit 11. The resin 25 serves to seal the unit 11 and prevents entry of deleterious foreign substances such as water, dirt, etc. The resin 25 also coats the surface of the spike 12 as it passes therethrough when driven into position, and thereby increases friction between the spike 12 and the surfaces of the adjacent strips 22 to prevent any possibility of the spike 12 working out.

The strips 22 are preferably neoprene-nylon corded strips as illustrated in FIGURES 1—4, but other similar oil-resisting materials and reinforcements may be used. Examples of oil-resisting rubbers include polychloroprene and butadiene-acrylonitrile copolymers, and suitable reinforcements therefor include textile materials such as cord and fibers, glass fibers, wire, steel straps, etc. For example, the strip 26 illustrated in FIGURES 5 and 6 has a thin steel strap 27 embedded therein as a reinforcement to increase the stiffness. Similarly, the strip 28 illustrated in FIGURES 7 and 8 has a plurality of steel wires 29 embedded therein as reinforcements which increase the stiffness. The strips 22, 26 and 28 may be of any convenient size, but usually a width of about ¾ inch, a length of about 5½ inches and a thickness of about ⅛ inch is preferred for use with a common ⅝ inch by 6 inch rail spike. The strips 23 may have the same width and thickness as strips 22, but the length is preferably about 1½ inches.

The case 19 may be of any desirable size and may be constructed of plastic or a suitable metal such as steel. One preferred casing for use with a common ⅝ inch by 6 inch rail spike and strips 22 and 23 having the above described dimensions is constructed of 18 gauge galvanized steel, and it is 2½ inches wide, 5½ inches long and ¾ inches thick (inside dimensions). The bottom is closed but the top is open, as illustrated in the drawings. The insert 21 for a casing 19 having the above dimensions is preferably constructed from sixteen of the strips 22 having

dimensions as described above, and two of the strips 23 having dimensions as described above. The strips 22 and 23 are preferably arranged as illustrated in FIGURES 1-4 of the drawings, and preferably are bonded, molded or bound together at the bottom to thereby form an integral insert which may be handled and used conveniently.

The insert 11 is preferably used with the casing 19. However, if desired the cross-tie 10 may be provided with openings 18 of a size similar to the inside dimensions of casing 19, and in such instances the inserts 11 may be placed directly in the openings 18 without using the casings 19.

It is understood that the insert 21 and the casing 19 are of a length sufficient to prevent the spike 12 from penetrating the bottom, and preferably the spike should not penetrate the bonded area. The bonded area may be shorter than illustrated in the drawings when this is desirable.

The cross-tie 10 is preferably constructed of concrete, but other materials including plastics and wood may be used. When concrete is used, the openings 18 or the units 11 are cast in cross-tie 10 in the proper positions for alignment with the spike holes 16 in the rail plates 15. The pads 14 then may be placed over the resin coated inserts 21 in cross-tie 10, the rail plates 15 placed thereover with the openings 16 aligned with the inserts 21, the rail 17 positioned on top of the rail plate 15, and the spikes 12 inserted in the openings 16 and driven into the inserts 21 to thereby anchor the rail 17 in place.

It is important that the inserts 21 be positioned in the cross-tie 10 as illustrated in the drawings, i.e., with the row of strips 22 extending longitudinally with respect to the length of the cross-tie. This arrangement allows the openings 16 in rail plates 15 to register with the inserts 21 over a substantial distance along the length of the cross-tie 10. Thus, rails 17 of any desired weight may be used interchangeably as the variations in the widths of the bases of the rail 17 and rail plate 15 does not prevent proper alignment of openings 16 with the strips 22 in inserts 21. Also, changes in the rail gauge may be made very easily and conveniently.

In instances where the elasticity of the insert 21 deteriorates somewhat with age, the design is such that it may be corrected by driving a shim between two of the strips 22. A shim is also often helpful when an old spike is used that has rusted to a size much smaller than the original size. The inserts 21 may be removed and replaced with new inserts when this is necessary. Thus, the invention assures long life of the equipment.

The foregoing detailed discussion and the drawings are for purposes of illustration only.

What is claimed is:

1. An insert for retaining rail spikes in a cross-tie comprising a plurality of flat elongated strip-like members having upper and lower ends, the strips being arranged so that the flat surfaces of adjacent strips are in contact, the strips being joined together at their lower ends to form a unitary structure at the lower ends, the upper ends of the strips being free to move from side to side, and the outer ends of the strips being tapered so as to form a depressed area between adjacent strips for receiving the sharpened end of a railroad spike.

2. The insert of claim 1 wherein the strips are constructed of an oil resisting polymeric material.

3. The insert of claim 1 wherein the strips are neoprene-nylon corded strips.

4. The insert of claim 1 wherein at least one shorter spacer strip is arranged between adjacent longer strips at the lower ends thereof in the area where the strips are joined together.

5. The insert of claim 1 wherein the strips are constructed of an oil resisting polymeric material and a reinforcement therefor.

6. The insert of claim 5 wherein the reinforcement includes a flat steel strip embedded in the polymeric material and extending along the length of the strip.

7. The insert of claim 5 wherein the reinforcement includes a plurality of steel wires embedded in the polymeric material and extending along the length of the strip.

8. A cross-tie having a plurality of the inserts of claim 1 embedded therein, the inserts being arranged in the cross-tie to receive the sharpened ends of rail spikes when a rail is anchored in place on the cross-tie thereby.

9. The cross-tie of claim 8 wherein the tops of the inserts are sealed off with a resinous material.

10. A unit for retaining rail spikes in a cross-tie comprising a casing having an open top, a plurality of flat elongated strip-like members having upper and lower ends in the casing, the strips being arranged so that the flat surfaces of adjacent strips are in contact, the strips being joined together at their lower ends to form a unitary structure at the lower ends, the upper ends of the strips being free to move from side to side, and the outer ends of the strips being tapered so as to form a depressed area between adjacent strips for receiving the sharpened end of a rail spike.

11. The unit of claim 10 wherein the casing has a plurality of indentations therein for aiding in retaining it in place when embedded in the cross-tie.

12. The unit of claim 10 wherein the strips are constructed of an oil resisting polymeric material and a reinforcement therefor.

13. The unit of claim 10 wherein the strips are neoprene-nylon corded strips.

14. The unit of claim 12 wherein the reinforcement includes a flat steel strap embedded in the polymeric material and extending along the length of the strip.

15. The unit of claim 12 wherein the reinforcement includes a plurality of steel wires embedded in the polymeric material and extending along the length of the strip.

16. The unit of claim 10 wherein at least one spacer strip is arranged between adjacent longer strips at the lower ends thereof, and the upper ends of the strips are spaced thereby.

17. A cross-tie having a plurality of the inserts of claim 10 embedded therein, the inserts being arranged in the cross-tie to receive the sharpened ends of rail spikes when a rail is anchored in place on the cross-tie thereby.

18. The cross-tie of claim 17 wherein the tops of the inserts are sealed off with a resinous material.

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DRAYTON E. HOFFMAN, *Primary Examiner.*

R. A. BERTSCH, *Assistant Examiner.*