Sept. 29, 1931. J. N. HOBART 1,824,778

RAILROAD TIE

Filed Nov. 25, 1930

FIGURE 1

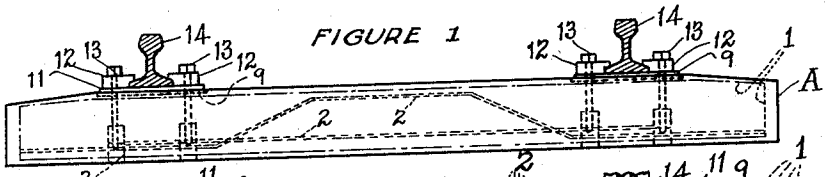



FIGURE 2

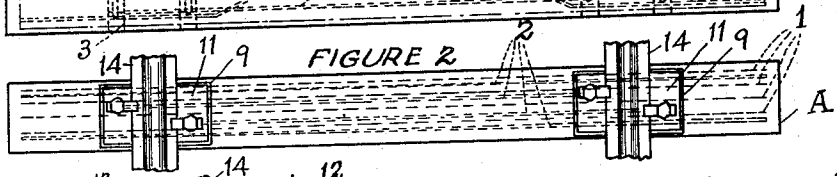



FIGURE 3

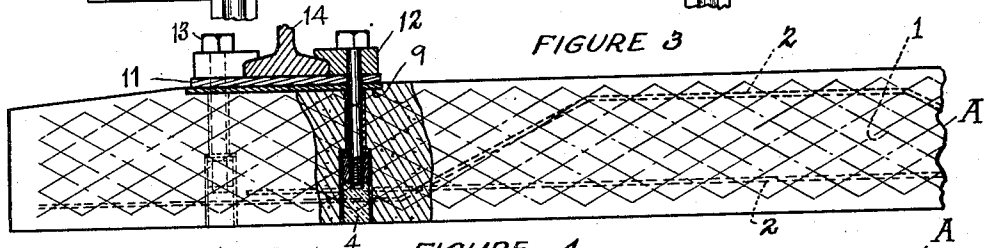
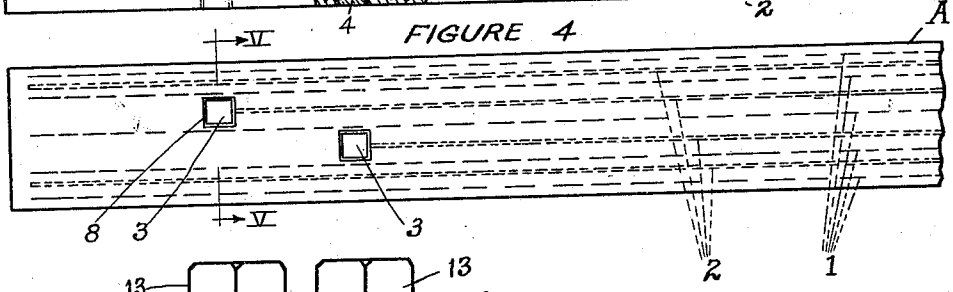



FIGURE 4



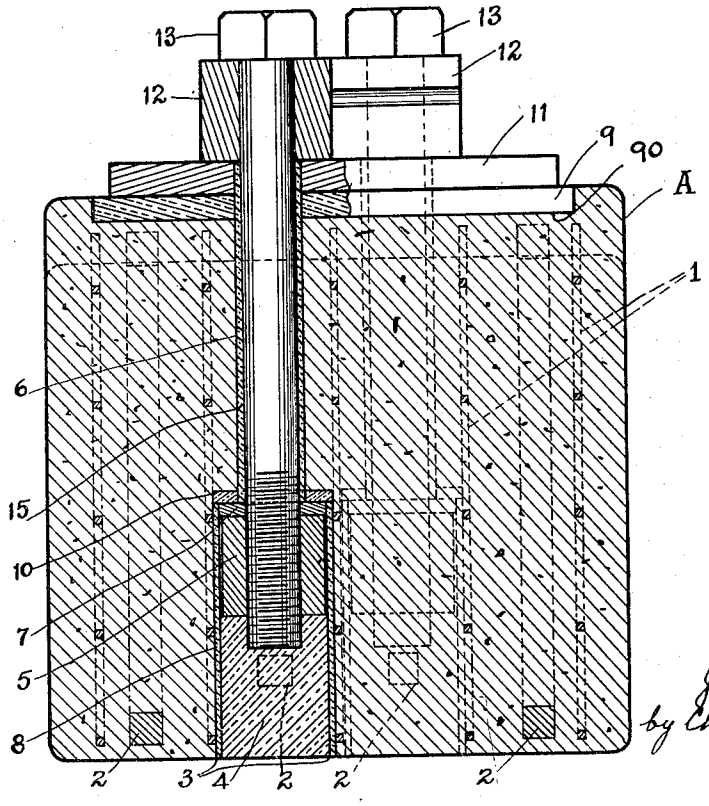




FIGURE 5

INVENTOR

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Patented Sept. 29, 1931 1,824,778

# UNITED STATES PATENT OFFICE

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## RAILROAD TIE

Application filed November 25, 1930. Serial No. 497,968.

This invention relates to reinforced concrete sleepers or railroad ties. I realize that broadly such sleepers are not novel, but the objects of my invention are directed to certain refinements in structure; that is to say, one object of my invention is to provide a concrete sleeper which has a metallic reinforcement arranged in a particularly effective manner within its body, to the end that in service a tie of given dimensions shall have greater strength to withstand the impact of heavy loads. Another object of the invention is to provide a reinforced concrete tie which is electrically insulated from the rails and from the means for securing the rails upon it. Still another object is to provide a concrete sleeper with rail-securing means which are protected from the weather, and are electrically insulated from the tie as mentioned above, and withal are inexpensive to construct and to install. Notice is hereby given of my divisional application, Serial No. 548,515, filed July 3, 1931.

In the accompanying drawings Figure 1 is a view in side elevation of a sleeper, embodying the invention; Figure 2 is a view of the same in plan from above; Figure 3 is a fragmentary view of the sleeper, to larger scale, and partly in side elevation and partly in vertical section; Figure 4 is a bottom plan view of that portion of the sleeper which is shown in Figure 3; and Figure 5 is a view in cross section, taken on the plane V—V of Figure 4.

The sleeper comprises a monolithic body A of an elongate rectangular shape, as indicated in the drawings; it is formed of concrete and has embedded in its body a metallic reinforcement. Advantageously, such reinforcement includes strips 1 of metal mesh, and a plurality of rods 2. Each strip 1, in the plane of its reach, extends with the length and height of the body A; the several strips are disposed at intervals throughout the width of the sleeper, and the rods 2 are located between the strips 1 in the manner illustrated in Figure 5. In Figure 4 it will be seen that there are four rods 2 distributed transversely of the sleeper. The two inner rods of the four extend adjacent the bottom of the sleeper, while the two outer rods are so bent or shaped with respect to their length that their medial portions lie close to the top face of the body A, and their end portions are located near the bottom of such body (see Figure 3). The structural characteristics of these reinforcing members, and their organization within the concrete body are factors of prime importance in producing the sleeper of my invention—a sleeper which to the best of my knowledge has greater durability and better load-carrying capacity than any concrete sleeper of hitherto known construction.

The means for securing the rails (14) to the sleeper are of importance, and, although the use of tie plates (11), rail-clamps (12), and bolts (13) to this end may not themselves be new, I shall describe the improvements in the structure of my sleeper which are responsible for greater efficiency in the use of these means. Holes 15 extend into the body of the sleeper for the reception of rail-securing bolts 13. In alignment with each bolt hole 15 is a recess or well 3, as shown in Figure 5, and within each recess a bolt-securing nut 5 is positioned. The wells 3 are flat-walled, to prevent the nuts which they house from turning; conveniently, the wells are square in cross-section and the nuts 5 which they house, accordingly, are square. It will be noted that each nut 5 is located well within the body A, occupying only a portion of its associated recess 3. The remaining portion of the recess—the region of the recess which is unoccupied by the nut—is packed with mastic filler 4, or other suitable material which is waterproof and electrically non-conductive. The filler is tightly packed into place, and in effect makes the nut 5 an integral part of the sleeper; thereby, the nut 5,

and the threaded shank of the bolt 13 which is readily screwed into the nut, are protected from the weather.

To accommodate the practice of adapting one or both rails 14 to serve as a conductor in an electrical signal or train control circuit, it is essential that the rails be electrically insulated from each other, and that each rail be so insulated from the ground. It is to this end that I provide a plate 9 of insulating material beneath each tie-plate 11. Desirably, the sleeper is formed with a shallow pocket 90 for the reception and the precise positioning of each insulating plate. Both plates 9 and 11 are provided with orifices in mutual registry with the pair of bolt holes 15 in each end of the sleeper. The walls of each bolt hole 15 are covered with an electrical insulation 6; the vertical walls of each recess 3 are clothed with insulation 8; and the inner terminal wall of each recess is provided with insulation 10. To withstand the pressure which is effected by the nut 5 in service, each recess includes a washer 7 between the nut 5 and its insulating member 10. Manifestly, electrical communication between the two rails 14 is prevented, and the filler 4, being non-conductive, insulates the bolts 13 and the rails from the ground.

Sleepers which are built in accordance with this specification are compact and heavy, providing a more stable track, better rail alignment and superior track surface. The rail clamps 12, obviously, may either be provided with ellipsoidal holes for the bolts 13 to permit the track to be gauged, or the clamps may be replaced by others which are so constituted as to allow for such gauging. It may be further remarked that the insulating plates 9 may be formed of a rubber composition, or a non-conducting fibrous material, and, in locating these plates 9 between the tie-plates 11 and the surface of the sleeper, they (plates 9) serve as shock absorbers, preventing acute strains (strains such as the rolling of a flat wheel creates) from being transmitted with sharp impact to the sleeper.

I claim as my invention:

1. A sleeper comprising a monolithic structure having a flat-walled recess extending from its bottom face and into its body, said sleeper including a bolt hole which extends inward from its top face and in axial alignment with said recess, which bolt hole terminates at the inner terminus of said recess, a nut which fits the walls of such recess adjacent its said terminus, said nut being of insufficient depth to fill the recess, and the region of such recess as is unoccupied by said nut being packed with filler, whereby said nut is secured within the body of said sleeper and comprises a fixed, threaded continuation of said bolt hole.

2. A sleeper comprising a monolithic structure having a flat-walled recess extending from its bottom face and into its body, said sleeper including a bolt hole which extends inwardly from its top face and in axial alignment with said recess, which bolt hole terminates at the inner terminus of said recess, a lining of electrical insulation covering the wall surfaces of said bolt hole and said recess, a nut which fits the insulation-covered walls of said recess adjacent its said terminus, said nut being of insufficient depth to fill the recess, and the region of such recess as is unoccupied by said nut being packed with filler, as described.

3. In a sleeper comprising a monolithic structure having a flat-walled recess extending from its bottom face and into its body, the combination of an insulating plate, a metal tie-plate resting upon said insulating plate, said sleeper including a bolt hole which extends inwardly from its top face and in axial alignment with said recess, each of said insulating plate and said tie-plate including an orifice in registry with said bolt hole, a lining of electrical insulation covering the wall surfaces of said bolt hole and said recess, a nut which fits the insulation-covered walls of said recess adjacent its said terminus, said nut being of insufficient depth to fill the recess, and the region of such recess as is unoccupied by said nut being packed with filler of electrical insulating material, whereby said nut is secured within the body of said sleeper and comprises a fixed, threaded continuation of said bolt hole.

4. In a sleeper comprising a monolithic structure having a flat-walled recess extending from its bottom face and into its body, the combination of a shallow pocket inset from the upper face of said sleeper, a plate of insulating material nested in said pocket, a metal tie-plate resting upon said insulating plate, said structure including a bolt hole which extends inward from the top face of said structure and in axial alignment with said recess, which bolt hole terminates at the inner terminus of said recess, a lining of electrical insulation covering the wall surfaces of said bolt hole and said recess, a nut which fits the insulation-covered walls of said recess adjacent its said terminus, said nut being of insufficient depth to fill the recess, and the region of such recess as is unoccupied by said nut being packed with filler of electrical insulating material, whereby said nut is secured within the body of said sleeper and comprises a fixed, threaded continuation of said bolt hole.

5. A sleeper comprising a monolithic structure having a recess extending from its bottom face and into its body, said sleeper including a bolt hole which extends inward from its face and terminates in said recess, a nut fitted in said recess and in alignment with the axis of said bolt hole, said nut being of insufficient depth to fill the recess, and the

region of such recess as is unoccupied by said nut being filled with electrical insulating material, whereby said nut is secured within the body of said sleeper and comprises a fixed, threaded continuation of said bolt hole.

6. The structure of the next preceding claim, in which the surfaces of said bolt hole and said recess are provided with a coating of electrical insulating material.

In testimony whereof I have hereunto set my hand.

JOSEPH N. HOBART.