Aug. 29, 1950 K. F. BEISEL 2,520,754

RAILWAY TIE

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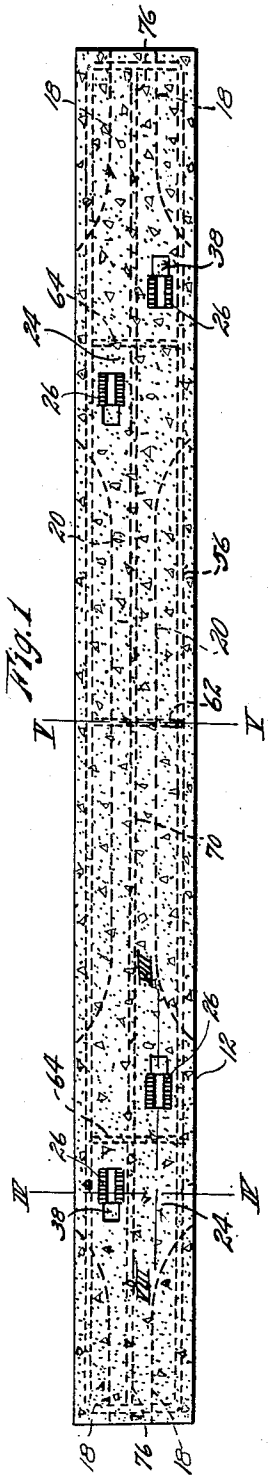


Fig. 1

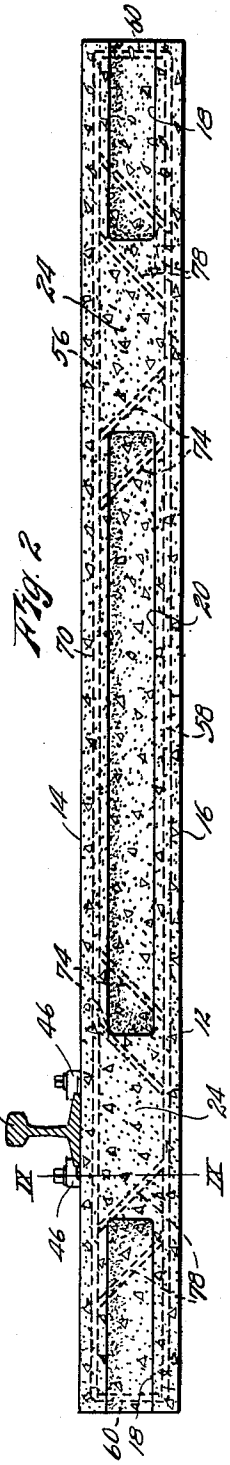


Fig. 2

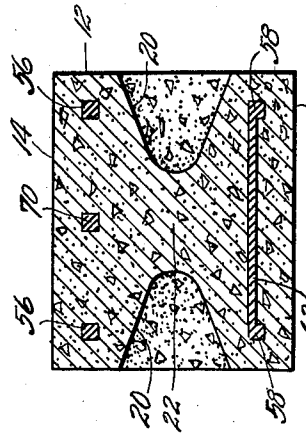


Fig. 5

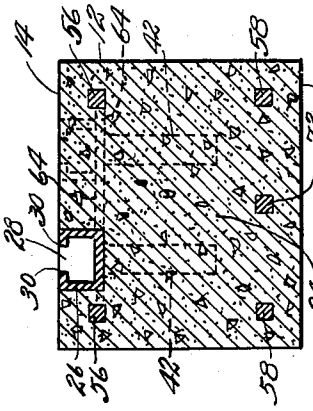


Fig. 4

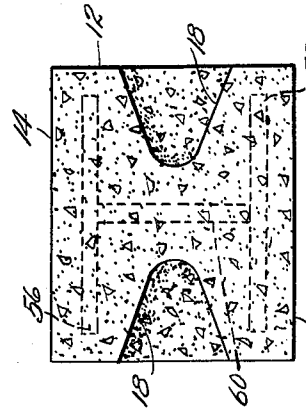


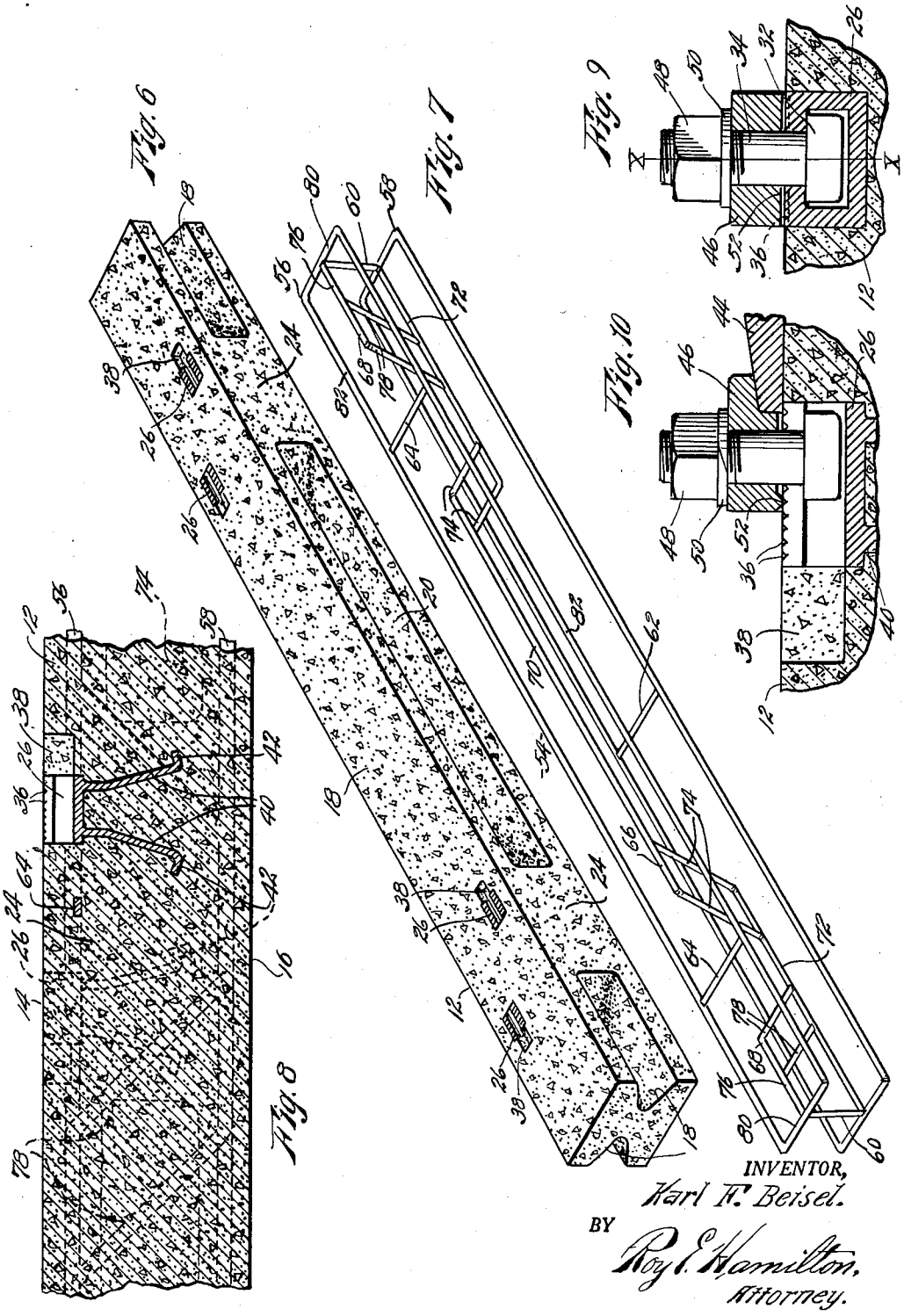
Fig. 3

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RAILWAY TIE

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RAILWAY TIE

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1 Claim. (Cl. 238—90)

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This invention relates to improvements in railway ties and has particular reference to an internally reenforced concrete tie.

The principal object of the present invention is the provision of a concrete railway tie internally reenforced by a unitary fabricated rod structure.

Another object of the invention is the provision of a non-metallic railway tie reenforced by a unitary skeleton of rigidly fabricated metallic rods.

A further object of the invention is the provision of a railway tie made of a plastic compound reenforced by a plurality of interconnected crossed loops of metal rods.

Another object is the provision of a concrete tie having embedded bolt sockets accessible from above for quick insertion of the head of the rail securing bolt. A still further object is the provision of an internally reenforced concrete tie having side pockets.

Other objects are sturdiness and economy of construction, efficiency and ease of operation and adaptability for receiving rails of different sizes.

With these objects in view, as well as other objects which will appear during the course of the specification, reference will be had to the drawings, wherein:

Figure 1 is a plan view of a railway tie embodying this invention.

Fig. 2 is a side elevation of the tie shown in Fig. 1 with a rail shown in position thereon.

Fig. 3 is an enlarged end elevation of the tie.

Fig. 4 is an enlarged cross sectional view taken on line IV—IV of Fig. 1.

Fig. 5 is an enlarged sectional view taken on line V—V of Fig. 1.

Fig. 6 is a perspective view of the tie.

Fig. 7 is a perspective view of the unitary reenforcing structure.

Fig. 8 is an enlarged sectional view taken on line VIII—VIII of Fig. 1.

Fig. 9 is an enlarged fragmentary sectional view taken on line IX—IX of Fig. 2.

Fig. 10 is a vertical sectional view taken on line X—X of Fig. 9.

Throughout the several views like reference characters refer to similar parts and the numeral 12 is the rail tie body member constructed of a plastic compound such as concrete of substantially rectangular cross sectional form. The top 14 and base 16 of the tie are disposed in parallel planar relation to serve respectively as bearings for the rails and a bearing for supporting the tie on the railroad bed. The tie or body member is

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recessed at its opposite ends and at its opposite sides at 18. The central portion of the tie is recessed inwardly from its opposite sides at 20. The inner portions of recesses 20 are spaced apart to present a supporting rib 22. The adjacent ends of recesses 18 and 20 are spaced apart to present a solid tie portion 24 to provide a suitable tie section for the reception of the rails.

Referring to Fig. 1 wherein the recesses 18 and 20 are shown in dotted lines, it will be noted that the body member is symmetrical in form. Furthermore, the recesses are made with arcuate approaches to the side walls, thus precluding objectionable corners. The formation of these recesses do not interfere substantially with the strength of the tie but do eliminate considerable material to lessen its weight. Embedded in the solid tie portion which is the rail bearing area, is a pair of spaced apart bolt sockets 26 of substantially rectangular cross section with a slot 28 formed in the upper side thereof to present ledges 30 to receive the head 32 of the bolt 34. The upper surface of the bolt socket is transversely notched at 36. A recess 38 formed in the tie at one end of the bolt socket is of sufficient size to receive the head of the bolt therein whereby it may be moved into the bolt socket as shown in Fig. 10. Integral with the bottom wall of the bolt socket is a pair of anchor bars 40 which diverge downwardly and are each provided with outwardly turned end portions 42. These anchor bars are of sufficient length to properly anchor the bolt socket in the concrete tie. The rail 44 extends transversely of the tie as shown in Fig. 2, and is secured in operative relation by means of rail clips 46 which are secured in the operative position by bolts 34 and nuts 48 which are provided with spring washers 50. This rail clip is provided at its base with a depending rib 52 adjacent its outer edge to engage the transverse notches formed in the bolt socket, thus preventing movement of the bolt and clip longitudinally of the tie. This longitudinal adjustment of the railway clip relative to the tie provides a securing means for rails of different sizes.

It is found advisable to spread a coat of red lead over that portion of the top of the tie contacted by the rail. This serves as a cushion to overcome the natural hardness of the cement structure.

The interior reenforcing structure or skeleton 54, best shown in Fig. 7, and in dotted lines in Figs. 1 and 2, serves to reenforce the concrete by adding tensile strength to the upper portion of the tie and compression strength to the lower

rail supporting portion of said tie whereby the applied loan is properly distributed throughout the tie structure. Furthermore, this reenforcing structure provides suitable distribution of the shearing action of the load throughout relatively large areas of the tie structure adjacent the rails. This reenforcing structure comprises an upper closed rectangular loop **56** and a lower closed rectangular loop **58**. These loops are disposed in parallel horizontal relation in the upper and lower portions of the tie respectively and are tied together at their opposite ends by vertically disposed bars **60** which are in the vertical central plane of the tie. The lower loop member **58** is provided at its central portion with a cross tie bar **62** and the loop **56** is provided with cross tie bars **64** directly beneath the points of application of the loads. A vertically disposed reenforcing member **66** positioned in the vertical central plane of the tie is provided with end sections **68** joined together at their top sides by a rod **70** disposed in the plane of the closed loop **56**. End sections **68** comprise a base rod **72** joined at its inner end by upwardly and inwardly inclined rods **74** to rod **70** and to a rod **76** by means of upwardly and outwardly extending rods **78**. It will be noted by referring to Fig. 2 that these end sections are so related to the line of application of the load that they are equidistant at opposite sides of said load and serve to strengthen the tie structure against the shearing action of the load.

The rod **76** is interconnected with the end bars **80** of the upper loop **56**. These rods forming the skeleton **54** are bent where convenient to change the direction and are properly welded at the points of joining so as to present an integral structure which may be properly positioned in the mold when the plastic material is poured. No part of this reenforcing structure is exposed but is sufficiently embedded in the concrete to insure proper functioning to reenforce the tie against tensile, compression and shearing action set up in the tie during the usual application of the load.

Referring to Figs. 4 and 5, it will be noted that in Fig. 4, there are three bars adjacent the bottom and two bars adjacent the top and that this section is taken adjacent the line of application of the load, thus taking care of the tensile pull in the top portion of the tie; also the shearing action of the load is decreased by the oblique bars **74** and **78** which distribute the load to the tie at points removed from the bearing surface of the rail. Furthermore, the longitudinal central portion of the tie is subjected to a greater tensile pull adjacent its top and is, therefore, reenforced by the longitudinal bars **82** of loop **56** and the central rod **70**. The cross tie bars **62** and **64** serve to maintain the elongated loops in proper relative relation during the process of construction of the tie. These rods forming the reenforcing structure are shown in the enlarged views as square in cross section. This form of rod **1** lends itself to the welding of the rods and also insures a better bond between the rods and the cement structure. However, it is quite apparent that other shapes of rods might be used with good effect.

The function of the recesses **18** and **20** is to lessen the weight of the tie without materially offsetting its strength and at the same time providing means whereby the ties are more securely anchored in the road bed.

This internally reenforced railway tie is relatively light, is long-lived, is reenforced to properly distribute the rail loads throughout the entire base of the tie, and when properly set in the road bed will not buckle and crack.

What I claim as new and desire to protect by Letters Patent is:

A concrete railway tie comprising an elongated body member having recesses formed in its side walls and having spaced apart solid rail receiving sections; horizontally disposed elongated reenforcing loops embedded in parallel relation in the upper and lower portions respectively of said body member; vertically disposed tie bars joining together the adjacent end portions of said loops; an undulated reenforcing planar member disposed in the vertical central plane of said reenforced body member having V-shaped depressions at said solid rail receiving sections and being firmly joined at its ends to the opposite end sections of said horizontally disposed loops, and transverse tie bars joining together the longitudinal side wires of said upper loop at said rail receiving section, said reinforcing member being disposed in the upper portion of said tie intermediate the rail receiving portions thereof and in the lower portion of said tie at said rail receiving portions.

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