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R. J. WELLS

2,081,966

RAILWAY TIE

Filed Nov. 15, 1934

Fig. 1

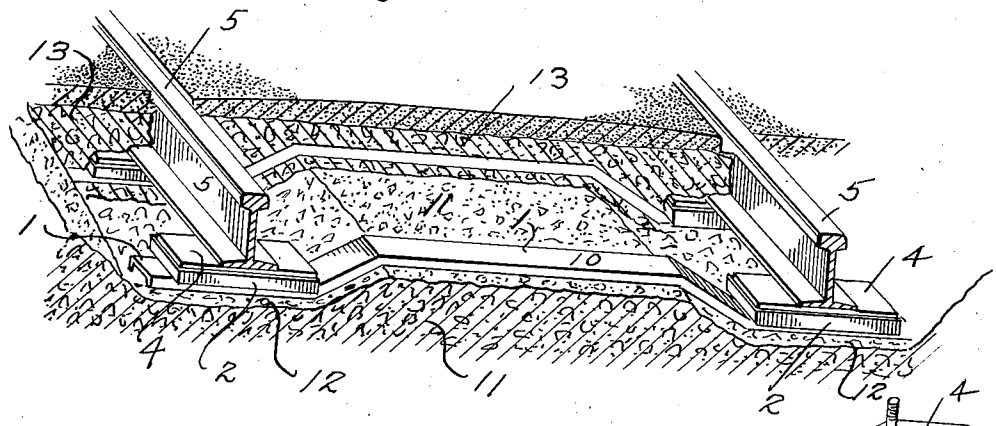


Fig. 2

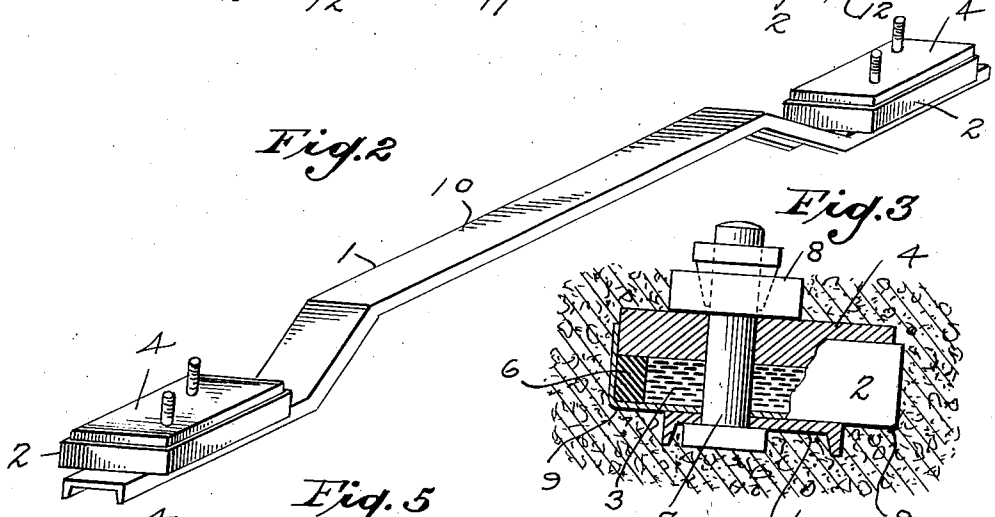


Fig. 3

Fig. 5

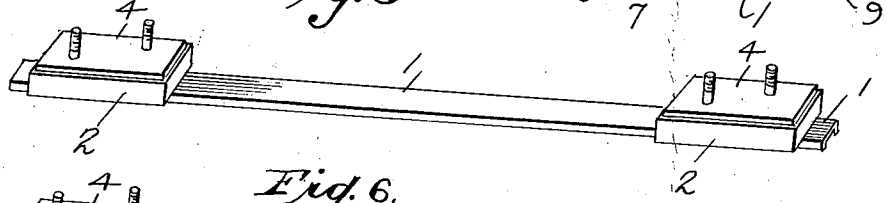


Fig. 6.

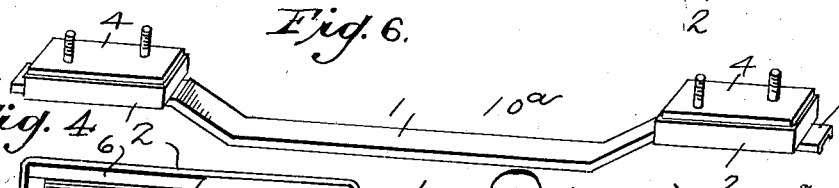
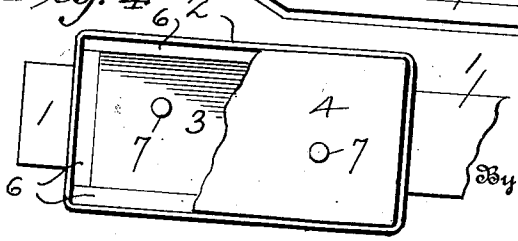


Fig. 4



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RAILWAY TIE

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12 Claims. (Cl. 238—59)

This invention relates to railway track construction, and more particularly to a resilient tie therefor and the mode of installation thereof.

While the present railway tie is primarily intended for street railway construction, and is especially desirable for replacement purposes in old track beds, it is not limited to such installation but in suitable size and proportions it is applicable to open track construction and original installation.

The object of the invention is to improve the construction as well as the mode of installation of ties whereby they may not only be economically manufactured, but will be more efficient in use, of maximum strength, and durability, light weight, and unlikely to get out of repair.

A further object of the invention is to provide resilient sleepers or supports for the track rails supported directly on the road bed or foundation.

A further object of the invention is to provide a railway tie capable of installation with minimum excavation, labor and expense.

A further object of the invention is to provide a tie having increased anchorage engagement with the road bed.

A further object of the invention is to provide improved means for confining the resilient material to prevent oozing thereof under influence of summer heat and traffic pressure.

A further object of the invention is the employment of an improved semi-solid or plastic resilient material capable of yielding under traffic loads, but incapable of displacement from the containers.

A further object of the invention is to provide a railway tie possessing the meritorious features of construction and advantageous characteristics hereinafter mentioned.

In the drawing wherein is shown the preferred, but obviously not necessarily the only form of embodiment of the invention, Fig. 1 is a perspective view illustrating the installation of the railway tie forming the subject matter hereof. Fig. 2 is a perspective view of the assembled tie. Fig. 3 is a sectional view through one of the resilient sleepers. Fig. 4 is a plan view thereof. Figs. 5 and 6 are perspective views of modifications of the form of the connecting tie bar.

Like parts are indicated by similar characters of reference throughout the several views.

Metallic railway ties are not new in this field. Different forms of tie structures have been proposed, varying from simple I-beams to quite complicated structures. It has been proven, however, that a track construction employing metallic ties is likely to be excessively rigid. Although a solid railroad bed is popularly supposed to be desirable, such road bed must in fact possess a certain elasticity or resiliency, without which the track will be disagreeable to ride over and will induce undue wear of the rails and ties as well as rapid deterioration of the rolling stock.

The primary purpose of the present tie structure is to afford a metallic tie having the requisite degree of resiliency which will not only improve traffic conditions, but which when embedded in a concrete foundation will absorb shock and vibration and so prevent breakage and disintegration of the concrete sub-structure. In such installation the transverse connecting bar of the tie becomes a reinforcement element of the concrete structure, enabling it to resist breakage while the resilient sleepers at opposite ends cushion the shock and vibration thereby further protecting the road bed from disintegration. Such resiliency is equally advantageous to the railway equipment by minimizing shock and vibration.

As illustrated in the drawing, the present tie comprises a channel bar 1 disposed with its flanged or recessed side downwardly whereby the flanges are embedded in the underlying concrete foundation and serve to more securely anchor the tie against creepage.

Secured to the opposite ends of the channel bar 1 are box-like receptacles 2 usually, but not necessarily, made of sheet metal. Within the receptacles 2 are bodies of resilient material confined by overlying sleeper plates 4 resting thereon, and fitted closely within the receptacles, but verticaly movable therein against the yielding resistance of the cushion body 3. The plates 4 support track rails 5 which rest thereon.

While rubber, composition or other resilient material may be employed within the receptacles 2, asphalt in a semi-liquid or plastic condition has been found quite satisfactory. However, to prevent displacement or oozing of the asphalt under traffic pressure when softened by summer heat, the asphalt is preferably intermixed with a fibrous material or with a suitable filler into a semi-solid form in which it can be molded or rolled into relatively thick boards and cut to size. Board-like material of fiber impregnated with asphalt or the like is now available upon the market. Such material while possessing considerable weight carrying capacity is sufficiently resilient to absorb vibration and shock, and yet is not subject to displacement from the receptacles. In lieu of employing such semi-solid asphalt board for the entire cushion, or employing asphalt in a semi-

liquid or plastic condition, either of which is suitable for use alone, these materials may be used in combination by arranging strips 6 of the solidified asphalt impregnated fibrous material about the walls of the receptacle 2, and then filling the interior space with plastic or semi-liquid asphalt or other analogous material. In such arrangement the strips of fibrous material or solidified asphalt underlying the crevices between the walls of the receptacle and the edges of the sleeper plate 4 serves as dams to confine the more fluid material and prevent leakage. Such sealing strips 5 will yield, however, under traffic pressure and will not materially dampen the resiliency of the cushion body as a whole.

Extending through the extremities of the channel bar 1 and the bottom of the receptacles 2 thereon and projecting thence through registering holes in the sleeper plate 4 are stud bolts 7 adjustably engaging rail clamps 8 which bear upon the base flanges of track rails 5 resting upon the sleeper plates 4.

The receptacles 2 are somewhat wider than the channel bar 1 whereby they project therebeyond at opposite sides of the tie bar into direct supporting contact with the concrete foundation or sub-bed of the track as at 9. This not only affords a more positive and direct support for the track rails but it enables a lighter tie bar 1 to be employed thereby materially cheapening the construction. Furthermore, by thus reducing the required size and weight of the channel bar 1, the entire tie is rendered of less weight and more easily handled and cheaply transported from place to place.

While an inverted channel bar is preferred, it will be obvious that the construction is not necessarily limited thereto but other cross sectional forms of tie bars may be employed, as for example a flat bar or strip or rod-like elements. While structural channel beams of suitable size are ordinarily used, such tie element may be formed by bending heavy sheet metal or plate material to the desired form.

One of the several advantages of the present tie for street railway construction and particularly for track replacement is that it may be made quite shallow and installed with minimum excavation, and less labor and material by utilizing a considerable portion of the old track bed. While for new construction, the tie is preferably, although not necessarily, straight as shown in Fig. 5, for street railway track replacement, where a suitable concrete sub-bed is already existent, the portion of the channel bar 1 intermediate the sleeper receptacles 2 is arched upwardly at 10 to greater or less extent according to the depth of the track rails to be employed and the character of the inter-rail paving. By this means a considerable portion of the original concrete substructure 11 may be left intact or merely leveled off and trenches 12 are excavated at the opposite sides to receive the sleeper receptacles and ends of the tie bar, where they are embedded along with the track rails 5 in a new concrete fill 13 which also embeds the arch 10 of the tie bar to less depth.

Conditions sometimes arise, especially in new construction, wherein an especially deep concrete sub-structure is necessary in which it may be desirable to embed the ties at a lower level either to avoid track conduits, pipes or other obstructions or for greater security. In such instances, the tie bar 1 may be formed conversely of the arched shape 10 with a dependent bight 10*a* intermediate the sleeper receptacles 2 as is shown in Fig. 6, which portion will be embedded more deeply in the concrete deposit.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute, the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. In a railway tie, a pair of spaced receptacles, resilient bodies therein, sleeper members resting therein on the resilient bodies, and a channel bar disposed with its recessed side downwardly connecting the receptacles one with the other to be embedded in the road bed, the channel bar being of less width than the receptacles whereby the latter project in opposite directions beyond the bar into supporting contact with the road bed independently of the bar, said bar being arched intermediate the receptacles above the level thereof.

2. A railway tie, including a pair of spaced receptacles containing resilient cushion material, rail supporting sleeper plates supported thereon, and a tie bar of less width than the receptacles extending therebeneath connecting the receptacles one to the other whereby said receptacles project therebeyond into direct supporting contact with the road bed.

3. A railway tie including a pair of spaced receptacles containing resilient cushion material, rail supporting sleeper plates supported thereon, and a tie bar interconnecting the spaced receptacles, said tie bar being formed into a bight intermediate the receptacles, the ends of which are to be embedded in the road bed material beneath the receptacles, means fixedly attaching the tie bar thereto beneath the receptacles, the bight of the tie bar being arched above the level of the receptacles and likewise embedded in the road bed material.

4. A railway tie including a pair of spaced receptacles containing resilient cushion material to be embedded in the road bed material, rail supporting sleeper plates supported thereon also embedded in the road bed material, and a tie bar interconnecting the spaced receptacles, said tie bar being arched intermediate the receptacles, attachment means fixedly securing the ends of the tie bar beneath the spaced receptacles, said intermediate arch portion being likewise embedded in the road bed material at a level higher than the spaced receptacle.

5. A railway tie including a channel bar disposed with its recessed side downwardly, separately formed box-like receptacles attached to the upper side of the channel-shaped bar in transverse relation thereto and projecting in opposite directions therefrom, resilient bodies therein, and rail supporting sleeper plates resting

thereon, said receptacles and rail supporting plates and the intermediate channel-shaped bar being adapted to be completely embedded in a road bed deposit.

6. A rail support, including a box-like receptacle, a body of fluid material contained therein, a rail supporting sleeper plate resting on said resilient material, and strips of solidified resilient material resting on the bottom of the receptacle adjacent the inner walls thereof beneath the crevices between the sleeper plate and the receptacle and serving as dams to confine the fluid material against leakage and displacement under traffic pressure.

7. A rail support including a box-like receptacle, a resilient semi-solid body of asphalt impregnated fibrous material resting on the bottom of the receptacle and contiguous to a side wall thereof, a body of semi-liquid asphalt material associated therewith within the receptacle, and a rail supporting sleeper plate supported on said resilient body.

8. A rail support including a box-like receptacle, spacer means therein comprising a resilient body of asphalt intermixed with a fibrous material to form a semi-solid cushion located contiguous to the side walls of the receptacle, a body of plastic asphalt material surrounded by said semi-solid cushion material contained within the receptacle, and a rail supporting sleeper member resting upon the spacer means.

9. A rail support including a box-like receptacle, a resilient body of fibrous material forming a circuitous semi-solid cushion, a body of plastic material surrounded by said semi-solid cushion within the receptacle, the body of semi-solid cushion material and the body of plastic material being of substantially equal depth and a rail supporting sleeper member resting thereon.

10. A rail support including a box-like receptacle, a body of fluid asphalt contained therein, preformed strips of resilient semi-solid material interposed between the body of fluid asphalt and the side walls of the receptacle and a rail supporting sleeper plate resting on the said semi-solid strips.

11. A railway tie including an elongated bar, box-like receptacles disposed transversely of the opposite ends of the bar and extending laterally therebeyond in opposite directions, bodies of resilient material contained in the receptacles, rail supports resiliently supported on said bodies of resilient material, the tie and receptacles being adapted to be completely embedded in a deposit of road bed material upon which the extending portions of the receptacles will directly rest at opposite sides of the tie bar and thereby support the rail supports independently of the tie bar.

12. A railway tie including a tie bar, receptacles carried by the opposite extremities of the tie, rail supports positioned therein, spacer members of semi-solid material located contiguous to the side walls of the receptacles on which the rail supports rest, and a body of semi-fluid resilient material associated with the spacer members within the receptacle and separated from the side walls of the receptacle by the interposed spacer members.

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