

March 29, 1932.

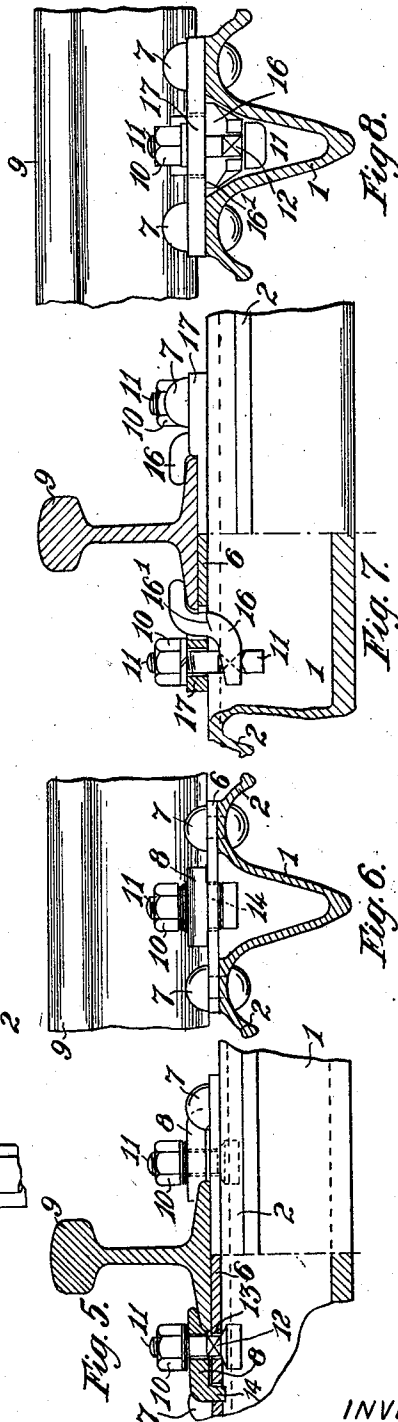
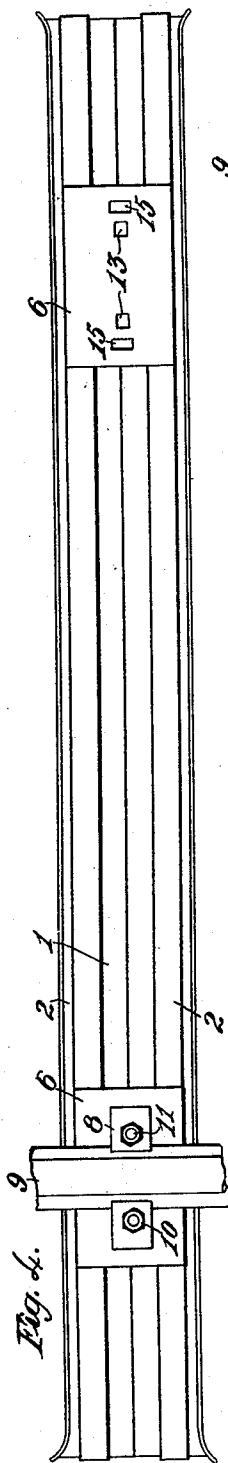
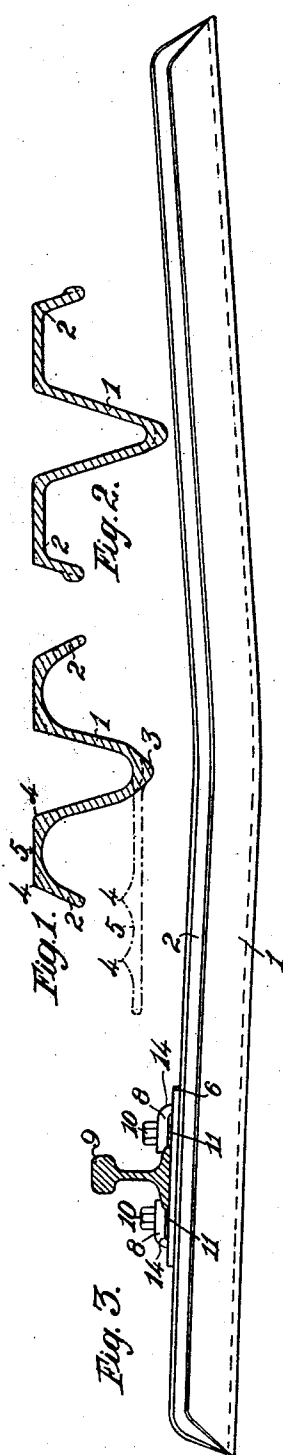
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RAILWAY SLEEPER AND ATTACHMENT THEREFOR

Filed Jan. 5, 1931

2 Sheets-Sheet 1



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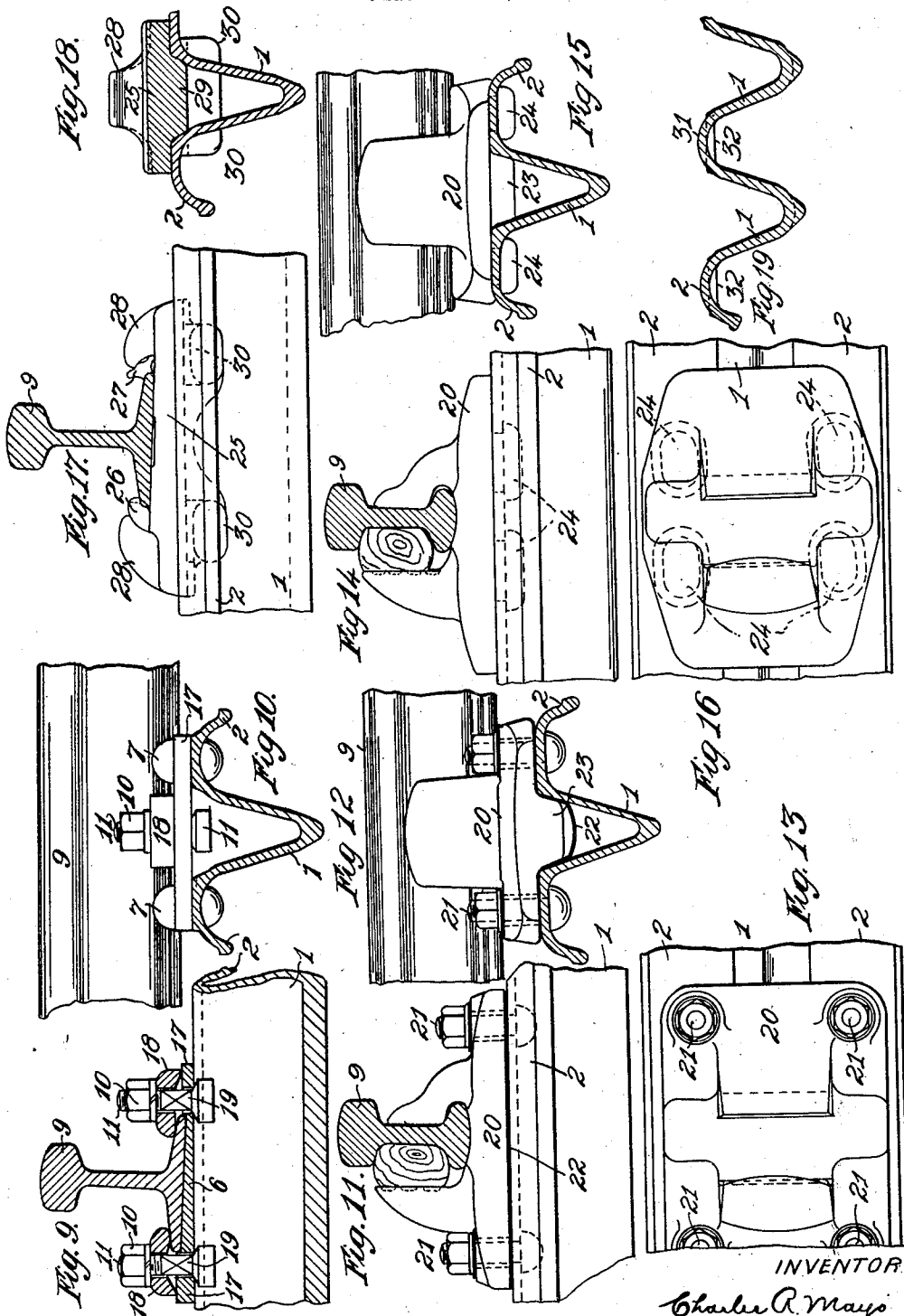
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RAILWAY SLEEPER AND ATTACHMENT THEREFOR

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UNITED STATES PATENT OFFICE

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RAILWAY SLEEPER AND ATTACHMENT THEREFOR

Application filed January 5, 1931, Serial No. 506,776, and in Great Britain January 9, 1930.

This invention comprises improvements in and connected with railway sleepers and attachments therefor and has for its principal object to provide an improved form of steel-plate sleeper.

More specifically one object is to provide a sleeper of which the section, when depressed by a load, tends to compact the ballast retained beneath the wings and with which the ballast is easily packed owing to the facility with which access is had thereunder, so that the sleeper can be bedded with great security and high resistance is offered to sleeper-creep. A further object is to provide a sleeper wherein the means employed for securing the rails are very accessible and can be adjusted without disturbing the sleeper or removing ballast. Yet another object is to provide a steel-plate sleeper of adequate strength and stiffness but of very light weight for a given rail weight or load, this being of importance having regard to the heavier rails now coming into more general use.

Various embodiments of the invention are illustrated by way of example in the accompanying drawings in which:—

Figures 1 and 2 are cross-sections showing forms of sleeper,

Figures 3 and 4 are a side elevation and plan of a complete sleeper,

Figures 5 and 6 are part sectional elevations, at right angles to each other, of one arrangement of sole plate and clips on a V-sleeper,

Figures 7 and 8 are similar views of a second such arrangement on a V-sleeper,

Figures 9 and 10 are similar views of a third such arrangement,

Figure 11 is a side elevation, Figure 12 a cross sectional elevation and Figure 13 a plan of a chair device fastened on to a V-sleeper,

Figures 14, 15 and 16 are views corresponding with Figures 11–13 and showing an alternative chair arrangement.

Figures 17 and 18 are an elevation and cross section of a V-sleeper and chair-like rail support, and

Figure 19 is a cross section of a W-shaped sleeper.

Figures 1 and 2 illustrate various forms of

V-section sleeper in accordance with the invention. The V-section sleeper 1 is formed with downturned wings or extensions 2 at the sides, said wings being produced when rolling or pressing the V-section from the flat strip. The wings may for example be rounded on the under side and flat on the upper side (Figure 1) or flat on both sides (Figure 2). Each wing has a width equal to about one third of the total width of the sleeper and is quite shallow as compared with the depth of the V. The sleepers may be produced each from a length of flat steel plate, giving the sections shown in dotted lines in Figures 1 and 2 and 19, or they may be cut from a length of flat steel strip after the latter has been rolled to the desired section. The plate or strip rolled may have a thickened rib 3 along the middle which in the finished sleeper forms the bottom of the V and gives greater thickness there. The plates or strips may have thickened portions 4 along their marginal parts and such thickened portions may present surfaces 5 which originally are concave about a longitudinal axis. Such a plate or strip is shown by chain lines in Figure 1 as it would appear before being rolled up to the V-section. After such rolling, the concave surfaces 5 of the thickened portions 4 are converted, as shown, into plane surfaces by the bending. Such plane surfaces can be used in the mounting of sole plates, chairs, and the like.

The plates or strips may be given other desirable sections or local formations for the production of desired sleeper parts when the sleepers are produced from such plates or strips. The depth, section and shaping of the sleeper in its final form will be calculated to suit the kind of ballast to be used, the axle loads to be encountered and the mode of attachment of the rails by sole-plates, chairs and other accessories or by their direct attachment to the sleepers. The edges of the wings may be beaded (Figure 2) to give increased strength and to facilitate handling. If it is desired to adapt the sleeper so that it will have a capacity for yielding or bending at the middle, a portion of the depth of the V can be removed by punching, shearing or the

like or by means applied during the rolling or pressing of the sleeper. Alternatively the section of the sleeper may vary along its length, being for instance of ordinary trough section in the middle and of V-section according to the invention at the rail seats and ends. The ends of the sleeper may be finished as desired. For example the ends may be closed or fish tailed by sloping down the surfaces of the sleeper as in Figures 3 and 4. Such closure tends to prevent movement laterally of the track.

The shape of the sleeper 1 may itself provide the necessary bearing surface for the rails; if the crests of the wings are rounded, however, they may be locally flattened for this purpose. Rail engaging lugs may be punched up from the wings 2 without detriment to the main body of the sleeper 1 and clips may be secured in position to hold the rails by means of bolts engaging the wings 2. Such bolts are easily accessible owing to the shallowness of the wings as compared with the V of the sleeper.

Alternatively the rails may bear on rolled, pressed or cast sole plates of ample width, welded, riveted, bolted or otherwise attached to the sleepers. This arrangement is shown in Figures 3 and 4 wherein sole plates 6, which extend across the hollow of the sleeper 1 from wing to wing thereof, are welded to said wings 2. In the modifications shown in Figures 5-10, the sole plates 6 are attached to the sleepers by rivets 7. The attachment of the rails may be accomplished by keys, bolts or clips. In Figures 3-6, simple clip plates 8 can be caused to grip the foot of the rail 9 to the sole plate 6 by screwing down nuts 10 on bolts 11 having squared portions 12 engaging square holes 13 in the plate 6. Downward lugs 14 on the clips 8 engage in holes 15 in the sole plate 6 to prevent twisting of said clips.

A different clip arrangement is shown in Figures 7 and 8. In this case the clips 16 are substantially S shaped, the upper hook of the S engaging over the bottom flange of the rail 9 while the lower hook is forked to engage around a square portion 12 of the T-headed bolt 11. It will be seen that the sole plate 6 is provided with thicker marginal portions 17 containing the holes for the bolts 11 and furnishing lateral ribs or abutments for taking side thrust of the rail. On tightening the nut 10 over its spring washer the inserted end of the clip 16 is lifted by the T-head of the bolt 11 and a lever action of say $1\frac{1}{2}$ to 1 about the shoulder 16' as fulcrum may be brought to bear upon the nose of the clip engaging the rail flange, thus permitting of a greater holding down pressure. These clips 16 and bolts 11 can be easily placed in position or removed and replaced at any time without disturbing the sleeper 1 or the rail 9 or causing any inconvenience as they are

readily accessible in the hollow of the sleeper.

In Figures 9 and 10 the clips are simply robust dished washers 18 having their concave side downwards so as to have lines of gripping contact on the rail foot and sole plate. These clips are caused to grip the rail flange to the plate 6 by tightening the nuts 10 on the bolts 11. Said bolts have squared shank portions 19 engaging square holes in the plate 6.

For attaching the sole plates to the rail, combinations of the means described above may also be employed. Alternatively sole plates of cast iron may be cast in position on the sleepers after the formation of the latter. Either the sleepers themselves or the sole plates can be shaped to give any required cant to the rails. Figures 3 and 4 illustrate a cambered sleeper 1 whereby a cant is imparted to the rail 9. Figures 5 to 8 show sole plates 6 designed to hold the rail 9 perpendicular to the sleeper 1 whatever the disposition of the latter may be. Figures 9 and 10, on the other hand, illustrate how a cant may be given to the rail 9 by the use of a sole plate 6 which is slightly wedge shaped. The rail instead of being held by clips on both sides, as shown, may be held between clips on the inside and lugs or flanges on the sole plate on the outside. Distance pieces gripping the flange of the rail may then be employed if desired.

The sleepers according to the invention may also be employed in conjunction with cast or "pressed up" chairs or chair-plates, bolted, riveted or cast thereon. Examples of chair supports for bull headed rails such as are commonly in use in Great Britain are illustrated in Figures 11-16. Figures 11-13 show a form of chair 20 of cast iron or wrought steel bolted (alternatively it might be riveted) by bolts 21 to the wings 2 of the sleeper 1. Insulation 22 in the form of fibre shims and fibre ferrules and washers on the bolts is provided for track circuiting purposes. A transverse rib 23 cast underneath the chair fits in the V of the sleeper and assists in securing the chair fast in position. In Figures 14-16 the similar chair 20 is secured to the sleeper 1 by dependent lugs 24 cast in position so as to project down through holes in the wings 2 of the sleeper. What has been said above regarding the canting of the rail when sole plates are used is equally applicable to these chair plates.

An arrangement employing a rail support 25 partaking of some of the characteristics of both sole plate and chair is illustrated in Figures 17 and 18. The rail shown, which is of the foot flange type, is held by its foot flange between two shaped keys 26, 27 wedged between said foot flange and upstanding recessed lugs 28 on the support 25. Said support 25 is cast on the sleeper 1, being formed with a rib 29 which fits in the V of the sleeper

and with four lugs 30 cast to project laterally through holes in the sides of the V.

An example of a W-section for a sleeper according to this invention is illustrated in Figure 19. As will be seen the section is virtually composed of two V sections 1. The wings 2 and central crest 31 being rounded, flats 32 are provided at the seats or points of attachment of the seating plates or chairs. Such plates or chairs may be secured by any of the methods described, for instance riveting may be employed at the central crest and welding at the wings. W or multi-V forms of sleeper are particularly applicable for use at rail joints, points and crossings. In yards or other places the V or W sleepers can be laid closely alongside one another in such a fashion as not only to support the track but also to form the yard or other flooring.

What I claim is:—

1. Steel-plate railway sleeper, of comparatively deep hollow V-section comprising inclined sides meeting in an apex ridge and wings of inverted trough formation extending outwardly from the top lateral edges of the sides and of considerably less depth than said sides.

2. Steel-plate railway sleeper, of comparatively deep hollow V-section comprising inclined sides meeting in an apex ridge, wings of inverted trough formation extending outwardly from the top lateral edges of the sides and of considerably less depth than said sides and bearing-flats provided on said wings.

3. Steel-plate railway sleeper, of comparatively deep hollow V-section comprising inclined sides meeting in an apex ridge, wings of inverted trough formation extending outwardly from the top lateral edges of the sides and of considerably less depth than said sides and rail supports attached to said wings so as to bridge the V-section.

4. Steel-plate railway sleeper, of comparatively deep hollow V-section comprising inclined sides meeting in an apex ridge, wings of inverted trough formation extending outwardly from the top lateral edges of the sides and of considerably less depth than said sides, sole plates attached to said wings so as to bridge the V-section, and clip devices for holding the rails down to the sole plates.

5. Steel-plate sleeper for a flanged rail according to claim 4, comprising a lever clip device having an intermediate fulcrum point of bearing under the sole plate, one arm of said lever being adapted for pressing down upon and gripping the rail-flange, and securing means such as a bolt device for applying upward pressure to the other arm of said lever.

6. Steel-plate railway sleeper, comprising a comparatively deep hollow V-section, wings of inverted trough formation extend-

ing outwardly from the top lateral edges of the section, and chairs cast in position upon said wings so as to bridge the V-section.

7. Steel-plate railway sleeper, comprising a comparatively deep hollow V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, and abutments formed on the sleeper to take up lateral thrust of the rails.

8. Steel-plate railway sleeper, comprising a comparatively deep hollow V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, sole plates attached to said wings so as to bridge the V-section, and abutments formed on the sole plates to take up lateral thrust of the rails.

9. Steel-plate railway sleeper, comprising a comparatively deep hollow V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, sole plates attached to said wings so as to bridge the V-section, and abutments formed on said sole plates for engaging said sleeper.

10. Steel-plate railway sleeper, comprising a comparatively deep-hollow V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, chairs attached to said wings so as to bridge the V-section, and abutments formed on said chairs for engaging said sleeper.

11. Steel plate railway-sleeper, comprising a comparatively deep hollow multiple V-section and wings of inverted trough formation extending outwardly from the top lateral edges of the section.

12. Steel plate railway sleeper, comprising a comparatively deep hollow multiple V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, and bearing-flats provided on said section and wings.

13. Steel plate railway sleeper, comprising a comparatively deep hollow multiple V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, and sole plates attached to said wings so as to bridge said multiple V-section.

14. Steel-plate railway sleeper, comprising a comparatively deep hollow V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, and a stiffening rib along the base of the V-section.

15. Steel-plate railway sleeper, comprising a comparatively deep hollow V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, and beads provided along the edges of said wings.

16. Steel-plate railway sleeper, comprising a comparatively deep hollow V-section, wings of inverted trough formation extending out-

wardly from the top lateral edges of the section, rail supports secured to said wings and insulation separating said supports from said sleeper.

- 15 17. Steel-plate sleeper for flanged rails, comprising a comparatively deep hollow V-section, wings of inverted trough formation extending outwardly from the top lateral edges of the section, sole plates attached to
19 said wings so as to bridge the V-section, up-
standing recessed lugs on said sole plates, and
shaped keys adapted for being wedged be-
tween the rail flanges and said recessed lugs.

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