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RAILROAD RAIL SUPPORTING STRUCTURE

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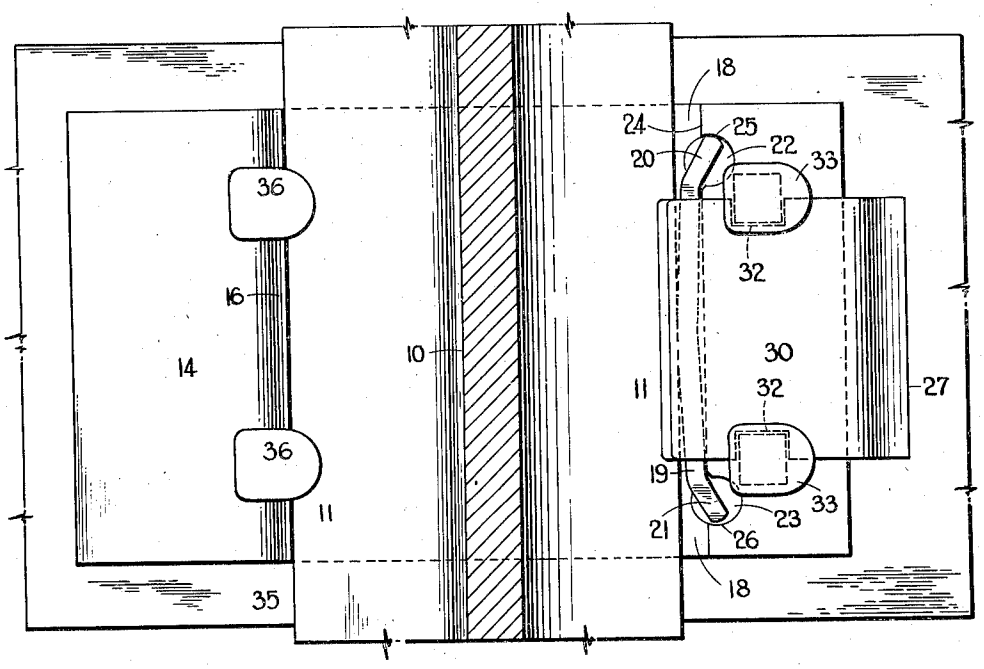


FIG. 1.

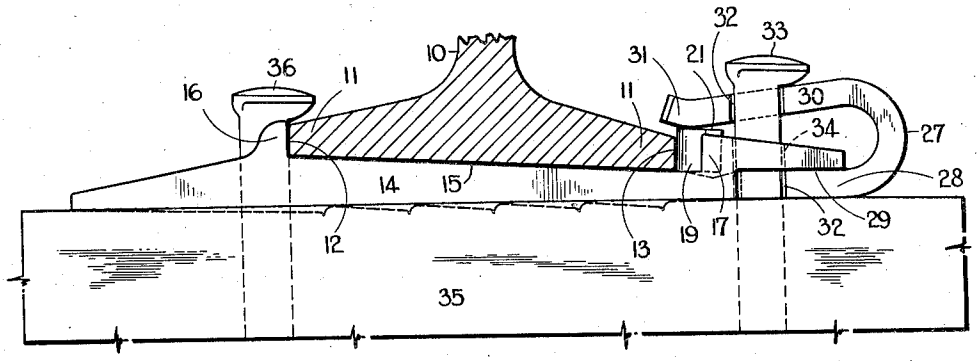


FIG. 2.

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RAILROAD RAIL SUPPORTING STRUCTURE

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20 Claims. (Cl. 238—315)

This invention has to do in general with railroad rail supporting means, and specifically with means for anchoring a rail on a tie plate to restrain vertical and longitudinal movement of the rail with respect to the tie plate.

An object of the invention is to provide a rail anchoring device arranged to frictionally engage the base flange of a rail to restrain longitudinal shifting thereof with respect to a tie plate, which device is securely anchored to the tie plate so that it can not be accidentally displaced from rail holding position.

A further object of the invention is to provide a rail anchoring device employing a rail base flange engaging spring arranged to be anchored to a tie plate, the said spring being of such formation that there is very little risk of breakage, in the process of application to a rail, or in use.

A still further object of the invention is to provide a rail anchoring spring embodying the aforesaid characteristics and advantages, which may be anchored to a tie plate by a simple anchoring clip, the said anchoring clip being so designed that a portion thereof is arranged to extend over the base flange of a rail to limit vertical movement of the rail with respect to the tie plate.

Another object is to provide simple and durable means to restrain endwise shifting of the rail engaging spring with respect to the tie plate.

The invention is further characterized by the provision of a novel form of tie plate and coacting rail anchoring means.

Other objects and advantages of the invention may be observed upon perusal of the following detailed description and the annexed drawing which illustrates one embodiment of the invention.

In the drawing:

Fig. 1 is a plan view showing a portion of a rail, a tie plate, and the application of the device of my invention thereto, and

Fig. 2 is an end sectional elevation of the structure shown in the aforesaid view.

Referring now to the drawing in detail, the numeral 10 designates a rail of standard form; 11 indicates the base flange thereof; and 12 and 13 the upright edges of the base flange. The tie plate 14 includes the usual rail base supporting surface 15 and rail supporting shoulders 16 and 17 extending in parallel relation longitudinally of the tie plate. The said shoulders are so spaced that when the rail is mounted on the tie plate, a gap 18 is established at one side of the rail base flange between the upright edge 13 thereof and the shoulder 17, for reception of the rail anchoring spring 19.

The rail anchoring spring 19 is of the semi-elliptical leaf type, with the ends 20 and 21 formed in such wise that when the spring is mounted, as shown in Fig. 1, the said ends seat in the apertures 22 and 23 drilled or otherwise formed in the top face of the tie plate. The apertures are also formed so that portions of the side wall 24 of the shoulder 17 are cut away to enable the ends 20 and 21 of the spring 19 to abut the walls of the said apertures, which walls establish abutment shoulders, the same being designated at 25 and 26. The spring 19 is of such formation and is so tensioned that when flexed and located in operative position as shown in Fig. 1, sufficient pressure is exerted by it to force the tie plate in the transverse direction of the rail and hold the upright face of the shoulder 16 against the upright face 12 of the rail base flange 11 in such manner that a frictional bond is established between the rail 10 and the tie plate 14 at one side of the said rail, and between the rail base flange upright face 13 and the spring 19 at the other side of the rail.

The spring 19 is held against vertical displacement by the anchor clip 27. This clip is of substantially U-shape formation and includes one arm 28 which seats in the recess 29 formed longitudinally of the tie plate 14, along its tie contact surface at the inner side thereof, and the arm 30, the end 31 of which projects over the spring 19 and a portion of the rail base flange 11. The anchor clip is notched at 32 at the sides thereof, and drift spikes 33, or the equivalent, seat in the said notches and extend through the apertures 34 in the said tie plate, into the tie 35. The other side of the tie plate 14 may be secured to the tie 35 in the usual manner, by one or more drift spikes 36, or the equivalent thereof.

To assemble the structure, the spring 19 is first flexed and positioned with a suitable flexing and inserting tool or device, so that it lies between the upright face 13 of the rail base flange and the face 24 of the shoulder 17, with the ends 20 and 21 thereof seated in the apertures 22 and 23 in position to abut either of the abutment shoulders 25 and 26. The anchor clip 27 is then driven, in the transverse direction of the tie plate 14, to the position illustrated, following which the drift spikes are driven into the tie 35.

The principal function of the structure is to restrain longitudinal shifting of the rail when the

latter is subjected to endwise thrust. To counteract the tendency for the rail to creep in its longitudinal direction, an intense frictional bond is established between the side wall of the shoulder 16 and the upright face 12 of the rail base flange, at one side of the rail, and between the upright face 13 of the rail base flange and the spring 19 at the other side of the rail. A further feature is to provide means to establish positive anchoring of the spring 19 so that it can not be accidentally dislodged from its operative position. This is accomplished by location of the ends 20 and 21 of the spring in the apertures 22 and 23 in position to abut the abutment shoulders 25 and 26 established by said apertures. In the event of the rather remote possibility of spring breakage, a broken portion of the spring can not work in an endwise direction out of the gap 18 unless its angular end is also broken off. This obliterates the possibility of the rail shifting transversely towards the shoulder 17 in the event of spring breakage.

A still further feature of the device of my invention resides in the peculiar formation of the anchor clip 27 and its mounting arrangement. The anchor clip, due to its U-shaped formation and form of anchoring against the under side of the tie plate, must flex or open up to permit upward movement of a rail a distance greater than the clearance space provided, if any, between the rail base flange and the overlying end 31 of the arm 30. Thus a resilient anchoring means is provided to hold the rail down on the tie plate, which affords many advantages over the well known spiking arrangement. The two spikes 33 positively limit movement of the anchor clip 27 transversely or longitudinally of the tie plate, wherefore the said spikes must be worked very loose or completely removed before the spring 19 can be accidentally dislodged from its operative position.

Having thus described my invention, what I claim is:

1. In a railroad rail supporting structure, the combination with a rail, of a tie plate adapted to support the said rail; a leaf spring anchored against longitudinal movement on the said tie plate and frictionally engaging one upright edge of the base flange of the said rail; and a spring holder anchored to the said tie plate and overlying the said spring to hold it in rail base flange engaging position.

2. In a railroad rail supporting structure, the combination with a rail, of a tie plate adapted to support the said rail; and a leaf spring anchored on the said tie plate and frictionally engaging one upright edge of the base flange of the said rail, to restrain the said rail against longitudinal movement with respect to the said tie plate.

3. In a railroad rail supporting structure, in combination, a tie plate having a rail base supporting surface and upstanding shoulders at the edge of the said supporting surface to limit lateral movement of a rail; a rail disposed on the said tie plate rail supporting surface between the said shoulders; a leaf spring arranged between one of the said tie plate shoulders and the adjoining base flange of the said rail to restrain longitudinal shifting of the rail when it is subjected to rail wave motion; and means fixed to the said tie plate and engaging the said spring to hold it against vertical displacement.

4. In a railroad rail supporting structure, in combination, a tie plate having a rail base supporting surface and upstanding shoulders at the edges of the said surface to limit lateral movement of a rail; a rail arranged on the said tie plate supporting surface between the said shoulders; a leaf spring arranged between one of the said shoulders and the adjoining base flange of the said rail and frictionally engaging the said rail; and a holder for the said spring anchored to the said tie plate and overlying the said spring and a portion of the base flange of the said rail to limit vertical movement of the said rail and the said spring with respect to the said tie plate.

5. In a railroad rail supporting structure, in combination, a tie plate embodying a rail base supporting surface and upstanding shoulders at the edges of the said supporting surface to limit lateral movement of a rail; a rail disposed on the said surface between the said shoulders; a leaf spring arranged between one of the said shoulders and the adjoining base flange of the said rail and frictionally engaging the said rail; and a holder for the said spring, interlocked to the said tie plate, and overlying a portion of the said spring and a portion of the base flange of the said rail, to limit vertical movement of the said spring and the said rail with respect to the said tie plate.

6. In a railroad rail supporting structure, in combination, a tie plate embodying a rail base supporting surface and upstanding shoulders at the edges of the said surface to limit lateral movement of a rail; a rail arranged on the said surface between the said shoulders; a leaf spring arranged between one of the said shoulders and the adjoining base flange of the said rail, the said spring being interlocked with the said tie plate, and frictionally engaging the edge of the rail base flange; and a holder for the said spring, interlocked with the said tie plate, to prevent the spring holder from moving in vertical and longitudinal directions with respect to the said tie plate, and overlying a portion of the said spring to hold it between the said tie plate shoulder and the adjoining base flange of the said rail.

7. In a railroad rail supporting structure, in combination, a tie; a tie plate fastened to the said tie; a rail mounted on the said tie plate; a leaf spring, anchored against longitudinal shifting, on the said tie plate, and frictionally engaging one upstanding edge of the base flange of the said rail; a spring holder interlocked with the said tie plate, to prevent the spring holder from moving in vertical and longitudinal directions, and overlying a portion of the said spring and a portion of the base flange of the said rail, to limit vertical movement of the said rail and the said spring with respect to the said tie plate; and a spike engaging the said spring holder and extending through the said tie plate into the said tie, to prevent transverse shifting of the said spring holder away from the base flange of the said rail.

8. In a railroad rail supporting structure, in combination, a tie plate having spaced rail base flange supporting shoulders; a rail mounted on the said tie plate between the said shoulders; and a leaf spring anchored against one of the said tie plate shoulders and arranged to contact with one edge of the base flange of the said rail, to urge the said tie plate in a transverse direction with respect to the said rail whereby the edge of the said rail base flange at the other side of the said rail is held in contact with its adjoining tie plate rail base flange supporting shoulder.

9. In a railroad rail supporting structure, in combination, a tie plate having spaced rail base flange supporting shoulders; a rail mounted on

the said tie plate between the said shoulders; a leaf spring arranged in flexed condition between one of the said tie plate shoulders and the adjoining edge of the rail base flange; and means fixed to the said tie plate and overlying the said spring to prevent it from shifting vertically.

10. In a railroad rail supporting structure, in combination, a tie plate having spaced rail base flange supporting shoulders; a rail mounted on the said tie plate between the said shoulders; a leaf spring arranged in flexed condition between one of the said tie plate shoulders and the adjoining edge of the rail base flange; and means fixed to the said tie plate and overlying the said spring and a portion of the rail base flange to limit vertical movement of the said spring and the said rail with respect to the said tie plate.

11. In a railroad rail supporting structure, in combination, a tie plate having an upstanding rail base flange supporting shoulder; a rail mounted on the said tie plate in close proximity to and in parallel relation with respect to the said shoulder; a leaf spring arranged in flexed condition between the said shoulder and the edge of the base flange of the said rail, the said spring being interlocked with the said tie plate, and frictionally engaging the upright face of the base flange of the said rail; and a spring holder fastened to the said tie plate and coacting with the said spring to hold it in rail engaging position.

12. In a railroad rail supporting structure, in combination, a tie plate having a rail supporting surface and an upstanding shoulder extending along one edge of the said surface to limit lateral movement of a rail; a rail mounted on the said tie plate rail supporting surface, in spaced relation to the said shoulder; a leaf spring arranged in flexed condition between the said shoulder and the upright edge of the base flange of the said rail, the said spring being arranged to frictionally engage the said rail and anchored to the said tie plate to limit endwise shifting thereof; and an anchor clip having a portion extending beneath the said tie plate and a part overlying the said spring to hold the latter in rail engaging position.

13. In a railroad rail supporting structure, in combination, a tie plate having spaced rail base flange supporting shoulders; a rail mounted on the said tie plate between the said shoulders; a leaf spring arranged in flexed condition between one of the said tie plate shoulders and the adjoining edge of the rail base flange; and an anchor clip of substantially U-shape formation, including a pair of spaced arms, one of which is arranged to abut the under side of the said tie plate, the other said arm being arranged to overlie the said spring and a portion of the base flange of the said rail; and a member engaging the said anchor clip and the said tie plate to restrain the said anchor clip against longitudinal and transverse displacement on the said tie plate.

14. A tie plate embodying a rail supporting surface, an upstanding shoulder extending along one side of the said rail supporting surface, and two recesses in the said upstanding shoulder, arranged in spaced relation, adapted to receive and support the ends of a leaf spring in such manner that endwise shifting of the leaf spring is prevented.

15. In a device of the character described, in combination, a tie plate embodying a rail supporting surface; an upstanding shoulder at one side of the said rail supporting surface adapted to form an abutment for a rail anchoring leaf spring; two spaced recesses in the said upstanding shoulder arranged to receive and hold the ends of a leaf spring; a leaf spring arranged lengthwise with respect to the said shoulder, with the ends thereof in the said recesses; and an anchor clip secured to the said tie plate, including a portion arranged to overlie the said spring, to hold the ends thereof against vertical displacement from the said recesses.

16. In a device of the character described, in combination, a tie plate embodying an upstanding shoulder extending longitudinally thereof; two spaced recesses in the said shoulder; a spring arranged lengthwise of the said shoulder, in contact therewith, with the ends thereof extending into the said recesses, whereby the said spring is restrained against longitudinal shifting with respect to the tie plate; and a spring holder fixed to the said tie plate to hold the said spring in the aforesaid position.

17. In a device of the character described, in combination, a tie plate having two upstanding abutment shoulders formed in the upper face thereof in spaced relation in the longitudinal direction of the said tie plate; a leaf spring arranged between the said shoulders with the ends thereof arranged to abut the said shoulders; and an anchor clip fixed to the said tie plate, having a portion arranged to overlie the said spring, to hold it between the said shoulders.

18. In a railroad rail supporting structure, the combination with a rail, of a tie plate adapted to support the said rail; a leaf spring anchored against longitudinal movement on the said tie plate and frictionally engaging one upright edge of the base flange of the said rail; and means anchored to the said tie plate and arranged to overlie the said spring to hold the said spring in rail base flange engaging position.

19. In a device of the character described, in combination, a tie plate embodying a rail supporting surface; an upstanding shoulder at one side of the said rail supporting surface adapted to form an abutment for a rail anchoring leaf spring; two recesses arranged in spaced relation in the said upstanding shoulder and adapted to receive and hold the ends of a leaf spring; a leaf spring arranged lengthwise with respect to the said shoulder, with the ends thereof in the said recesses; and means secured to the said tie plate arranged to engage the said spring to hold the ends thereof against vertical displacement from the said recesses.

20. In a device of the character described, in combination, a tie plate; a rail supported by the said tie plate; a leaf spring disposed in the longitudinal direction of the said rail, anchored against longitudinal movement with respect to the said tie plate, and frictionally engaging the said rail; and means anchored with respect to said tie plate and engaging the said spring to hold the said spring against vertical displacement from rail engaging position.

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