April 19, 1932. G. T. WILLARD 1,854,497

RAILWAY TIE PLATE

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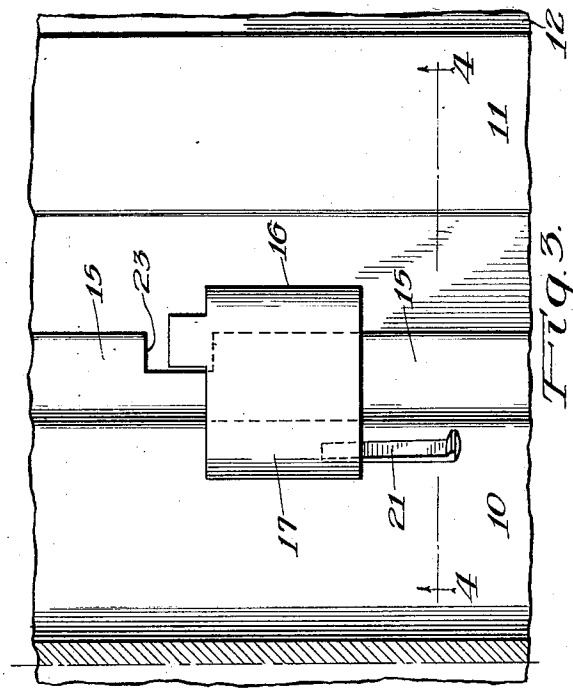

Fig. 3.

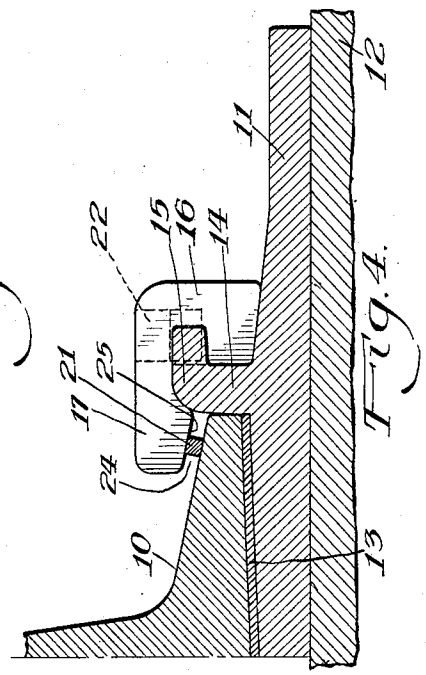

Fig. 4.

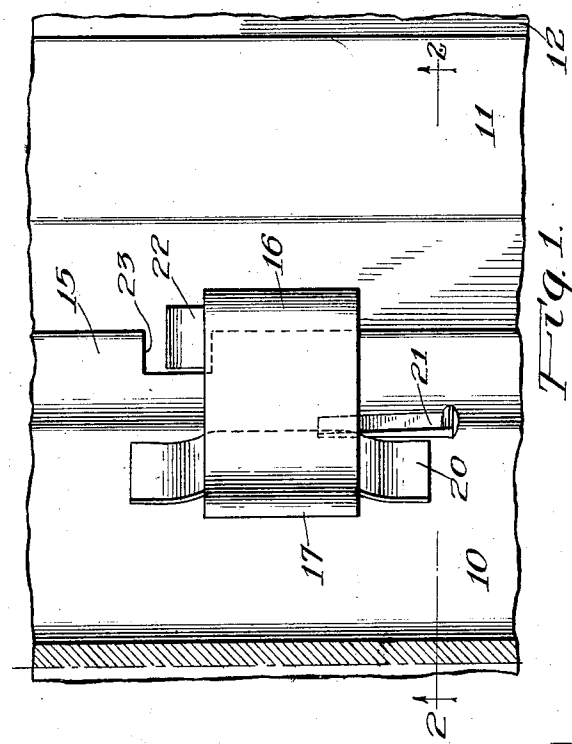

Fig. 1.

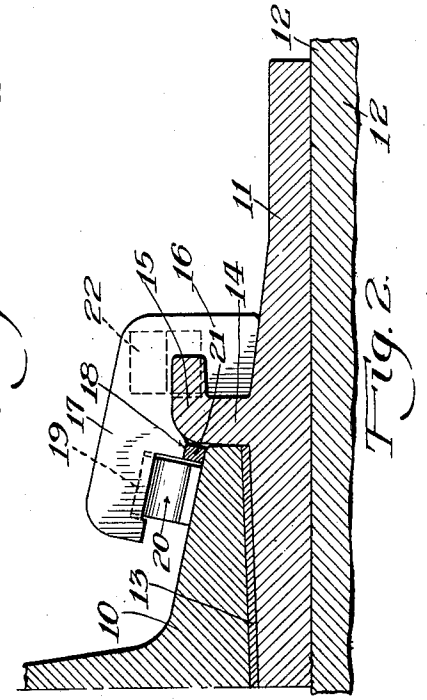

Fig. 2.

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RAILWAY TIE PLATE

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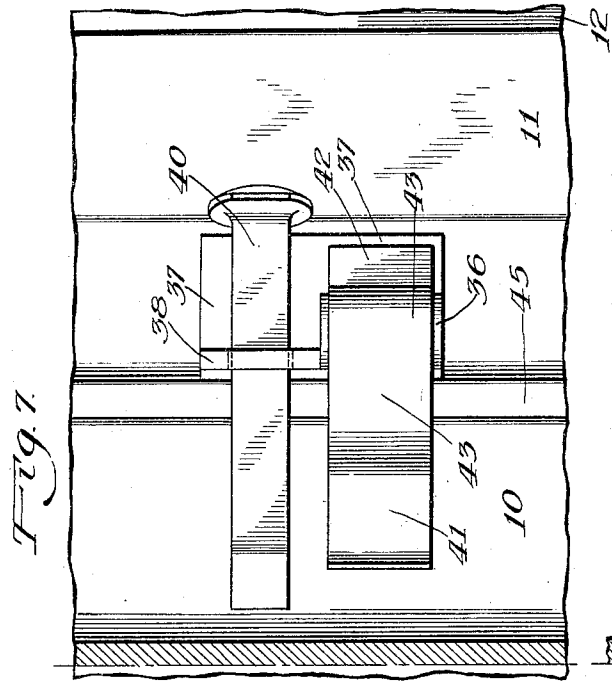

Fig. 7.

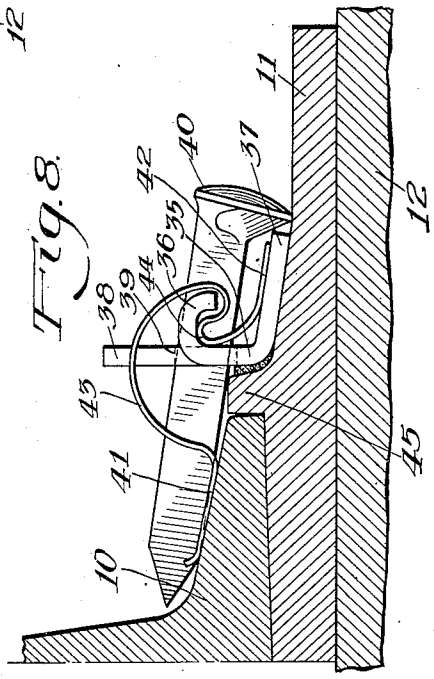

Fig. 8.

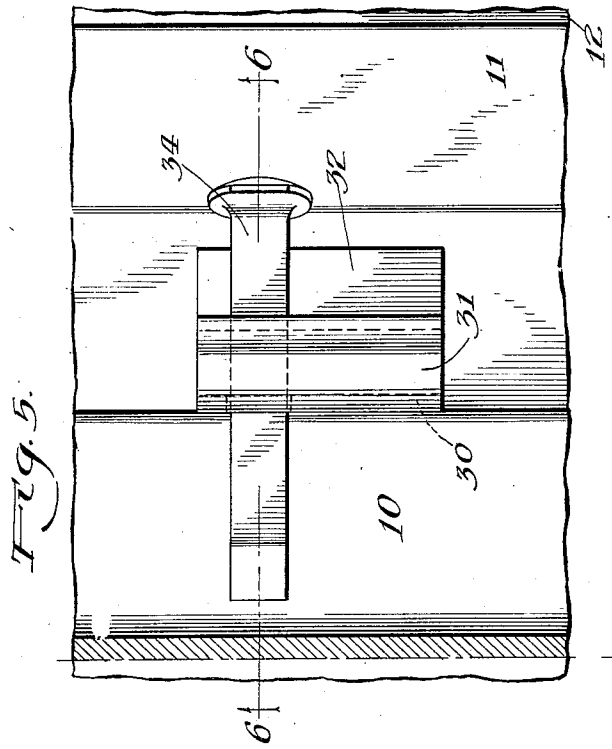

Fig. 5.

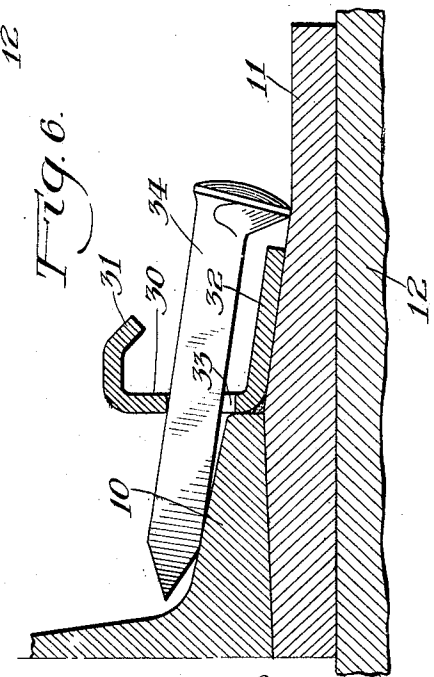

Fig. 6.

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Patented Apr. 19, 1932 1,854,497

UNITED STATES PATENT OFFICE

GEORGE T. WILLARD, OF CHICAGO, ILLINOIS

RAILWAY TIE PLATE

Application filed May 22, 1931. Serial No. 539,202.

This invention relates to railway tie plates.

The main object of the invention is to produce, in combination with a tie plate on which the rail is non-fixedly or yieldingly held to permit wave motion of the rail under loads without injury to the track, means for temporarily establishing a rigid connection between rail and plate for the purpose of allowing the track to be raised by lifting or jacking up of the rail without distorting or otherwise injuring the yielding connecting means.

Tie plates in common use at present are provided with a plurality of spike holes located adjacent the edges of the rail flanges when the rail is in position on the plate, through which spikes are driven into the tie, the heads of the spikes which attach the plate to the tie functioning also to hold the rail on the plate by engaging the edges of the rail flanges. The wave motion of the rail under load usually pulls the spikes upwardly, resulting in loosening the plate from the tie and consequent mechanical wear and necessity for respiking. On the other hand, if the connection between rail and plate and between plate and tie is a firm, rigid connection, the wave motion of the rail lifts the plate and tie from the ballast, which is highly objectionable.

To overcome the objections just referred to I have designed various forms of plates provided with rail retaining devices for non-fixedly or yieldingly connecting the rail to the plate, by the use of which wave motion of the rail may take place without disturbing the connection between the plate and tie and without lifting of the plate and tie from the ballast. These constructions form the subject of my co-pending application filed May 22, 1931, Serial No. 532,201.

The subject of the present invention, namely the means for temporarily establishing a rigid connection between rail and plate, may be embodied in the various forms of plates which are shown in said co-pending application, only some of which have been shown in the drawings of the present application. Changes in details of plate constructions and of rail retaining devices may be made without departing from the scope of this invention.

Plates embodying the invention may be made of rolled steel, cast steel or cast iron and may be secured to the tie with cut spikes, screw spikes or bolts or both cut spikes and screw spikes or bolts.

I have chosen to embody the various forms of my invention in tie plates provided with flat tie bearing surfaces but obviously the bottom may be provided with transversely disposed ribs or with reinforced portions located at the stress points under the rail flange edges, or both, and the reinforced portion may be provided with a short rib depending from the reinforced or thickened portion and extending longitudinally thereof and parallel with the rail edges. Any desired bottom construction may be used but I prefer to embody my invention in plates wherein all ribs and reinforcing members on the plate bottom are formed with rounded non-fiber cutting edges.

In the drawings:

Fig. 1 is a plan view of one-half of a tie plate embodying my invention, showing part of a rail in position thereon.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a plan view similar to Fig. 1 showing a modified form of the invention.

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a plan view similar to Fig. 1, showing another modification of the invention.

Fig. 6 is a vertical section taken on the line 6—6 of Fig. 5.

Fig. 7 is a plan view showing another modification of the invention.

Fig. 8 is a vertical section through the plate of Fig. 7, showing the rail retaining devices in elevation.

In the drawings, the rail flange is indicated at 10, the tie plate at 11 and the tie at 12. A shim 13 made of treated compressed wood or fiber may be used between the rail and the plate. The plate 11 is provided on its rail bearing surface with a pair of transversely extending spaced apart shoulders 14, one at each side of the rail flange 10 and preferably located adjacent to and parallel with

the edges of the rail. The rail supporting surface between the shoulders 14 is shown as flat and canted but it may be provided with weight reducing grooves extending transversely of the plate and it may be cambered, or cambered and grooved, as desired.

Each shoulder 14 is provided wih a flange 15 formed on its upper portion. This flange 15 may be a horizontally disposed flange as shown in Figs. 1 to 4 inclusive or may be turned down into hook form.

A rail retaining device for non-fixedly or yieldingly holding the rail on the plate is associated with the shoulder 14—15, the same comprising a plate and shoulder engaging member 16 having an arm 17 overhanging the rail flange 10. The arm 17 fits over the top of the flange 15 and a depending rib 18 extends across the rail retaining device parallel with and located slightly above the rail flange 10. Toward its free end the arm 17 is grooved in its lower surface as indicated by the dotted line 19, the groove extending parallel with the rail and being adapted to accommodate a spring 20, the median portion of which bears against the grooved surface of the arm 17 and the ends 21 of which bear on the rail 10, by which rail creeping is retarded.

Normally the space between the surface 18 and the rail flange 10 permits wave motion of the rail to take place without disturbing the position of the plate 11 or loosening the spikes or bolts by which the plate may be fastened to the tie 12, and without lifting the plate and tie from the ballast. However, when it is desired to raise the track, that is, to raise the rail, plate and tie, as a unit, by jacking up the rail between the ties, it is highly desirable to eliminate the space between the rail retaining device and the rail flange and to convert the yielding connection between rail and plate into a rigid non-yielding connection. This result I accomplish by inserting a wedge 21 between the part 18 and rail flange 10. The wedge may be an ordinary cut spike or other suitable device which may be easily removed when it is desired to restore the track to normal position.

The rail retaining device 16 is preferably provided with a stud 22 adapted to be forced into the recess 23 in the shoulder flange 15 to prevent movement of the device longitudinally of the shoulder 14.

In Figs. 3 and 4, parts similar to those just described have been designated by the same numbers. In this modification the overhanging arm 17 is not grooved and the spring 20 has been eliminated. The space 24 between the rail flange 10 and the lower surface 25 of the arm 17 normally permits wave motion of the rail to take place without loosening the plate from the tie or lifting the plate and tie from the ballast, and when it is desired to raise the track as a whole by jacking up the rail, the wedge 21 may be inserted between the surface 25 and rail flange 10 as explained in connection with Figs. 1 and 2. The form of rail retaining device shown in Figs. 1 and 2 is preferred for the reason that the spring 20, bearing on the rail, effectively retards rail creeping. A coiled spring may be substituted for spring 20.

In Figs. 5 and 6, I have shown a plate 11 having formed thereon or fixed thereto at opposite sides of the rail base, a shoulder 30 with hook flange 31 and base 32. The shoulder 30, 31 may be integral with the plate in which case the base 32 may be dispensed with.

The shoulder 30 is provided with a horizontally disposed aperture 33 through which a spike or other wedge member 34 may be inserted as shown in Fig. 6. A rail retaining device is intended to be used in connection with the shoulder 30 and flange 31. The rail retaining device may be in the form of a rigid member such as shown in Figs. 2 and 4 heretofore described or may be made of spring metal as is the rail retaining device shown in Fig. 8. Regardless of the precise form of rail retaining device which may be adopted for use with the plate of Figs. 5 and 6, the normal connection between rail and plate will be a non-fixed or yielding one to accommoadte wave motion of the rail without injury to the track, and when it is desired to establish a rigid connection between rail and plate for the purpose of raising the track by jacking up the rail, then a spike or wedge 34 is inserted through the aperture 33, the end of the wedge bearing on the rail flange 10 and the head of the spike or wedge bearing on the plate 11 as shown in Fig. 6.

In Figs. 7 and 8 the plate 11 has been provided with a shoulder 35 formed with a hook flange 36, and a base 37, fixedly secured to the plate 11. The hook flange 36 is of less width than the shoulder 35 and base 37 and at the side of said member 36 the shoulder 35 extends upwardly to form an ear indicated at 38. The ear 38 is provide with an aperture 39 through which a spike or wedge member 40 may be inserted when a rigid connection of rail to plate is desired.

The rail retaining device shown in this modification is a strip of spring metal bent to provide a rail bearing arm 41, a plate bearing arm 42 and an intermediate curved portion 43 joined to the plate bearing arm by a sharply curved member 44 which bears against the flange 36. This retaining device provides the normal yielding connection between rail and plate which is desirable for accommodating the wave motion of the rail. When it is desired to convert this yielding connection into a rigid one, the spike or

wedge 40 is inserted through the apertured ear 38, with its end bearing on the rail flange 10 and its head bearing on the plate 11. The plate 11 may be provided with a rail abutting shoulder 45 if desired.

Changes may be made in details of construction without departing from the scope of my invention and I do not intend to be limited to the exact form shown and described except as set forth in the appended claims.

I claim—

1. In a railway tie plate, the combination of rail retaining means for normally non-fixedly holding a rail on the plate and means for rigidly holding the rail and plate together.

2. A railway tie plate having a transversely extending shoulder at each side of its rail bearing surface, a rail retaining device in engagement with said shoulder for normally non-fixedly holding the rail on the plate, and removable means for rigidly holding the plate and rail together.

3. A railway tie plate having a transversely extending shoulder at each side of its rail bearing surface, a rail retaining device in engagement with said shoulder for normally non-fixedly holding the rail on the plate, and removable means associated with said shoulder for rigidly holding the plate and rail together.

4. A railway tie plate provided at each side of its rail bearing surface with an apertured shoulder extending transversely of the plate and parallel to the rail edge, a rail retaining device mounted on said shoulder for yieldingly connecting the rail to the plate and a removable wedge member adapted to be inserted through said apertured shoulder for rigidly holding the rail and plate together.

5. A railway tie plate provided on its rail bearing surface with a transversely extending rail abutting shoulder at each side of the rail seat, a flange formed on the shoulder, an apertured ear extending upwardly from the shoulder adjacent the flange, a rail retaining device mounted on the flange and a wedge member extending through said apertured ear in engagement with the rail flange and the top of the plate.

6. A railway tie plate provided at each side of its rail bearing surface with a transversely extending shoulder, a flange formed on the upper part of said shoulder, a rail retaining device mounted on said flanged shoulder for non-fixedly holding the rail on the plate, and removable means between the rail retaining device and the rail flange for rigidly holding the rail and plate together.

7. A railway tie plate provided at each side of its rail bearing surface with a transversely extending shoulder, a flange formed on the upper part of said shoulder, a rail retaining device mounted on said flanged shoulder for non-fixedly holding the rail on the plate, said rail retaining device having an arm overhanging and spaced from the rail flange, and a wedge adapted for insertion between the overhanging arm and the rail flange.

8. A railway tie plate provided at each side of its rail bearing surface with a transversely extending shoulder, a flange formed on the upper part of said shoulder, a rail retaining device mounted on said flanged shoulder for non-fixedly holding the rail on the plate, said rail retaining device having an arm overhanging and spaced from the rail flange, a spring between the arm and the rail flange, and a wedge adapted for insertion between the overhanging arm and the rail flange.

In testimony, that I, claim the foregoing as my invention, I affix my signature, this 16th day of May, 1931.

GEORGE T. WILLARD.