A. MORRISON.

RAILWAY TIE PLATE.

APPLICATION FILED FEB. 1, 1910.

961,517.

Patented June 14, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

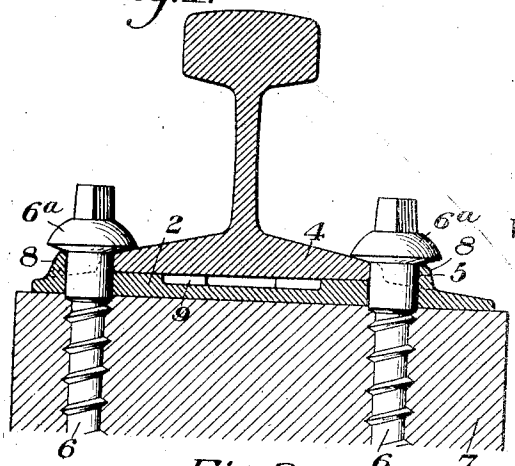


Fig. 2.

Fig. 5.

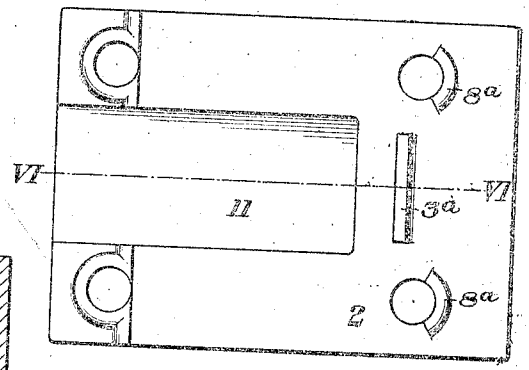
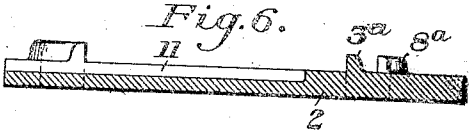


Fig. 6.



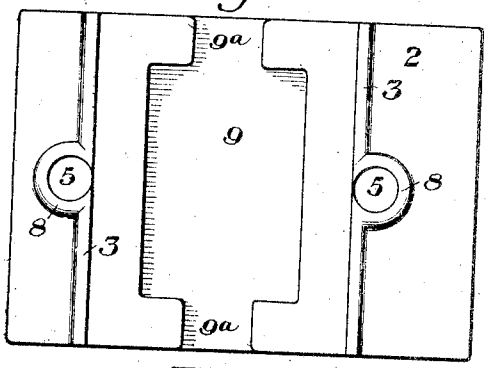
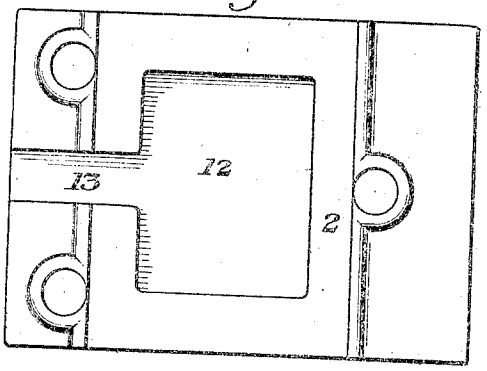


Fig. 3.

Fig. 7.



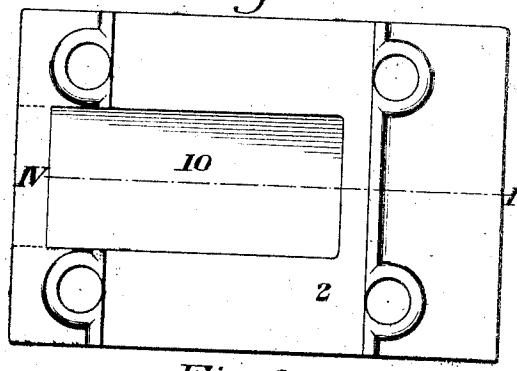
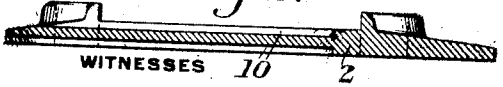


Fig. 4.

Fig. 8.



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3 SHEETS—SHEET 2.

Fig. 9.

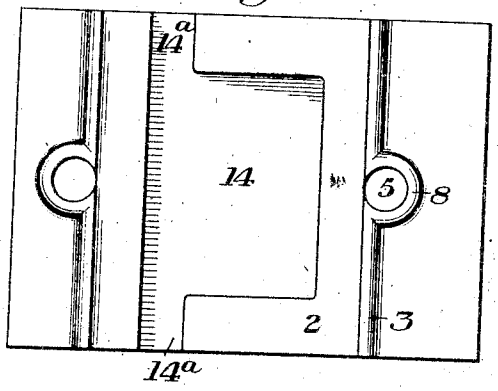


Fig. 12.

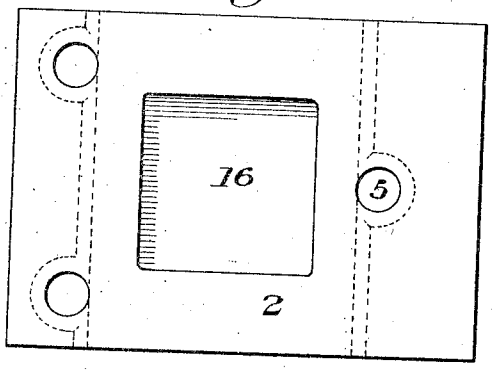


Fig. 10.

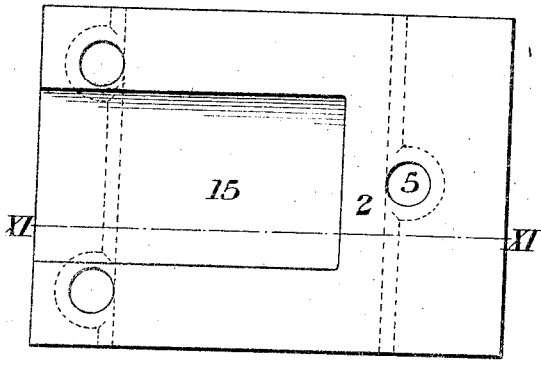


Fig. 13.

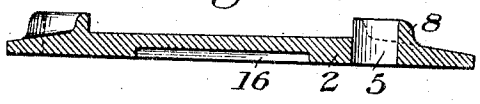


Fig. 14.

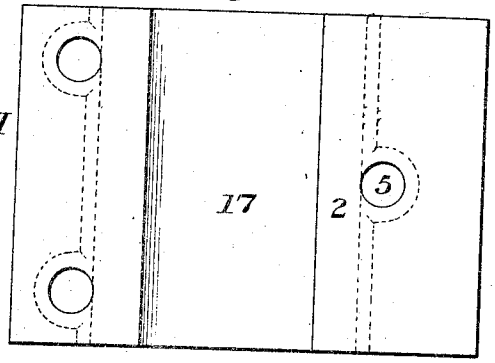


Fig. 11.

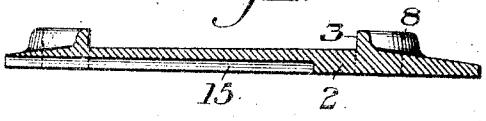
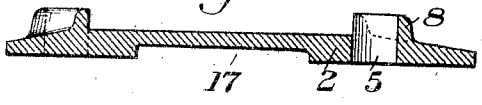


Fig. 15.



WITNESSES

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3 SHEETS—SHEET 3.

Fig. 16.

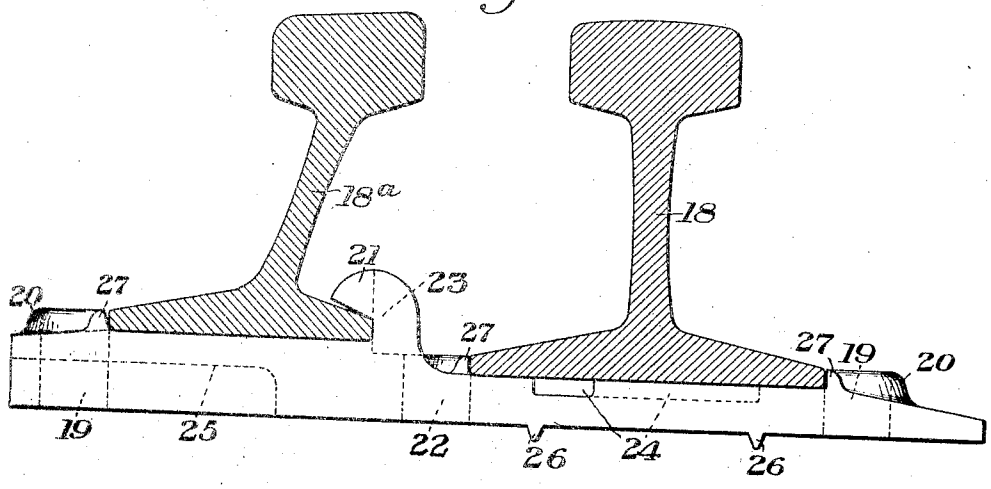
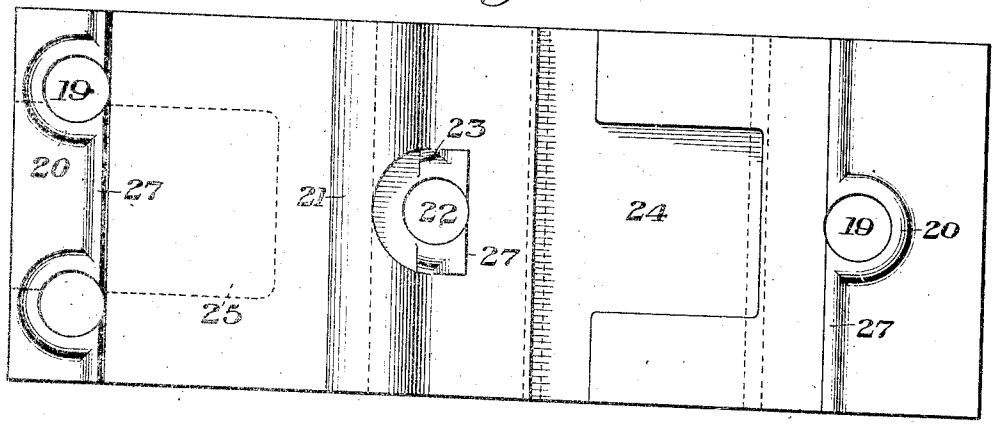


Fig. 17.



WITNESSES

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RAILWAY-TIE PLATE.

961,517. Specification of Letters Patent. Patented June 14, 1910.

Application filed February 1, 1910. Serial No. 541,232.

To all whom it may concern:

Be it known that I, ANDREW MORRISON, a resident of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Railway-Tie Plates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional view showing my invention applied to a rail; Fig. 2 is a top plan view of the tie plate shown in Fig. 1; Fig. 3 is a similar view showing another form; Fig. 4 is a section on the line IV—IV of Fig. 3; Fig. 5 is a top plan view of another form of plate; Fig. 6 is a section on the line VI—VI of Fig. 5; Figs. 7 and 8 are views similar respectively to Figs. 5 and 6, but showing another modification; Fig. 9 is a top plan view showing still another form; Fig. 10 is a bottom plan view of another form; Fig. 11 is a section on the line XI—XI of Fig. 10; Figs. 12 and 13 are views similar respectively to Figs. 10 and 11 showing another form; and Figs. 14 and 15 are similar views showing still another form; and Fig. 16 is a transverse vertical section illustrating my invention as applied to a guard rail tie plate; and Fig. 17 is a plan view of the said tie plate.

My invention has relation to railway tie plates, and more particularly to tie plates which are intended for use with screw-threaded spikes as distinguished from ordinary driven spikes, although some of the features of my improved tie plate are applicable to plates which are secured by ordinary driven spikes.

An object of my invention is to provide a tie plate having novel and efficient means for holding the screw spikes, which will prevent their spreading or backing away from the rails, and which will permit of the heads taking a proper gripping bearing upon the base flanges of the rails, notwithstanding variations in the thickness of such flanges.

A further object of my invention is to provide a tie plate in which the amount of metal required for their construction is materially reduced without in any way weakening the plate or impairing its efficiency, the reduction being made at portions of the plate which are largely neutral in service, and where the reduction of metal is without effect upon the efficiency.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown various modifications thereof, it being premised, however, that these are illustrative only, and that other modifications may be made within the spirit and scope of the appended claims.

Referring first to the form of tie plate shown in Figs. 1 and 2, the numeral 2 designates the plate, which is formed on its upper surface with the parallel, transversely extending, ribs or flanges 3, between which seats the base 4 of the track rail. 5 designates holes formed through the plate adjacent to each of the ribs or flanges 3 for the purpose of receiving the securing screw spikes 6, which enter the wooden tie 7. The holes 5 are provided with the surrounding raised flanges 8, which are of less exterior diameter than the diameter of the head 6^a of the screw spike 6. These flanges are preferably of a height slightly less than the standard thickness of the outer edges of the rail bases, so as to insure a proper bearing of the head 6^a upon the rail bases and to allow for some wear in service. The flanges 8 are of sufficient height to form a proper bearing for the screw spikes which will prevent their backing away from the rails, or spreading so as to leave the rail improperly secured. The flanges are shown as being of substantially the same height as the transversely extending ribs or flanges 3 or 3^a, which is preferred, inasmuch as it gives a maximum support for the shank of the spike without being sufficiently high to support the head. The upper edge portions of these flanges are also preferably beveled so as to reduce their thickness. This makes it easy in driving or redriving a spike in case the flanges should project slightly too high to enable them to be readily crushed or flattened down so as not to interfere with driving the spike down to take a secure grip on the flange of the rail.

It has been proposed heretofore to provide

a tie plate having a plurality of grooves for the purpose of reducing the amount of metal required, these grooves being distributed at intervals over the area of the plate. The end portions of the plates, however, are the portions which sustain the greatest stresses in service, and which should be weakened to the least extent, while the central portions of the plates can be reduced in thickness to a considerable extent without in any way impairing their efficiency. In accordance with my invention, therefore, I provide in either the top or the bottom surface of the plates, or in both top and bottom surfaces, a single recess the major portion of which is centrally located, and which leaves the end portions of the plates of full thickness and unimpaired strength. In Figs. 1 and 2 this recess is shown at 9. It is also shown as having relatively narrow end portions 9^a extending to the sides of the plates. The purpose of narrowing up the end portions of the recess is to give the rail a maximum bearing at opposite sides of the plates, while at the same time providing for as large a reduction of metal as is practicable.

In the form of the invention shown in Figs. 3 and 4, the metal reducing recess 10, instead of extending transversely of the plate, extends longitudinally thereof and opens at one end of the plate. The major portion of the area of this recess, however, is at the central portion of the plate. In this form I have also shown the plates provided with four spike holes instead of two. It will be obvious, however, that in all of the forms which I have shown, I do not limit myself to any particular number of spike holes.

In the form shown in Figs. 5 and 6, the plate instead of being of reduced thickness at its end portions, as shown in the preceding figures, is of full thickness throughout except where reduced by the recess 11, which corresponds to the recess 10 of Fig. 3. In this form I have also shown the flanges 8^a surrounding two of the spike holes as being of segmental form, and have shown a short transverse rib 3^a intermediate of said spike holes, instead of a rib extending from edge to edge of the plate as in the preceding figures.

In the form shown in Figs. 7 and 8, the plate has three spike holes similar to those shown in Figs. 1, 2, 3 and 4, and has a large central recess 12 in its upper surface, with a relatively narrow neck portion 13 extending therefrom to one end of the plate.

In the form shown in Fig. 9, the recess 14 is generally the same in form and arrangement as the recess 9 shown in Fig. 2, but the narrow portions 14^a leading to the said edges of the plates, instead of leading from the central portion of the recess lead from one side thereof, the purpose of this arrangement being to bring these portions of the grooves to one side of the central line of the rail and to give a maximum amount of metal underneath the web of the rail without diminishing the size of the recess.

The form shown in Figs. 10 and 11 is similar to that shown in Figs. 3 and 4, except that the recess 15 is formed in the bottom surface of the plate instead of in the upper surface, and only three spike holes are illustrated.

In Figs. 12 and 13 I have shown another arrangement of the bottom recess, indicated at 16, which is similar to the top recess 12 shown in Fig. 7, but which does not open to either the end or side edge of the plate.

Figs. 14 and 15 show a plate having a bottom recess 17 of uniform width extending transversely across the central portion of the plate.

In Figs. 16 and 17 I have shown my invention applied to a guard rail tie plate; that is to say, to a tie plate which is of sufficient length to extend underneath both a track rail 18 and a guard rail 18^a. This tie plate is shown as provided with spike holes 19 surrounded by flanges 20 of the character previously described, and also having a transversely extending lip 21 to engage the inner base flange of the guard rail. This lip has a central spike hole 22 with short upwardly extending segmental flanges 23 at opposite sides thereof.

In the upper surface of the tie plate underneath the main rail 18 I have shown a weight-reducing depression 24 of the form illustrated in Fig. 9; and in the under side of the tie plate underneath the guard rail 18^a I have shown a weight reducing recess 25 of the form shown in Figs. 3 and 4. Inasmuch as the major portion of the load on the tie plate comes through the main rail 18, while the load transmitted through the guard rail 18^a is comparatively light, it is desirable that the end of the tie plate underneath the rail 18 shall have a greater tie-bearing area than the portion which is underneath the guard rail. This tends to equalize the extent to which the tie plate will embed or seat itself in the wooden tie. If the bearing surfaces of the two ends of the plate were substantially equal, the end supporting the main rail 18 would tend to embed itself deeper in the tie than the opposite end. This tendency is corrected by the weight-reducing recess 25 being located in the under side of the plate while the weight-reducing recess 24 is located in the top surface of the plate. The end of the plate underneath the main rail is also preferably provided with the adhesion ribs or

flanges 26. The upper surface of the plate is provided with the three transverse rail-seating shoulders or flanges 27.

The drawings show the tie plate considerably thicker at the end which is underneath the guard rail than at the opposite end. This, however, is incidental and due to the fact that the guard rail section employed is of a less height than the main rail and a thicker tie plate is used in order to properly elevate the guard rail. If a higher guard rail is employed, the tie plate may be of uniform thickness, except for the weight-reducing recesses; or the guard rail may be elevated in various other ways. There is, however, an advantage in using a tie plate of the form shown, inasmuch as the natural breaking point of such a plate is adjacent to the lip 21, and by using a plate which is thicker at this end, the strength of the plate at the breaking point is materially increased.

A further advantage due to the provision of the recesses in the upper surfaces of the tie plate is, that such recess provides a clearance for sand and other dirt which works underneath the base of the rail, and thus largely reduces the wearing action between the rail and plate.

It will be readily understood that the forms of top recesses which I have shown may also be used on the bottom of the plate; and that the forms of the bottom recesses shown shall also be used on the upper surfaces of the plate; also that these recesses may be of other forms besides those shown, the essential feature being that in each case the recess shall operate to remove a maximum amount of metal from the central portion of the plate. The reduction of metal which is thus effected, is a very considerable item in the practical manufacture of these plates, and results in a considerable decrease in the manufacturing cost.

My invention is applicable to both cast and rolled tie plates, since the various forms of metal-reducing recesses and spike head bearings shown can be readily formed both by rolling and casting.

What I claim is:—

1. A railway tie plate having a transverse rail-bearing projection on its upper surface, and a spike hole in the line of the said projection, said hole having an upwardly projecting rim flange surrounding the rear but not the front portion thereof, said flange being of substantially the same height as the rail-bearing projection, said flange forming a bearing for the shank of the spike to prevent it from backing away from the rail but leaving the head of the spike practically unsupported thereby, substantially as described.

2. A railway tie plate having a transverse rail-bearing projection on its upper surface, and a spike hole in the line of the said projection, said hole having an upwardly projecting rim flange surrounding the rear but not the front portion thereof, said flange being of substantially the same height as the rail-bearing projection, said flange forming a bearing for the shank of the spike to prevent it from backing away from the rail but leaving the head of the spike practically unsupported thereby and having a beveled upper edge portion, substantially as described.

3. A railway tie plate, having a recess in one of its faces, the major portion of said recess being located at the portion of the plate which is centrally underneath the track rail, said recess being at least partially closed at its ends to provide increased rail bearing area where the rail comes upon and leaves the plate; substantially as described.

4. A railway tie plate, having a recess in one of its faces, the major portion of said recess being located at the portion of the plate which is centrally underneath the track rail, and provided with a relatively narrow drainage passage leading to an edge of the plate; substantially as described.

5. A railway tie plate, having a recess in one of its faces, the major portion of said recess being located at the portion of the plate which is centrally underneath the track rail, and provided with a relatively narrow drainage portion leading therefrom to an edge of the plate, said narrow drainage portion being at one side of the web of the rail; substantially as described.

6. A railway tie plate, having a recess in one of its faces, the major portion of said recess being located at the portion of the plate which is centrally underneath the track rail, and provided with relatively narrow drainage portions leading therefrom to opposite edges of the plate, said drainage portions being at one side of the web of the rail; substantially as described.

7. A railway tie plate having a portion to seat underneath the main rail, and another portion to seat underneath the guard rail, the portion underneath the main rail having a weight-reducing recess in its upper surface, and the portion underneath the guard rail having a weight-reducing recess in its lower surface; substantially as described.

8. A railway tie plate having a portion to seat underneath the main rail, and another portion to seat underneath the guard rail, the portion underneath the main rail having a weight-reducing recess in its upper surface, and the portion underneath the guard rail having a weight-reducing recess in its lower surface, that end portion of the plate which is underneath the guard rail being of

greater thickness than the other end portion; substantially as described.

9. A railway tie plate having a portion to seat underneath a main rail, and another portion to seat under a guard-rail, the portion underneath the main rail having a greater bearing area upon the tie and a less bearing surface for the base of the rail than the portion underneath the guard-rail; substantially as described.

In testimony whereof, I have hereunto set my hand.

ANDREW MORRISON.

Witnesses:
G. M. VIERS,
H. M. CORWIN.