E. F. DAVIS.

RAILWAY TIE.

APPLICATION FILED FEB. 19, 1908.

935,966. Patented Oct. 5, 1909.

Fig. 1

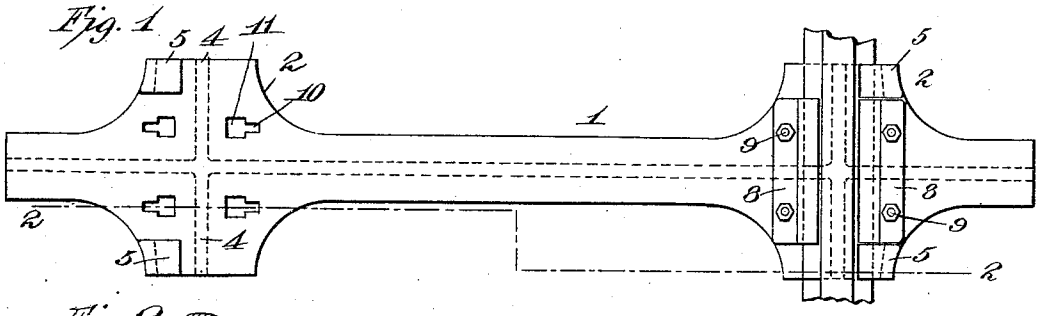


Fig. 2

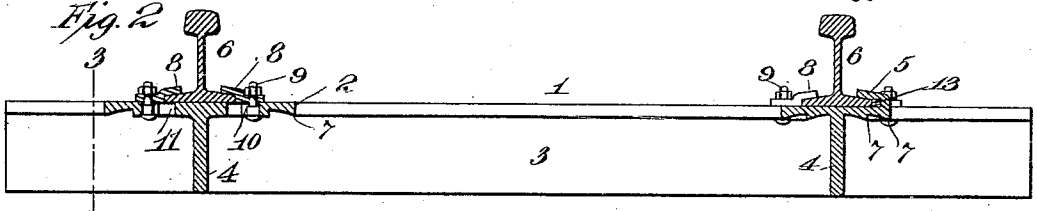


Fig. 3

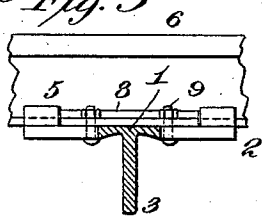


Fig. 4

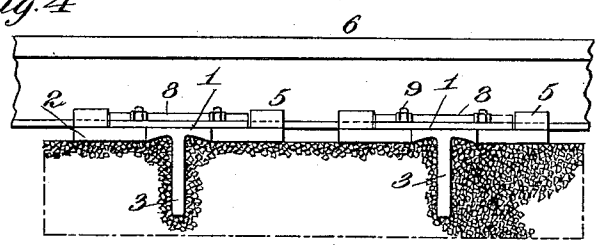


Fig. 5

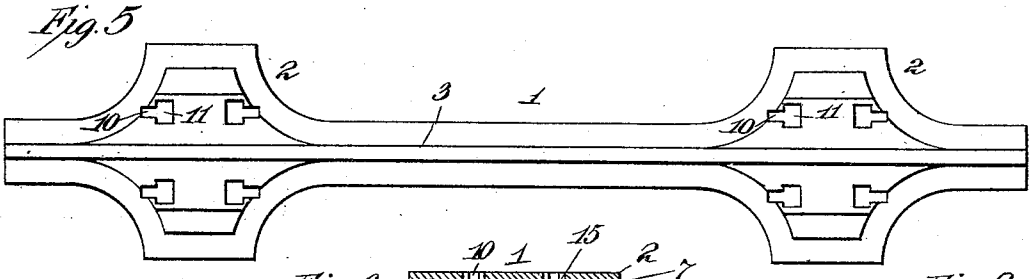


Fig. 6

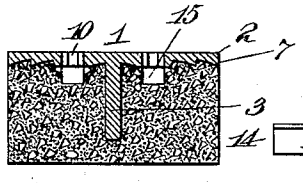


Fig. 8

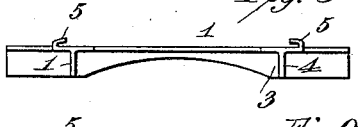


Fig. 7

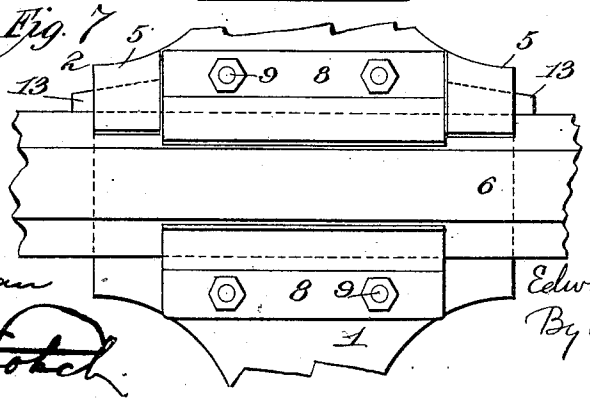
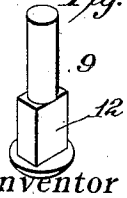


Fig. 9



Witnesses:

Jas. T. Coleman

John Tobel

Inventor

Edwin F. Davis

By Dyer & Dyer

Attorneys.

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C

UNITED STATES PATENT OFFICE.

EDWIN F. DAVIS, OF CORNING, NEW YORK.

RAILWAY-TIE.

935,966. Specification of Letters Patent. Patented Oct. 5, 1909.

Application filed February 19, 1908. Serial No. 416,723.

To all whom it may concern:

Be it known that I, EDWIN F. DAVIS, a citizen of the United States, and a resident of the city of Corning, county of Steuben, and State of New York, have invented a new and useful Railway-Tie, of which the following is a specification.

This invention relates to ties for railways.

The objects I have in view are to produce a tie which will be cheap to manufacture and of great durability.

Further objects are to produce a tie to which the rail may be secured with simple fastenings, in which the rail may be readily removed and the position of which may be adjusted to accommodate the expansion and contraction of the tie.

Further objects are to produce a tie against which the ballast may be readily tamped, and which will always remain in contact with the ballast irrespective of the vibrations of traffic upon the rails.

These and further objects appear from the following specification and accompanying drawings, considered together or separately.

Figure 1 is a plan view of a tie embodying my invention. Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1. Fig. 3 is a cross section on the line 3—3 of Fig. 2. Fig. 4 is a side view of two ties in connection with the rail. Fig. 5 is a bottom view of a modified tie. Fig. 6 is a cross section of a tie combined with a support of concrete, the tie serving as a reinforcement of the concrete and a support for the rail. Fig. 7 is a detail of the fastening. Fig. 8 is a side view of a modified form of tie; and Fig. 9 is a perspective view of one form of rail securing bolt.

In all of the views like parts are designated by the same reference characters.

The tie is made of metal either rolled or malleable. It comprises a plate 1, of suitable length and width, and of a thickness sufficient to give the necessary strength. The top of this plate is preferably flat and is widened at the points that the rails will rest upon, such widened portions being indicated by the character 2. This is for the purpose of giving a longer base for the rails to rest upon, and also to reduce the width of the middle of the tie, to secure reduced weight, greater cheapness, and above all, great elasticity. The plate is provided with a depending flange 3, extending preferably the full length of the tie, and of a depth and thickness to secure the necessary strength. This flange may be of uniform depth throughout its length, as shown in Fig. 2, or it may be of less depth in the middle, as shown in Fig. 8. The latter structure is preferred, as it gives the tie greater elasticity, approaching the elasticity of a wooden tie. One objection to metal ties is that they are too rigid and unyielding. My tie has no such objectionable features. The tie is also preferably provided with cross flanges 4—4 extending under the widened portions 2. These cross flanges impart greater strength to the tie, and also serve as a means to prevent the tie moving longitudinally upon the ballast. These cross flanges 4 may be omitted, as shown in Fig. 5. The widened portions of the plate are provided with ears or fingers 5—5, which are preferably integrally formed with the plate. These fingers are located, as shown in Fig. 1, so as to engage with the permanent definite abutment to prevent the outside flange of the rails 6—6, and form a rails from spreading.

So much of the tie as is described is best made of a single piece of metal which can be cast and annealed to be made malleable or may be rolled at moderate cost. This tie is adapted to be placed upon the usual ballast as ordinary ties are placed, or it may be placed upon a bed of concrete of the same length and width as the tie, thereby producing a concrete tie with a reinforced portion upon which the rail is supported. One of the important features of my invention, which I will now describe, relates to the means whereby the ballast may be tamped against the bottom of the plate and upon the sides of the flanges 3 and 4, in such a manner that it will not be loosened and will not be driven out by the hammering or pounding action of traffic upon the rails. This means in its simplest aspect consists in making the bottom face of the plate 1 serrated; that is to say, the plate is thicker at its edges than at a point nearer its middle. This is illustrated in Figs. 3 and 4. By this arrangement the material which constitutes the ballast may be tamped into the space below the top plate of the tie. Any vertical movement of the tie caused by the hammering action of traffic, instead of causing the ballast to move away from the tie, as is the condition of all other

ties with which I am familiar, causes the ballast to pack more solidly underneath the tie.

The cross section of the tie, shown in Fig. 3, is substantially the same throughout its length except the portions immediately coincident to the cross flanges 4. At these points, owing to the presence of the cross flanges, the bottom of the plate must necessarily be flat. This flat cross section, however, extends as short a distance as possible from the depending flange 3 and cross flanges 4. The bottom of the widened portions of the plate above the cross flange 4 are also best made serrated, as shown at the right of Fig. 2. The bottom of the plate 1 may be provided with ridges which are carried out on curved lines into the widened portions and are parallel with the outer edge of the plate. These ridges, shown at 7, in Fig. 2, are formed with inclined top walls and vertical inner edges, so that they have the same effect as the serrated surface adjacent to the flange 3. This is desirable when the width of the plate bears such a relation to the thickness of the plate that if but a single curved surface were used, it would not possess sufficient concavity if formed by curving the under surface of the plate, as shown in Fig. 2. Where the plate becomes wider adjacent to the points 2, the lower surface of the plate may be divided into ridges 7—7, as shown, and the desired degree of concavity thereby secured.

In connection with the tie already described, I provide a novel means for attaching the rail. This means comprises plates 8—8 which rest upon the plate 1 of the tie and also upon the flange of the rail 6. These plates are secured to the tie by bolts 9, the heads of the bolts lying below the tie and their upper extremities being set up with nuts against the plates 8. These bolts pass through oblong holes 10, each having an enlargement 11 for the passage of the bolt head. When the bolt is inserted from above, the head is passed through the opening 11 and the bolt is moved to one side so that the shank enters one of the holes 10 which are smaller than the heads. The shank of the bolt is provided with a portion 12 that is oblong in cross section, and of a width greater than the width of the holes 10, so that the bolt will not turn in the hole. The head of the bolt is small and rounded, so as not to obstruct the tamping of the ballast. The holes 10 may be elongated, as shown, so that the bolts may be moved to secure a certain amount of adjustment of the plates 8.

I prefer to have some space between the ears or fingers 5 and the flanges of the rail; in this space may lie a wedge or liner 13. The plate 8 lying between the ears 5—5 will serve as a means for preventing the wedges 13 from coming out. To remove these wedges it is first necessary to remove the plate 8. The purpose of the wedge 13 is to provide for the expansion and contraction of the tie. In cold weather the length of the tie is reduced, the gage of the tracks is also reduced. The wedge 13 is then removed and one of less depth than that for warm weather is substituted. These wedges may be conveniently changed by removing the plate 8 lying between the two ears 5. This makes it possible to withdraw a wedge and substitute one of greater or less depth if desired.

My improved tie may be used upon ordinary ballast or may be combined with a concrete base, as shown in Fig. 6. This concrete base 14 may be molded to any desired shape so that the requisite amount of material will be secured to secure the desired strength. The flanges 3 and 4 will rest within the mass of concrete and will adequately reinforce it. Small pockets 15 should be left in the concrete to accommodate the heads of the bolts 9.

In accordance with the provisions of the patent statutes, I have described the principle of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is merely illustrative and that the invention can be carried out in other ways.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A railway tie formed of a metal plate, the said plate being widened at the places that the rail rests upon, and having a continuous groove in its lower face, the groove extending out into the widened portion.

2. A railway tie formed of a metal plate, the said plate being widened at the places that the rail rests upon, and having continuous grooves extending along its lower face, the grooves extending out into the widened portion, and additional grooves in the widened portions.

3. A tie having integral ears to engage with the outside of the rail, in combination with a separate plate, bolts holding the plate between the ears, and in contact with the flanges of the rail, and a wedge between the plate and the ear, the said wedge being retained in position by engagement with the plate.

4. A metal tie formed of a plate upon which the rails rest with a longitudinal rib on the under side of the plate, the said rib being of less depth at the middle than at the ends, and the bottom of the plate being grooved parallel to the rib, the deepest part of the groove lying next the rib.

5. A metal tie formed of a plate upon which the rails rest, with a longitudinal rib

on the under side of the plate, grooves in the bottom of the plate parallel to the rib, a transverse rib on the under side of the plate, the grooves on the bottom of the plate extending parallel to the transverse rib, the deepest part of the groove lying next the rib.

6. A metal tie formed of a plate upon which the rails rest, with a longitudinal rib on the under side of the plate, grooves in the bottom of the plate parallel to the rib, a plurality of transverse ribs on the under side of the plate and grooves extending parallel to the transverse ribs, the deepest part of the grooves lying next the ribs.

7. A railway tie formed of a metal plate, the plate being widened near its ends to support the rails, and a continuous groove in the lower face of the plate, the bottom of the groove being inclined from the edge of the plate inward.

8. A railway tie formed of a metal plate, the plate being widened near its ends to support the rails, and with a plurality of continuous grooves along the lower surface of the plate at its edge, the bottoms of the grooves being inclined from the edges of the plate inward.

This specification signed and witnessed this fourth day of February, 1908.

EDWIN F. DAVIS.

Witnesses:
LEONARD H. DYER,
JOHN L. LOTSCH.