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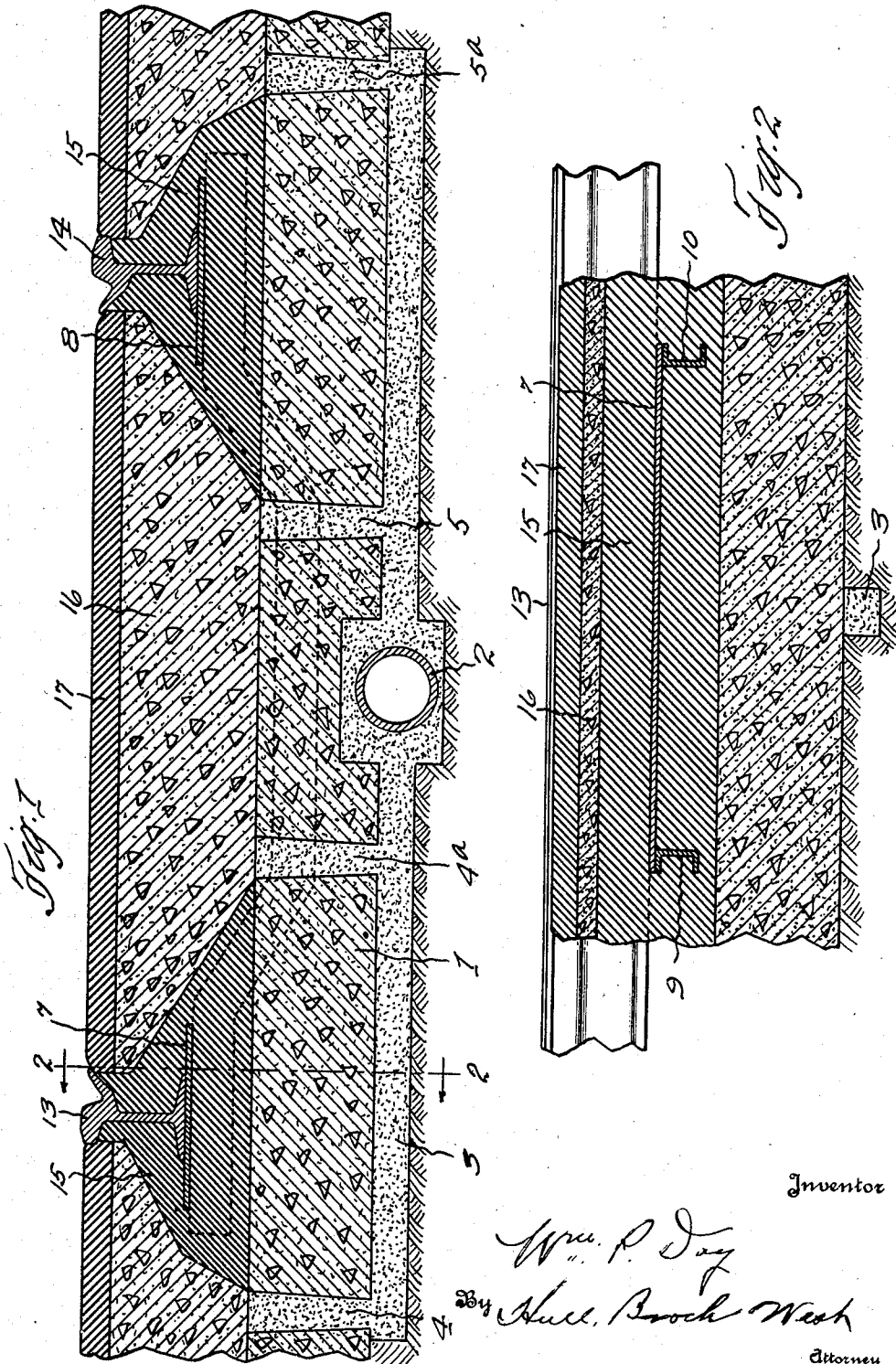
W. F. DAY

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ROADBED CONSTRUCTION FOR RAILWAYS

Filed July 15, 1929

2 Sheets-Sheet 1



Inventor

Wm. F. Day

By Hull, Brock Wash

Attorney

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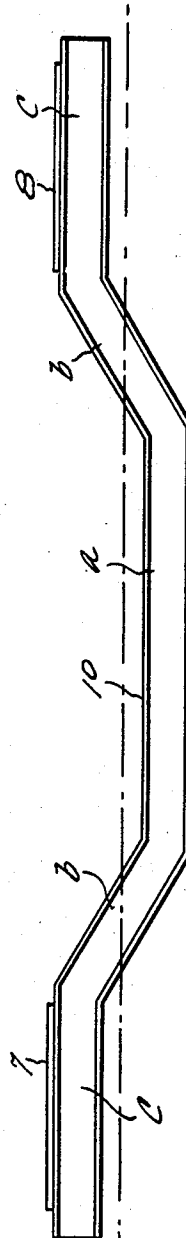
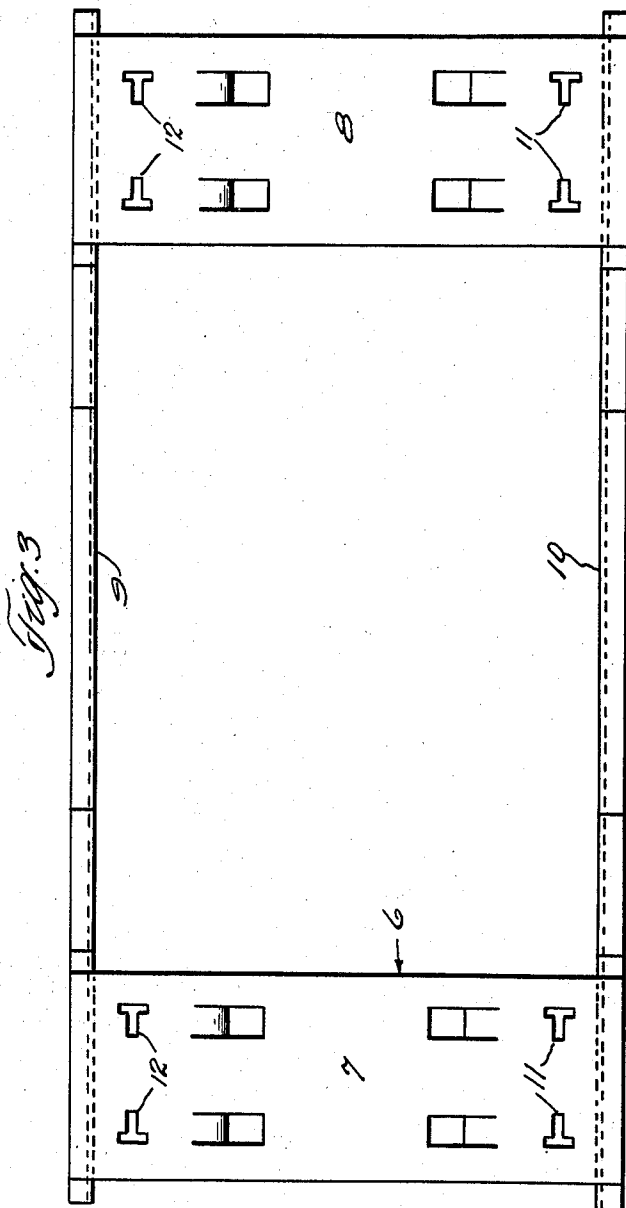
W. P. DAY

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ROADBED CONSTRUCTION FOR RAILWAYS

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2 Sheets-Sheet 2



Inventor

Wm. P. Day
By *Hull, Brock & West*
Attorneys

UNITED STATES PATENT OFFICE

WILLIAM P. DAY, OF CLEVELAND HEIGHTS, OHIO

ROADBED CONSTRUCTION FOR RAILWAYS

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This invention relates to a roadbed construction for street or boulevard railways and the main object of the invention is to provide a roadbed construction in which any water which may seep in around the rails will be drained away from the bases of the rails and prevented from collecting around the rail plates or the ends of the ties.

Another object of the invention is to provide a roadbed construction in which rails are supported upon a lower layer or foundation of concrete which is provided with drain openings which permit the water to drain away from the bases of the rails.

A further object of the invention is to provide a road bed construction of the character described which consists of a foundation of concrete which is provided with suitable drain openings for draining the water away from the rails and in which the upper portion of the roadbed is formed of one or more layers of road forming material which is readily removable to permit the rails to be removed for replacement or repair.

A further object of the invention is to provide a roadbed construction of the character described in which the bases of the rails and the rail plates to which the rails are secured are covered with a waterproofing material which will tend to direct the water away from the rails and into suitable drain openings.

A still further object of the invention is to provide a roadbed construction of the character described which consists of a concrete foundation on which are supported steel ties which are so shaped and arranged that the central portions of the ties are embedded in the concrete foundation and the end portions are deflected upwardly and disposed in a plane above the foundation.

Further and more limited objects of the invention will appear as the description proceeds and by reference to the accompanying drawing in which Fig. 1 is a vertical sectional view through the roadbed disclosing the preferred embodiment of my invention; Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1; Fig. 3 is a top plan view of one of the twin ties; and Fig. 4 is a view in end elevation of one of the twin ties.

Referring now to the drawings, the reference character 1 designates the bottom layer of concrete which will be referred to as the foundation. Disposed below the foundation and preferably between the rails is a drain conduit 2 which extends longitudinally of the track and practically parallel therewith. Arranged at intervals about three feet apart and extending transversely of the road-bed are trenches 3 from which lead branches 4, 4^a and 5, 5^a. The trenches 3 and the branches 4, 4^a and 5, 5^a are preferably filled with gravel, stone, cinders or other suitable material adapted to permit water to drain there-through and into the main drain conduit 2 which is preferably formed of drain tile. Supported upon the foundation are ties 6 which are preferably made of steel and are of the twin type. The ties consist essentially of rail plates 7 and 8 which are connected by cross beams or angle bars 9 and 10. The rail plates are provided with oppositely disposed pairs of T-shaped openings 11 and 12 which are adapted to receive tie clamps therein for securing the rails in place. The rail plates also have portions cut therefrom and bent downwardly as shown more clearly in Fig. 3, which portions are embedded in the road forming material when the construction is completed. Each of the angle bars or cross beams 9 and 10 are shaped as shown most clearly in Figs. 3 and 4 and consist of a central portion *a*, oppositely inclined portions *b* and end portions *c*. The central portions of the angle bars are preferably embedded in the concrete foundation as shown most clearly in Fig. 1. The end portions *c* are disposed in a plane above the foundation. The foundation is first laid with the rails arranged in the position shown in Fig. 1 and the concrete is allowed to harden and set. The spaces beneath the rail plates 7 and 8 are then filled with a waterproof material known as bituminous concrete and which consists essentially of slag and crude asphalt in approximately the following proportions:

3 parts fine slag, 2 parts coarse slag, 1 part crude asphalt. The rails 13 and 14 are secured to the rail plates by suitable tie clamps. The rail plates are also covered with bitumi-

nous concrete which extends upwardly along each rail to a point adjacent the top thereof. This material 15 is inclined toward the drain openings as shown most clearly in Fig. 1 so that any water which may seep in adjacent the rails will be deflected into the drain openings as hereinbefore described. After this layer of bituminous concrete has set, a second layer of concrete 16 may be applied up to about the level shown in Fig. 1. After this layer of material has set, a top layer 17 of surface material is applied and may consist of asphalt or any other suitable material. By reference to the drawing, it will be seen that these two layers of material completely fill the space between the rails and adjacent thereto so that only the tops of the rails are exposed. It is, of course, understood that one or more layers of material may be used for this purpose.

According to the preferred manner of forming this roadbed construction, I first provide a trench of suitable depth and which is slightly wider than the track. I then place within the trench the main drain conduit 2 which is preferably formed of drain tile. Suitable forms are then inserted to provide the trenches 3 and the branch drain openings or conduits 4, 4^a and 5, 5^a. The ties are then arranged in place and supported on suitable blocks with the rails secured thereto in a manner well known to those skilled in the art. The lower layer of concrete is then poured up to the level shown in Fig. 1 and allowed to harden and set. Due to the shape of the angle bars, the end portions of the ties will be disposed above the foundation. The spaces beneath the rail plates are then filled with bituminous concrete which is tamped into place. The rail plates and the bases of the rails are then covered with a layer of the same material which extends upwardly to a point near the top of the rails. The surface of this material is inclined so as to drain toward the branch drain conduits hereinbefore referred to. This material is allowed to set and the layer of concrete 16 is applied up to about the level indicated in Fig. 1 and allowed to harden and set. The layer of surface material 17 is then applied in the usual manner and may consist of asphalt, concrete or any other suitable material. By referring to the drawings, it will be seen that the branch drain conduits 4, 4^a and 5, 5^a extend only through the foundation and terminate along opposite sides of the rails adjacent the edges of the waterproof material. These drain openings are preferably about three feet apart and extend along both sides of the rails as shown. It will now be clear that any water which may seep in along the heads of the rails will strike the layer of bituminous concrete which is waterproof and be deflected into the branch drain openings 4, 4^a and 5, 5^a and drain through

the trench 3 into the main drain conduit 2.

It will also be clear that the upper layers of material, including the bituminous concrete, may be removed down to the foundation without disturbing the rails so as to permit the rails to be removed for replacement or repair without disturbing the foundation. It will now be clear that I have provided a roadbed construction which accomplishes the objects of the invention as hereinbefore stated.

Various changes may be made in the manner of assembling and arranging the various parts without departing from the spirit of the invention. My invention is also not limited to any particular type of road forming material either for the foundation or for the uppermost layers, and while I have in this specification used the term "concrete," it is to be understood that I do not intend by this term to limit the invention to any specific mixture of material, but rather to use the term generically as embracing all of that class of materials in which a suitable bonding material, such as cement or asphalt, is used in connection with gravel, stone, sand or similar material. It is therefore understood that the invention is limited only in accordance with the scope of the appended claims.

Having thus described my invention, what I claim is:

1. A roadbed construction for street or boulevard railways comprising a concrete foundation, a plurality of steel ties of the twin type having rail plates secured to the ends thereof, the central portions of said ties being embedded in the foundation and the end portions and rail plates being disposed in a plane above said foundation, rails secured to said rail plates respectively, a waterproof material filling the spaces beneath the rail plates and also covering the bases of the rails and extending upwardly along each rail to a point adjacent the top thereof, and road forming material filling the space between and adjacent said rails.

2. A roadbed construction for street or boulevard railways comprising a concrete foundation, a plurality of steel ties of the twin type having rail plates secured to the ends thereof, the central portions of said ties being embedded in the foundation and the end portions and rail plates being disposed in a plane above said foundation, rails secured to said rail plates respectively, a waterproof material filling the spaces beneath the rail plates and also covering the bases of the rails and extending upwardly along each rail to a point adjacent the top thereof, road forming material filling the space between and adjacent said rails, and a drain conduit disposed below said foundation and having a plurality of branches leading through the foundation and terminating along opposite sides of said rails.

3. A roadbed construction for street or boulevard railways comprising a concrete foundation, a plurality of steel ties of the twin type having rail plates secured to the ends thereof, the central portions of said ties being embedded in the foundation and the end portions and rail plates being disposed in a plane above said foundation, rails secured to said rail plates respectively, a waterproof material filling the spaces beneath the rail plates and also covering the bases of the rails and extending upwardly along each rail to a point adjacent the top thereof, and road forming material filling the space between and adjacent said rails, said waterproofing material consisting of bituminous asphalt. 70
4. A roadbed construction for street and boulevard railways comprising a concrete foundation, a plurality of steel ties the central portions of which are embedded in said foundation and end portions of which are disposed in a plane above said foundation, a pair of rails secured to said ties respectively, waterproof material filling the spaces beneath the end portions of said rails, said waterproofing material extending upwardly about each of said rails to a point adjacent the top thereof, and road forming material filling the space between and adjacent said rails. 75
5. A roadbed construction for street and boulevard railways comprising a concrete foundation, a plurality of steel ties the central portions of which are embedded in said foundation and end portions of which are disposed in a plane above said foundation, a pair of rails secured to said ties respectively, waterproof material filling the spaces beneath the ends of said ties and the bases of said rails, road forming material filling the space between and adjacent said rails, and a drain conduit extending along the track and having branches leading therefrom for draining water away from the rails. 80
- In testimony whereof, I hereunto affix my signature. 85
- WILLIAM P. DAY. 90
6. A roadbed construction for street and boulevard railways comprising a concrete foundation, a plurality of steel ties the central portions of which are embedded in said foundation and end portions of which are disposed in a plane above said foundation, a pair of rails secured to said ties respectively, waterproof material filling the spaces beneath the end portions of said rails, said waterproofing material extending upwardly about each of said rails to a point adjacent the top thereof, road forming material filling the space between and adjacent said rails, and a drain conduit disposed below said foundation and having a plurality of branches leading through the foundation and terminating along opposite sides of said rails. 95
7. A roadbed construction for street or boulevard railways comprising a concrete foundation, a plurality of steel ties the central portions of which are embedded in said foundation and end portions of which are disposed in a plane above said foundation, a pair of rails secured to said ties respectively, waterproof material filling the spaces beneath the end portions of said rails, said waterproofing material extending upwardly about each of said rails to a point adjacent the top thereof, and road forming material filling the space between and adjacent said rails, said waterproofing material consisting of bituminous asphalt. 100
8. A roadbed construction for street or boulevard railways comprising a concrete foundation, a plurality of cross ties the central portions of which rest on said foundation and the end portions of which are disposed in a plane above said foundation, a layer of waterproof material filling the spaces beneath the end portions of said ties, a pair of rails secured to said ties respectively, waterproof material filling the spaces beneath the ends of said ties and the bases of said rails, road forming material filling the space between and adjacent said rails, and a drain conduit extending along the track and having branches leading therefrom for draining water away from the rails. 105
- In testimony whereof, I hereunto affix my signature. 110
- WILLIAM P. DAY. 115
9. A roadbed construction for street and boulevard railways comprising a concrete foundation, a plurality of steel ties the central portions of which are embedded in said foundation and end portions of which are disposed in a plane above said foundation, a pair of rails secured to said ties respectively, waterproof material filling the spaces beneath the end portions of said rails, said waterproofing material extending upwardly about each of said rails to a point adjacent the top thereof, and road forming material filling the space between and adjacent said rails, said waterproofing material consisting of bituminous asphalt. 120
10. A roadbed construction for street and boulevard railways comprising a concrete foundation, a plurality of steel ties the central portions of which are embedded in said foundation and end portions of which are disposed in a plane above said foundation, a pair of rails secured to said ties respectively, waterproof material filling the spaces beneath the end portions of said rails, said waterproofing material extending upwardly about each of said rails to a point adjacent the top thereof, and road forming material filling the space between and adjacent said rails, said waterproofing material consisting of bituminous asphalt. 125
11. A roadbed construction for street and boulevard railways comprising a concrete foundation, a plurality of cross ties the cen- 130