Feb. 12, 1963 P. SPENCE 3,077,600

RAILROAD CROSSING

Filed April 19, 1960

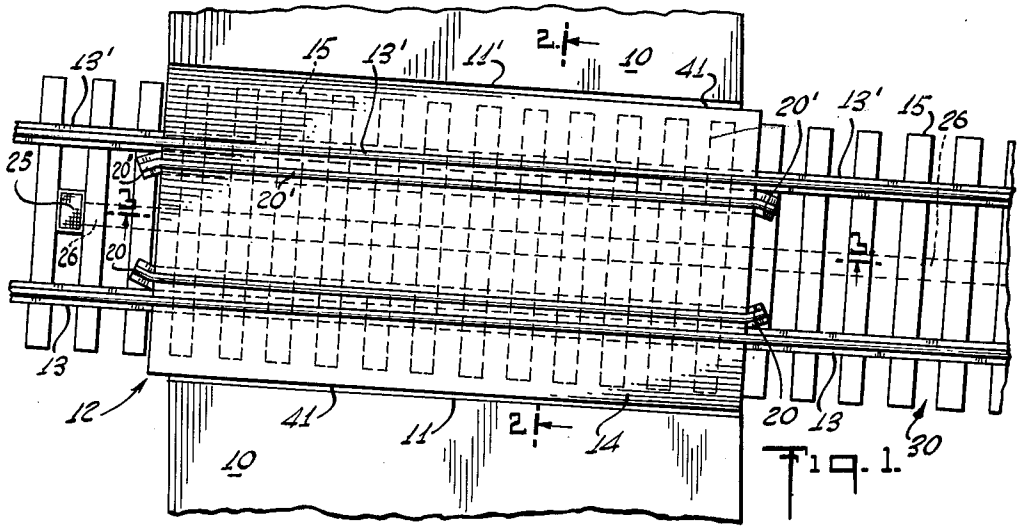


Fig. 1.

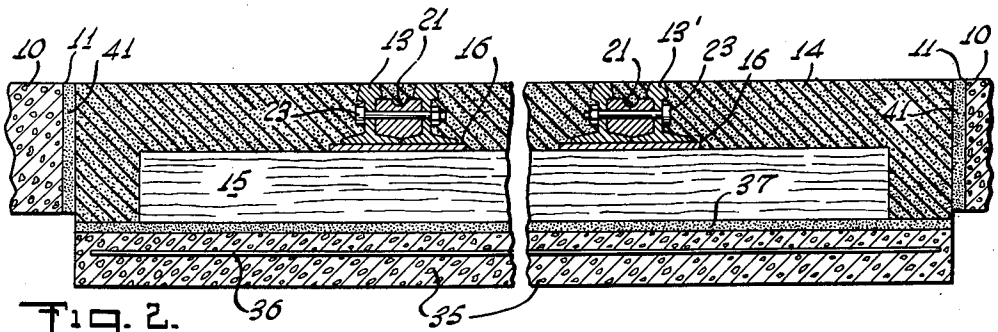


Fig. 2.

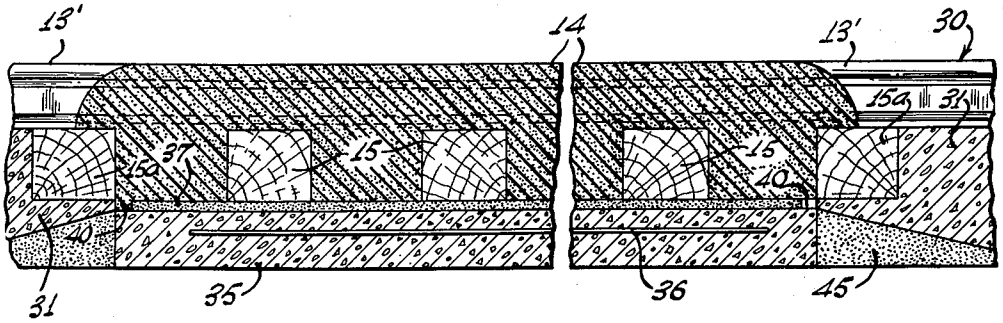


Fig. 3.

INVENTOR
PAULSEN SPENCE
BY
Mitchell & Bechert
ATTORNEYS

United States Patent Office 3,077,600 Patented Feb. 12, 1963

3,077,600

RAILROAD CROSSING

Paulsen Spence, P.O. Box 77, Baton Rouge, La.

Filed Apr. 19, 1960, Ser. No. 23,248
2 Claims. (Cl. 238—8)

The present invention relates to railroad crossings and has particular application to railroad-highway crossings.

Usually, the base of a railroad bed is constructed to be somewhat resilient to absorb and dampen the violent and variable pounding load forces caused by the hard wheels of a train. Suitable cushioning means such as dirt, sand, gravel, etc., are placed between the rail ties and the railroad base to provide a load absorbing and dampening effect, and this form of construction has proven to be satisfactory for this purpose.

However, such resilient railroad bed bases which are located at a highway crossing have not been entirely satisfactory due to the development of ruts and depresses and, also, humps and ridges. It has been proposed in the past to eliminate the unevenness in a road bed that develops at a highway crossing by providing a more rigid base at that point. This solution, at best, is only temporary because the forces of passing trains eventually cause a rigid base to crack and break up.

Accordingly, it is an object of the invention to provide an improved railroad-highway crossing.

Another object of the invention is to provide a railroad-highway crossing which will be sufficiently resilient to prevent deterioration by passing trains and sufficiently rigid to provide continuously smooth support for crossing vehicular traffic.

In one form of the invention, sand is used as the force dampening instrumentality and is distributed over a major portion of a reinforced concrete base. The peripheral edges of the sand area are set inwardly of the base edges to permit the tie and rail filler to form retainer lips around the perimeter of the sand area. Hot mix asphalt pavement is the preferred filler in that it is readily moldable and affords a slightly shiftable medium about the rails and ties for further absorption of the forces of a rolling train.

Further objects and advantages of the invention will be understood from a reading of the following description with reference to the accompanying drawings, in which:

FIG. 1 is a plan view of a railroad crossing constructed in accordance with the present invention;

FIG. 2 is a section taken along the line 2—2 of FIG. 1; and

FIG. 3 is a section taken along the line 3—3 of FIG. 1.

In FIG. 1 a concrete highway 10 is discontinued at borders 11 and 11' of a railroad crossing, designated generally by the numeral 12. Although the crossing is angularly disposed relative to the highway, its generally rectangular shape is kept substantially uniform for simplicity in the construction and for even distribution of rolling train forces through its structure.

The longitudinally extending parallel train rails 13 and 13' pass through the asphalt upper portion 14 of the crossing and are attached to the transversely disposed and longitudinally spaced wooden ties 15 via their connections (not shown) at the tie plates 16, shown only in FIG. 2. A pair of guard rails 20 and 20' run adjacent the inner edges of the rails 13 and 13', respectively, through the crossing upper portion with the opposing edges of the base flanges of the train rail and guard rail on either side of the crossing in abutting relation. The ends of the guard rails protrude at either end of the crossing and are bent inwardly of the train rails to prevent their outward bending and consequent obstruction

of the train wheel flange paths through the crossing. Stabilizer spacers 21 co-extend with the length of the crossing between the train and guard rails and have their peripheral surfaces abutting the opposing surfaces of the mating rails. Nut and bolt arrangements 23 secure the rail and spacer assemblies. The tie plates 16 extend transversely in the crossing upper portion to underlie the two rail assembly.

A grated entrance 25 to a pipe 26 which extends longitudinally beneath the crossing structure centrally thereof is shown to indicate the relative position of a grading drainage which is utilized to disperse collecting rain water away from the crossing structure. The drainage conduit extends from either end of hte crossing in the neutral ground 30 of the railroad bed. As shown in FIG. 3 only, the bed continues at the ends of the crossing in the form of a gravel or a slag ballast 31.

The foundation 35 of the crossing is a concrete slab reinforced by bars 36. The slab may be prefabricated or may be formed upon the ground, not shown, underlying the crossing. After the slab is placed in position, a layer of sand 37 is distributed over the upper surface of the slab. A one inch layer has been found to be sufficient to form a proper underlayer for the ties and to afford an adequate amount of shiftable material for redistribution underneath the ties for leveling the same. The area of the sand layer defines a width coextensive with the width of the foundation, and a length shorter than the length of the foundation. Thus, when the hot mix asphalt upper section of the crossing is first poured, retainer lips 40 are formed at the front and rear edges of the sand layer and the sand is restrained against redistribution due to rolling train forces in the longitudinal direction. Where lateral redistribution of the sand layer might be a problem, as where the crossing is at a curve in the railroad, retainer lips may be formed on either side edge of the sand layer in the same manner.

The sand underlying the ties effects a dampening of the violent rolling train vibrations received by the rails, and which would otherwise be received directly from the ties by the rigid concrete foundation. The utilization of asphalt as the tie and track filler carries through the characteristic resilience of the crossing of the invention and effects a further dissipation of the passing train forces within the crossing.

As seen in FIG. 2, sand is also used to fill the laterally spaced expansion joints 41 between the highway and the crossing at the upper portion thereof. Again, the shiftability or pliability of tampered sand is utilized for dampening the vibratory train effected forces. And this characteristic resiliency is also carried through at the ends of the crossing where the end ties 15A of the crossing halfway underlie the downwardly curved ends of the asphalt upper section and are supported by a comparatively thin wedge of neutral zone ballast which overlies the tampered upwardly inclined sand wedges 45 extending to the ends of the concrete foundation.

The crossing of the invention, therefore, provides shock insulation between it and the ground at its ends and the highway at its sides, as well as between the tie supported rails and the foundation. It should be understood that sand is not the only material which may be used to absorb the crossing forces. Rubber, for instance, or other resilient means may be used. The advantage of sand is that its shiftability is desirable in the tie leveling process during the construction of the crossing. The invention further provides a most rigid type of foundation while permitting a controlled and shock dampening resilient movement of the crossing upper portions in response to rolling train forces within the crossing.

Obvious modifications may be made of the specific construction shown and described herein without departing

from the spirit of the invention, the scope of which is to be limited only by the following claims.

What is claimed is:

1. A railroad crossing comprising

a rigid base,

said rigid base extending longitudinally and having an upper surface having peripheral dimensions substantially equal to that of said crossing,

a layer of distributable sand,

said layer of distributable sand having peripheral dimensions and surface areas substantially equal to that of said rigid base and being supported on said upper surface of said rigid base,

a plurality of rail ties,

said rail ties extending and being positioned directly on top of said layer of sand and being supported thereby,

parallel and transversely spaced train rails,

said train rails extending longitudinally on top of said ties and secured thereto,

and a relatively resilient hot mix asphalt filler interposed between said ties and said rails and being supported by said layer of sand between said ties,

said area of sand having peripheral edges spaced inwardly of said peripheral edges of said rigid base, whereby retainer lips are formed by said highway filler,

said retainer lips projecting downwardly adjacent said edges of said layer of sand.

2. A railroad crossing comprising

a rigid base,

said rigid base extending across the area of said crossing and having an upper surface having peripheral dimensions substantially equal to that of said crossing,

a layer of pliable material,

said layer of pliable material having peripheral dimensions substantially equal to that of said rigid base and being supported upon said upper surface of said rigid base,

a plurality of rail ties,

said rail ties extending transversely and being spaced longitudinally on top of said layer of pliable material and being supported thereby,

parallel and transversely spaced train rails,

said train rails extending longitudinally on top of said ties and secured thereto,

highway filler means interposed between said ties and said rails and being supported by said layer of pliable material between said ties,

said layer of pliable material having peripheral edges spaced inwardly to said peripheral edges of said rigid base, whereby retainer lips are formed by said highway filler,

said retainer lips projecting downwardly adjacent said edges of said pliable material.

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