Aug. 4, 1925. 1,548,057

D. C. MULVIHILL

RAILWAY GRADE CROSSING

Filed March 27, 1925 2 Sheets-Sheet 1

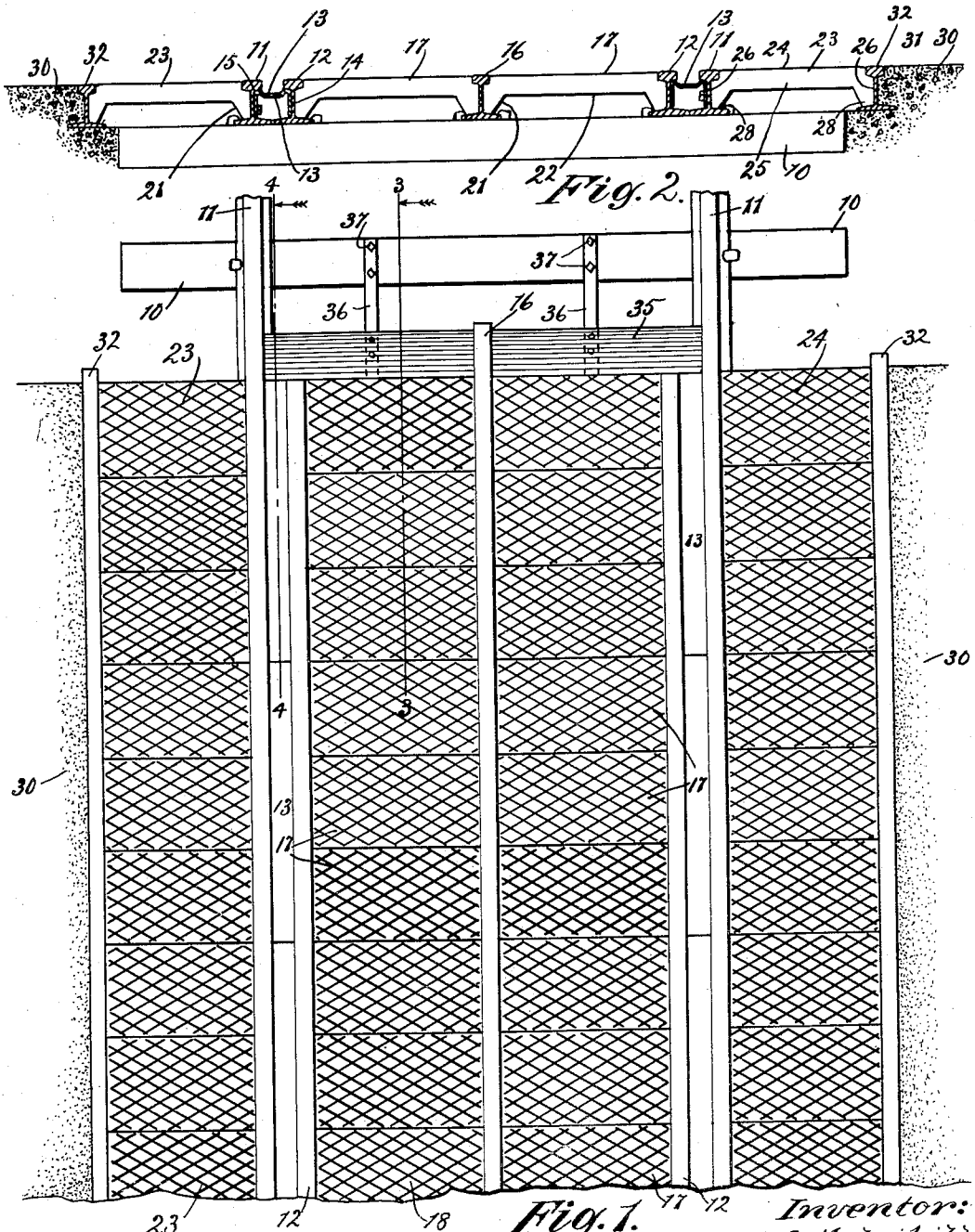


Fig. 2.

Fig. 1.

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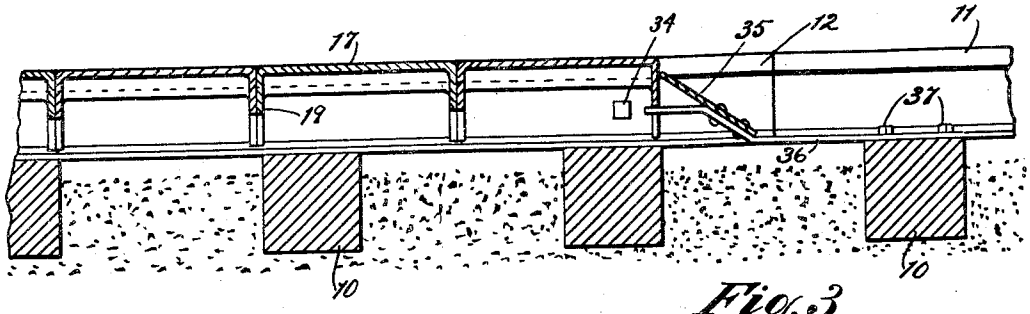


Fig. 3.

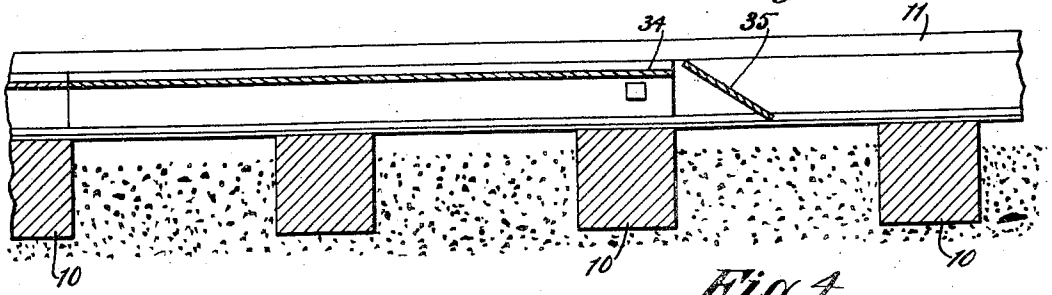


Fig. 4.

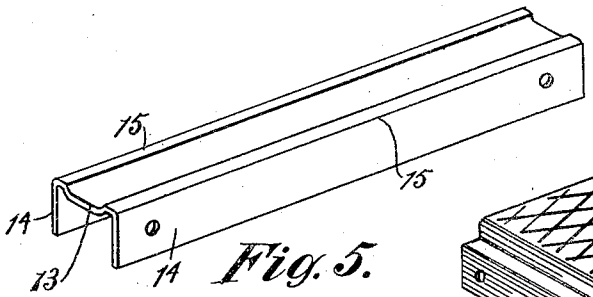


Fig. 5.

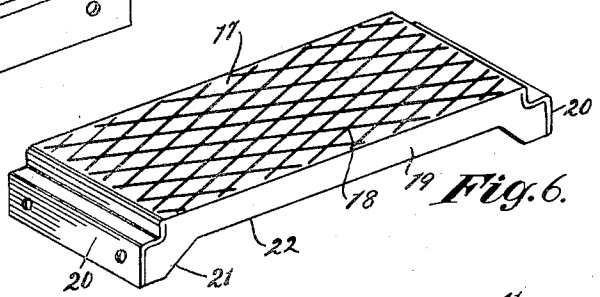


Fig. 6.

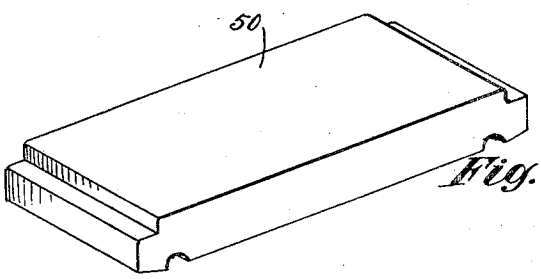


Fig. 7.

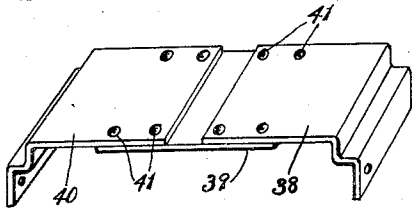


Fig. 8.

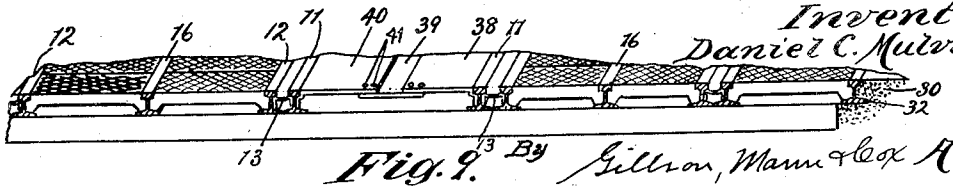


Fig. 9.

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UNITED STATES PATENT OFFICE.

DANIEL C. MULVIHILL, OF HANNIBAL, MISSOURI.

RAILWAY GRADE CROSSING.

Application filed March 27, 1925. Serial No. 18,678.

To all whom it may concern:

Be it known that I, DANIEL C. MULVIHILL, a citizen of the United States, and resident of Hannibal, county of Marion, and State of Missouri, have invented certain new and useful Improvements in Railway Grade Crossings, of which the following is a specification and which are illustrated in the accompanying drawings, forming a part thereof.

This invention relates to crossings of highways with railways at grade level, and has for its principal objects to provide a crossing structure that can be easily applied to the railway; that will readily accommodate itself to the conditions of both highway and railway service, and that can be readily applied and removed without injury to either the crossing or the railway.

Further objects and advantages of the invention will become apparent as the disclosure proceeds and the description is read in connection with the accompanying drawings illustrating a selected embodiment of the invention, and in which—

Fig. 1 is a partial plan view of a railway crossing embodying the invention;

Fig. 2 is a transverse section of such a crossing;

Figs. 3 and 4 are partial longitudinal sections taken on the lines 3—3 and 4—4 of Fig. 1;

Fig. 5 is a perspective view of a spacer used between the track rails and the guard rails;

Fig. 6 is a perspective view of a plate element used to form a roadway between the rails;

Fig. 7 is a perspective view of a wooden block that may be substituted for the plate elements, when desired;

Fig. 8 is a fragmentary perspective view showing a special plate for use at switch crossings or double track crossings;

Fig. 9 is a fragmentary perspective view showing a crossing with such a plate in use.

In the drawings 10 indicates cross ties to which the track rails 11 are secured in the usual manner. Guard rails 12 are laid on the ties between the track rails and secured in proper spaced relation to accommodate the flanges of the car wheels. Spacer and filler blocks 13 are preferably used between the track rails and guard rails. These are conveniently made of metal and substantially U-shaped in cross section. The sides 14 and the corners 15 of these blocks are preferably shaped to conform closely to the web and underside of the head of the rails. The intermediate portion of the blocks is curved downwardly to provide ample room for the wheel flanges. The presence of the blocks between the guard and track rails renders that space self-cleaning.

An intermediate rail 16 is secured to the ties between the guard rails. Both the guard and intermediate rails may be made of old track rails and are preferably of lighter section than the track rails, so that their heads may be at a slightly lower level than the heads of the track rails, thereby affording better clearance.

Between each guard rail and the intermediate rail are sets of plates 17, each of which comprises a flat body portion 18 (Fig. 6) having stiffening side flanges 19 and stepped end flanges 20, conforming closely to the shape of the web and head of the guard and intermediate rails. The stiffening flanges 19 are preferably cut away at 21 and 22. The cutting at 21 affords clearance for the heads of the spikes that secure the rails to the ties, and the cutting at 22 effects a considerable saving of metal.

With plates such as described the guard and intermediate rails may be laid on the ties and the plates inserted sidewise into position. Due to the shape of the end flanges the plates will be interlocked with the rails against movement either up or down, and one bolt 34 through the rails and the end plates of each set will be sufficient to hold the plates in place.

When the highway is made of concrete, or other masonry, it may terminate at the end of the ties 10 and be provided with a rail 32 similar to the guard and intermediate rails embedded in the concrete, as shown in Fig. 2. With such an arrangement, plates 23, similar to the plates 17, may be inserted between the track rails, and the rails 32, and held in place by the same bolts 34. By spacing the rails 32 from the track rails a distance equal to that between the guard rails 12 and the intermediate rails 16, the same plates may be used both inside and outside the track.

The interlocking relation between the plates and the rails permits the entire structure to flex readily as the track yields under the weight of passing trains, and yet prevents them from being sufficiently dis-

placed to effect the highway. The bolts 34 should fasten the end plates loosely so as to permit this flexure without strain either on the bolts or the plates. The outer ends of the side plates 23 can pivot freely with respect to the rails 32 and thus eliminate the strain that in most structures causes the adjacent portions of the highway to be rapidly broken and worn away.

This construction has a decided advantage over crossings where the elements are bolted or spiked to the ties, for the necessary flexure has a tendency to work the fastenings loose and the contact between the elements and the ties injures the latter both by direct pressure and by retaining moisture. The flexibility of this crossing eliminates springing and warping so common in the older crossings.

Where a wooden crossing is preferred the plates may be replaced by wooden blocks 50 shaped substantially as shown in Fig. 7, with the ends stepped to correspond with the ends 20 of the plates 17. These may, for example, be of oak four and one-quarter inches thick, twelve inches wide and twenty-four inches long. They can be inserted in the same way that the metal plates are and secured in place by bolts passing through the rail adjacent to the outer sides of the end blocks.

At each end of the crossing there is an inclined guard plate 35, provided with straps 36 spiked or bolted to a tie, as indicated at 37. Similar guard plates may also be located outwardly of the rails 11 as well as between the same. These guards serve to lift anything swinging from a passing train and prevent its catching against the end of the crossing.

When a crossing falls at a switch or at double tracks, the space between the adjacent track rails may be covered by a set of plates having the same general form as the plates 18, but made in three pieces 38, 39 and 40, to permit them to be readily fitted between the rails, as the distance between them varies. The plates 38 and 40 may be of standard construction and the plate 39 made of a width corresponding to the particular space to be covered, and secured to the plates 38 and 40 by bolts or rivets 41. The application of this structure is illustrated in Fig. 9.

I claim as my invention:

1. In a grade crossing, a track including cross ties with track rails and guard rails secured thereto, an intermediate rail between the guard rails, a set of plates between each guard rail and the intermediate rail, each plate comprising a flat body portion having stiffening flanges at its sides and stepped supporting flanges at its ends resting on the base flanges of the guard and intermediate rails, and means to secure the end plates of each set to the track.

2. In a grade crossing, a series of cross ties, a pair of side rails, an intermediate rail, a set of plates between each side rail and the intermediate rail, each comprising a flat body portion having stiffening flanges at its sides and stepped flanges at its ends resting on the base flanges of the side and intermediate rails, inclined guard plates at the ends of the crossing and straps secured to the cross ties and supporting the guard plates.

3. In a grade crossing, a track including cross ties with track rails and guard rails secured thereto, an intermediate rail between the guard rails, a set of plates between each guard rail and the intermediate rail, a pair of rails outside the track rails and spaced therefrom, a set of plates between each track rail and the corresponding outside rail, each said plate comprising a flat body portion having stiffening flanges at its sides and stepped supporting flanges at its ends resting on the base flanges of the rails and means to secure the end plates of each set to the track.

4. In a grade crossing, a series of cross ties, track rails, guard rails, an intermediate rail, a set of plates between each guard rail and the intermediate rail, each plate comprising a flat body portion having stiffening flanges at its sides and stepped supporting flanges at its ends resting on the base flanges of the guard and intermediate rails whereby the plates may be inserted between the rails and slid to position, and means for securing the end plates of each set to the rails.

5. In a grade crossing, a track including cross ties, a track rail secured thereto, a highway including masonry with a rail embedded therein at each side of the track rail, a set of plates between each track rail and the corresponding rail embedded in the masonry, and means to secure the end plates of each set to the track.

In testimony whereof I affix my signature.

DANIEL C. MULVIHILL.