A modular railroad grade crossing comprises in combination a railroad grade crossing base on which are superimposed rails and flangeway guards secured rigidly to the base and to each other.

2 Claims, 7 Drawing Figures
1 MODULAR RAILROAD GRADE CROSSING

BACKGROUND OF THE INVENTION

This invention pertains to railroad grade crossings. It pertains particularly to railroad grade crossings composed of modules which may be supplied as rigid, integrated units and employed in the assembly of railroad grade crossings of any desired width, gage, or degree of track curvature.

In the construction of railroad grade crossings, i.e., crossings of a highway or roadway across a railroad track, it is of primary importance to provide protection of the railroad car wheel flanges while at the same time providing a grade crossing enabling vehicles and pedestrians to cross the tracks safely. This objective is difficult of accomplishment, since it is inherent in the operation of the vehicles that they will fill with gravel and other debris the flangeways provided along the tracks for protecting the flanges of the car wheels. Also, where paving is employed in the crossing, the railroad car wheels tend to crumble the paving as they pass over the crossing, disintegrating the paved surface, and filling the flangeways.

Although many types of flangeway guards are known to the prior art, these have been used primarily for preventing derailment of the railroad cars as they cross the grade crossing and have not effectively overcome the above noted problems of filling the flangeways with debris and destroying the paving adjacent the flangeway guards and rails.

It accordingly is the general object of the present invention to provide a railroad grade crossing composed of prefabricatable modules which may be assembled into a crossing of any desired width, gage or degree of curvature and which, when assembled as a platform, is characterized by a high degree of rigidity and stability, and uniform bearing on the sub-grade ballast.

Further objects of the invention comprise the provision of a modular railroad grade crossing which protects the flanges of the wheels of passing railroad cars, which is provided with flangeways which are easy to clean and drain efficiently; which retains and protects the associated paving materials, particularly the margins of such paving materials adjacent the rails and flangeway guards; which is safe in that it includes flangeways of such a character as not to entrap the feet of pedestrians and the wheels of passing bicycles; which secures the rails against longitudinal movement so that they need not be welded; which assists in preventing derailment on curves; which may be prefabricated in a central location and readily installed at the grade crossing with minimum disruption of railroad and highway traffic; and which is durable and of long life.

Still another important object of the invention is the provision of a modular railroad grade crossing which is smooth and of neat appearance, and remains in this condition during its service life, with minimum maintenance.

SUMMARY OF THE INVENTION

The foregoing and other objects of the invention are accomplished by the provision of a modular railroad grade crossing which in essence comprises a railroad grade crossing base of railroad ties or cast concrete, and a pair of spaced parallel flangeway guards superimposed on the base. Each flangeway guard comprises an integral plate angularly shaped to provide a substantially horizontal, outwardly directed, base plate segment disposed flat on the upper surface of the grade crossing base; an upright rail guard segment; and an inwardly directed, substantially horizontal cap segment.

A pair of spaced, parallel railroad rails is superimposed on the base plate segments of the flangeway guards in substantially parallel, laterally spaced relation thereto. Bolts or other securing means secure one side of the base plate segments to the grade crossing base and one side of the rails to the base plate segments. Spikes or bolts secure the other side of the base plate segments to the grade crossing base and the other side of the rails to the base plate segments. A suitable paving material such as asphalt or concrete is poured in the space between the flangeway guards and outside the rails to provide a uniform surface which is retained and protected by both the flangeway guards and rails.

THE DRAWINGS

In the drawings:
FIG. 1 is a top perspective view of one of the modules of the hereindescribed modular railroad grade crossing.
FIG. 2 is a schematic plan view of the railroad grade crossing, composited from modules such as the module of FIG. 1;
FIG. 3 is an enlarged, fragmentary, detail, sectional view taken along line 3-3 of FIG. 1.
FIG. 4 is a fragmentary detail view taken along line 4-4 of FIG. 1.
FIG. 5 is a top perspective view illustrating a railroad grade crossing module in a second embodiment.
FIG. 6 is an enlarged, fragmentary, detail sectional view taken along line 6-6 of 5, and
FIG. 7 is an enlarged, fragmentary, sectional view illustrating the application of a wear strip to the flangeway guard components of the railroad grade crossing of my invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The modular railroad grade crossing of my invention is described in two illustrative embodiments, i.e., the embodiments of FIGS. 1-4 inclusive wherein use is made of a base consisting of wooden or concrete ties; and the embodiment of FIGS. 5 and 6 wherein use is made of a cast concrete base.

Considering first the embodiment of FIGS. 1-4:
A typical railroad grade crossing arrangement enabling the passage of automotive vehicles over the rails is illustrated schematically in FIG. 2. In this arrangement the highway 10 complete with center stripe 12 is crossed by railroad tracks 14 supported on ties 16 in the usual manner. The grade crossing comprises a plurality of grade crossing modules, indicated generally at 18, placed side by side with the flangeway guard components thereof butt welded endwise to each other.
Each of modules 18 includes a structural railroad grade crossing base comprising a plurality of parallel railroad ties 20. These may comprise the usual creosoted wood ties, or if preferred for certain applications, ties made of prestressed concrete.
Superimposed on base 20, transversely thereof, are a pair of spaced parallel flangeway guards indicated generally at 22. These important members of the hereindescribed railroad grade crossing assembly serve at least three important functions. First they serve the usual function of preventing the derailment of cars passing
over the crossing. Second, they serve a retaining function, retaining and capping paving material laid between the guards and preventing its spalling and disintegration during use. Third, when interlocked with the rails and base, they act as beams to give rigidity and stability to the module.

The structure of flangeway guards 22 is illustrated particularly in FIGS. 1 and 3. Each guard is made of an integral plate, angularly shaped, when viewed in transverse cross section, to provide a base 24 of sufficient extent to underlie rail 14; an upright segment 26 of sufficient height to reach the top of the rail and paving; and a cap segment 28 of sufficient length to overlie cap the margin of paving material adjacent the flangeway guard. Base segment 24 of the flangeway guard is directed outwards with respect to the grade crossing, while cap segment 28 thereof is directed inwardly of the crossing. Upright segment 26 is formed with a reverse bend at its lower portion. This provides a pocket of sufficient extent to accommodate a retaining bolt assembly.

Each flangeway guard is designed for positioning with base 24 underlying rail 14 with the rail a spaced distance laterally from the flangeway guard. This space, indicated at 30 of FIG. 3, provides a pocket of receiving the flanges of the railroad car wheels as the cars pass over the track.

Securing means are provided for interlocking the flangeway guards, rails, and base into a rigid, stable, structural assembly.

To this end, there are provided bolts 32 which penetrate openings in flangeway guard base 24 in the space between rail 14 and the upright segment 26 of the flangeway guard. The lower ends of the bolts have heads which engage clamping bars 34. The upper ends of the bolts mount nuts 36 which exert bearing pressure against spring clips 38. The latter are of conventional construction and bear against both the base of rail 14 and the base 24 of flangeway guard 22. The bolt assembly thus secures one side of the base plate segment to the grade crossing base and one side of the rail to the base plate segment.

Second securing means are provided which secure the other side of base plate segment 24 to the grade crossing base and the other side of rail 14 to the base plate 24. As illustrated in FIG. 3, such securing means comprises spikes 40 penetrating the outer margin of base plate segment 24 at longitudinally spaced intervals and having heads which overlie and bear against the outer portion of the base of rail 14.

Lugs 42 also are provided which further assist in positioning the rail on base plate segment 24, as illustrated in FIG. 4.

The space between flangeway guards 22 and the area outside of rails 14 is filled with paving 44. This may comprise a suitable grade of concrete or asphalt. It is poured in such a manner that it abuts against flangeway guard upright segment 26, which serves as a retaining wall for the paving, and beneath flangeway guard segment 28, which serves as a cap, thereby protecting the sensitive side and edge margins of the paving from spalling and degradation upon the passage of traffic over the crossing.

Preferably, a further quantity of paving 44 is poured in the space between rail 14 and flangeway guard 26. This is poured to such a depth, and contoured in such a manner, that it defines the longitudinal pocket 30 which receives the flange of the railway car wheel.

The embodiment of FIGS. 5 and 6 is similar to that above described with the exception that a precast concrete base is employed in place of the wood or concrete tie base.

Thus, as is shown in FIG. 5, the base 18a comprises a block of concrete of the desired dimensions contoured to form not only a base part 20a but also a sur-

facing or paving part 44a.

The side and top surfaces of parts 20a and 44a are contoured and recessed to form a seat for flangeway guard 22. This member of the assembly may be identical in construction and contour to that previously described. It supports rail 14 in the same laterally spaced relation as required to provide a flangeway.

The components of the assembly are interlocked by securing means which comprise identical concrete bolts assemblies indicated at 46.

These are of conventional construction. Each includes a nut 48 embedded in the concrete at spaced intervals along the length of base plate segment 24. Cooperating bolts 50 penetrate appropriately registering openings through the base plate segment and are threaded into the nuts. Conventional spring clips 52, which may be identical with clips 38 above described, are interposed in the assembly for bearing engagement with the base of rail 14 on both sides of the rail.

In this manner the assembly components are interlocked as required to lend the desired degree of integration, rigidity and stability.

In the assembly of FIGS. 5 and 6, a quantity of asphalt, or a further quantity of concrete, is poured in the area outside of rails 14 as well as in the pocket existing between the rail and flangeway guard. It serves the same purpose as the paving material employed in the same locations of the previously described embodiment.

In both embodiments, the surface of the rail projects slightly above the level of the top surface of the paving to prevent destruction of the latter upon passage of the cars, particularly those equipped with car wheels which have become concavely rounded through use.

As illustrated in FIG. 7, in both of the described embodiments of the invention there may be included a wear strip 54 welded to the arcuate surface present at the junction between upright segment 26 and cap segment 28 of the flangeway guard. This is particularly desirable on curves, where the flanges of the car wheels are thrown against the flangeway guard and in time would cause excessive wear.

Thus, by the present invention I have provided a railroad grade crossing which may be constructed in any desired form from appropriately placed modules. The finished crossing comprises an integrated, stable, structural unit in which the flangeway guards are bolted and spiked to a base in such a manner as to clamp the rails tightly, preventing any longitudinal movement. Accordingly, during use of the crossing the rails do not exert a pumping action which would result in mechanical damage to the paving. There is minimal subsidence and the pavement remains integral to the road surface over long periods of time.

Furthermore, the rails are locked to gage and creeping is prevented. This makes possible paving and molding the flangeways in such a manner that they drain efficiently and clean easily, insuring the desired result of
providing a railroad grade crossing which is neat in appearance, easily crossed by motor traffic, and non-destructive to the flanges of the wheels of railroad cars traversing the crossing.

Having thus described my invention in preferred embodiments, I claim:

1. A modular railroad grade crossing comprising in combination:
   a. a railroad grade crossing base,
   b. superimposed on the base a pair of spaced, parallel flangeway guards each comprising an integral plate angularly shaped in transverse cross section to provide
      1. a substantially horizontal outwardly directed base segment disposed flat on the upper surface of the grade crossing base,
      2. a reversely bent upright rail guard segment, and
      3. an inwardly directed substantially horizontal cap segment,
   c. a pair of spaced, parallel railroad rails superimposed on the base plate segments of the flangeway guards in substantially parallel laterally spaced relation thereto,
   d. first securing means securing one side of the base plate segments to the grade crossing base, and one side of the rails to the base plate segments.
   E. the reversely bent upright rail guard segment providing a pocket between the lower ends of the rail and guard segment for reception of said first securing means while spacing the upper end of the guard segment closer to the upper end of the rail for reception of the flange of the railroad car wheel,
   f. second securing means securing the other side of the base plate segments to the grade crossing base and the other side of the rails to the base plate segments, and
   g. paving material supported on the grade crossing base between the upright rail guard segments and beneath the cap segments of the railway guards by which the paving material is retained and capped, respectively.

2. The modular railroad grade crossing structural assembly of claim 1 wherein the grade crossing base comprises a plurality of wooden railroad ties, the first securing means comprise elongated bolts extending upward through the ties and openings in the base segment, the lower ends of the bolts having enlarged heads, and elongated clamping bars are interposed between said enlarged heads and the underside of the ties.

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