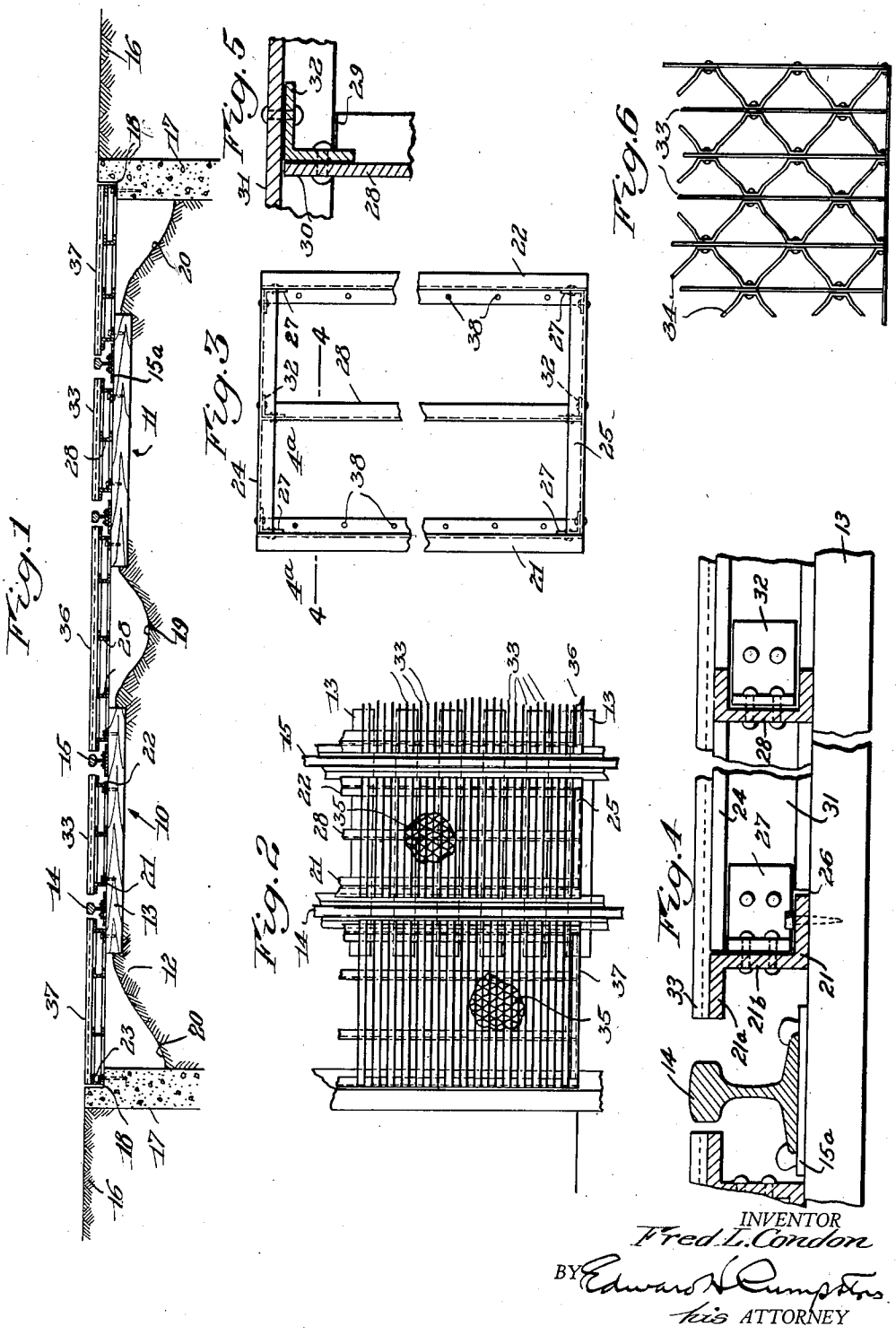
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RAILWAY CROSSING

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RAILWAY CROSSING

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This invention relates to railway road grade crossings and, more particularly, to units for surfacing a road adjacent and between the railway rails, one object of the invention being to provide an improved metallic, road surfacing unit for such crossings of a more practical and efficient character.

Another object is the provision of a crossing unit adapted to be fabricated of standard materials in a plant and readily assembled in place at the crossing.

Another object is to provide such a crossing unit adapted to be conveniently installed and removed for repairs, without disturbing the arrangement of the cross ties or rails of the railway, or interfering with the electrical circuits in which the rails may be connected.

Another object is the provision of a crossing unit of the above character adapted to be mainly supported on the existing cross ties of the railway without disturbing the grading or drainage arrangements of the railway bed.

Still a further object is the provision of a crossing unit having in combination with the above advantages an open or reticulated surface element for the road or highway which is self-draining and affords efficient traction for road vehicles.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a transverse sectional elevation of a double track railway and road crossing showing the invention applied thereto;

Fig. 2 is a top plan view of parts shown in Fig. 1 with details of the surfacing or decking portion omitted for clarity, except in circled areas;

Fig. 3 is an enlarged top plan view of the frame portion of one of the units before application thereto of the surfacing or decking portion;

Fig. 4 is an enlarged, sectional elevation of part of the frame portion on the line 4—4 in Fig. 3, and showing the same provided with a decking portion and applied to a part of the railway track.

Fig. 5 is an enlarged, sectional plan view of the sill and stringer connection shown in Fig. 3, and

Fig. 6 is an enlarged, fragmentary plan view of the surfacing or decking portion.

The invention is disclosed in the present instance, by way of illustration, as applied to a highway grade crossing over a double track railway and illustrating the adaptation of the invention both between the rails and at the approaches thereto. One of the railway tracks is indicated generally at 10 and the other at 11, the tracks being the same so that a description of one will apply to both. Track 10, for example, comprises a ballasted and graded road-bed 12 on which are laid the usual wooden cross ties 13. Rails 14 and 15 are spiked in the usual or any suitable manner to the cross ties, with interposed tie-plates 15a, as well understood in the art. The road or highway is indicated at 16, including at the approach to the tracks, on either side, a concrete abutment wall 17, preferably formed with a lower step 18, for a purpose hereafter described. The railway road-beds are formed with a drainage channel 19 between the tracks and with a similar channel 20 adjacent each approach abutment 17, as usual in such constructions.

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The units embodying the present invention are laid between the road abutments and the outer track rails and between the tracks and between the rails of each track, so as to provide the improved surfacing from one approach abutment of the road continuously across the tracks and to the other abutment, as shown.

Each unit has a self-contained, integral character of construction comprising, preferably, a pair of structural steel bars at opposite sides of the unit and adapted to form its main supports. At least one of said side bars 21 is of standard Z-bar shape, in cross section, while the opposite side bar may also be a Z-bar 22, or a standard channel bar 23, depending upon whether the unit is to be positioned between the rails or between the tracks and a road abutment, as more fully explained hereafter. Each unit comprises also a pair of sill bars, 24 and 25, of standard channel shape, connecting the opposite ends of the side bars (Figs. 3 and 4). The Z-bars are preferably arranged with their upper flanges 21a extending outwardly from the unit, and the sill bars preferably have their lower flanges 26 cut away to clear the inwardly extending lower flange of the Z-bars, as shown in Fig. 4. Angle brackets 27 are riveted to the webs 21b of the Z-bars and sill bars to rigidly connect them together, so that the sill bars are supported wholly by the Z-bars. The sill bars are preferably of the same height as the Z-bars, with the flanges at top and bottom of both elements lying flush with one another, as shown in Fig. 4.

The rectangular frame thus formed comprises

also one or more stringer bars 26, preferably of standard channel shape in cross section and of the same height as the sill bars and Z-bars. Each stringer bar is preferably arranged equidistant from and parallel with the side bars and has its ends connected with the sill bars 24 and 25. For this purpose, the flanges of the stringer bars are preferably cut away, as at 29 (Fig. 5), leaving the web portion of the bar extending adjacent the web portion 31 of the sill bar for connection therewith. Angle brackets 32 are riveted to these webs to rigidly connect the same, with the stringer bars thus supported at their ends on the sill bars and with the top and bottom surfaces of the stringer bar flanges lying substantially in the same plane as the corresponding flange surfaces of the Z-bars, so that all of the elements of the unit frame lie level or flush with one another on both its top and bottom sides.

Each unit is surfaced by a section of open or reticulated decking best shown in Fig. 6 of the drawings, which may be any one of several commercially available forms of such decking comprising, in the present instance, a series of continuous, spaced, parallel, steel carrying bars 33, of sufficient height and strength to support a substantial load or weight, these bars being preferably interconnected, as shown, by means of angular connecting or bracing bars 34. Such decking sections are made to correspond in size and shape with the framework units described above and are placed upon the units with the weight-bearing bars 33 extending transversely of and resting upon the side bars, 21, 22, and the stringer bar or bars 28 of the unit. The decking is secured in such position by any suitable means, being preferably welded at a number of points of contact so as to form a substantially integral and unitary part of the unit. For clearer illustration, only the bars 33 are shown in Fig. 2, except at the circled areas 35, where the connecting bars 34 are also shown, and it will be understood that the whole area of each unit is preferably surfaced by such decking.

The construction of the unit varies somewhat for the different areas to be covered. The construction described above, comprising Z-bars on opposite sides and a single stringer bar 28, is that preferred for use between the rails of each track. For surfacing the areas between the rails of adjacent tracks, a larger unit 36 is employed comprising Z-bars on both sides of the unit and a plurality of stringer channels 28. In this case, the side bars rest upon the cross ties of adjacent tracks, respectively, and the unit bridges the drainage channel 19 between the tracks. For the approaches to the crossing, the unit is preferably constructed, as indicated at 37, having a Z-bar on one side resting upon the cross ties of the track and the standard channel iron bar 23 at the other side of the unit resting upon the road abutment 17 at its depressed shoulder or step 18, thus bridging the drainage channel 20 of the road bed. The bottom flange of each side bar may be formed with drilled holes 38 through which spikes are driven into the cross ties or abutments, to anchor each unit in place.

Any number of units may be placed end to end longitudinally of the tracks to continuously and completely surface the crossing of a road of any width and where the road crosses the tracks in an inclined or oblique direction, the units may be readily made with correspondingly inclined ends to maintain parallel relation with the tracks of the road.

The invention provides a structural unit for

building crossings having a unitary, self-contained construction and capable of being manufactured economically from standard materials in a factory, ready for installation at a crossing. The unit is readily installed without requiring any special and expensive construction of the crossing, and, in fact, without any rearrangement or disturbance of the railway cross ties or rails. Furthermore, a crossing so constructed requires no disturbance of the usual grading of the roadbed for drainage, such as the provision of the drainage channels or ditches 19 and 20. While the units may be laid so as to position their surfaces in close proximity to the rails, there is no actual contact and no interference with electrical signal circuits in which the rails may be included. Thus the upstanding web portion 21[b] of each Z-bar is located with its bottom adjacent to but spaced from the tie plate 15[a] of the rail and its flange and the top flange 21[a] of the Z-bar projects above the rail flange and tie-plates close to but in spaced relation with the head of the rail, to maintain a substantially continuous road surface. This spacing may be quite close at the outer sides of the rails of each track, but is slightly increased, as shown in Fig. 4, at the inner sides of the rails to accommodate the wheel flanges of railway vehicles and preserve electrical insulating spacing. The bottom flanges of the Z-bars are turned away from the flanges and tie-plates of the rails and provide supporting surfaces of substantial area resting on the cross ties to which they are secured. The Z-bar forms in this arrangement have the further advantage that they leave the bottom flange of each Z-bar exposed for access from above for the application of the means for fastening it to the cross ties through the flange openings 38, whereas I-beam or channel forms for these bars would necessitate the insertion of the fastening means at an inclination to the vertical direction in order to clear the upper flange of the I-beam or channel. Where such fastening means are to be inserted vertically, as with these Z-bar forms, the tools for that purpose can be inserted through the openings in the decking without necessarily removing the decking from the frame.

The supporting frame of the present invention is strongly constructed to bridge the gap, for example, between adjacent tracks as shown at the center of Fig. 1 of the drawings. This has been accomplished, notwithstanding the limited height of the tops of the rails above the ties, by disposing the sill and stringer bars within the vertical limits of the side bars, so that all of these bars may be given a height equal to that of the rails themselves, except for the limited height of the decking. This has made it possible to give to the sill bars which bridge the wide gap between the rails and between the tracks, as well as to the stringer bars, an ample height in sectional form and an ample weight-bearing capacity, thus making compact and maximum use of the limited vertical space available. By means of such construction, the side, sill and stringer bars may be given the form of structural steel bars of standard cross-sectional shapes which are commercially available at minimum cost and they are rigidly connected together by means such as bolts, so that they may be assembled at the factory and then applied to the cross ties as a unit separate from the decking, the open character of the frame facilitating ready access to the spikes or other means for fastening it to the cross ties. The surfacing of the frame with

separately formed decking permits of the use of suitable, commercially available decking which, as in the case of the frame bars, is manufactured in large quantities and available commercially at minimum cost. This open type decking has its component parts integrally and strongly constructed, comprising a series of parallel, weight-supporting bars resting on the top surfaces of and bridging the side and stringer bars so as to increase the weight-bearing capacity of the unit as a whole. The removable character of the decking allows the frame to be exposed for attachment to the cross ties and for adjustment from time to time, as well as any necessary cleaning or levelling of the road bed, which may be effected through the open frame without removing the frame. The construction thus accomplishes the combination of maximum supporting strength, accessibility for installation and upkeep and economy of labor and materials.

As portions of the highway or road, the units provide strong and rigid, weight-bearing surfaces lying substantially flush with the treads of the rails, so as to maintain a smooth crossing, while the open or reticulated character of the surface provides for drainage into the drainage system of the railway bed and affords highly efficient traction surfaces for vehicular traffic on the road or highway.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of a preferred embodiment, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. In a railway road crossing, a self-contained, metallic road unit comprising supporting frame and surfacing portions, said frame portion having Z-bars at opposite sides thereof adapted to be supported on and secured to the railway cross ties intermediate and parallel with adjacent rails, said Z-bars having their top flanges projecting above the flanges and tie plates of said rails and adjacent to the heads thereof to maintain substantial continuity of road surface and having their bottom flanges extending away from said rail flanges and tie plates and affording substantial weight-bearing areas, and said Z-bars having their upstanding web portions and top flanges located in spaced relation with the flanges and tie plates and heads of said rails, respectively, to maintain an electrical insulating spacing therefrom, sill bars substantially coextensive in height with said Z-bars and connected to and supported by the opposite ends of said Z-bars, respectively, to bridge the space therebetween, a stringer bar supported between said sill bars intermediate said Z-bars, all of said bars having their tops lying substantially in a common top plane of said unit, and said surfacing portion comprising a section of open decking construction supported on and secured to the tops of said bars, said unit being substantially equal in height to said rails and adapted to be installed and removed independently of disturbance of said rails and cross ties.

2. In a railway road crossing, a self-contained, metallic road unit comprising supporting frame and surfacing portions, said frame portion having Z-bars at opposite sides thereof adapted to be supported on and secured to the railway cross ties intermediate and parallel with adjacent rails, said Z-bars having their top flanges projecting above the flanges and tie plates of said rails and adjacent to the heads thereof to maintain substantial continuity of road surface and having their bottom flanges extending away from said rail flanges and tie plates and affording substantial weight-bearing areas, and said Z-bars having their upstanding web portions and top flanges located in spaced relation with the flanges and tie plates and heads of said rails, respectively, to maintain an electrical insulating spacing therefrom, sill bars having their ends connected to and supported by the opposite ends of said Z-bars, respectively, to bridge the space therebetween, a stringer bar located intermediate said Z-bars and having its ends connected to and supported by said sill bars, all of said bars being substantially coextensive in height and having their tops and bottoms lying substantially in common top and bottom planes of said unit, and said surfacing portion comprising a section of open decking construction supported on and secured to the tops of said bars, said unit being substantially equal in height to said rails and adapted to be installed and removed independently of disturbance of said rails and cross ties.

3. In a railway road crossing, a self-contained, metallic road unit comprising separately formed supporting frame and surfacing portions, said frame portion having Z-bars at opposite sides thereof intermediate and parallel with adjacent rails, said Z-bars having their top flanges projecting above the flanges and tie plates of said rails and adjacent to the heads thereof to maintain substantial continuity of road surface and having their bottom flanges extending away from said rail flanges and tie plates and affording substantial weight-bearing areas, and said Z-bars having their upstanding web portions and top flanges located in spaced relation with the flanges and tie plates and heads of said rails, respectively, to maintain an electrical insulating spacing therefrom, sill bars substantially coextensive in height with said Z-bars and connected to and supported by the opposite ends of said Z-bars, respectively, to bridge the space therebetween, a stringer bar supported between said sill bars intermediate said Z-bars, all of said bars having their tops lying substantially in a common top plane of said unit, and said surfacing portion comprising a section of open decking construction supported on and fixed to the tops of said bars and including substantially continuous carrying bars extending in parallel spaced relation with one another across said Z-bars and stringer bar to increase the weight-carrying capacity of said unit, said unit being substantially equal in height to said rails and adapted to be installed and removed independently of disturbance of said rails and cross ties.

4. In a railway road crossing, a self-contained, metallic road unit comprising separately formed supporting frame and surfacing portions, said frame portion having Z-bars at opposite sides thereof adapted to be supported on and secured to the railway cross ties intermediate and parallel with adjacent rails, said Z-bars having their top flanges projecting above the flanges and tie plates of said rails and adjacent to the heads thereof to maintain substantial continuity of road surface and having their bottom flanges extending away from said rail flanges and tie plates

and affording substantial weight-bearing areas, and said Z-bars having their upstanding web portions and top flanges located in spaced relation with the flanges and tie plates and heads of said rails, respectively, to maintain an electrical insulating spacing therefrom, sill bars having their ends connected to and supported by the opposite ends of said Z-bars, respectively, to bridge the space therebetween, a stringer bar located intermediate said Z-bars and having its ends connected to and supported on said sill bars, all of said bars being substantially coextensive in height and having their tops and bottoms lying substantially in common top and bottom planes of said unit, and said surfacing portion comprising a section of open decking construction supported on and secured to the tops of said bars and including substantially continuous carrying bars extending in parallel spaced relation with

one another and across said Z-bars and stringer bar to increase the weight-carrying capacity of said unit, said unit being substantially equal in height to said rails and adapted to be installed and removed independently of disturbance of said rails and cross ties

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