July 21, 1953 R. EKSERGIAN ET AL 2,646,008

VERTICALLY EXTENDED DEAD LIGHT PANEL
OF PASSENGER RAILWAY CARS

Filed May 27, 1949 3 Sheets-Sheet 1

FIG. 1

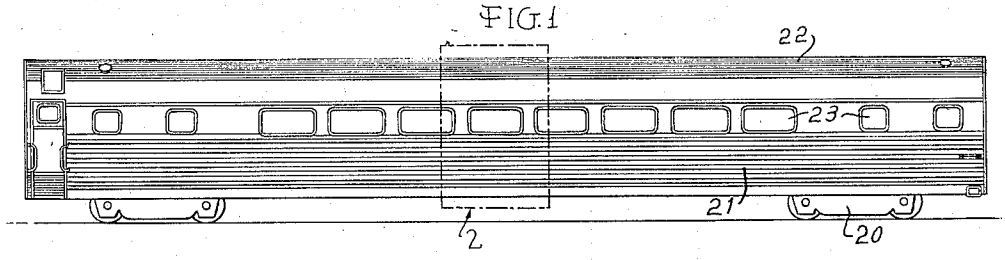
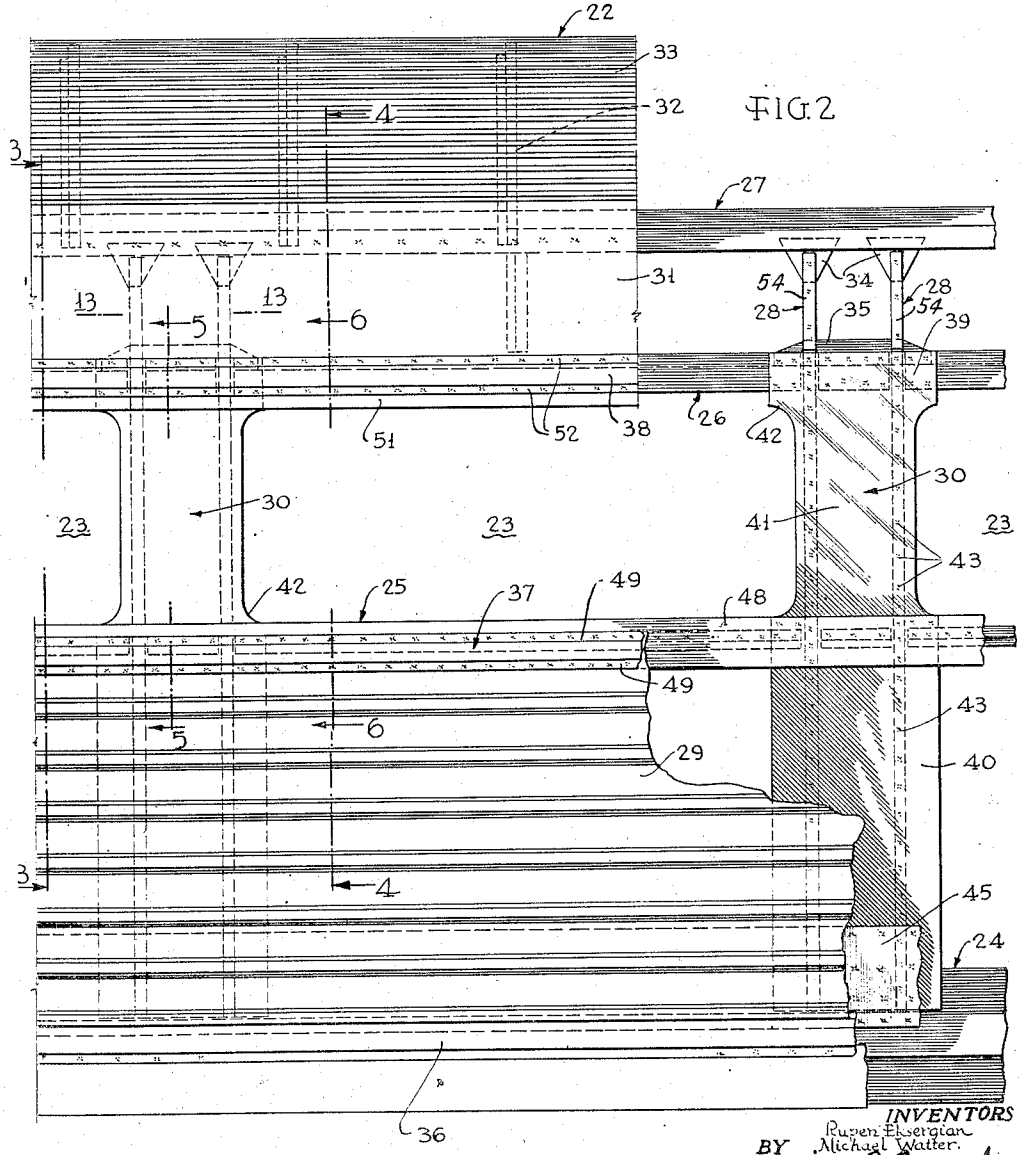


FIG. 2



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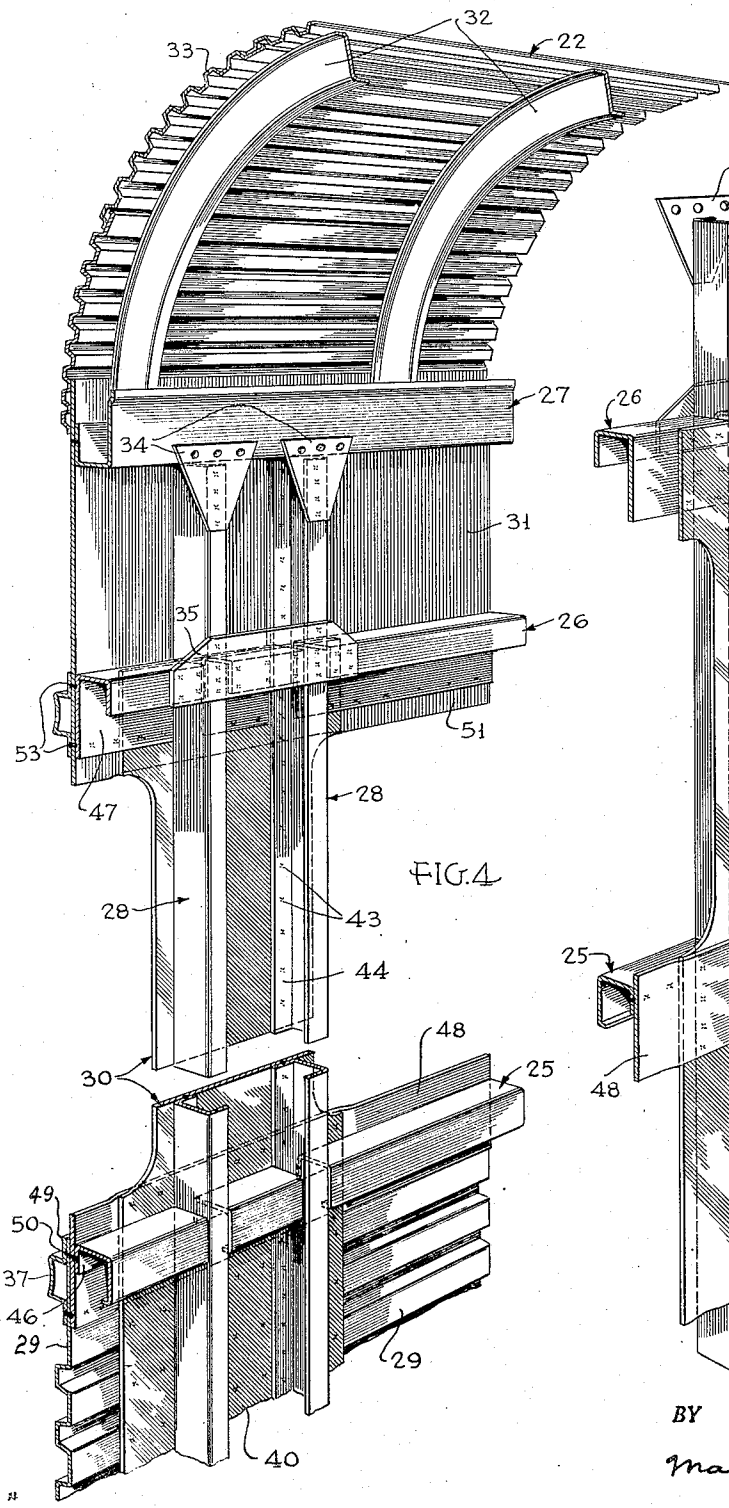


FIG. 4

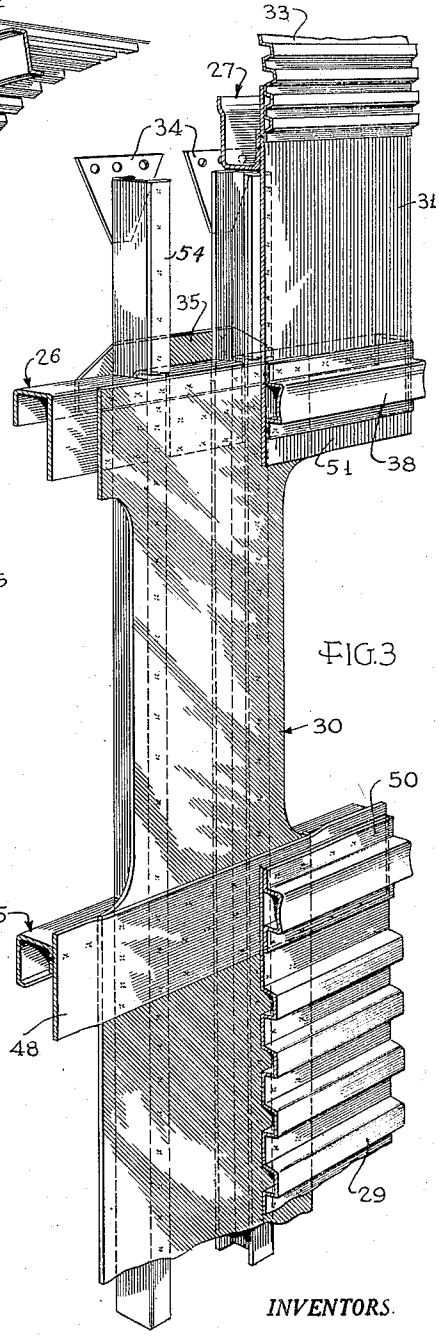


FIG. 3

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VERTICALLY EXTENDED DEAD LIGHT PANEL OF PASSENGER RAILWAY CARS

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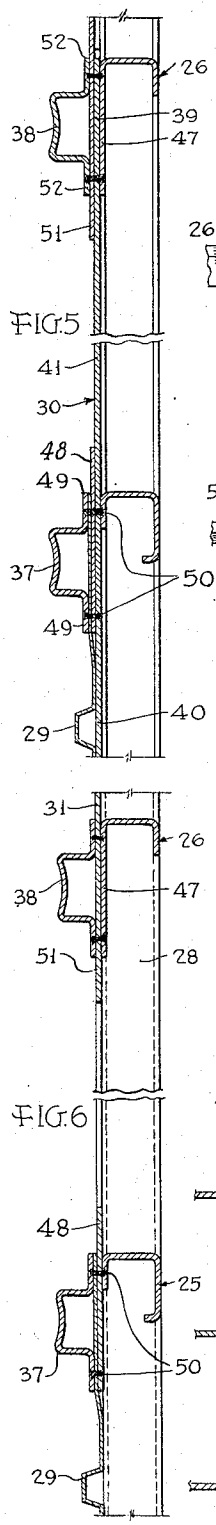


FIG.5

FIG.6

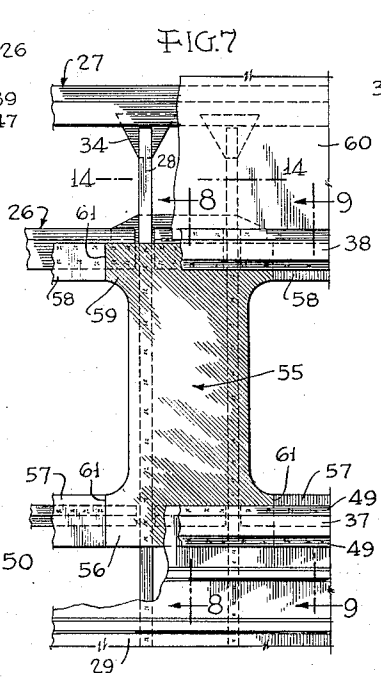


FIG.7

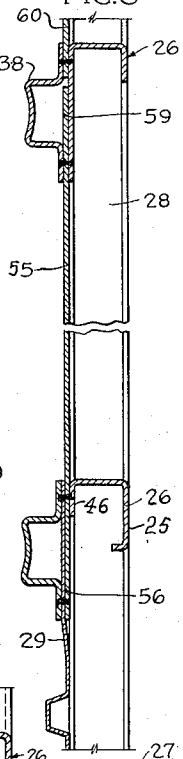


FIG.8

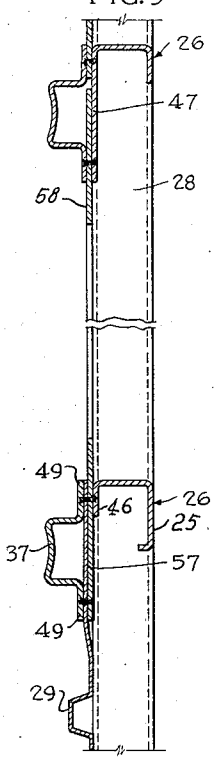


FIG.9

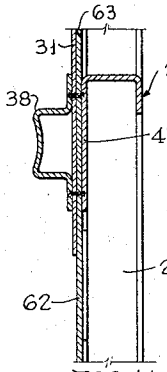


FIG.11

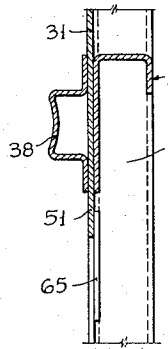


FIG.12

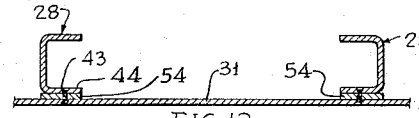


FIG.13

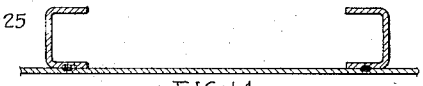


FIG.14

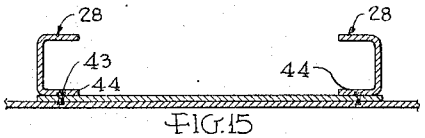


FIG.15

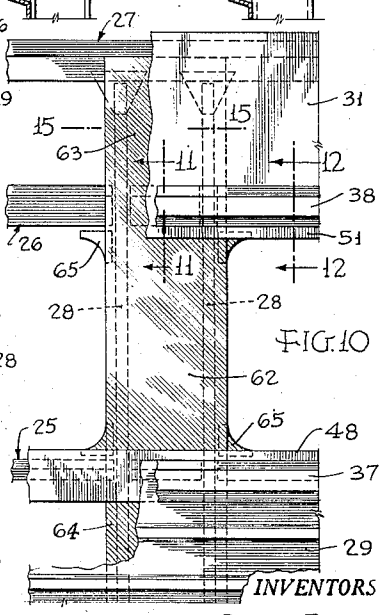


FIG.10

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UNITED STATES PATENT OFFICE

2,646,008

VERTICALLY EXTENDED DEAD LIGHT PANEL OF PASSENGER RAILWAY CARS

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Application May 27, 1949, Serial No. 95,644

7 Claims. (Cl. 105—401)

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The invention relates to a specific type of side wall construction for railway cars made largely of sheet metal. The previously suggested type of construction has vertical posts arranged in pairs between window openings and interconnected above and below the opening by inwardly facing hat-section moldings, horizontal dead light webs and shear panels, and it has the posts of each pair interconnected between the openings by structural dead light panels.

The object of the invention is a general strengthening of the above specified type of construction and, particularly, the avoidance of stress concentrations at the corners of the window openings.

The objects of the invention are, generally speaking, achieved by vertically extending the dead light panels and webs and the shear panels, or at least one or more of these members, beyond the level heretofore considered appropriate.

The objects, features and advantages of the invention will be more fully and more easily understood from the illustration of several embodiments of the invention in the attached drawing and from the following detailed description.

In the drawing:

Figure 1 is a diagrammatic small-scale side elevation of a passenger railway car to which the invention may be applied;

Figure 2 is a fragmentary elevation, on a larger scale, of the region of the railway car surrounded by the dot-and-dash line 2 in Figure 1, certain parts of the outer panels of the roof being broken away to expose the underlying structure;

Figure 3 is a fragmentary perspective view and a section along line 3—3 of Figure 2 of the side wall in the region of one of the posts, again certain parts of the panels being broken away and sectioned;

Figure 4 is an inside perspective view and section along line 4—4 of Figure 2;

Figures 5 and 6 are fragmentary vertical sections, on a still larger scale, along the correspondingly numbered lines of Figure 2;

Figure 7 is a fragmentary side elevation of a portion of a side wall in the region between two window openings, certain parts being broken away, illustrating a second embodiment of the invention;

Figures 8 and 9 are vertical fragmentary sections, on a larger scale, along the correspondingly numbered lines of Figure 7;

Figure 10 is a fragmentary side elevation similar to Figure 7 but of a third embodiment of the invention;

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Figures 11 and 12 are fragmentary vertical sections, on a larger scale, along the correspondingly numbered lines of Figure 10; and

Figures 13, 14, and 15 are fragmentary horizontal sections along the correspondingly numbered lines of Figures 2, 7 and 10, respectively, illustrating the differences between the three embodiments in the upper post region.

The railway car illustrated in Figure 1 presents an elongated hollow body of generally prismatic shape which is supported near its ends by trucks 20 and comprises a pair of side walls 21 (only one shown) and a roof 22. The side walls 21 surround a series of large window openings 23.

Side wall 21 comprises a plurality of vertically spaced chord structures, a bottom chord or sill 24, a lower window chord 25, a window header 26 and a top rail or chord 27. The last-named chord, prior to the final assembly of the body, preferably constitutes simultaneously the roof sleeper and a part of the roof unit rather than of the side wall unit.

The longitudinal chord structures 24 to 27 are interconnected by a plurality of longitudinally spaced vertical post members 28 arranged in pairs with close spacing between adjacent window openings 23.

The skeleton framework formed by the chord structures 24 to 27 and the posts 28, is covered on the outside, strengthened, diagonally braced and rigidified by sheet metal structural panels including a longitudinally corrugated lower panel sheathing 29, dead light panels 30 between the window openings, and a letter board panel sheathing 31. The panels 29 and 31 are referred to hereinafter as shear panels.

The roof 22 comprises longitudinally spaced transverse carlines 32 having their ends secured in the top rail or sleeper 27, and a longitudinally corrugated roof sheathing 33 secured to the carlines 32 and along its lower margin to the letter board panel 31.

Gussets 34 connect the upper ends of the posts 28 with the roof sleeper on the inside of the wall. Other gusset plates, such as indicated at 35, connect the sections of the longitudinal chord structures, e. g., of the window header 26, where they are interrupted by the posts 28 with each other and with the posts.

Inwardly facing, longitudinally extending hat sections are secured to the outside of the side wall. One such section forms a rub rail 36 along the bottom chord 24, another such section forms a belt rail 37 along the lower window chord 25, and a third such section forms a window header molding 38 along window header 26.

The general construction described so far, in itself, does not constitute the invention to be covered by the present application but is closed, for instance, in the earlier applications of Albert G. Dean, Serial No. 782,000, filed October 24, 1947, for "Cover Panels for Vehicles Especially Railway Cars," now Patent No. 2,592,545, and Serial No. 38,727, filed July 14, 1948, for "Roof and Side Wall Construction of Bodies for Land Vehicles, Especially Railway Cars," now Patent No. 2,514,123. These are assigned to the same assignee as the present application. The subject matter of the present application resides in improvements now to be described.

In the embodiment illustrated in Figures 1 to 6 and 13, the dead light panels **30** are upwardly extended at **39** and downwardly extended at **40** beyond the upper and lower margins, respectively, of the window openings **23**. The extensions **39**, **40** are wider than the middle portion **41** between the openings **23** and form the rounded corners **42** of the openings. The dead light panel **30** and its extensions **39**, **40** are secured over their entire height by spot welds **43** to the outer arms **44** of the channel-section posts **28** and in the region of overlap to the outer arms **45**, **46**, **47** of the chord structures **24**, **25** and **26**. The downward extension **40** is also secured, preferably by the spot welds indicated in Figures 3 and 4, to the shear panel **29**.

A continuous, longitudinally extending web, band or strip **48** is arranged below the window openings and forms the lower margins thereof. This strip is so wide that it is overlapped by the upper and lower arms or flanges **49** of the belt rail **37**. The shear panel **29** is upwardly extended so as to terminate with the upper margin of belt rail **37**. The flanges **49**, the shear panel **29**, the web or strip **48**, the outer arms **46** of the chord structure **25**, the downward extensions **40** of the dead light panels **30** and the outer arms **44** of the posts **28**, in their regions of overlap, are structurally connected with each other by spot welds **50**. The downward extension of web **48** and the upward extension of shear panel **29**, or one of them combine with belt rail **37** to provide a closed-box-sectional belt rail structure which adds considerably to the strength of the side wall structure, especially in the regions where stress concentrations are encountered, that is, at the lower corners of the window openings **23**. Further strengthening for the same purpose is achieved by the continuous longitudinal extension of the web **48** across the posts **28** and by the downward extension **40** of the dead light panels **30** to the lower chord structure **24**.

The letter board **31** above the window openings is downwardly extended at **51** to form the upper margins of the window openings. This extension **51** of the letter board is overlapped by both arms or flanges **52** of the header molding **38**. The arms **52**, the letter board extension **51**, the outer arm **47** of header rail **26**, the upper extension **39** of dead light panel **30**, and the outer arms **44** of the posts **28** are structurally secured together by spot welds **53**. Here, too, the hat-section window header molding **38** is transformed into a strong closed box-sectional structure by its connection with the letter board extension. The upward extensions **39** of the dead light panels **30** and the described header construction, result in great strength at the upper corners of the window openings where stress concentrations may be encountered.

Different means may be employed for accommodating variations in the number of layers of sheet metal secured to the outsides of the posts and chord structures. Figures 2, 3 and 13 show the interposition of spacer strips **54** between the outer arms **44** of the posts and the letter board **31** in the region above the upward extension **39** of the dead light panels. Strip **48**, upper margin of shear panel **29** and belt rail **37**, as well as window header molding **38** and downward extension **51** of letter board **31** are outwardly joggled or offset in the regions where they cross the dead light panel extensions **40** and **39**, respectively. Sometimes it may be found advantageous to joggle or offset the post and chord members or to provide also the chord members with spacer strips similar to the strips **54** shown for the posts.

The framework of the side wall shown in Figures 7 to 9 and 14 is practically identical with the framework described in connection with the first embodiment, so that the same reference numerals are applied and only the differences are described in the following.

The dead light panel **55** has its downward extension **56** terminated with the lower margin of belt rail **37**. The lower margins of the window openings **23** are formed by separate strips or webs **57** abutting the dead light panel extensions **56**. The upper margins of the window openings **23** are formed by similar separate strips **58** abutting the upper extension **59** of the dead light panels, and the letter board **60** ends slightly above the dead light panel extensions **59** and the strips **58** without overlapping them.

The arms or flanges **49** of the belt rail, the extension **56** of the dead light panels or the dead light panel connecting strips **57** and the outer arms **44** and **46** of posts **28** and chord members **25**, are structurally secured to each other in their regions of overlap by spot welds resulting, as in the previous embodiment, in a closed box-sectional structure and in great strength and rigidity at the corners of the window openings.

Above the window openings, great strength is achieved by the wide overlap of the upper dead light panel extensions **59** or the dead light panel connecting strips **58** and the arm **47** of the window header **26** and by the combination with header molding **38**.

The meeting edges of the dead light panels **55** and their connecting strips **57**, **58** may be secured to each other at **61** by arc or other fusion welding. On account of the abutting arrangement of the dead light panels **55**, their interconnecting strips **57**, **58** and the letter board **60**, no variations in the number of layers of sheet metal are encountered, as in the first embodiment, doing away with the need for inserts or joggling.

In the third embodiment illustrated in Figures 10 to 12 and 15, the basic framework is again the same as in the preceding embodiments, and is marked in the drawings by the same reference numerals.

In this case, as shown in Figure 10, dead light panel **62** is upwardly extended at **63** to the top rail **27** and downwardly at **64**. The sides of the dead light panel **62** are parallel to each other throughout their height, that is, the dead light panel does not form the rounded corners of the window openings and requires only narrower stock. The corners of the window openings are formed by generally triangular corner pieces **65**

secured to the dead light panel 62 and, respectively, to the continuous lower web or strip 48 and the downward extension 51 of the letter board. Apart from these differences, the construction along the upper and lower margins of the window openings is identical with the construction shown in Figures 1 to 6 and 13. It may be noted, however, that the upward extension 63 in this embodiment fulfills the functions of the spacing strips 54 of the first embodiment.

The invention is not restricted to all details of the illustrated embodiment but is susceptible to modifications and adaptations which will easily occur to those skilled in the art.

The invention may, for instance, be applied to car bodies other than passenger railway car bodies which are of elongated generally prismatic shape, such as buses or baggage and similar cars for passenger railway trains.

It should also be noted that the new construction is not necessarily applied to a body over its entire length but that it may be restricted to such regions where specific strength requirements have to be met. This means that some of the posts may have dead light panels of previously-proposed types, whereas other posts have the dead light panels extended downwardly upwardly, or both, so as to increase their strength and the strength of their connection with the adjoining chord structures and panels. In regard to the formation of the belt rail and header moldings and the connecting strips between the dead light panels, it is, however, likely that a uniform construction will be maintained throughout the length of the car in accordance with one of the different forms of the invention.

What is claimed is:

1. In a vehicle body of elongated shape, such as for railway passenger trains; a side wall including a plurality of vertically spaced longitudinal chord structures including a bottom chord, a lower window chord, a window header chord, and a top rail; a plurality of vertical posts arranged with longitudinal spacing in pairs between window openings; a longitudinal structural sheathing member interconnecting and diagonally bracing the bottom chord, the lower window chord and the posts; a longitudinal structural sheathing member interbracing the window header, the top rail and the upper ends of the posts; and structural dead light panels interconnecting the pairs of posts between the window openings; said structural sheathing members and said dead light panels being arranged on the same side of said side wall; at least some of said dead light panels being vertically extended beyond one of said window chords and structurally overlappingly connected through said extension with the posts and the structural sheathing member overlapped by said extension.

2. In a vehicle body, such as for railway passenger cars, of elongated shape having side walls with a series of window openings provided therein, a side wall having vertical posts between successive window openings and a chord structure along the lower margin of the window opening, said chord structure including an inwardly facing hat-section belt rail, and a structural sheathing member interbracing and connecting the posts and said chord structure below the window openings, said sheathing member being upwardly extended so as to extend across the mouth of the hat section and be overlapped by both flanges of the latter to which it is structurally connected so as to form with the hat section a continuous box-sectional structure.

3. In a passenger railway car or similar body provided with a series of window openings in its side walls, a side wall having a pair of posts between two successive window openings, a dead light panel interconnecting the posts on their outside and defining the side margins of said window openings, longitudinal chord structures adjoining and interconnecting said posts, and a continuous sheet metal band secured flatwise to one of said longitudinal chord structures and extending uninterruptedly along one of the horizontal margins of the openings and across said posts, said band forming the horizontal margin at the window openings and tying the chord structures into the posts.

4. In a railway passenger car or similar vehicle body of elongated shape, the combination comprising a side wall provided with window openings, with a plurality of vertically spaced longitudinally extending chord structures of which one is arranged along the lower margin and another along the upper margin of the window openings, with posts arranged between the window openings and connected with said chord structures, and with a longitudinal panel secured to one of said chord structures and said posts and extending upwardly beyond the window openings, said panel being extended longitudinally beyond said posts and vertically toward the longitudinal center of the window openings, said panel forming by its free edge the respective longitudinal margin of the window openings.

5. In a passenger railway car or the like, a side wall surrounding window openings and having posts and dead light panels between window openings and having along at least one of the horizontal sides of the openings inner longitudinally extending chord members and an outer longitudinally extending inwardly facing hat-section molding of sheet metal along a horizontal margin of a window opening, a web of sheet metal along a horizontal margin of a window opening being inserted between and secured to said chord members and both flanges of the hat section, said web projecting beyond the hat section and the chord members toward the window opening and adjoining the dead light panels at the vertical sides of the respective window opening.

6. In a railway car for passenger trains; a side wall forming part of a load supporting and stress transmitting car body; a plurality of vertically spaced longitudinal side wall chord structures including a bottom chord, a lower window chord, a window header chord, and a top rail; a plurality of vertical side wall posts arranged with longitudinal spacing in pairs between the side wall openings; a longitudinal structural sheathing member interconnecting and diagonally bracing the bottom chord, the lower window chord and the posts; a longitudinal structural sheathing member interbracing the window header chord, the top rail and the upper ends of the posts; and dead light panels interconnecting the pairs of posts between the window openings and arranged on the same side of said side wall as said sheathing members; said dead light panels being vertically extended beyond the lower window chord and the window header chord and structurally overlappingly connected through said vertical extensions with said longitudinal structural sheathing members and the posts.

7. In a vehicle body of elongated shape, such as for railway passenger cars; a side wall in-

cluding a plurality of vertically spaced longitudinal chord structures including a bottom chord, a lower window chord, a window header chord, and a top rail chord; a plurality of vertical posts arranged with longitudinal spacing in pairs between window openings; a longitudinal structural sheathing member interconnecting and diagonally bracing the bottom chord, the lower window chord and the posts; a longitudinal structural sheathing member interbracing the window header chord, the top rail and the upper ends of the posts; dead light panels interconnecting the pairs of posts between the window openings, at least some of said dead light panels being vertically extended beyond one of said window chords and connected with a longitudinal chord structure therebeyond and also connected through said extension with the posts and overlapped structural sheathing member; said sheathing members, dead light panels and reinforcing member being arranged on the same side of said

side wall; and a hat-section sheet metal reinforcing member extending longitudinally across the posts and dead light panel members, said reinforcing member being overlappingly secured, through its flanges, to a longitudinally extending panel which is, in turn, secured both to a window chord and to said dead light panels.

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