

April 11, 1961

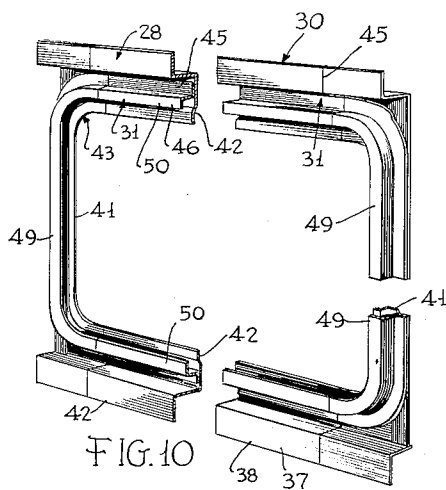
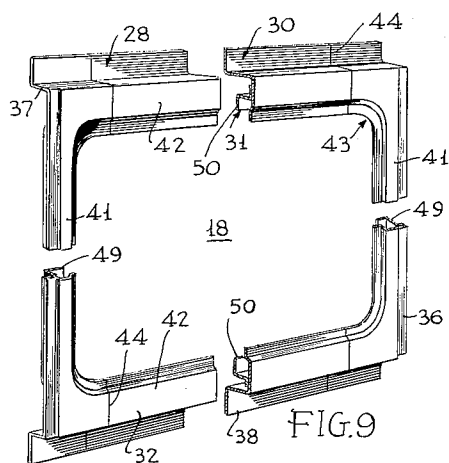
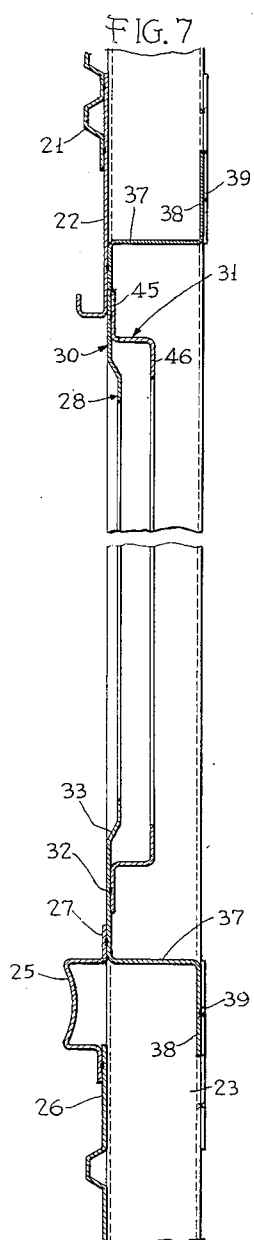
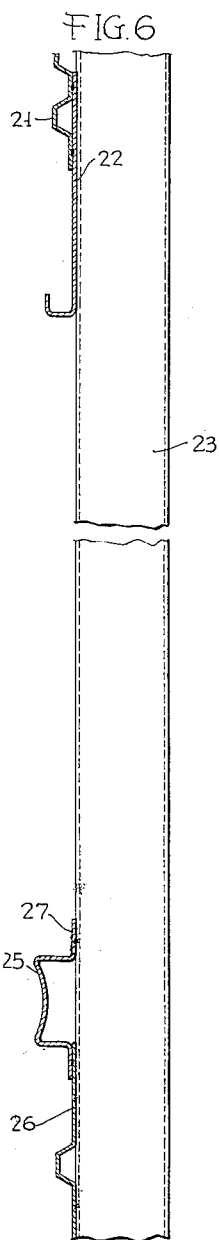
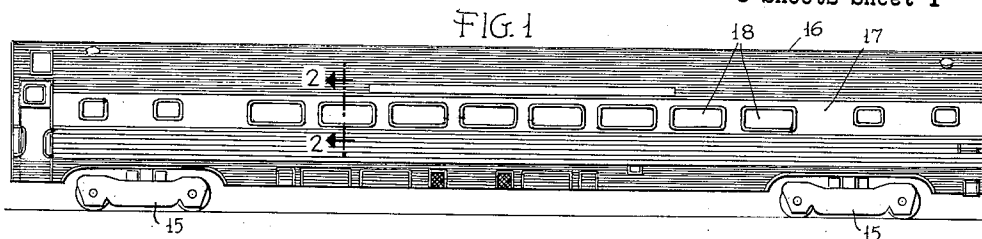
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2,978,995

WALL STRUCTURE, PARTICULARLY FOR RAILWAY CARS

Filed April 2, 1958

3 Sheets-Sheet 1



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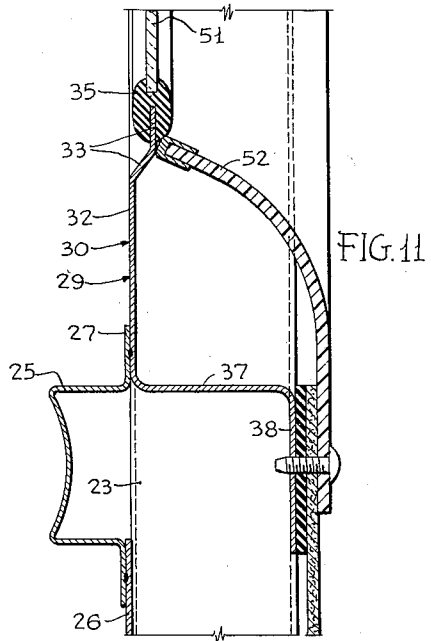
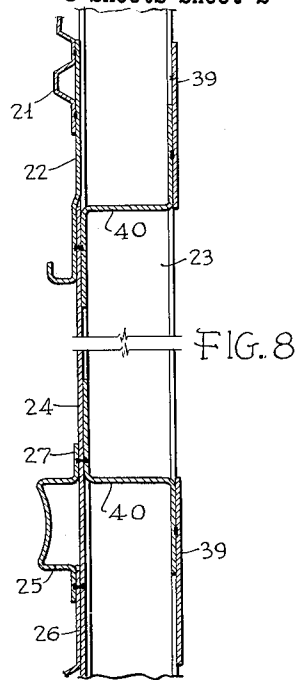
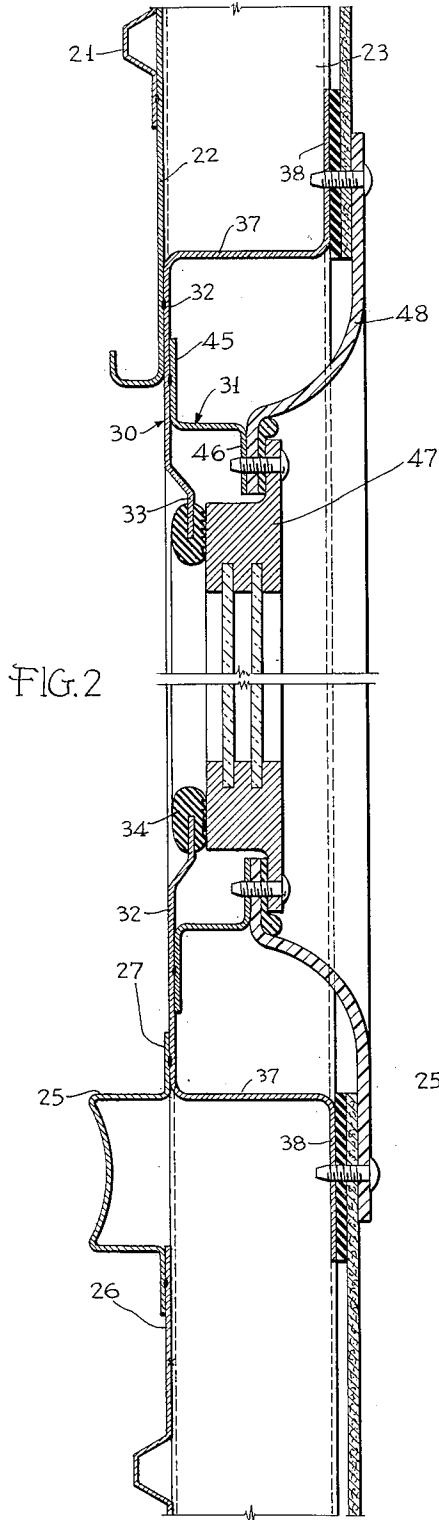
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WALL STRUCTURE, PARTICULARLY FOR RAILWAY CARS

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3 Sheets-Sheet 2



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FIG. 3

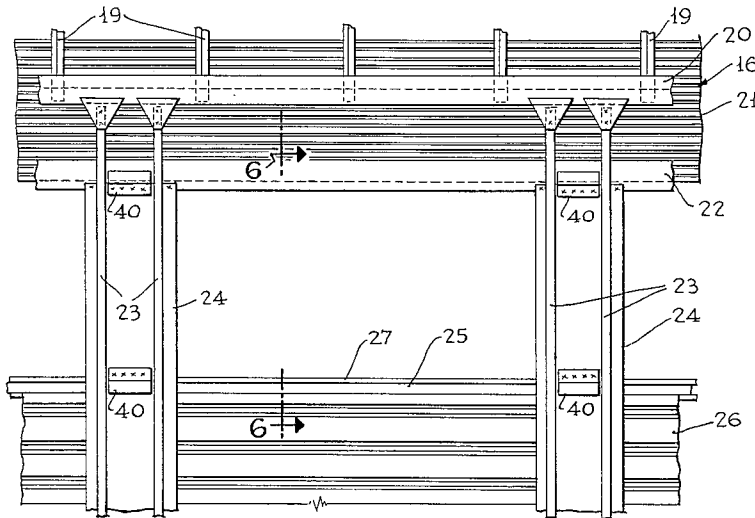


FIG. 4

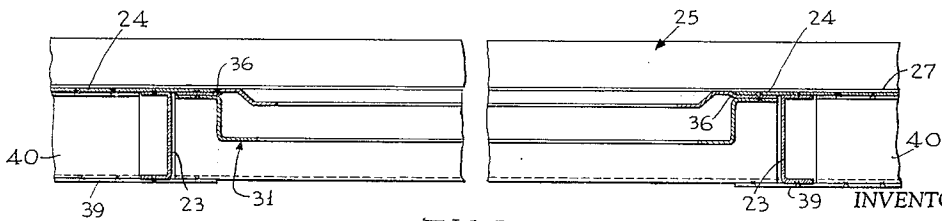
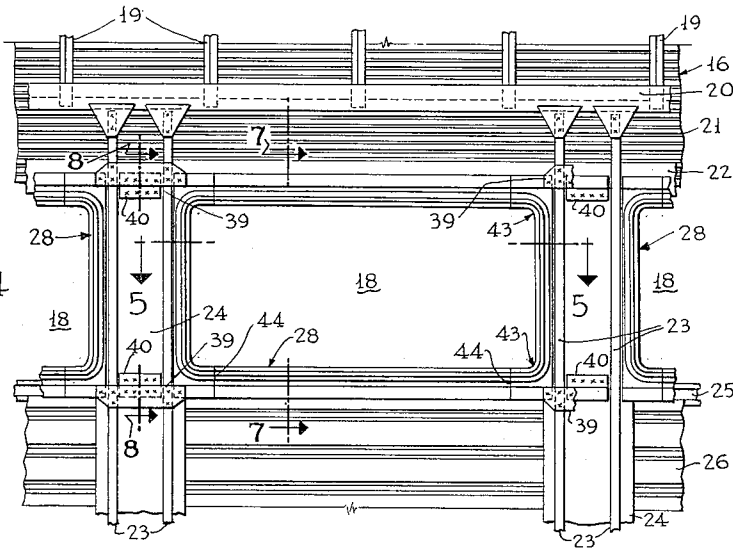


FIG. 5

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WALL STRUCTURE, PARTICULARLY FOR
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The invention relates to a construction of vehicle bodies, particularly of the type used for passenger railway trains. More specifically the invention relates to the construction of side walls of vehicle bodies around window or other openings and in regions adjoining such openings.

Among the objects of the invention is a marked simplification and a reduction of the number of members entering into the structure while obtaining the same or greater strength than obtainable by comparable constructions of known type.

A principal feature of the invention resides in a window frame unit which is suitable for bench assembly as distinguished from known constructions in which the window frame is assembled during its incorporation into the remainder of the wall structure. The new unit provides an accurate opening for the window or the like, and incorporates main structural wall members above and below the opening.

The edge of the window, to which the window proper attaches, is recessed so as to protect the edge of rubber window sealing units or glazing strips from the abrading action of car washing machines and so as to stiffen the edge of the opening in providing a strong supporting edge for the window seal.

The new construction results in fewer pieces, a structure which can be made more accurately, and which can be finished more satisfactorily at lower cost than known structures because the new construction can be made on a bench or in small assembly fixtures.

Further objects, features and advantages will become apparent from the embodiments illustrated in the drawing and described in the following.

In the drawing:

Fig. 1 is a small-scale, diagrammatic side elevation of a passenger railway car;

Fig. 2 is a fragmentary section along line 2-2 of Fig. 1 on a greatly increased scale;

Fig. 3 is a fragmentary inside elevation of side wall and roof structure around one window opening prior to the insertion of the novel window frame units, the scale being between the scales of Figs. 1 and 2;

Fig. 4 is a fragmentary inside elevation corresponding to Fig. 3 but after completion of the side wall by the addition of the new window frame units;

Fig. 5 is a horizontal fragmentary section along line 5-5 of Fig. 4 on a somewhat larger scale;

Figs. 6 and 7 are fragmentary vertical sections, respectively along line 6-6 of Fig. 3 and 7-7 of Fig. 4, on the scale of Fig. 5;

Fig. 8 is a fragmentary vertical section along line 8-8 of Fig. 4;

Figs. 9 and 10 are, respectively, outside and inside perspectives, partly sectionalized, of the novel window frame unit, the scale being slightly larger than the scale of Figs. 3 and 4; and

Fig. 11 is a fragmentary section through the lower margin of window and window opening, illustrating an

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embodiment which is slightly different from the embodiment illustrated in Figs. 2, 4, 5, 7, 9 and 10.

The railway car shown in the drawing is supported by trucks 15 and comprises a roof 16 and side walls 17 with window openings 18. Roof 16 comprises transverse carlines 19 having their ends interconnected by a longitudinal sleeper or sill 20 on each side and having their outsides covered by and connected with a longitudinally corrugated roof sheathing 21 which terminates in a lower reinforcing web 22.

Side wall 17 comprises U-section post members 23, arranged in pairs between adjacent window openings 18 and having their upper ends secured to roof sleeper 20. The outside flanges of the post members 23 are secured to deadlight panels 24 which are likewise arranged between the window openings 18, which have their upper ends secured to reinforcing web 22, and which have their lower portions covered by and secured to a belt rail 25 and a longitudinally corrugated, structural panel 26. Belt rail 25 is an inwardly facing hat section having an upwardly extending flange or web 27.

The construction, described so far, is substantially known and is shown by itself in Figs. 3 and 6.

Inserted into and connected with this wall structure is the novel window frame unit 28 shown before its installation in Figs. 9 and 10 and after its installation in Figs. 2, 4, 5 and 7 as well as in modified form 29 in Fig. 11.

Both forms, 28 and 29, of the window frame unit have in common a main frame member 30 and differ only in that the unit 28 comprises an additional frame member 31 and in the installation of the window panes therein.

Main frame member 30 has a generally plane portion or leg 32 which extends all around opening 18 but has its inner margin slightly inwardly offset at 33 so that a window sealing strip 34 (Fig. 2) or a window retaining or glazing strip 35 (Fig. 11) will have its outer side flush with or inwardly recessed relative to the outer surface of portion 32.

Portion 32 of member 30 is slightly inwardly offset at 36 along its vertical sides, the offsets overlapping and being secured to the inner surface of deadlight panels 24. The horizontal upper and lower marginal parts of member 30 are Z-sections having a horizontal, inwardly directed web 37, a vertical inner leg or flange 38 directed away from the center of opening 18, and an outer flange or web which is formed by portion 32 and directed from web 37 toward the center of opening 18.

The horizontal parts of portion 32 are overlappingly secured to the insides of roof reinforcing web 22 and flange 27 of belt rail 25 respectively. The width of web 37 is such that the legs or flanges 38 are flush with the inner surface of post members 23. Gusset plates 39 connect legs 38 with the inner legs of posts 23 and with the inner legs of short Z-section frame members 40 which are inserted between and secured to adjacent posts 23. The outer legs of the short members 40 are overlappingly connected with the roof reinforcing web 22 and deadlight panels 24.

The webs 37 and legs 38 of frame member 30 constitute together with the members 39, 40 main parts of longitudinal chord structures above and below the window openings 18. Such chord structures were hitherto constituted by members formed separate from the window frames. In the new construction the larger part of these chord structures is now formed by the window frame units and only the narrow gaps between them are supplied by the members 39, 40. This means a great simplification and a saving of weight, quite apart from other advantages of the invention.

Each window frame member 30 may consist of a pair of vertical stampings 41 and a pair of horizontal profiles 42. The stampings 41 include the rounded corners 43

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of the window openings whereas the members 42 are straight sided so that they may inexpensively be formed on a power brake or on a draw bench.

The width of the window opening is simply determined by the length of the members 42 inserted between the members 41 and flash or otherwise welded to the latter at the seams 44. The height can be made to suit by varying the size of the vertical stamped pieces 41. This arrangement further permits ready accommodation to varying sizes of deadlights 24 which are encountered in the design of a variety of car types.

The embodiment illustrated in Figs. 2, 4, 5, 7, 9 and 10 has the Z-section auxiliary member 31 secured by its outer laterally outwardly extending leg 45 to the inside of portion 32 of main frame member 30 while its laterally inwardly extending leg 46 serves for the securement of a window glazing unit 47 and the attachment of an inner trim molding 48. The glazing unit has its outer surface sealed by the before mentioned rubber sealing strip 34 which is held by the recessed inner marginal recessed portion 33 of the main frame member 30. Molding 48 is also secured to flanges 38.

The auxiliary frame member 31 may be subdivided at substantially the same lines 44 as the main frame member 30 so that also the inner frame member consists of vertical members 49 extending around the corners 43 and straight profiles 50 which can be cut from straight stock to any desired length.

The window frame unit 29, shown in Fig. 11, differs from the unit 28 shown in the preceding figures, only in that the auxiliary member 31 is omitted, that the recessed margins 33 carry window pane 51 directly by means of retaining strip 35 and that window molding 52 is secured only to flanges 38 and merely abuts retaining strip 35.

It will have become evident from the foregoing description that window frame units 28 or 29 may be bench-assembled to the exact shape and dimensions desired for the window opening 18 and the dimensions of the opening provided between roof reinforcing web 22, post members 23, deadlight panels 24 and belt rail 25 which likewise have been pre-assembled with each other into the structure shown in Figs. 3 and 6.

It will furthermore be evident that the new units 28 or 29 may be inserted as units into the pre-assembled side wall structure providing window opening of exactly the desired size and configuration while any minor deviations of the opening provided in the pre-assembled side wall structure are easily taken care of by the overlapping portions between frame member 30 on the one hand and side wall and roof members 22, 24, 25 on the other hand. Repair in case of accident is easier because a production unit can be inserted after removing the damaged unit.

The recess of margin 33 is such as not only to protect the edge of the rubber windows sealing unit 34 or glazing strip 35 from the abrading action of car washing machines but also tending to stiffen the edge of the opening so as to provide a strong rigid support for retainer 34 or seal 35.

While the invention has been illustrated by means of two embodiments, differing from each other only in minor respects, it is not restricted to these embodiments and their details but is susceptible to modifications and to adaptations to varying conditions.

What is claimed is:

1. In an elongated prismatic vehicle body, having a side wall with window openings therein between vertical posts on each side of the openings and between upper and lower longitudinal panels secured on the outer sides of the posts, in combination, a window frame secured in each window opening, the frame including Z-shaped horizontal frame chord elements at the top and bottom rigidly connected by vertical frame elements, the intermediate webs of the Z-shaped frame chord elements being substantially the same width as the posts, the exterior flange

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legs of the Z-shaped chord elements having their marginal edges extending inwardly of the opening and the interior flange legs of the Z-shaped elements extending outwardly, Z-shaped horizontal body chord elements of like size and disposition as the frame chord elements located between and beside the window openings in alignment with said upper and lower frame chord elements, means securing the exterior legs and the interior legs respectively of all of said Z-shaped chord elements together and to said posts to form through-running load transmitting body chord members, and the exterior legs of all Z-shaped chord elements being secured along their length to said upper and lower longitudinal panels, and deadlight panels secured exteriorly to said posts and to said upper and lower longitudinal panels, said vertical frame elements having flange legs aligning with the exterior flange legs of the horizontal frame chord elements and secured to said deadlight panels.

2. In an elongated prismatic vehicle body, having a side wall with window openings therein between vertical posts on each side of the openings and between upper and lower longitudinal panels secured on the outer sides of the posts, in combination, a window frame secured in each window opening, the frame including Z-shaped horizontal frame chord elements at the top and bottom rigidly connected by vertical frame elements, the intermediate webs of the Z-shaped frame chord elements being substantially the same width as the posts, the exterior flange legs of the Z-shaped chord elements having their marginal edges extending inwardly of the opening and the interior flange legs of the Z-shaped elements extending outwardly, Z-shaped horizontal body chord elements of like size and disposition as the frame chord elements located between and beside the window openings in alignment with said upper and lower frame chord elements, means securing the exterior legs and the interior legs respectively of all of said Z-shaped chord elements together and to said posts to form through-running load transmitting body chord members, and the exterior legs of all Z-shaped chord elements being secured along their length to said upper and lower longitudinal panels, and deadlight panels secured exteriorly to said posts and to said upper and lower longitudinal panels, said vertical frame elements having flange legs aligning with the exterior flange legs of the horizontal frame chord elements and secured to said deadlight panels, said exterior flange legs of the horizontal and vertical frame elements being offset inwardly at their marginal edges to receive a window sealing strip having its outer surface approximately flush with the outer surface of the main part of said flange legs.

3. In an elongated prismatic vehicle body, having a side wall with window openings therein between vertical posts on each side of the openings and between upper and lower longitudinal panels secured on the outer sides of the posts, in combination, a window frame secured in each window opening, the frame including Z-shaped horizontal frame chord elements at the top and bottom rigidly connected by vertical frame elements, the intermediate webs of the Z-shaped frame chord elements being substantially the same width as the posts, the exterior flange legs of the Z-shaped chord elements having their marginal edges extending inwardly of the opening and the interior flange legs of the Z-shaped elements extending outwardly, Z-shaped horizontal body chord elements of like size and disposition as the frame chord elements located between and beside the window openings in alignment with said upper and lower frame chord elements, means securing the exterior legs and the interior legs respectively of all of said Z-shaped chord elements together and to said posts to form through-running load transmitting body chord members, and the exterior legs of all Z-shaped chord elements being secured along their length to said upper and lower longitudinal panels, and deadlight panels secured exteriorly to said posts and to said upper and lower longitudinal panels, said vertical frame elements having

flange legs aligning with the exterior flange legs of the horizontal frame chord elements and secured to said deadlight panels, and a peripheral reinforcing member having an angular cross section with an interior flange leg with its free margin extending inwardly toward the center of the window opening at a distance from the exterior flange legs of said Z-shaped elements and having an exterior flange web secured to the flange legs of said Z-shaped elements.

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