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RAILROAD CAR WALL CONSTRUCTION

Filed Feb. 18, 1939

2 Sheets-Sheet 1

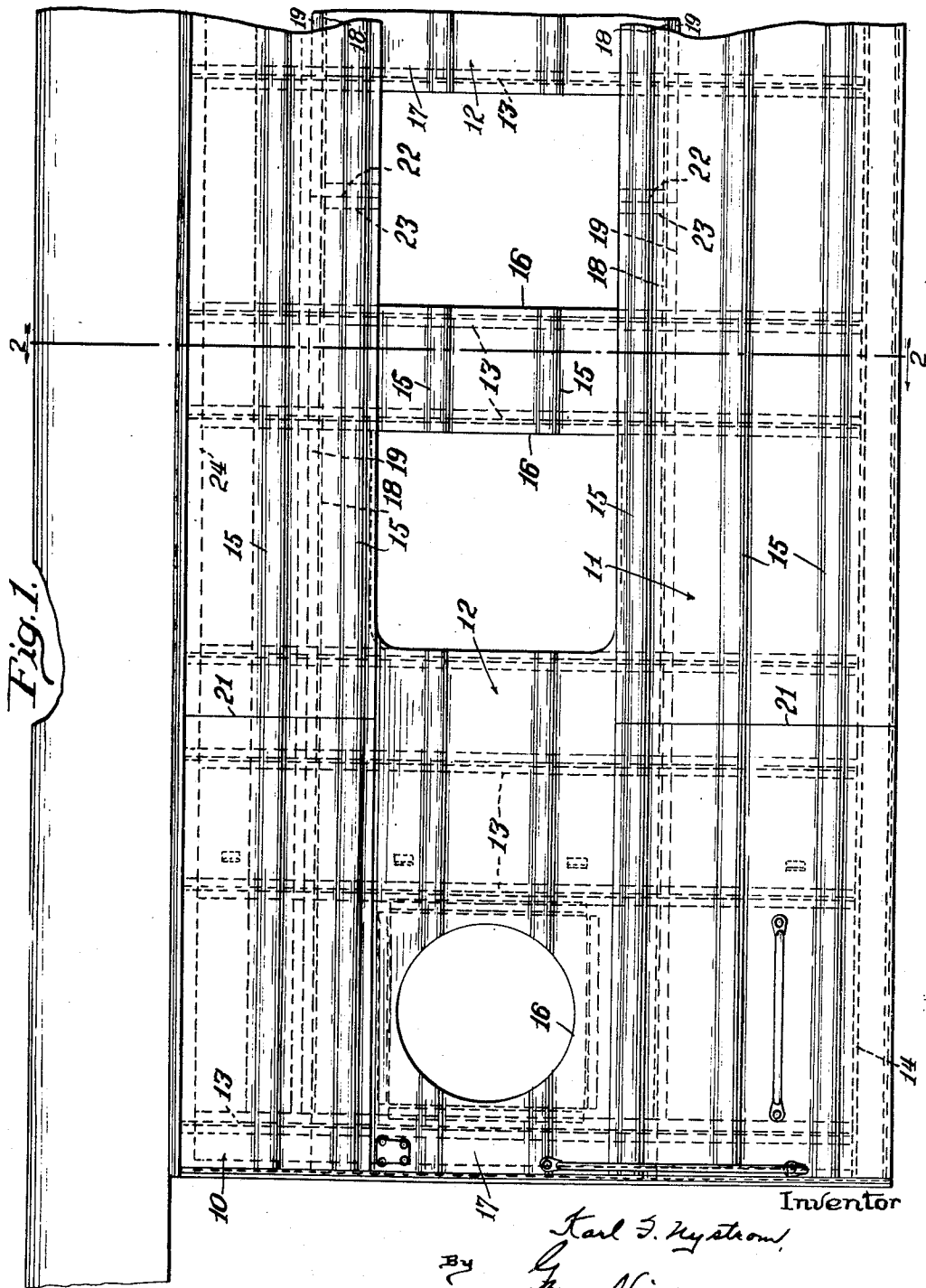


Fig. 1.

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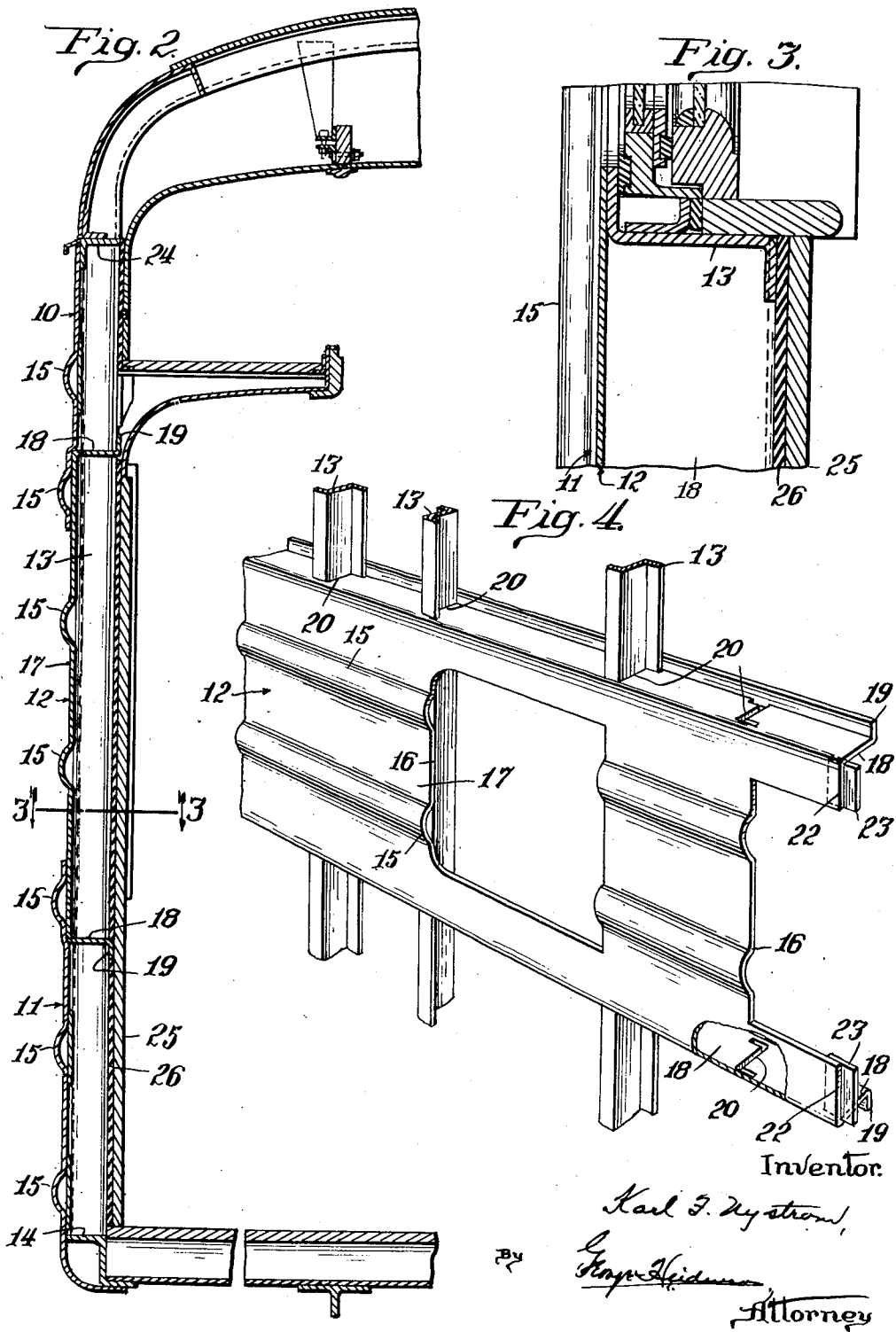
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

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RAILROAD CAR WALL CONSTRUCTION

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Application February 18, 1939, Serial No. 257,040

4 Claims. (Cl. 105—401)

My invention relates more particularly to the side frame construction of railroad passenger cars, namely to cars whose side frames and walls are composed of steel sections or elements arranged in intimate reinforcing relation with each other to provide a very rigid car adapted to withstand the usual strains and stresses to which such cars are subjected.

The object of the invention is the provision of an all-steel side frame construction wherein the outer side wall sheets and the metallic side wall posts are arranged in interengaging relation and the sheets and posts formed to permit them to be welded together into a unitary streamline structure involving longitudinally disposed beam-like sections adapted to resist impacts and any tendency to buckle, while at the same time providing greater lightness especially desirable in high speed train construction.

The invention also has for its object the provision of a car side frame which may be more readily formed and assembled than is the case with railroad passenger cars as heretofore constructed.

The above enumerated objects and others, as well as the advantages inherent in the invention, will all be readily comprehended from the following detailed description of the accompanying drawings wherein:

Figure 1 is an elevation of one end of a car side wall structure involving my invention.

Figure 2 is a vertical sectional view taken along the line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 2 as viewed by the arrows.

Figure 4 is a perspective view of a portion of the intermediate sheet of the car side wall with portions of the vertical posts shown associated therewith.

My invention relates more especially to the side frame and wall construction of steel railroad passenger cars composed of steel-sheets or plates and metal posts which permit all of the elements to be welded together into a unitary structure whereby the car side walls will be provided with longitudinally extending beam forming portions or continuous reinforcing ribs from end to end of the car adapted to withstand the impacts and strains to which such cars are subjected. The invention also contemplates, in keeping with the requirement of lightness in fast moving trains, a minimum number of elements commensurate with the size of the car.

The invention more specifically stated relates to the formation of one of the side wall sheets and the vertical side posts, in association with the adjacent side wall sheets, all constructed and arranged to permit the sheets and side posts to be welded together into a unitary structure adapted to be put into place and united with the car side sills, car roof and end walls.

Figures 1 and 2 illustrate an adaptation of my invention to an all steel type of railroad passenger car; only one end of a car side wall being shown in Figure 1, which is deemed sufficient to disclose the invention; it being understood that the improved structure preferably extends throughout the length of the car and is of similar construction throughout.

The side frame as illustrated comprises the top or letter-board sheet 10, lower side sheet 11, intermediate sheet 12 and the vertical side posts 13, all integrally united as hereinafter described.

The top or letter-board sheet 10 along its upper longitudinal edge is connected with the car-roof forming elements; while the lower longitudinal edge of the lower side sheet 11 is disposed about the car side sill 14 and secured thereto. These two side sheets 10 and 11 are preferably provided with the longitudinally extending outwardly bowed corrugations 15, disposed throughout the lengths of the sheets and of the construction disclosed in my copending application Serial Number 144,294 issued as Patent No. 2,150,897, March 21, 1939. The sheets 10 and 11 are formed to extend continuously from end to end of the car.

The intermediate sheet 12, a portion whereof is shown in Figure 4, also extends from end to end of the car; being preferably formed of separate sections of comparative length, for example 10'—4½'', a length sufficient to accommodate three window-openings, as shown at 16 in Figure 1 and the ends of the respective sections butt-welded together into a continuous car-length sheet.

Each section of the intermediate sheet 12 consists of the main or body portion 17, of width greater than the height of the window-openings 16 which are to be cut therein, and the horizontally disposed flanges 18, 18 extending throughout the upper and lower longitudinal edges of the sections. The flanges 18 are arranged on what may be termed the inside of the sheet and terminate in vertically disposed flanges 19; the flanges 19 at top and bottom being disposed in opposite directions, see Figures 2 and 4.

The horizontal flanges 18 are of comparative

width and are provided with longitudinally spaced apart slots as at 20, see Figure 4, for the purpose of receiving the vertical side posts 13; the slots being preferably formed to match the cross-sectional configuration of the car side-posts 13.

The intermediate sheet unit 12 is also preferably provided with outwardly bowed corrugations 15 arranged in spaced relation between the top and bottom longitudinal edges of the unit 12; the corrugations being similar to those in the top or letterboard sheet 10 and the bottom sheet 11, extending lengthwise of the car side wall.

With the window-openings arranged in the intermediate sheet 12 between its top and bottom longitudinal edges, it is apparent that the angular flanges of the sheet extend continuously from end to end of the sheet both above and beneath the windows and thus provide beam-sections throughout the car side wall, which, in conjunction with the outer corrugations 15, provide a rigid side wall section.

In the construction of the side wall, sheets of suitable lengths to constitute, respectively, the top or letter board and the lower side sheet are welded together in continuous lengths extending full length of the car body, as indicated at 21 in Figure 1. The intermediate sheet 12, in order to facilitate manipulation, is preferably composed of separate sections or blanks of lengths sufficient to receive a number of window-openings and parts of a window-opening as shown for illustration in Figure 1 where one section of the intermediate sheet 12 extends from the end of the car body to the point indicated at 22 where it abuts the end of the next section and is secured or welded thereto and the joint preferably provided on the insides of the sections with the splice plates shown in dotted lines at 23 in Figure 1 and in full lines at the right in Figure 4 and these plates welded to the ends of the adjacent sections constituting the intermediate pan-like sheet or of window-opening unit 12.

The sections which are to constitute the intermediate sheet after being provided along their longitudinal edges with a suitable number of slots of shape matching the cross-sectional contour of the posts 13—which may be of any suitable shape, preferably of the Z-shape cross-section shown—and the marginal edges with the slots bent into the angular flanges shown, then have the vertical side posts 13 threaded through the slots sufficiently to properly locate the intermediate sheet in its position, with the posts extending beyond the longitudinal edges of the intermediate sheet to extend rearward of the top or letter-board sheet 10 and lower side sheet 11 and permit the ends of the side posts to be welded or otherwise firmly secured to the top rail 24 and to the side sill 14 after the side wall unit frame is put into position.

After the posts 13 have been properly threaded through the slots 20 in both flanges 18 of the intermediate sheet 12, the adjacent flanges of the posts 13 are then spot welded to the main body 17 of the intermediate sheet and the horizontal flanges 18 and vertical flanges 19 are welded to the posts 13 with the vertical flanges overlapping and arranged against the inner laterally disposed portions or flanges of the posts and welded thereto, thus providing an integral intermediate side wall unit which forms a sub-assembly of the final side frame assembly.

After the posts have been properly threaded through the slots and welded as described, the desired window-openings are then laid out in

this pan-like sheet or intermediate unit and the window-openings cut out by appropriate means and the sub-assemblies then placed in position between the letter-board sheet and lower side sheet and in proper sequence relative to the car body, with matching ends, and with the exposed ends of the posts in lapping relation with the letter-board and lower side sheets and the posts spot welded to the last mentioned sheets. The abutting joints in the horizontal and vertical flanges of the pan or intermediate sheet are then securely arc welded together and the overlapping portions of the letter-board, intermediate and lower side sheets welded together. The assembled side frame unit is then applied to the car body and secured to the adjacent portions of the car body.

As is apparent from the drawings and the foregoing description, a continuous longitudinal beam-like element, both above and below the windows, is provided consisting of horizontally and vertically disposed portions or flanges which affords the requisite lateral stiffness for the side frame assembly. Furthermore, by providing the slots in the flanges as described, I permit the use of single piece side posts and obviate joints in the individual side posts and consequently obtain a very rigid car side frame construction.

It will be understood, of course, that any suitable length of sections may be employed to constitute the respective sheets 10, 11 and 12 commensurate with the car length; the intermediate sheet sections, for convenience in handling, being shown of length sufficient to receive two complete window-openings and one-half or portion of a third window-opening, as disclosed in Figure 1; the length and number of sheet-sections, however, may vary in keeping with the car length.

After the complete side frame unit has been put into place on the car side, the car inside wall sheets 25 with intervening insulation 26, as shown in Figure 2, is then applied and suitably secured in place.

The exemplification chosen to illustrate my invention is believed to be its best embodiment but structural modifications are possible and may be made without, however, departing from the spirit of my invention as defined by the appended claims.

What I claim is:

1. In a railroad car construction, a side frame comprising longitudinally extending letter-board, intermediate and lower side metal sheets; the intermediate sheet being provided with longitudinally spaced window-openings and its upper and lower longitudinal edges bent inwardly to provide horizontally disposed portions terminating in vertically extending flanges, said horizontal portions at longitudinally spaced points being provided with closed ended slots; and vertically disposed posts extending through said slots and intimately secured to said horizontal portions, vertical flanges and to the inner sides of the main portions of the letter-board, intermediate and lower side sheets.

2. In a railroad car construction, in combination with spaced apart vertical posts an intermediate sheet disposed lengthwise of the car and provided with window-openings and with laterally disposed portions extending lengthwise of said sheet above and below the window-openings, said portions being provided with openings shaped to match the cross-sectional configuration of said posts which are threaded through said openings, the body of the sheet having out-

wardly disposed portions extending throughout the length of the sheet; the posts being welded to the main body of the sheet and to said laterally disposed portions of the sheet.

5 3. In a railroad car side frame construction, an intermediate window-opening sheet metal section having longitudinally extending and outwardly disposed reinforcing surfaces and extending lengthwise of the car-side, the upper and 10 the lower longitudinal marginal portions being bent horizontally inward and then vertically to constitute a longitudinally extending beam both above and below the window-openings, with the horizontal top and bottom marginal portions 15 provided at longitudinally spaced points with closed ended slots; and vertical metal posts disposed through said slots and integrally united

with said horizontal and vertical portions of said sheet.

4. In a railroad car side frame, an integral car length window unit composed of longitudinally disposed metallic sheets arranged in end-to-end abutting relation and welded together, 5 said sheets being provided with window-openings and being formed of pan-shape cross-section with the top and bottom marginal edges disposed inwardly and provided with Z-shape open- 10 ings and terminating in vertical flanges; and vertically disposed posts of Z-shape cross-section threaded through said openings and welded to the marginal edges and vertical flanges of the sheets.

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