Nov. 3, 1953 F. A. ECOFF 2,657,645

RAIL CAR PANEL

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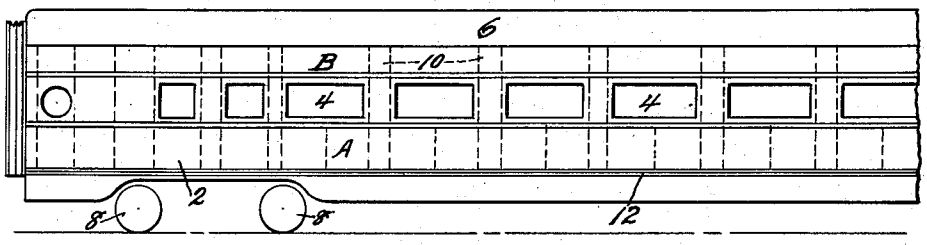

Fig. 1

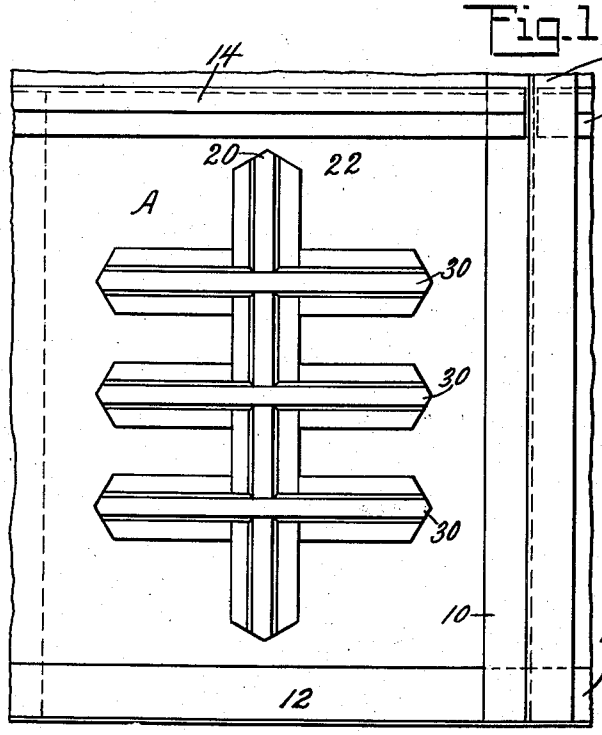

Fig. 3

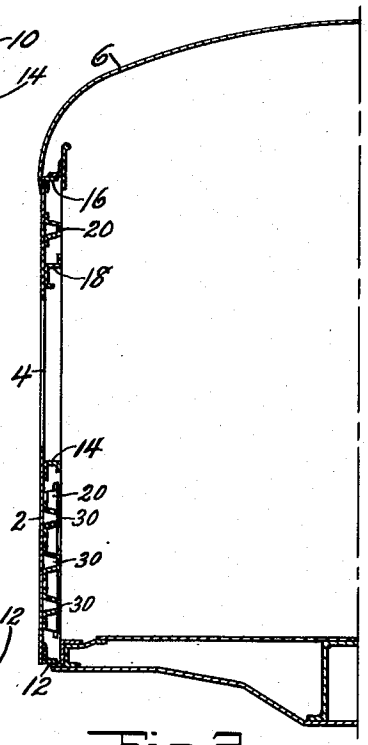

Fig. 2

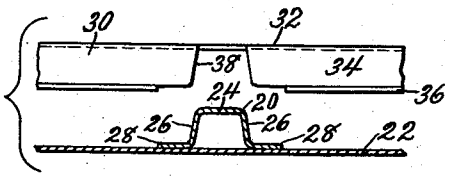

Fig. 4

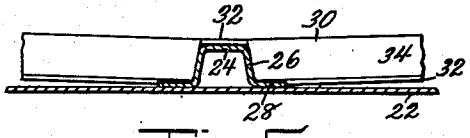

Fig. 5

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RAIL CAR PANEL

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3 Claims. (Cl. 105—401)

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This invention relates to rail cars in general and in particular to the panels of rail cars having flat, smooth exterior surfaces.

In the construction of rail cars having smooth exterior surfaces it is almost impossible to produce a smooth, flat side which does not show buckles when given a high gloss coat of paint. While a car side may under certain conditions of temperature and loading appear quite smooth and flat, it will under other conditions of temperature and loading show buckles to a greater or lesser degree. If the panel areas between the framing members are quite small the buckles are not particularly objectionable, but where as in light weight construction the panel areas are large and the metal sheets light, the buckles are quite objectionable. In certain constructions the light weight panels are stiffened by covering the entire inner surface with corrugated sheets. Such an arrangement, however, adds materially to the cost of construction and destroys the light weight advantages gained by using the thin sheets and spaced framing. The buckles can also be removed by tensioning the sheets through the use of heat, but this in some instances injures the sheets and is not effective under different load conditions to eliminate buckles. It is an object, therefore, of the present invention to provide extremely light weight stiffeners which can be applied to the panels where needed and which will effectively remove the buckles.

A further object of the invention is the provision of stiffeners arranged in cross form and so applied to the panel as to mutually tension each other.

A still further object of the invention is the provision of stiffeners applied to panels in a definite sequence and in such a manner as to place the panel under light tension while breaking up any buckles present.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawings, in which

Fig. 1 is an elevational view of substantially one-half of a railway passenger car;

Fig. 2 is a section taken through the car at one of the window openings;

Fig. 3 is an inside elevational view of one of the stiffened panel areas;

Fig. 4 is a sectional view showing the manner of applying the stiffeners, and

Fig. 5 is a sectional view similar to Fig. 4 but showing the stiffeners in applied position prior to welding.

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Referring now to the drawings in detail it will be seen that a conventional railway car having sides 2, windows 4 and roof 6 has been shown as supported by wheels 8. The side is constructed as usual of posts 10, side sill structure 12, belt rail 14 and top plate 16. As is customary, a longitudinal stiffening strip 18 extends longitudinally of the car above the windows. The posts, sill and belt rail will define panel areas A located below the window, while the posts, plate 16 and strip 18 will define panel areas B located above the windows in what is generally termed the letterboard area.

One of the panel areas A has been shown enlarged in Fig. 3, but it is to be understood that any description of this panel is equally applicable to any of the panels A, as well as to the panels B. As shown most clearly in Fig. 3, a relatively long stiffener 20 is welded or otherwise attached to the metal sheet 22 of the panel and this stiffener is placed with its longitudinal axis parallel to the longitudinal axis or long dimension of the panel. As shown the stiffener is of general hat shape or flanged channel cross-section, having web or top portion 24, flanges 26 and reflanges 28. These reflanged portions 28 are spot welded or otherwise attached to the sheet 22. Following the application of stiffener 20 to the panel additional stiffeners 30 are applied and these are applied in sufficient number to break up or remove the buckle from the panel. Usually it will be found that one stiffener 20 and one stiffener 30 are sufficient; in other words, a cross form stiffener. However, in cases of bad or deep buckles additional stiffeners 30 will be required as shown.

Each of the stiffeners 30 is also of hat or flanged channel cross-section, having a web 32, flanges 34 terminating in reflanges 36. As best shown in Figs. 4 and 5, the stiffeners 30 are notched as at 38 by having portions of the flanges 34 and reflanges 36 removed. The amount of metal removed to produce the notch 38 is slightly less than the amount of metal in the cross-section of stiffener 20, thus when the stiffeners 30 are applied and forced down into position, the notch will cause the stiffener to be bent slightly as shown in Fig. 5 so that while the central portion is in contact with stiffener 20, the end portions will be spaced from the panel 22. Upon application of pressure to the stiffener 30, as shown in Fig. 5, it will be forced into intimate contact with the sheet 22 of the panel, thus stressing the stiffener and particularly placing the web 32 in tension. While the stiffeners 30

are held in intimate contact with the panel **22** they are spot welded or otherwise secured thereto. After spot welding and removal of the pressure, the tension in webs **32** will equalize by placing the sheet **22** under slight tension. In other words, by applying the stiffeners **30** in the manner described there is a slight bowing effect given stiffeners **30** and **20** as well as panel **22**. This slight bowing and tensioning of panel **22** is added to by the slight squeezing of flanges **26** of the stiffener **20**.

In the case of the panels B quite frequently the application of the stiffeners **20** running longitudinally of the panel is sufficient, but where deep buckles appear it will be necessary to apply cross members or stiffeners as described in connection with panel A.

While the invention has been described more or less in detail with specific reference to the drawings, it will be understood that various modifications and rearrangements of parts other than those shown and described may be made and all such modifications and rearrangements of parts are contemplated as will fall within the scope of the appending claims defining my invention.

What is claimed is:

1. A stiffened panel for railway cars comprising a thin substantially flat sheet of metal, frame members secured to the metal sheet and bounding a panel area in the sheet, a first stiffener welded to said panel on one side thereof, and a plurality of additional stiffeners positioned substantially normal to said first stiffener and overlapping the same and welded to said one side of the panel.

2. A stiffened panel for railway cars comprising a thin substantially flat sheet of metal, frame members secured to the sheet of metal and bounding a panel area, and hat shaped stiffeners welded to said panel on one side thereof to provide therewith box like stiffeners for the panel, said stiffeners being arranged substantially in the

form of a cross free of attachment to the frame members, at least one of said stiffeners being bowed prior to welding to the panel to place the metal of the panel under tension.

3. A stiffened panel for railway cars comprising a thin substantially flat sheet of metal, frame members welded to the metal sheet and bounding a panel area, a first stiffener of channel cross-section having the flanges thereof terminating in outwardly directed reflanges, welds securing said reflanges to the metal panel, a second stiffener of channel cross-section having the flanges thereof terminating in outwardly directed reflanges, said second stiffener having portions of the flanges and reflanges cut out whereby said second stiffener may etxend transversely of and overlap said first stiffener with the reflanges of each disposed in a common plane, the cut out portions of the flanges of said second stiffener being of slightly less area than the cross-section dimension of said first stiffener whereby said second stiffener flanges tightly engage the flanges of said first stiffener when in secured position on the panel, and welds securing said second stiffener reflanges to said metal panel.

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