Jan. 14, 1969 J. W. ALLEN ET AL 3,421,453

VERTICAL CORRUGATED SIDE FOR GONDOLA CAR

Filed Oct. 5, 1966 Sheet 1 of 3

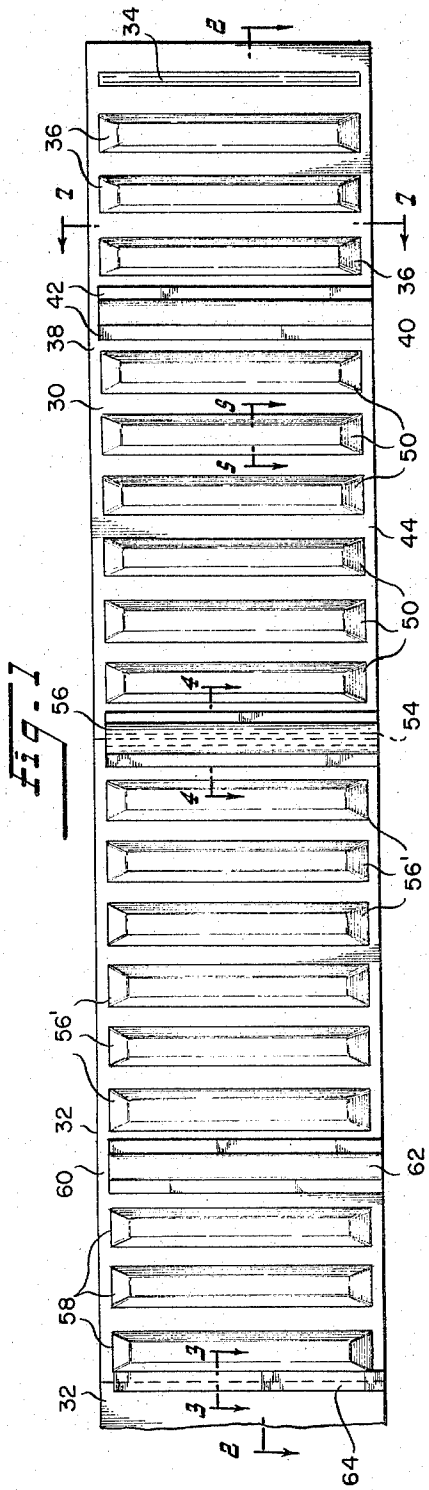


Fig. 1

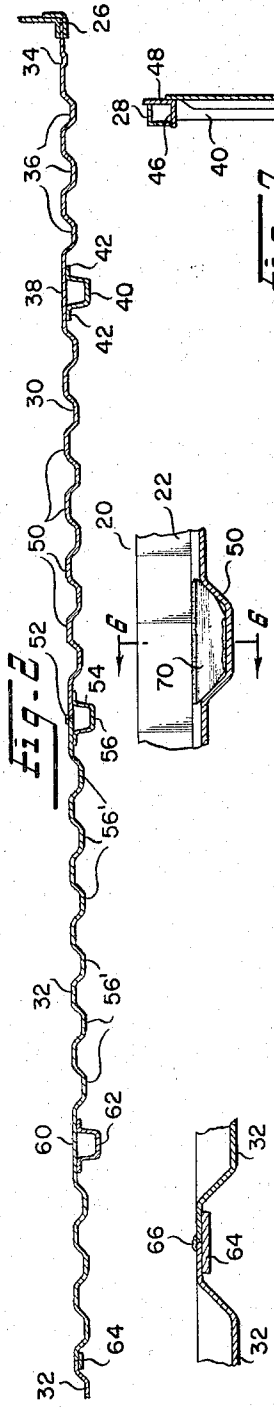


Fig. 2

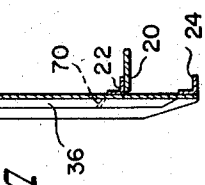


Fig. 7

Fig. 5

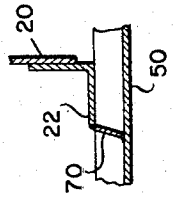


Fig. 6

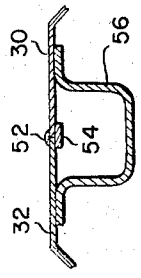


Fig. 4

Fig. 3

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VERTICAL CORRUGATED SIDE FOR GONDOLA CAR

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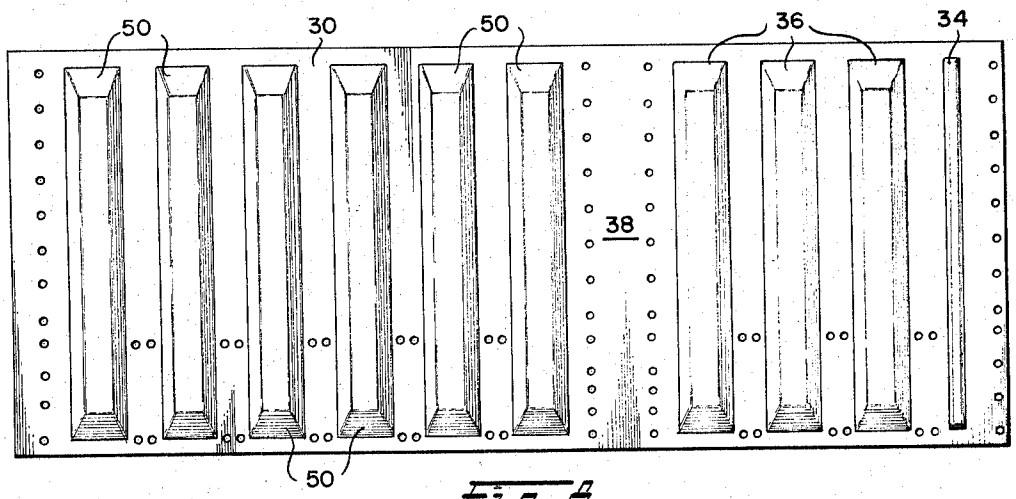


Fig. 8

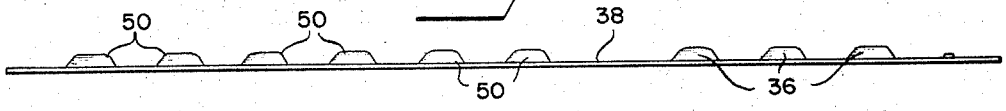


Fig. 9

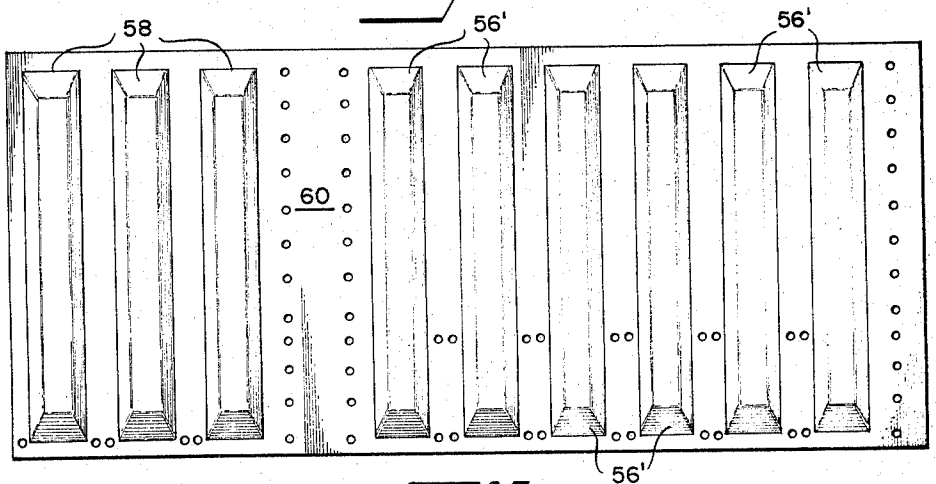


Fig. 10

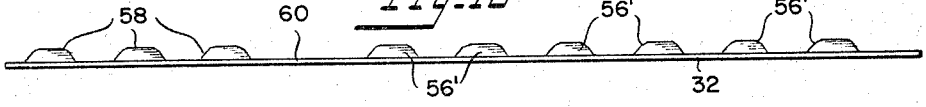


Fig. 11

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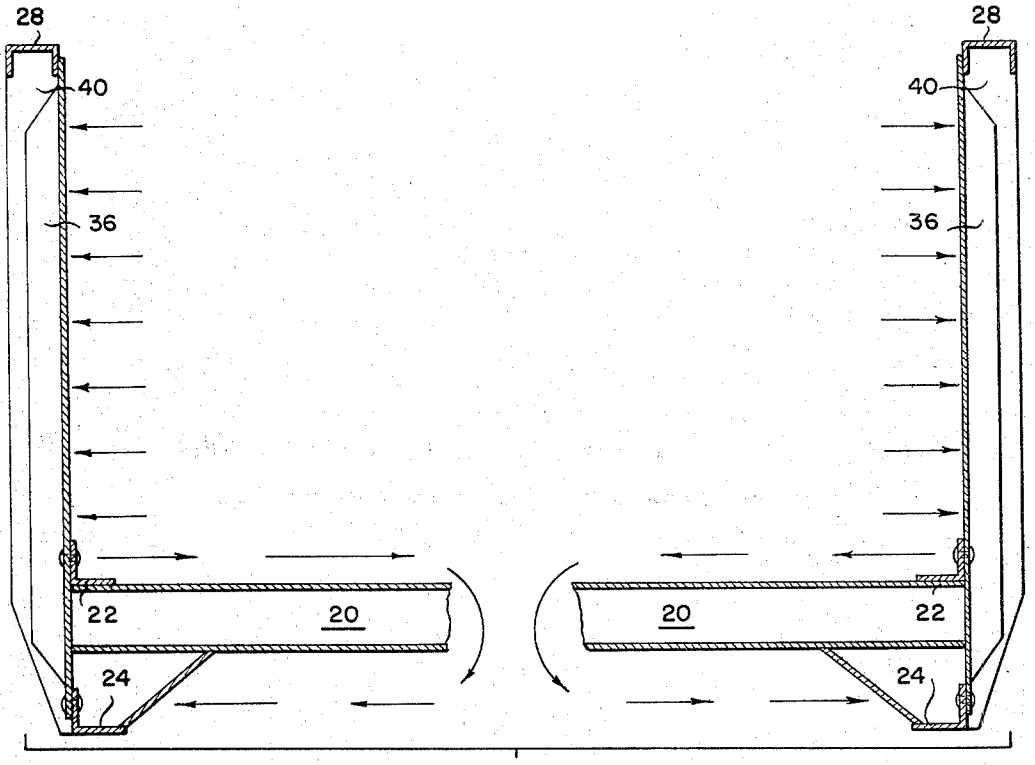


Fig. 12

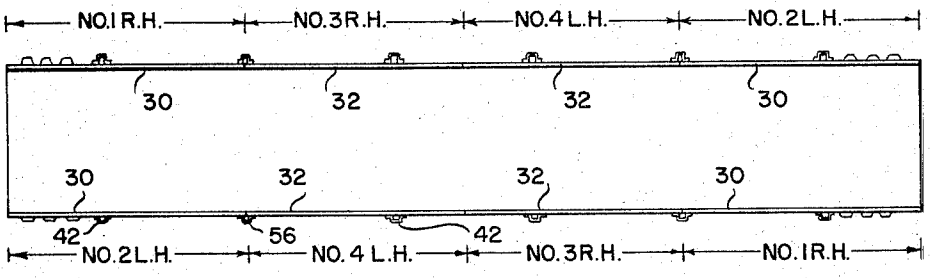


Fig. 13

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VERTICAL CORRUGATED SIDE FOR GONDOLA CAR

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U.S. Cl. 105—406 6 Claims
Int. Cl. B61d 17/08

ABSTRACT OF THE DISCLOSURE

A side wall structure for gondola or other open-top cars wherein said side walls function as girders between the ends of the car and also carry part of the load to the body bolsters by extending down over both side sills of the car for stiffness and whereby a resisting moment is provided by the floor structure against the pressure of the load on the side wall.

Background of the invention

Gondola cars are provided with the usual underframe comprising center sill, bolsters, side sills, end sills, etc. In most such cars the side sill is at substantially the level of the car floor so that the floor is supported on the underframe and side sill. In a good many such cars there is another auxiliary sill which is spaced below the other sill.

The side wall of these cars, having both upper and lower side sill members, comprises a flat sheet of metal extending from one corner of the car to the other and having along its top margin a chord member in the form of a channel iron, or bulb angle. The side wall extends down over the upper and lower sill members and is secured thereto. Side stakes in the form of channel pieces with narrow flanges are secured to the side wall so as to extend vertically from the top chord member to the bottom of the wall. They are spaced horizontally along the wall.

It thus becomes possible to integrally form in the side wall, between the stakes secured thereto, vertically corrugations, spaced longitudinally along the wall, which extend from the upper to the lower margins of the wall, terminating wholly within the wall, but which extend over the upper side sill and down to the lower side sill.

Thus when a gondola car having these sides thereon is loaded with a plastic lading, the pressure exerted on the inside of the side results in a resisting moment of the floor structure due to the vertical corrugations cantilevering from the floor structure.

Description of the invention

The objects of the invention are to provide a side wall for a gondola car having upper and lower side sills, said side wall being provided with vertical horizontally spaced corrugations pressed therein, which corrugations terminate wholly within the side, leaving the side margins and end margins flat and in the same plane. The side wall is applied to the car underframe and upper and lower side sills with the lower side margin of the wall secured to the lower side sill and the wall also secured to the upper side sill.

Referring now to the accompanying drawing forming part of this application and wherein like reference characters indicate like parts.

FIGURE 1 is a side elevation of a portion of a gondola car side wall illustrating our invention.

FIGURE 2 is a cross section on the line 2—2 of FIG. 1.

FIGURE 3 is a section on the line 3—3 of FIG. 1.

FIGURE 4 is a section on the line 4—4 of FIG. 1.

FIGURE 5 is a section on the line 5—5 of FIG. 1.

FIGURE 6 is a section on the line 6—6 of FIG. 5.

FIGURE 7 is a section on the line 7—7 of FIG. 1.

FIGURE 8 is a side elevation of an end sheet of the side wall.

FIGURE 9 is an edge elevation of FIG. 8.

FIGURE 10 is a side elevation of an intermediate sheet of the side wall.

FIGURE 11 is an edge elevation of FIG. 10.

FIGURE 12 is a cross sectional view through a gondola car indicating by arrows the bulging load on the gondola side and the resisting moment of the floor structure whereby the side can act as a cantilever structure from the floor framing.

FIGURE 13 is a diagrammatic view of the arrangement of the sheets to make up the side wall.

As shown in FIG. 12, the floor of a gondola car is indicated at **20**, the upper side sill is indicated at **22** and the lower side sill is indicated at **24**. A corner post of the car is indicated at **26** as seen in FIG. 2 which extends upwardly from the end of the bottom sill to the end of the top chord **28**. The top chord may be in the form of the two angles, as shown in FIG. 7, or a downwardly facing channel as shown in FIG. 12, or it may be in the form of a bulb angle.

Each car side wall is composed of two end sheets **30** and two intermediate sheets **32**, which, when secured together end to end, extend from corner post **26** to corner post **26** of the car. The upper edge margin of this composite side wall overlaps slightly the top chord **28** and is secured thereto by welding or the like. The side wall also overlaps the upper sill **22** and edge of the floor **20** and is also secured thereto in any desired manner. The side wall extends on downwardly and its lower edge margin overlaps and is secured to the upstanding flange of the lower side sill **24**. The lower margin of the side is thus secured to the outside of the upper and lower sills and the upper margin is secured to the inside of the top chord **28**.

The end sheets **30** and intermediate sheets **32** are each formed of flat rectangular sheet material. They are of a length so that when welded or otherwise secured together in end to end fashion they together form the whole side wall of the car, acting as a girder extending from corner post **26** to corner post **26**.

The end and intermediate sheets are substantially the same in that each is provided with equally spaced vertical corrugations which extend from substantially the bottom to substantially the top of the sheet. The corrugations are formed integrally in the sheets by pressing the same therein between reciprocal dies. The forming of the corrugations in this way, wholly within the bounding planes of the sheet, leaves a marginal area surrounding the sheet which is flat and in the same plane, providing ease in welding or otherwise securing the wall to the side sills, floor and top chord of the side wall.

The end sheets **30** each has a narrow shallow corrugation **34** pressed therein of the same length as the other corrugations but located close to the end edge of the sheet. Inwardly from this shallow corrugation **34** are a plurality (in this instance 3) of spaced wider and deeper corrugations **36**. Inwardly of these corrugations is a flat area **38** on which is secured a side stake **40** which is channel shaped with side flanges **42—42** secured to the side sheet. These stakes **40** extend from the bottom edge **44** of the sheet to adjacent the top edge where they abut and are secured to the bottom horizontal flange **46** of the side plate. The upper flat side margin of the sheet overlaps and is secured to a vertical flange **48** of the top chord.

Inwardly of the side stake **40** of each end sheet is an-

other series (in this instance 6) of equally spaced integrally formed vertical corrugations **50**, which are identical to the corrugations **36**.

The end sheet **30** terminates just inwardly of the innermost corrugation **50** and the end edge thereof abuts the end edge of the adjacent intermediate sheet **32**. The said end edges are welded together, as at **52**. To strengthen this joint a narrow backing strip of material **54** is welded to the outside of the abutting joint of said edges, and another stake **56**, identical to stake **40**, is welded to the meeting margins of sheets **30** and **32** over the strip **54**. See FIG. 4.

The intermediate sheets have the same arrangement of integral corrugations therein, that is, a group of six corrugations **56**, and a group of three corrugations **58** with a flat area **60** between these groups upon which is secured a stake **62**, identical with the stake **40**. Where the ends of the intermediate sheets **32** meet as shown in FIGS. 1 and 3, there is a flat backing strip of material **64** welded over the meeting edges to strengthen the joint. The meeting edges of said intermediate sheets are welded together as indicated at **66**. See FIG. 3.

The other half of the car side is identical to that just described so that the composite side wall extends from corner post **26** to corner post **26** of the car. Said corner posts **26** extend upwardly from the corners of the car underframe as is common and the ends of the side sills **22** and **24** engage and are secured to said posts, also as is common.

It will be noted that the corrugations **36**, **50**, **56** and **58** extend from the top chord **48** over both side sills **22** and **24** and are secured to each as well as the side edge of the floor **20**, which is shown diagrammatically in FIG. 7. This is a principal feature of the invention, in that the vertical corrugations cantilever from the floor structure and provide a moment in said corrugations to resist pressures of a plastic lading outwardly against the sidewall.

To prevent granular material carried within such cars from flowing downwardly in the corrugations past the car floor and out of the car, we have provided a closure or baffle plate **70** for each corrugation. These baffles or closure plates are of a configuration in plan view to fit the contour of the corrugations and are welded therein on an incline (see FIGS. 5, 6 and 7) so that the lower edge engages and is welded along the upper edge of the vertical flange of the upper side sill **22**. Each of the integrally formed corrugations **36**, **50**, **56** and **58** is provided with a closure or baffle plate **70** to prevent leakage of granular lading to outside the car.

From the foregoing it will be understood by those versed in the art that we have devised an improved composite side wall for gondola or open-top freight cars having upper and lower side sill members, said side wall having formed therein integral vertically disposed spaced corrugations, which corrugations span both side sills and floor structure and cantilever from the floor structure, providing a moment in said corrugations to resist pressures of plastic lading against said sidewall.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. In a railway gondola car having upper and lower side sills, top chords, and a floor structure substantially in plane with said upper sill, the combination therewith of a side wall overlapping the outside of said sills and floor structure, secured thereto and extending thereabove, and overlapping the inside of said top chords, horizontally spaced vertically disposed corrugations integrally formed in said side wall and extending from the upper margin to the lower margin of said wall, whereby forces imposed by a lading against said side wall above the floor structure results in a resisting moment of the floor structure due to the corrugations cantalevering from the floor structure.

2. The structure of claim **1**, said corrugations terminating wholly within said wall leaving a flat coplaner marginal area entirely about said wall for engagement with said lower sill and chord member.

3. The structure of claim **1** and a closure plate or baffle fitting the inside contour of each corrugation, inclining downwardly therefrom and secured to the upper sill member to prevent the escape of granular lading from said car through said corrugations.

4. The structure of claim **1**, said vertical corrugations being arranged in groups having a flat space between said groups, and side stakes of channel form located in said spaces and secured to said wall, said stakes extending from adjacent the top edge of said wall to the lower edge thereof.

5. The structure of claim **1**, said side wall being composed of several sheets joined in end to end relation, backing strips covering said joint and welded to the side margins thereof to strengthen said joint.

6. The structure of claim **5**, and a side stake of channel form located over said backing strip to further strengthen said joint and said side wall.

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