

Nov. 24, 1959

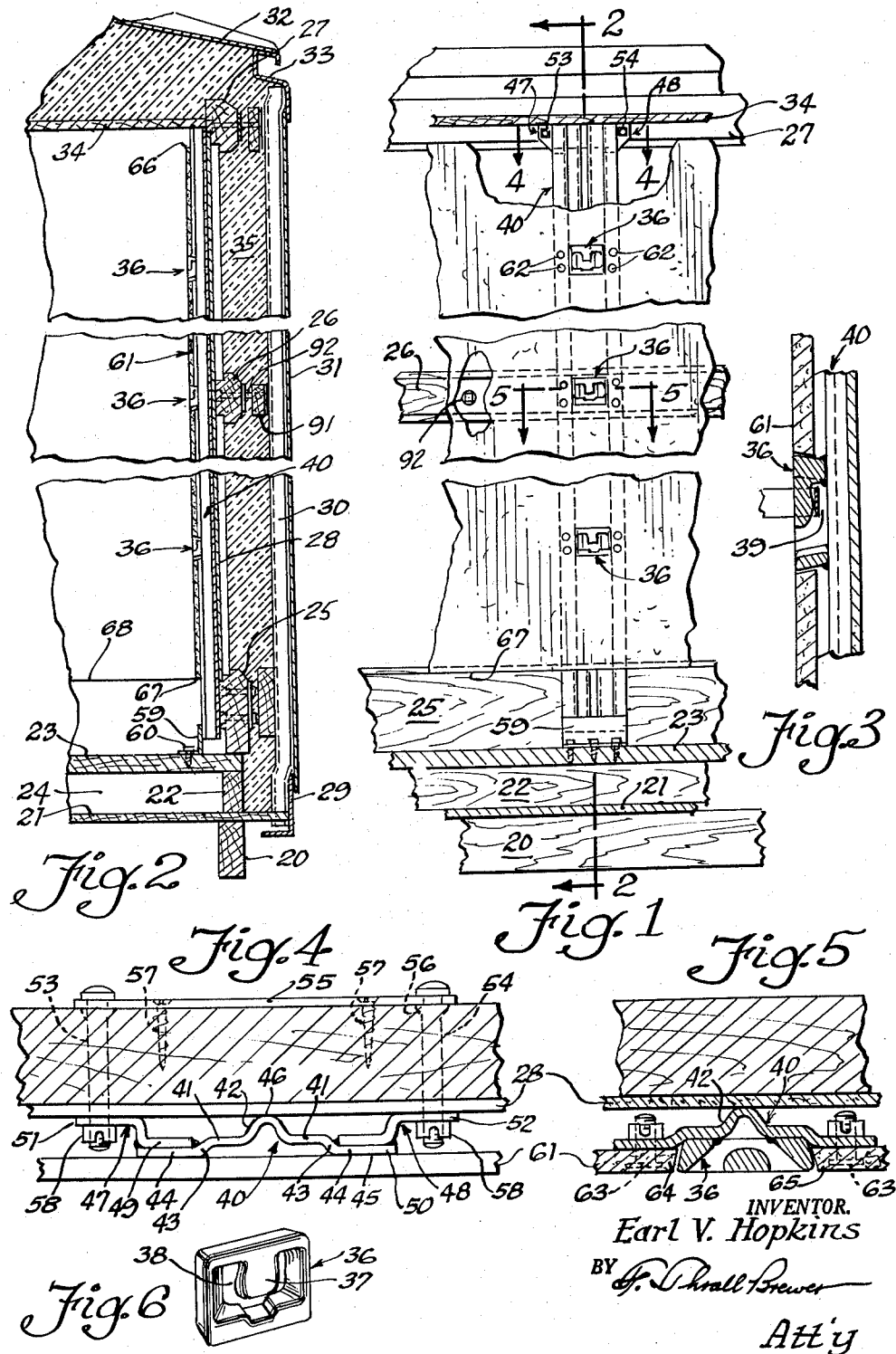
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2,914,004

LADING STRAP ANCHOR SUPPORTS FOR REFRIGERATOR CARS

Filed April 19, 1954

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

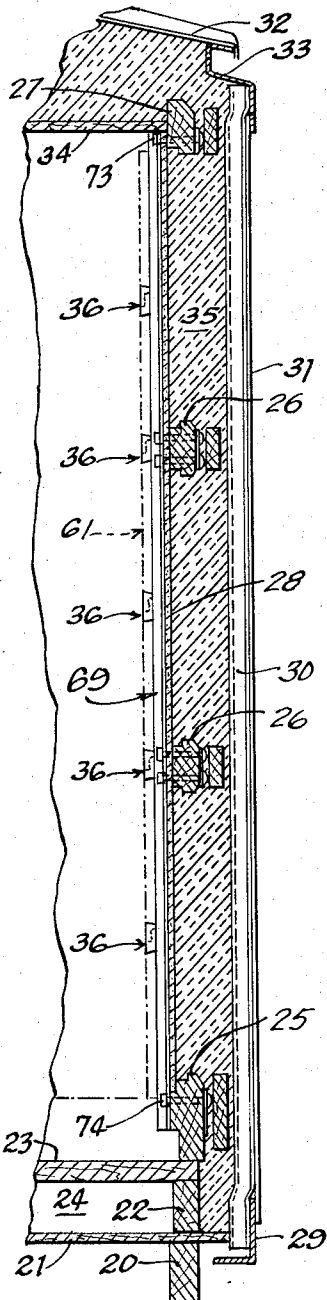


Fig. 7

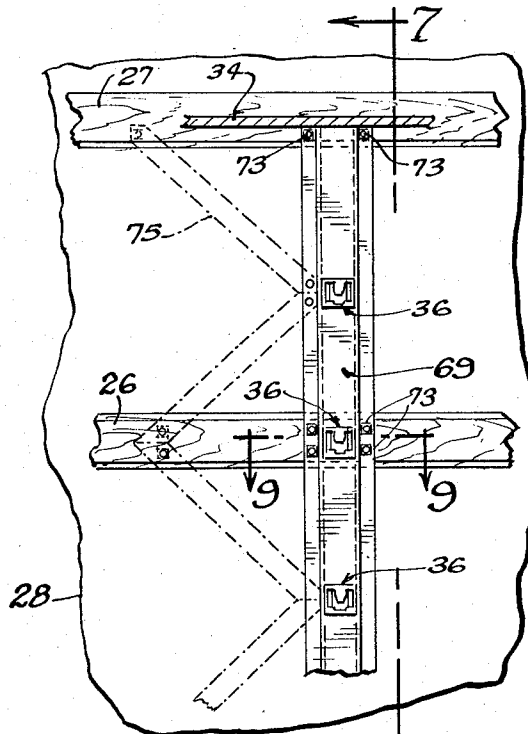


Fig. 8

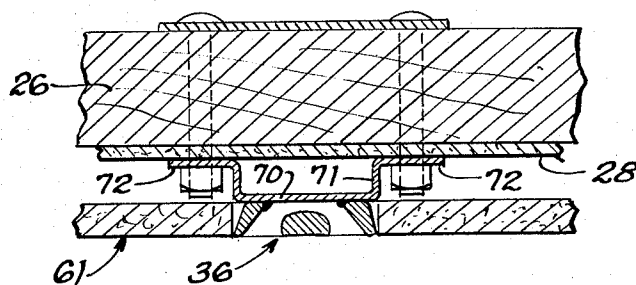


Fig. 9

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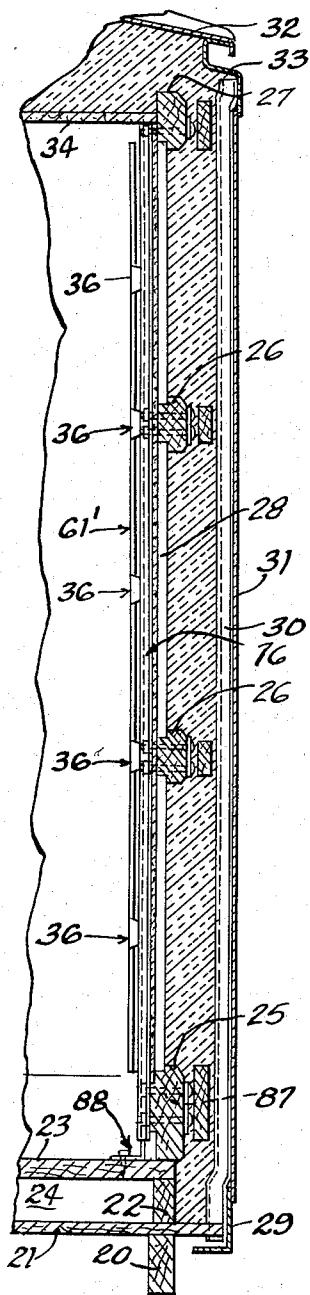


Fig. 10

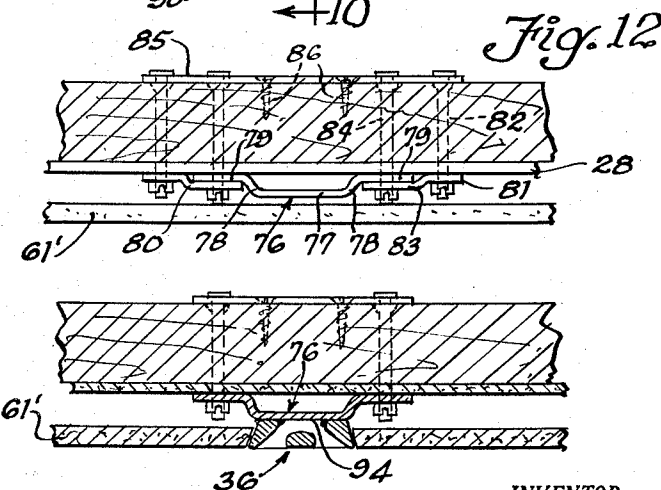
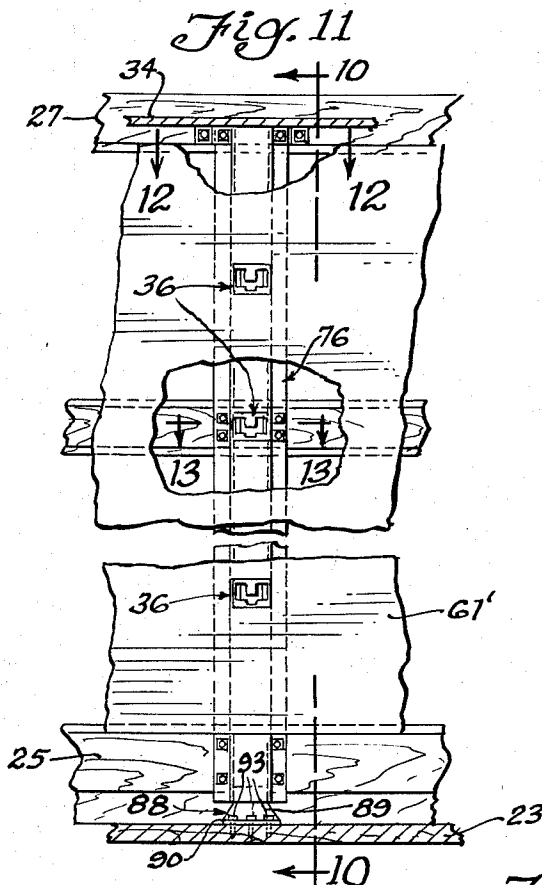


Fig. 13

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1

2,914,004

LADING STRAP ANCHOR SUPPORTS FOR REFRIGERATOR CARS

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4 Claims. (Cl. 105—423)

This invention relates to lading strap anchor supports for refrigerator cars. It will be described with reference to its application to refrigerator cars for railroads, although it is understood that the invention may be applied with equal facility to refrigerated trucks, ships and other carriers of freight.

Refrigerator cars, as presently constructed, embody an outer shell and an inner lining spaced from the shell, and have a sub-lining between the outer shell and inner lining with insulation packed in the space between the sub-lining and the outer shell. Suitable braces and supports are provided for the sub-lining and the inner lining to give them rigidity. These braces and supports are disposed in the space between the sub-lining and the outer lining so that they may function to support the sub-lining. An air space is left between the sub-lining and the inner lining through which free circulation of air is encouraged. Such air space is generally referred to as the air flue and is desirably maintained free of obstructions in a vertical direction to permit the cold air to pass from the inner portion of the refrigerator car along the sides and ends thereof. Openings are provided at the top and bottom of the car lining, so that any air in the air space or air flue which may become warmed through a heat transfer from the outer shell through the insulation and sub-lining may rise in the air flue to the top of the car lining and then through the opening thereat into the interior of the car where it is again cooled.

The car lining is generally made strong enough to take the side thrust of the load in the car but it is generally desirable to anchor the load in some manner to the side walls of the car to prevent it from shifting longitudinally of the car. Normally the side walls of refrigerator cars do not offer facilities for the secure attachment of lading strap anchors.

The principal object of this invention accordingly is the provision of a supporting means for lading strap anchors in refrigerator cars or vehicles wherein the supporting means is securely braced without the aid of heat conductive elements which extend through the car wall in a manner to impair the insulating efficiency of the wall, and which further does not interfere with the normal circulation of air in the space between the sub-lining and car lining usually found in such cars or vehicles.

As a more specific object of this invention I wish to provide a support for lading strap anchors for refrigerator cars or the like which will be secured to the wall brace members, but which will have means spaced from the brace members to which the lading strap anchors may be welded or otherwise secured in such manner that series of said anchors may be installed in the car as a unitary sub-assembly, if desired, and such anchors will form a smooth continuation of the inner wall of the car lining.

A still further object of this invention is the provision of a supporting means for lading strap anchors wherein said supporting means is comprised of wing channel members disposed vertically against the sub-lining of a refrigerator car or the like so as not to interfere with the normal circulation of air between the sub-lining and the inner

2

lining of the refrigerator car, said channel being of such depth and configuration that when one element thereof contacts the sub-lining, another element thereof contacts the inner lining and may be secured thereto for rigidity, the channel being provided with surfaces intermediate the sub-lining and inner lining through which the lading strap anchors may be secured.

Other objects of this invention are the provision of special securing means for a channel shaped supporting member for lading strap anchors which, together with such supporting means, form strong abutments for the load, are simple and easy to manufacture and install and do not necessitate any radical changes here in the construction or function of the average refrigerator car or the like.

These and other objects of this invention will become apparent from the following detailed description when taken together with the accompanying drawings, in which

Fig. 1 is a fragmentary front elevational view of a portion of a refrigerator freight car to which the supporting means for lading strap anchors made according to this invention is shown;

Fig. 2 is a fragmentary end sectional view of the lading strap anchor support of this invention, wherein the section is taken substantially on line 2—2 of Fig. 1 and viewed in the direction indicated;

Fig. 3 is an enlarged fragmentary end sectional view of a lading strap anchor and its support drawn to a larger scale than Fig. 2, and showing more clearly the construction of this portion of Fig. 2;

Fig. 4 is a fragmentary top sectional view of the support for lading strap anchors taken substantially along a line 4—4 of Fig. 1 and drawn to a larger scale than Fig. 1;

Fig. 5 is a fragmentary top sectional view of a lading strap anchor and its support wherein the section is taken substantially at a position indicated by a line 5—5 of Fig. 1;

Fig. 6 is a perspective view of a typical lading strap anchor which may be used with the supporting means shown in Fig. 1;

Fig. 7 is a fragmentary sectional view similar to Fig. 2 and illustrating another form of lading strap anchor support for refrigerator cars embodying the principles of this invention;

Fig. 8 is a fragmentary front elevational view of the lading strap anchor supporting means of Fig. 7;

Fig. 9 is a fragmentary top sectional view of the supporting means of Figs. 7 and 8, showing a lading strap anchor secured thereto, the section being taken substantially on a line 9—9 of Fig. 8 and in the direction of the arrows;

Fig. 10 is a fragmentary end sectional view similar to Figs. 2 and 7, and depicting another form of support for lading strap anchors for refrigerator cars;

Fig. 11 is a fragmentary front elevational view of the supporting means of Fig. 10, with certain portions of the inner lining removed to show the construction of the supporting means;

Fig. 12 is a fragmentary top plan view of the supporting means of Fig. 11, taken substantially along a line 12—12 of Fig. 11; and

Fig. 13 is a fragmentary sectional view of the supporting means for lading strap anchors showing one such anchor mounted thereon, the section being taken substantially along a line 13—13 of Fig. 11.

Referring now to the drawings for a detailed description of the invention and particularly to Figs. 1 to 6 inclusive, a typical refrigerator freight car construction may include sub-floor supports 20, upon which rests sub-floor 21 constituting the underside of the floor construc-

tion of the car. On sub-floor 21 and over the sub-floor supports 20 is secured a wood furring strip 22 upon which is nailed the decking 23 of the car. The space between the decking 23 and sub-floor 21 may be filled with insulation 24 to prevent a rapid heat transfer from the exterior of the car through the decking 23 thereof.

At vertically spaced intervals in the car wall structure, horizontally disposed belt rails 25, 26 and 27 are utilized, which belt rails are usually made of wood, and the bottom of which belt rails is typified by member 25 resting upon the decking 23, and the top of which belt rails is typified by member 27, while intermediate belt rails take the form of member 26. Each of the belt rails 25, 26 and 27 is secured to appropriate horizontal wooden frame members 91 by lag screws or bolts 92 or the like, said horizontal frame members being rigidly secured to the vertical members of the steel side framing of the car, including side posts 30. It is understood that as many horizontally disposed belt rails will be provided in a refrigerator car as is deemed necessary to afford the requisite strength and rigidity for the walls of the car.

To the left-hand sides of belt rails 25, 26 and 27, as viewed in Fig. 2, is secured relatively thin sheet material to provide sub-lining 28 for the car. Said sheet material is preferably fiber board or other substantial insulating material. It can be plywood, inasmuch as its primary function is merely to retain insulation.

Sub-floor 21 extends beyond or overhangs sub-floor supports 20 and abuts on the inner surface of a side sill angle 29 of the car. Steel side posts 30 extend upwardly from the side sill angle 29 to a side plate 33 and are secured to each to form the support for outer steel sheathing 31 of the car. A roof 32 for the car is supported from posts 30 by the Z-section side plate 33, the ceiling for the car, however, being spaced below the roof and formed by horizontal wood sheathing 34 extend laterally from upper horizontal belt rails.

The space between the outer steel sheathing 31 and the sub-lining 28 is desirably filled with heat insulating material to prevent the transfer of heat from the outer sheathing 31 to the interior of the car. The space between roof 32 and ceiling 34 may be packed with insulating material.

It is contemplated that the cargo will be securely fastened to the walls of the car by thin flexible flat strips of steel or the like generally known as lading straps or ties. The ends of the straps are secured to anchors such as the one shown at 36 in Fig. 6, said anchors being preferably made as steel forgings and welded or otherwise secured to a fixed portion of the interior of the car. Said anchor 36 has an integral lug 37 extending into an opening 38 in the central region of an outer mounting portion of the anchor. The thickness of the lug is less than the thickness of the outer mounting portion of the anchor, so that when the anchor is secured against a flat wall or supporting member, a space 39 (Fig. 3) remains behind the lug. A looped end of the lading strap may thus be hooked around the lug 37 and is then automatically retained to prevent slipping of the strap from said anchor. The manner in which the lading strap is secured to lug 37 is well known in the art, so that further discussion herein is considered to be unnecessary.

The support for the anchors, in accordance with this invention, comprises wing channel posts 40 disposed vertically against sub-lining 28 and extending from the ceiling 34 of the car to within a short distance of decking 23. The wing channel posts are shown in section in Figs. 4 and 5 and include spaced web sections 41 connected by an outwardly pressed bead 42, each web section 41 terminating laterally in an angularly disposed side section 43 which in turn terminates in outwardly extending coplanar wings 44. The space between the inner regions of side sections 43 is substantially equal in length to the horizontal dimension of the anchor 36, such that said anchor may be received within the side

sections 43, as shown in Fig. 5. The maximum depth of the wing channel posts, that is, the dimension from inner faces 45 of the wings 44 to the exterior surface 46 of the bead 42, is substantially equal to the desired air space between the inner surface of the sub-lining 28 and the outer surface of inner lining 61 of the car to provide a desirable air circulation in the car wall.

The means for securing the upper end of wing channel posts 40 to brace member 27 is shown in Figs. 1 and 4, and comprises plates 47 and 48 which are Z-shaped in cross section, as viewed in Fig. 4, one leg 49 and 50 of each of the plates 47 and 48 respectively being welded to the wings 44 of the channel posts and the other legs 51 and 52 abutting on sublining 28 and being secured to the brace member 27 by suitable bolts 53 and 54.

Since posts 40 are secured in place after brace member 27 is assembled on the car, and since wood screws would not provide sufficient holding power for the posts, it is necessary that bolts 53 and 54 be assembled relative to brace member 27 prior to the installation of such brace member permanently into the car frame. Accordingly, upset collar bolts 53 and 54 are assembled through key slots in a plate 55, so that said bolts will be, to all intents and purposes, a part of plate 55. Suitable openings are then drilled in belt rail 27 to receive bolts 53 and 54 and plate 55 is then secured to said belt rail 27 by wood screws 57. Thus, when post 40 is to be assembled on the interior of the car, plates 47 and 48 are simply threaded over the protruding ends of bolts 53 and 54 and are then secured against sub-lining 28 by self-locking nuts 58.

The lower end of each post 40, as shown, is secured to decking 23 by a short section of angle iron 59 which is welded across the wings 44 of the post, and is provided with a plurality of openings in the horizontal portion thereof through which lag bolts 60 extend to secure the angle iron 59 to the decking 23, or optionally, may be secured to the bottom belt rail 25 in the same manner as to the top belt rail.

As shown in Figs. 1 and 5, a plurality of lading strap anchors 36 are welded to the side portions of the wing channel posts at predetermined intervals, said anchors extending into the interior of the car beyond the outer faces 45 of the wing channel posts 40. Inner car lining 61 is placed over channel posts 40, the lining being interrupted or provided with openings through which the anchors 36 are exposed for use. It is contemplated that the inner surfaces, that is, the surfaces extending into the car, of anchors 36 will be flush with the surface of car lining 61 and exposed to the interior of the car, so that the anchors 36 will not undesirably project into said car interior. Since the lining 61 is preferably made of horizontally disposed boards, the cutting out of the sheeting at the anchor may leave an unsupported end of a board which may eventually work loose or allow dirt or other matter to enter the air space between the inner lining and the sub-lining where it would be difficult to remove. Thus, the board ends may be secured to the wings 44 of channel posts 40 by bolts 63, in the manner shown in Figs. 1 and 5. For this purpose posts 40 may be provided with bolt holes 62 to receive the bolts 63 which pass through overlying ends 64 and 65 of the boards which are cut out to accommodate anchors 36.

It may be observed that the top 66 and bottom 67 of the inner car lining 61 are spaced from the ceiling 34 and decking 23 respectively of the car. This construction provides openings at the top and bottom of the air space between sublining 28 and inner car lining 61 through which air may pass as it is warmed and rises. This provides a continuous circulation of air through the cargo in the interior of the car. Since wing channel posts 40 are disposed vertically in the air space, they interpose no obstruction to the free vertical movement of the air in the air space which insures the passage of air around the cargo, said cargo being preferably held

5

6

above decking 23 by suitable racks, shown in outline at 68.

The form of lading strap anchor support shown in Figs. 7 to 9 inclusive is adapted for use in the same types of refrigerator cars as the support shown in Figs. 1 to 6. A description of the construction of the car, therefore, will be omitted, reference being had for this purpose to the description of the corresponding parts depicted in Figs. 1 to 6 inclusive.

The support for the lading strap anchors 36 in Figs. 7 to 9 constitutes a wing channel post 69 having a central web portion 70 terminating at opposite sides in parallel leg sections 71, at the sides of which coplanar wings 72 extend outwardly, the plane of the wings 72 being substantially parallel to the plane of the central web portion 70.

The anchors 36 are welded or otherwise secured in spaced relationship to the surfaces 73 of web sections 70 of the wing channel posts, and exposed to the interior of the car, the vertical spacing of the anchors being desirably selected to suit the general cargo for which the car is intended.

The upper ends of the posts 69, in the disclosed structure, are secured directly to the horizontal belt rail 27 by fastening means, such as bolts 73, said bolts being made available to the interior of the car in the manner described with reference to bolts 53 and 54 of Fig. 4. Similarly, the bottom portions of posts 69 may be secured directly to horizontal brace member 25 by bolts 74. To relieve some of the stress from the central unsupported region of the posts between horizontal brace members 25, 26 and 27, angle braces 75 may be employed, said angle braces being secured at one end to the horizontal brace members and at their converging ends to the wings 72 of the posts 69.

The form of lading strap anchor support shown in Figs. 10 to 13 inclusive is again adaptable for use in the same type of refrigerator car as the form shown in Figs. 1 to 6 inclusive, and hence the details of construction of the car are omitted.

In Figs. 10 to 13 inclusive the lading strap anchor 36 is secured to a wing channel post 76 having a central web portion 77 on the sides of which are angularly disposed and substantially parallel legs 78 terminating in coplanar wings 79. As shown in Figs. 12 and 13, web portion 77 is flat and the plane of the wings 79 is substantially parallel to the plane of web 77. The upper end of each post 76 is secured to horizontal belt rail 27 by Z-shaped straps 80, one leg 81 of each of which is secured to the sub-lining 28 by a bolt 82 passing through said lining and also through the belt rail 27, and the other leg 83 of each strap overlies one of the wings 79 and is secured thereto by a bolt 84. Said bolts 82 and 84 are fastened to a plate 85 which is, in turn, secured by wood screws 86 to the belt rail 27 in the manner described with reference to bolts 53 and 54 of Fig. 4.

The bottom regions of posts 76 may be secured directly to the horizontal belt rail 25 by bolts 87 passing through the wings 79 thereof, and for added strength an angle iron 88 may be welded to the lower interior region of the central web section 77, as shown in Fig. 10. Said angle iron may be shaped to reduce the width of the leg 89 thereof so as to leave a relatively long horizontal leg 90 through which a plurality of lag bolts 93 may be passed to secure said leg 90 to the decking 23. The greater length of leg 90 provides an optimum spacing for the lag bolts to avoid undue weakening of the portion of the leg between the bolts.

The anchors 36 are welded to the exterior surfaces 94 of the web sections 77 of the posts 76, said surfaces 94 being those which face the interior of the car. The inner car lining 61' is cut out to receive anchors 36, said anchors as in the previously described modifications being flush with the inner surface of inner lining 61'.

It may be apparent that posts 76 and posts 69 and

40 interpose no material restriction to the vertical movement of air in the space between the sub-lining and inner lining of the car, and yet provide a firm support for the lading strap anchors.

It is understood that the foregoing description is merely illustrative of preferred embodiments of the invention and that the scope of the invention is not to be limited thereto, but is to be determined by the appended claims.

What I claim is:

1. In a refrigerator vehicle having heat insulated walls including side posts, belt rails of relatively non-heat-conductive material supported from the side posts, sub-lining secured to the belt rails, and inner lining spaced from the sub-lining to define flue space for the vertical circulation of air; the improvement comprising supporting posts extending vertically through said flue space in spaced relationship to one another longitudinally of the vehicle, first means securing said supporting posts to the belt rails, and second means securing the belt rails to said side posts, said first means and said second means being separated at the belt rails in order to avoid continuity of heat-conductive material extending through the heat-insulating walls.

2. In a refrigerator vehicle having heat-insulated walls including side posts, outer wall covering material secured to the support posts exteriorly of the vehicle, belt rails of relatively non-heat-conductive material supported from the side posts interiorly of the vehicle and extending longitudinally thereof in vertically spaced relationship to one another, and inner lining covering the belt rails interiorly of the vehicle; the improvement comprising lading strap anchor supporting posts extending vertically across the belt rails between the belt rails and said inner lining and in spaced relationship to one another longitudinally of the vehicle, first metallic means securing said supporting posts to the belt rails, and second metallic means securing the belt rails to the side posts, said first metallic means and said second metallic means being separated at the belt rails in order to avoid continuity of heat-conductive material extending through the heat-insulating walls.

3. The combination as described in claim 2, said lading strap anchor supporting posts having a central longitudinally ribbed web section, side flanges extending in diverging relation to one another from the sides of the web section, and substantially coplanar attaching wings extending outwardly from the free ends of the side flanges, said first metallic means and said inner lining being secured to the attaching wings.

4. The combination as described in claim 2, said lading strap anchor supporting posts having a central longitudinally ribbed web section, side flanges extending in diverging relation to one another from the sides of the web section, substantially coplanar attaching wings extending outwardly from the free ends of the side flanges, means securing the first metallic means to the attaching wings, means securing the inner lining to the attaching wings, and an anchor secured to the web and having an opening therein in communication with the interior of the longitudinal rib in the post.

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