

Sept. 16, 1941.

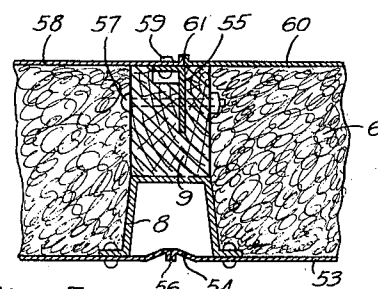
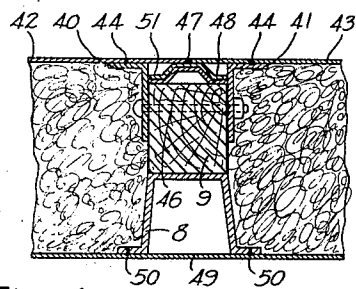
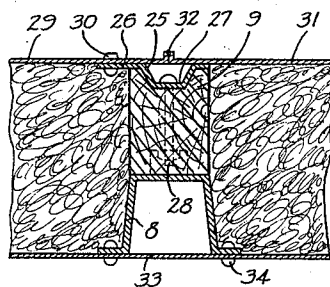
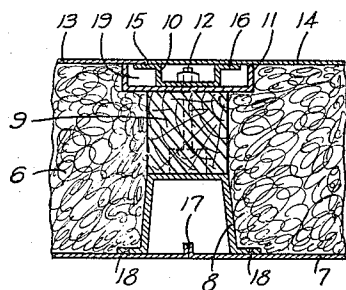
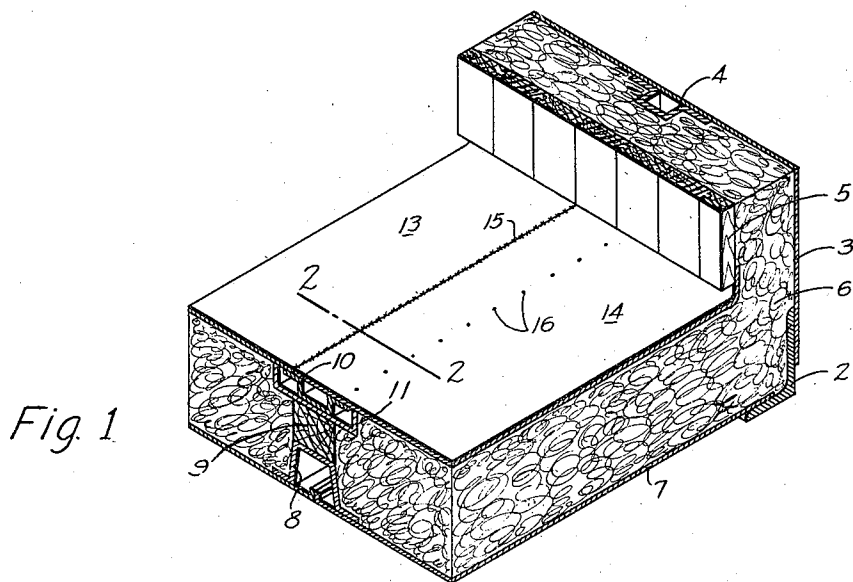
C. D. BONSALL

2,256,375

INSULATED CAR WALL

Filed July 9, 1938

2 Sheets-Sheet 1



Inventor:
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Sept. 16, 1941.

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2,256,375

INSULATED CAR WALL

Filed July 9, 1938

2 Sheets-Sheet 2

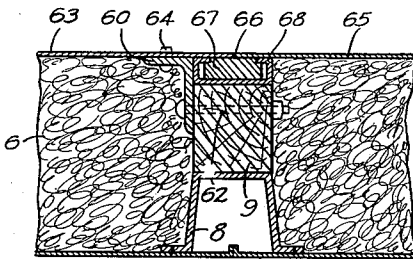


Fig. 6

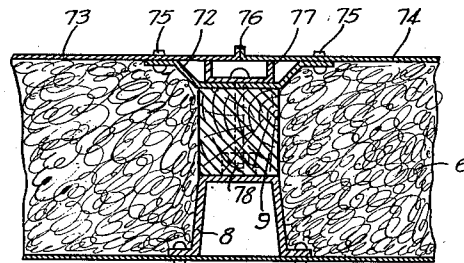


Fig. 7

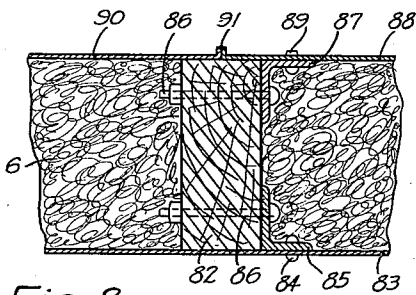


Fig. 8

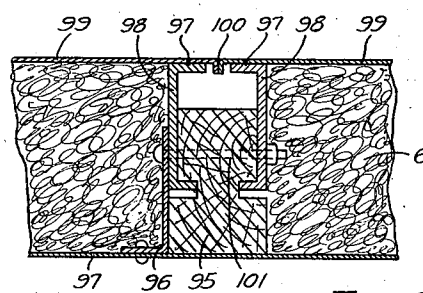


Fig. 9

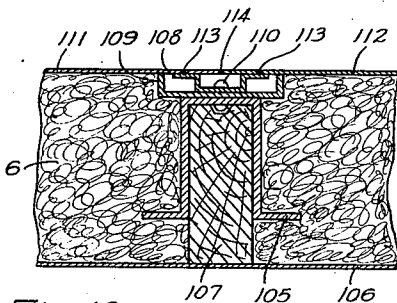


Fig. 10

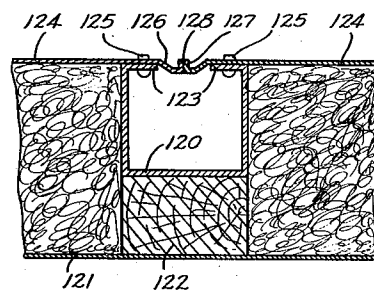


Fig. 11

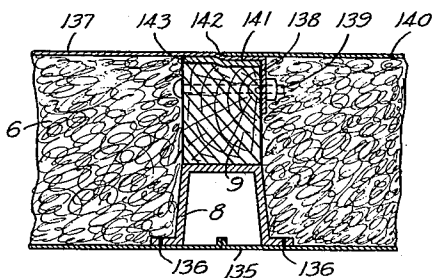


Fig. 12

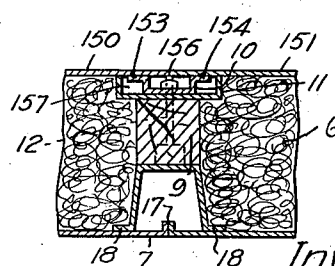


Fig. 13

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UNITED STATES PATENT OFFICE

2,256,375

INSULATED CAR WALL

Charles D. Bonsall, Pittsburgh, Pa., assignor to
Standard Railway Equipment Manufacturing
Company, Chicago, Ill., a corporation of Dela-
ware

Application July 9, 1938, Serial No. 218,450

13 Claims. (Cl. 189—34)

This invention relates to insulated walls for refrigerator cars used to transport perishable commodities. Walls of such cars must be well insulated to prevent or retard transfer of heat therethrough and must be watertight to prevent moisture reaching the insulation and impairing the insulating efficiency thereof. The construction herein disclosed may be used for any wall of a refrigerator car including floor, side walls, end walls, roof and door.

It is an object of this invention to provide a wall having metallic sheets on both sides thereof. It is a further object to provide strengthening members and insulation between the sheets and to weld the sheets together at their adjacent edges. It is important that the sheets be welded to form moisture-proof seals because insulation usually used in refrigerator cars is of a type whose efficiency is greatly decreased when it is moist. Refrigerator car walls are subjected on the inside to moisture from the lading and refrigerant and on the outside from rain and splashing. It is, therefore, very essential that the insulation be kept dry.

Another object of the invention is to protect the insulation during construction of the wall. Insulation usually used in refrigerator cars is highly inflammable and may be ignited if it is close to heat and sparks which accompany welding. It is, therefore, an object of this invention to divert such heat and sparks away from the insulation to prevent the igniting thereof.

It is a further object of the invention to provide a wall from which one sheet may be removed and replaced without removing adjoining sheets and without disturbing the insulation.

In the drawings:

Fig. 1 is a perspective view of a portion of a refrigerator car showing my invention adapted to a floor construction.

Fig. 2 is a section on line 2—2 of Fig. 1.

Figs. 3 to 13 inclusive show modified constructions.

The parts of a car shown in Fig. 1 are side sill 2; side sheathing 3; side post 4; side lining 5 and insulation 6. A lower metallic sheet 7 rests preferably upon the horizontal leg of the side sill angle 2. A metallic stringer 8 is secured by welding or rivets to the lower sheet 7 and is supported preferably by the side sill 2. An insulating piece 9 is mounted upon and secured to the stringer 8. A metallic attaching piece 10 and a protecting piece 11, made preferably of fibre or other rigid heat insulating material, are secured to the insulating piece 9 by the bolts 12. Two

upper sheets 13—14 are welded together with a continuous seam weld 15 to provide a watertight joint. As shown in Fig. 2, the weld 15 is used also to attach the sheets to one leg of the attaching piece 10 while a series of rivet or plug welds 16 secure the sheet 14 to the other leg of the attaching piece, 10. The lower sheet 7 is shown formed in two sections and joined by a seam weld 17 on upturned flanges. The sheet 7 is shown secured to the stringer 8 by rivet welds 18. The protecting piece 11 spaces the insulation 6 away from the welding by providing the air channels 19, thus protecting the insulation from igniting.

In the modification shown in Fig. 3, the attaching piece 25 has an outwardly projecting leg 26 and a depressed portion 27. The attaching piece 25 is secured to the insulating piece 9 by the bolts 28. One of the upper sheets 29 is secured by rivets 30 to the leg 26. The rivets 30 are of a type, such as Huck rivets, which may be inserted and driven entirely from above; i. e., without touching the end of the rivet 30 which is adjacent the insulation 6. The other upper sheet 31 is secured to the sheet 29 by a continuous seam weld 32. The lower sheet 33 is secured to the stringer 8 by the rivets 34.

Fig. 4 shows a construction in which there are two attaching pieces 40—41 to which two upper sheets 42—43 are secured by rivet welds 44. The pieces 40—41 are secured to the insulating piece 9 by the bolts 46. The sheets 42—43 are secured together by the continuous seam weld 47. A supporting member 48 supports the upper sheets adjacent the weld 47 and a protecting piece 51 affords protection against the heat and sparks from welding. The lower sheets 49 are secured to the stringer 8 by the rivet welds 50.

In the construction shown in Fig. 5, the attaching piece 55 rests in a slot and is secured to the insulating piece 9 by the bolts 57. One of the upper sheets 58 is secured to the attaching piece 55 by rivets (such as Huck rivets) 59, while the other upper sheet 60 is secured to the sheet 58 by a continuous seam weld 61, the weld being above the insulating piece 9 to prevent the insulation 6 from igniting. The lower sheets 53 are upwardly offset 54 below the stringer 8 and provided with depending flanges which are secured by a continuous seam weld 56. This allows each lower sheet 53 to be removed without disturbing other parts of the walls and also keeps the weld 56 flush with the lower surface.

Fig. 6 shows an angle shaped attaching piece 60 secured to the insulating piece 9 by the bolts 62. One upper sheet 63 is secured to the at-

taching piece 60 by rivets (such as Huck rivets) 64 and the other upper sheet 65 is secured to the sheet 63 by a continuous seam weld 66. A protecting piece 67 held in the clamp 68 affords protection for the insulation 6 against the heat and sparks from welding.

In the modification shown in Fig. 7, the attaching piece 72 has the upper sheets 73—74 secured to it by rivets (such as Huck rivets) 75. A continuous seam weld 76 joins the sheets 73—74 and a protecting piece 77 affords protection against heat and sparks from welding. The protecting piece 77 and the attaching piece 72 are secured to the insulating piece 9 by the bolts 78.

In Fig. 8 the stringer 82 consists entirely of wood. The lower sheet 83 is secured by rivets 84 to a lower attaching means 85 which is secured by bolts 86 to the stringer 82. An upper attaching means 87 is also secured by bolts 86 to the stringer 82. One of the upper sheets 88 is secured to the upper attaching means 87 by rivets (such as Huck rivets) 89 and the sheet 90 is secured to the sheet 88 by a continuous-seam weld 91, the weld being above the stringer 82 to prevent heat and sparks caused by the welding from igniting the insulation 6.

In the construction shown in Fig. 9 the stringer 95 has attached thereto lower attaching means 96 to which the lower sheet 97 is riveted. Upper attaching means 98 each have secured thereto, preferably by rivet welds 97, an upper sheet 99. The upper sheets 99 are flanged downwardly at their adjacent edges and joined with a continuous seam weld 100. The lower and upper attaching means 96—98 are secured to the stringer 95 by the bolts 101.

Fig. 10 shows a construction in which the metallic stringer 105 is spaced above the lower sheet 106 by the wooden piece 107. An attaching piece 108 and a protecting piece 109 are secured by rivets 110, to the stringer 105. Upper sheets 111—112 are secured by rivet welds 113 to the attaching piece 108 and secured together at their adjacent edges by a continuous seam weld 114.

In Fig. 11 the metallic stringer 120 is spaced above the lower sheet 121 by the wooden member 122. The stringer 120 is provided with inwardly projecting flanges 123. An upper sheet 124 is secured to each flange 123 by rivets (such as Huck rivets) 125. The adjacent edges of the upper sheets 124 are downwardly offset 126 and provided with upwardly projecting flanges 127 which are joined together by a continuous seam weld 128. This arrangement provides for the weld 128 to be flush with or below the floor level of the car.

In the construction shown in Fig. 12 the metallic stringer 8 has lower sheets 135 secured, preferably by rivet welds 136, to the bottom thereof and an insulating piece 9 secured to the top thereof. One of the upper sheets 137 is formed with a depending flange 138 which is secured to the insulating piece 9 by bolts 139 or by leg screws. The sheet 137 is offset downwardly 141 adjacent the flange 138 and the adjoining sheet 140 nests in said offset 141 to form a smooth upper surface. The sheets 137—140 are joined with a continuous seam weld 142 and a protecting piece 143 is positioned between the sheet 137 and the insulating piece 9 to protect the insulating piece 9 and the insulation 6 from the heat and sparks which accompany welding.

Fig. 13 shows a modification similar in certain respects to that shown in Fig. 2. Each of the upper sheets 150—151 is attached, preferably by

the plug welds 153—154, to one leg of the attaching piece 10. The sheets 150—151 are joined by the seam weld 156 disposed between the plug welds 153—154 and the protecting piece 11 forms, in cooperation with the sheets 150—151, the space 157 to protect the insulation 6 from the heat of welding.

Reference is herein made, under Rule 43, to co-pending applications of Garth G. Gilpin, Serial No. 218,464, filed July 9, 1938, and Serial No. 218,465, filed July 9, 1938, in which are claimed certain constructions disclosed but not claimed by me in this application.

The accompanying drawings illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof, within the scope of the claims, will occur to persons skilled in the art.

I claim:

1. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener disposed in said space, insulation in said space adjacent said stiffener, said stiffener comprising an attaching piece having spaced apart portions, means to secure each of said metallic sheets to one of said portions, said metallic sheets being welded together between said means, and a recessed protecting piece disposed between said spaced apart portions arranged to cooperate with said metallic sheets to form a space which embraces the weld.

2. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener disposed in said space, insulation in said space adjacent said stiffener, said stiffener comprising an attaching piece having spaced apart portions, means to secure each of said metallic sheets to one of said portions, said metallic sheets being welded together between said means, and a recessed protecting piece arranged to cooperate with said metallic sheets to form a space which encases said attaching piece.

3. A wall for a refrigerator car comprising a lower sheet, a stringer above said lower sheet, insulation adjacent said stringer, insulating means carried by said stringer, a groove in the upper surface of said insulating means, a pair of upper sheets welded together above said groove so that the space formed thereby protects said insulation from the heat of welding, an attaching piece having oppositely extending arms disposed within said groove and also carried by said stringer, and means to secure each of said upper sheets to one arm of said attaching piece.

4. A wall for a refrigerator car comprising a lower sheet, a stringer above said lower sheet, an insulating piece mounted upon said stringer, insulation above said lower sheet and adjacent said stringer, a pair of upper sheets, attaching means to secure said upper sheets to said insulating piece, said upper sheets being welded together at their adjacent edges independently of said means, and a protecting piece also secured to said insulating piece and forming a part of a wall structure which at least partially encases a space positioned adjacent the weld to prevent said insulation from being ignited by the heat of welding.

5. A wall for a refrigerator car comprising a

lower sheet, a stringer above said lower sheet, insulation above said lower sheet and adjacent said stringer, a pair of upper sheets, an attaching piece secured to said stringer, means to secure said upper sheets to said attaching piece, said upper sheets being welded together at their adjacent edges independently of said means, and a protecting piece secured to said stringer and forming a part of a wall structure which at least partially encases a space positioned adjacent the weld to prevent said insulation from being ignited by the heat of welding.

6. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets welded together and disposed in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener disposed in said space, insulation in said space adjacent said stiffener, means independent of the welding for attaching one of said metallic sheets to said stiffener, and heat insulating means carried by said stiffener and having parts spaced from portions of said metallic sheets to form walls at least partially encasing an air space positioned adjacent the weld, thereby protecting said insulation from the heat of welding.

7. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets welded together and disposed in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener disposed in said space, insulation in said space adjacent said stiffener, means independent of the welding for attaching said metallic sheets to said stiffener, and heat insulating means carried by said stiffener and having parts spaced from portions of said metallic sheets to form walls at least partially encasing an air space positioned adjacent the weld, thereby protecting said insulation from the heat of welding.

8. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets welded together and disposed in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener disposed in said space, insulation in said space adjacent said stiffener, means including welding independent of the first mentioned welding for attaching one of said metallic sheets to said stiffener, and heat insulating means carried by said stiffener and having parts spaced from portions of said metallic sheets to form walls at least partially enclosing an air space encasing said attaching means, thereby protecting said insulation from the heat of welding.

9. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets welded together and disposed in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener disposed in said space, said stiffener comprising a stringer and heat insulating means, insulation in said space adjacent said stiffener, means independent of the welding for attaching one of said metallic sheets to said stringer, said heat insulating means having parts spaced from portions of said metallic sheets to form walls at least partially encasing an air space positioned adjacent the weld, thereby protecting said insulation from the heat of welding.

10. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets welded together and disposed in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener disposed in said space, insulation in said space adjacent said stiffener, means independent of the welding for attaching one of said metallic sheets to said stiffener, and means to retard flow of heat through said stiffener between said first mentioned sheet and said metallic sheets and having parts spaced from portions of said metallic sheets to form walls at least partially encasing an air space positioned adjacent the weld, thereby protecting said insulation from the heat of welding.

11. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets welded together and disposed in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener in said space, insulation in said space adjacent said stiffener, an attaching piece carried by said stiffener and having a portion disposed to one side of the weld, means to secure one of said metallic sheets to said portion, and heat insulating means carried by said stiffener and having parts spaced from portions of said metallic sheets to form walls at least partially encasing an air space positioned adjacent the weld, thereby protecting said insulation from the heat of welding.

12. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets welded together and disposed in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener in said space, insulation in said space adjacent said stiffener, an attaching piece carried by said stiffener and having a portion disposed to one side of the weld, means to secure one of said metallic sheets to said portion, and heat insulating means positioned to retard flow of heat through said stiffener between said first mentioned sheet and said metallic sheets and having parts spaced from portions of said metallic sheets to form walls at least partially encasing an air space positioned adjacent the weld, thereby protecting the insulation from the heat of welding.

13. A wall for a refrigerator car comprising a sheet, a pair of metallic sheets welded together and disposed in spaced relation to the first mentioned sheet to form a space therebetween, a stiffener in said space, insulation in said space adjacent said stiffener, an attaching piece carried by said stiffener and having spaced apart portions disposed on opposite sides of the weld and a central part aligned with said weld in spaced relation thereto, means to weld said metallic sheets to said portions, and heat insulating means carried by said stiffener and having parts spaced from portions of said metallic sheets to form walls at least partially enclosing an air space encasing said attaching piece, thereby protecting said insulation from the heat of welding.

CHARLES D. BONSALE.