

July 6, 1937.

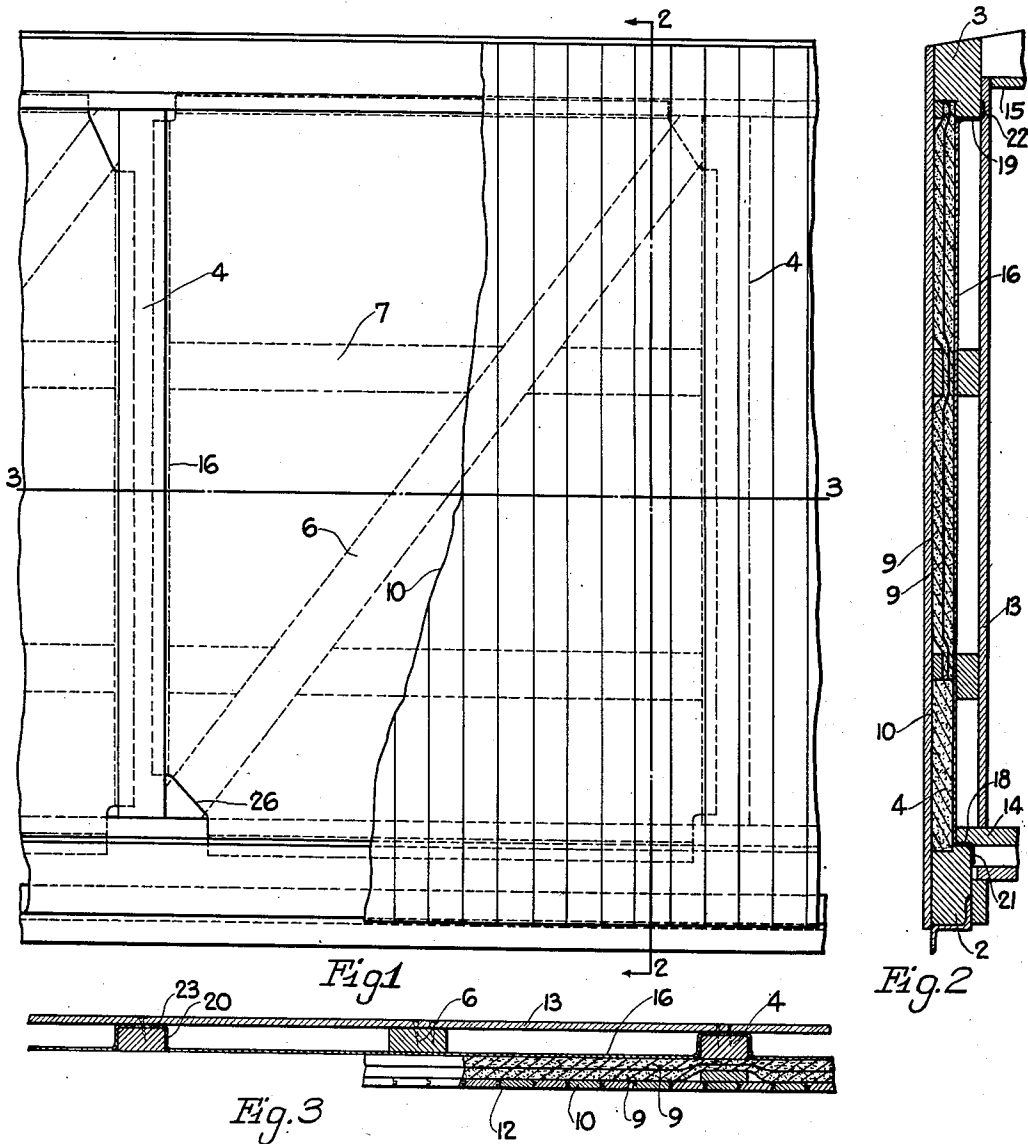
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2,085,923

RAILWAY REFRIGERATOR CAR

Filed Dec. 7, 1931

4 Sheets-Sheet 1



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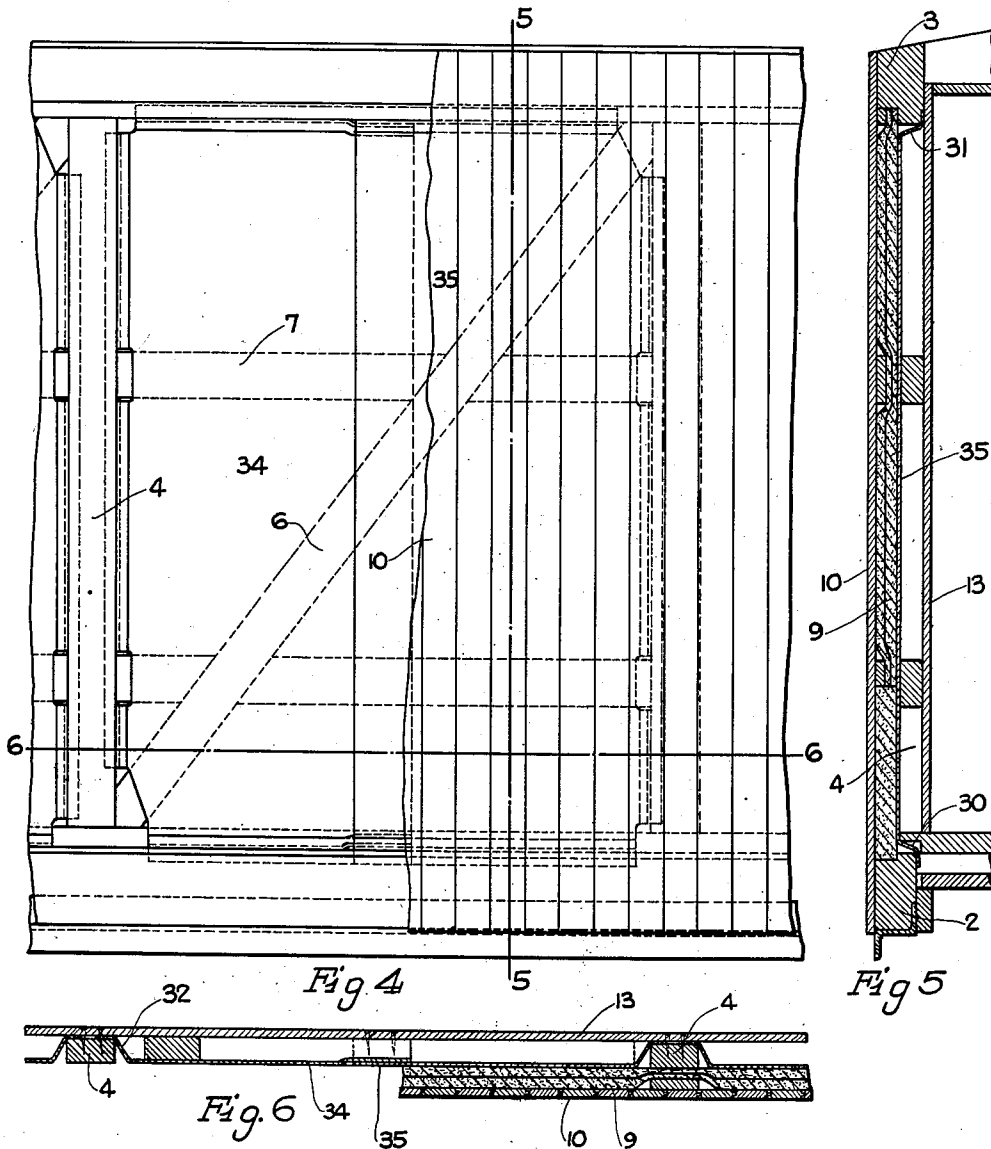
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RAILWAY REFRIGERATOR CAR

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4 Sheets-Sheet 2



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RAILWAY REFRIGERATOR CAR

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4 Sheets-Sheet 3

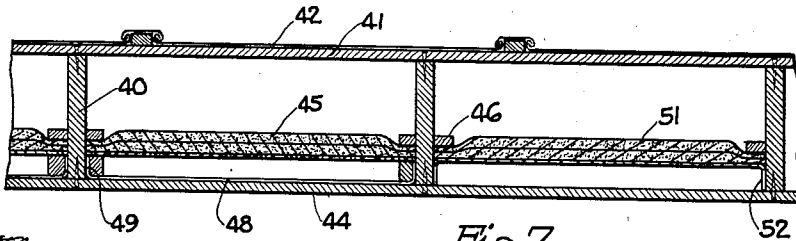


Fig. 7

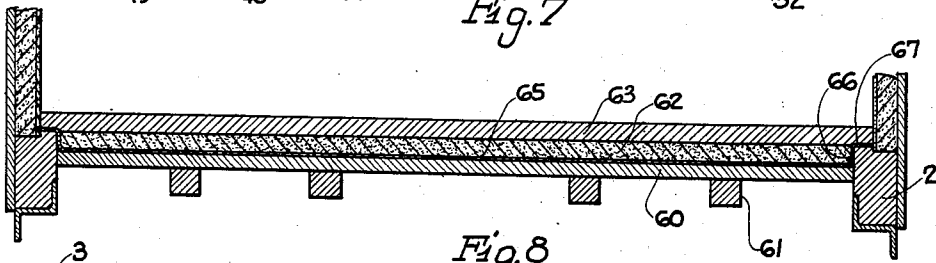


Fig. 8

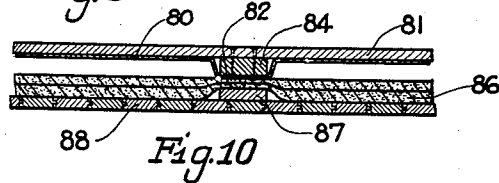


Fig. 10

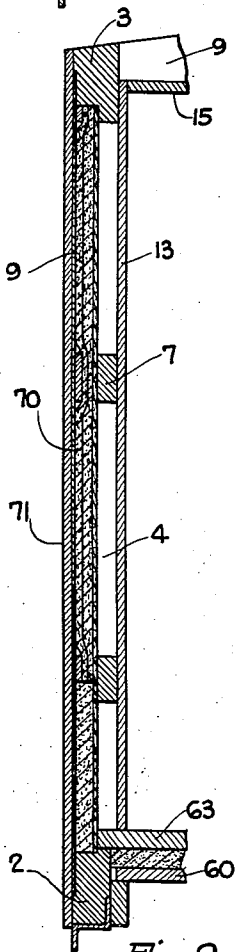


Fig. 9

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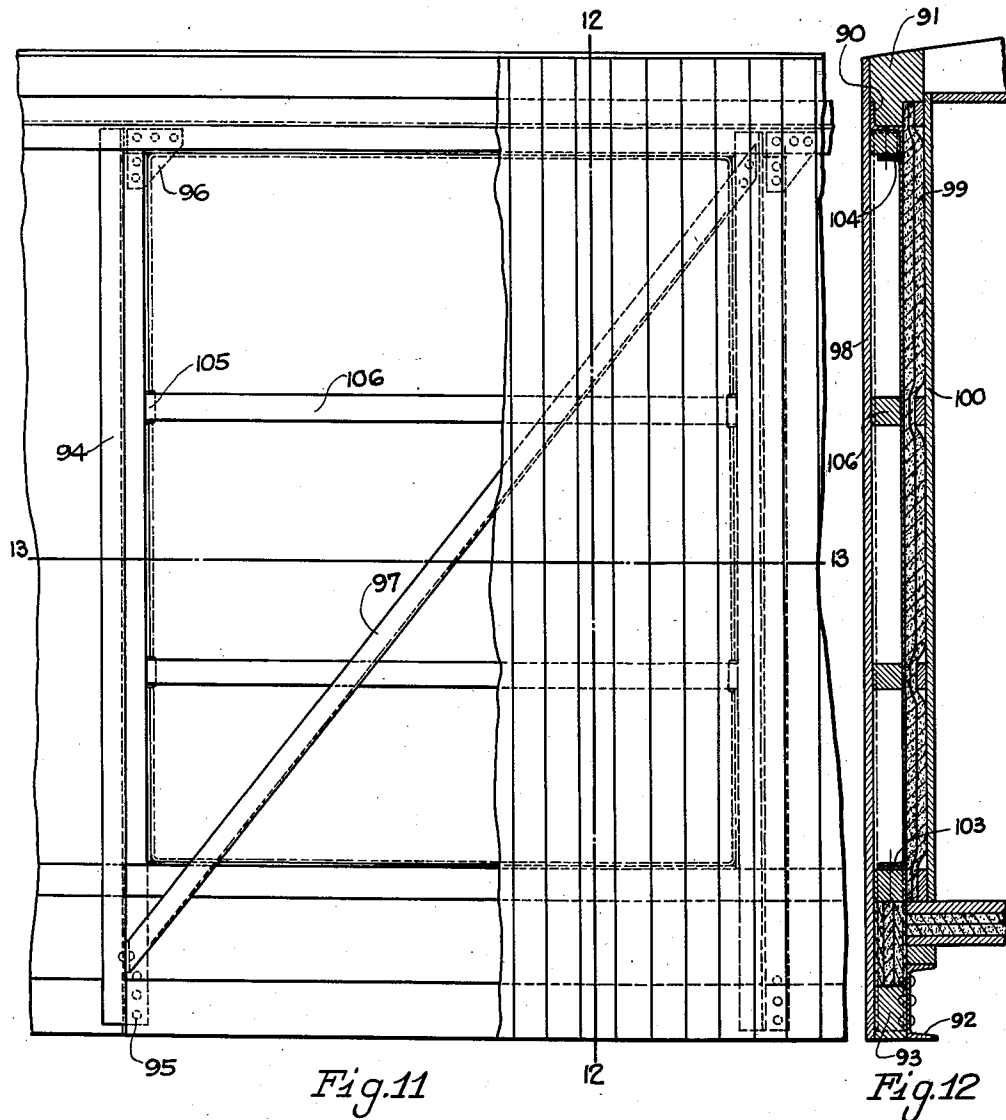
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RAILWAY REFRIGERATOR CAR

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,085,923

RAILWAY REFRIGERATOR CAR

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16 Claims. (Cl. 105-423)

The invention relates to railway refrigerator cars which are used to transport perishable goods. Such cars are provided with insulated walls, roof and floor to maintain a substantially even temperature within the car by keeping out the heat and cold of the outside atmosphere and retaining the cold air within the car, which air has been cooled by some sort of artificial refrigerating system.

One of the objects of the invention is to provide means to prevent the infiltration of warm air into the car and the egress of cold air out of the car. The ordinary wooden sheathing of a refrigerator car comprises a plurality of narrow boards (3/4" face) nailed vertically to the sill and plate, respectively, of the car, which boards have a tongue and groove connection between adjacent boards. These boards shrink causing openings between the boards. Furthermore, these boards are cracked and split by the weaving of the car or by the workmen when applying them to the car. Also the tongues are frequently damaged by the workmen. Such conditions are difficult to overcome and result in a sheathing which is not air tight and which allows the exterior warm air to infiltrate into the car and the cold interior air to get out, or rain, snow or dust to enter the car and damage the insulation which is usually wool or hair-felt and easily damaged. Sparks also frequently enter the car through such openings in the sheathing. Such sheathing is applied to the side walls, end walls, roofs, door and even the floors of refrigerator cars.

Another object of the invention is to flexibly connect the means which perform the object of the invention to the adjacent frame members of the car so that any weaving or other service movements of the car will not destroy such means or reduce its capacity to perform its function.

Another object of the invention is to arrange such means so that it will be adjustable to various distances between the adjacent frame members.

I have used the term "spaced apart frame members" to distinguish any pair of frame members which are spaced apart, such as the sill and plate in the side wall of a car; the opposite side plates in the roof of a car; the adjacent carlines in the roof of a car; the adjacent vertical posts in the side wall or end wall of a car; the opposite side sills in the underframe of a car, etc.

In the drawings:

Fig. 1 is a fragmentary view of the side wall of a refrigerator car incorporating my invention.

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

Fig. 3 is a section on line 3-3 of Fig. 1.

Fig. 4 is a fragmentary view of the side wall of a refrigerator car showing a modification of my invention.

Fig. 5 is a section on line 5-5 of Fig. 4.

Fig. 6 is a section on line 6-6 of Fig. 4.

Fig. 7 shows a section of a typical roof of a refrigerator car incorporating my invention.

Fig. 8 is a section of a typical floor of a refrigerator car incorporating my invention.

Fig. 9 is a cross section of a typical side wall of a railway car incorporating a modification of my invention.

Fig. 10 shows a section of a modified wall construction, and Figs. 11, 12 and 13 show a modified construction.

Figs. 1, 2 and 3 show a typical refrigerator car side wall comprising a sill 2, and a plate 3 (spaced apart frame members) and posts 4 which form struts between the sill and the plate, which sill, plate and spaced apart posts form a substantially rectangular frame. The diagonal braces 6 and horizontal brace 7 are also frequently used. The insulating wall 9 extends vertically between the sill 2 and the plate 3 and extends horizontally between the posts 4, or, in a great many instances, extends along the entire side of the wall of the car beyond said posts, as shown in Fig. 3. The outside sheathing 10 is secured to the outside of the sill 2 and plate 3, respectively, and usually comprises a series of parallel narrow boards having a tongue and groove connection (12) between adjacent boards. The inside lining 13 extends from the floor 14 to the ceiling 15 and comprises a series of narrow horizontal boards having a tongue and groove connection between adjacent boards. The narrow boards of the sheathing and lining are not air tight, as heretofore mentioned, therefore, I provide a metallic plate 16 or sheet to prevent the air from infiltrating through the wall which is secured to the side sill 2, side plate 3, and preferably also the adjacent vertical post 4. This sheet 16 is preferably positioned in contact with the insulation 9 so as to prevent the insulation from sagging; in fact, I prefer to position the insulating wall 9 between the metallic plate 16 and the outside sheathing 10 so as to retain it in position.

The metallic sheet is preferably provided with flanges 18, 19 and 20 adjacent the sill 2, plate and vertical post, respectively, which flanges are preferably secured to these frame members by nails, bolts or other similar means so that after the sheathing and insulation is in place the metallic sheet can be pressed against the insulating wall

and nailed to the frame members while under pressure. These flanges are preferably provided with re-flanges 21, 22 and 23 which overlap the sill and plate and also preferably the vertical post, respectively, to give further assurance that drafts will neither enter nor leave the car. Rubber or waxed paper or some similar material may be placed between the frame member and the flange, or if preferred, next to the re-flange.

The diagonal braces 6 should extend from the top of one post or strut 4 to the bottom of the adjacent post or strut 4 and I prefer to cut away the flanges at the ends of these braces (at 26) so that the brace will bear directly against the sill and at the lower end of the brace and against the plate at the upper end of the brace.

Figs. 4, 5 and 6 show a modified construction wherein the flanges 30, 31 and 32 on the metallic plate are obliquely positioned and spaced apart from the adjacent frame member so as to provide flexibility to allow the car to weave without cracking or buckling the metallic plate. The movements of the car over the track, particularly around curves, and the inertia of the car body when stopping or starting (and moving over a rough and uneven track) causes the vertical walls and roof of the car to change from rectangular outlines to those of parallelograms. The diagonally disposed flanges 30, 31 and 32 form a flexible connection between the body of the plate and the adjacent frame members and allow the side (or end) wall to assume the shape of a parallelogram without causing stresses which would crack the plate. A cracked plate would allow air to enter the car. When a car receives a jolt which frequently occurs in coupling at high speed the side plates (3) tend to jump upwardly but the side sills (2) do not move upwardly as much because they are nearer the line of thrust (the coupling line) and furthermore these side sills are usually attached to a metallic underframe. This results in the side plate (3) moving away from the side sill (2) so that if the metallic plate was rigidly secured to the side plate and side sill it would be torn by such a movement but the diagonally disposed flanges 30, 31 and 32 provide a flexible attachment whereby the plate is allowed to expand when the car is jolted. Furthermore the side swaying of the car, due to rounding curves and uneven loading, causes the roof to move laterally relative to the underframe so that the side plate (3) is not above the side sill (2), but again the oblique flanges 30, 31 and 32 provide flexible connection between the plate and the adjacent frame member to prevent the plate from being cracked. It is a known fact that the insulation of wooden refrigerator cars is destroyed by the service movements of the car.

In Figs. 4, 5 and 6 the metallic panel between adjacent posts comprises a pair of telescopic plates 34—35 to provide adjustability for various distances between adjacent posts or other frame members. This feature is desirable because the distances between two end posts; between a corner post and an end post; or between two side posts may be different from each other necessitating adjustability. In this modification the features of the telescopic plates and the obliquely positioned flanges are both included; in other words, the modification is capable of flexibility and adjustability.

Fig. 7 shows a typical roof of a railway refrigerator car incorporating my invention wherein the spaced apart carlines or frame members

40 support a wooden roof 41 covered by a metallic flexible roof 42. The ceiling 44 is nailed to these carlines 40 and the insulation 45 is attached to the carlines by cleats 46. My improved metallic plate 48 may bear against the ceiling 44 and be provided with upstanding flanges 49 secured to the carlines, or it may support the insulation 51 and be provided with downwardly projecting flanges 52 which are secured to the carlines 40. Both constructions are shown in Fig. 7.

Fig. 8 shows a typical floor of a refrigerator car wherein the sub-flooring 60 is supported by stringers 61, which sub-flooring supports the insulation 62. The main flooring 63 rests upon the side sills 2. My improved metallic plate 65 is shown positioned between the sub-flooring 60 and the insulation 62 and is provided with upstanding flanges 66 preferably secured to the side sills 2, which flanges 66 are provided with re-flanges 67 in contact with the upper part of the side sills 2.

Fig. 9 shows a modification wherein a flat metallic plate 70 is secured to the sill 2 and plate 3, respectively, (or other frame members) before the wooden sheathing 71 is applied, which sheet forms a draft-proof construction for the wall.

Fig. 10 shows a modified construction wherein the body 80 of the metallic sheet is adjacent the lining 81 and pressed inwardly (82) to overlap the nailing strip (or frame member 84). In this form the metallic strip extends continuously over the frame member 84 and is connected to the adjacent metallic sheet by some telescopic arrangement similar to that shown in Figs. 4, 5 and 6. The insulation 86 is between the post 87 and frame member. Numeral 88 is the sheathing.

Figs. 11, 12 and 13 show a modified construction wherein the framing of the car comprises a metallic reinforcement 90 for the side plate 91, and a metallic reinforcement 92 for the side sill 93 with a metallic vertical post 94 secured to the stiffener 92 by rivets 95 and secured to the stiffener 90 by the gussets 96. The metallic diagonal braces 97 are also frequently used. The exterior sheathing 98 is positioned outside of the metallic frame and the insulation 99 and the lining 100 are usually placed inside of the metallic framing and I prefer to place the body portion 101 of my metallic plate between the metallic framing and the insulation, preferably adjacent the insulation so as to support it. Wooden members are shown adjacent the metallic parts as nailing strips for the sheathing, lining, insulation, etc., and the flanges 102—103—104 are preferably secured to these wooden pieces with waxed paper, tarred paper or some similar means between the flanges and the wooden pieces to produce a tight joint.

These flanges may be secured by nails, screws or bolts.

The vertical flanges 102 are notched out at 105 for the horizontal nailing strips 106.

The metallic sheets are preferably galvanized or made of copper bearing steel or some other provision should be made to prevent corrosion as they are not accessible after the car is assembled.

The term "wall," as herein used, may mean side wall; end wall; roof; flooring or even the door of a car.

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.

5 I claim:

1. In a railway refrigerator car having spaced apart frame members, the combination of an insulating wall extending between said frame members, and a metallic plate extending between said frame members to prevent infiltration of air through said insulating wall, said plate provided with obliquely positioned flanges adjacent the members to provide flexibility therebetween, said flanges each having a re-flange overlapping and secured to one of said frame members.

2. In a railway refrigerator car having spaced apart frame members, spaced apart struts extending therebetween, and a sheathing secured to said frame members and said struts, the combination of an insulating wall extending between said frame members and between said struts, and a metallic plate extending between said frame members and between said struts to prevent infiltration of air through said insulating wall, said plate provided with flanges adjacent the members and struts respectively to provide flexibility therebetween, said flanges each having a re-flange overlapping and secured to said frame members and to said struts, respectively.

3. In a railway refrigerator car having spaced apart frame members and spaced apart struts extending therebetween, the combination of an insulating wall extending between said frame members and between said struts, a metallic plate extending between said frame members and between said struts, said plate provided with flanges adjacent the members and said struts to provide flexibility therebetween, said flanges each having a re-flange overlapping and secured to said frame members and to said struts, respectively, and a diagonal brace extending from the top of one strut to the bottom of the other strut, said flanges being cut away at the ends of said brace so that the brace will bear directly against the members and the struts.

4. A wall for a railway refrigerator car comprising spaced apart frame members, spaced apart struts therebetween, an insulating wall extending between said frame members and between said struts, and a metallic plate attached to said frame members and to said struts so as to prevent air from infiltrating through said insulating wall, said plate being flexibly attached to said frame members and to said struts for the purposes specified.

5. A wall for a railway refrigerator car comprising spaced apart frame members, an insulating wall extending between said frame members, and a metallic plate attached to said frame members so as to prevent air from infiltrating through said insulating wall, said plate being flexibly attached to said frame members for the purposes specified.

6. A wall for a railway refrigerator car comprising spaced apart members, spaced apart struts therebetween forming a substantially rectangular frame, an insulating wall extending between said frame members, and a metallic panel attached to said frame members so as to prevent air from infiltrating through said insulating wall, said panel comprising a pair of telescopic plates to provide adjustability for various distances between the frame members on opposite sides of said rectangular frame.

7. A wall for a railway refrigerator car com-

prising spaced apart members, spaced apart struts therebetween forming a substantially rectangular frame, an insulating wall extending between said frame members, and a metallic panel flexibly attached to said frame members so as to prevent air from infiltrating through said insulating wall, said panel comprising a pair of telescopic plates to provide adjustability for various distances between the frame members on opposite sides of said rectangular frame.

8. A wall for a railway refrigerator car comprising a frame, a wooden sheathing, a metallic plate, and an insulating material between the sheathing and the plate, said metallic plate being flexibly attached to said frame.

9. A wall for a railway refrigerator car comprising a frame, a wooden sheathing secured to the frame, an insulating material, and a metallic plate flexibly secured to said frame and arranged to prevent infiltration of air through said insulating material.

10. A wall for a railway refrigerator car comprising spaced apart frame members, an exterior wooden sheathing secured to said frame members, an insulating wall next to said sheathing, a metallic plate secured to said frame members so as to prevent air which infiltrates through the sheathing and insulation from entering the car, and a lining spaced apart inwardly from said metallic plate to protect the metallic plate.

11. A wall for a railway refrigerator car comprising spaced apart frame members, an exterior wooden sheathing secured to said frame members, an insulating wall next to said sheathing, a metallic plate flexibly secured to said frame members so as to prevent air which infiltrates through the sheathing and insulation from entering the car and to allow relative movement between the frame members and the plate, and a lining spaced apart inwardly from said metallic plate to protect the metallic plate.

12. In a railway car wall comprising an exterior sheathing, an interior lining and an insulation therebetween in combination with a metallic plate associated and arranged with said wall to prevent infiltration of air through said wall.

13. In a railway car wall comprising frame members, an exterior sheathing, an interior lining and an insulation between the sheathing and the lining in combination with a metallic plate associated and arranged with said wall to prevent infiltration of air through said wall, said metallic plate being attached to said frame members so that the weaving of the car will not crack the plate.

14. In a railway car wall comprising horizontal frame members, vertical struts therebetween, an exterior sheathing, an interior lining and an insulation between the sheathing and the lining in combination with a metallic plate associated and arranged with said wall to prevent infiltration of air through said wall, said metallic plate being attached to said frame members and said struts so that the weaving of the car will not crack the plate.

15. A wall for a railway refrigerator car comprising spaced apart frame members, an insulating wall extending between said frame members, and a metallic plate attached to said frame members so as to prevent air from infiltrating through said insulating wall, said plate formed with obliquely positioned flanges attached to said frame members so as to provide flexibility between said plate and said frame members.

16. A wall for a railway refrigerator car comprising spaced apart frame members, spaced apart struts therebetween, an insulating wall extending between said frame members and between
5 said struts, and a metallic plate attached to said frame members and to said struts so as to pre-

vent air from infiltrating through said insulating wall, said plate formed with obliquely positioned flanges attached to said frame members and said struts so as to provide flexibility between said plate, said frame members and said struts.

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