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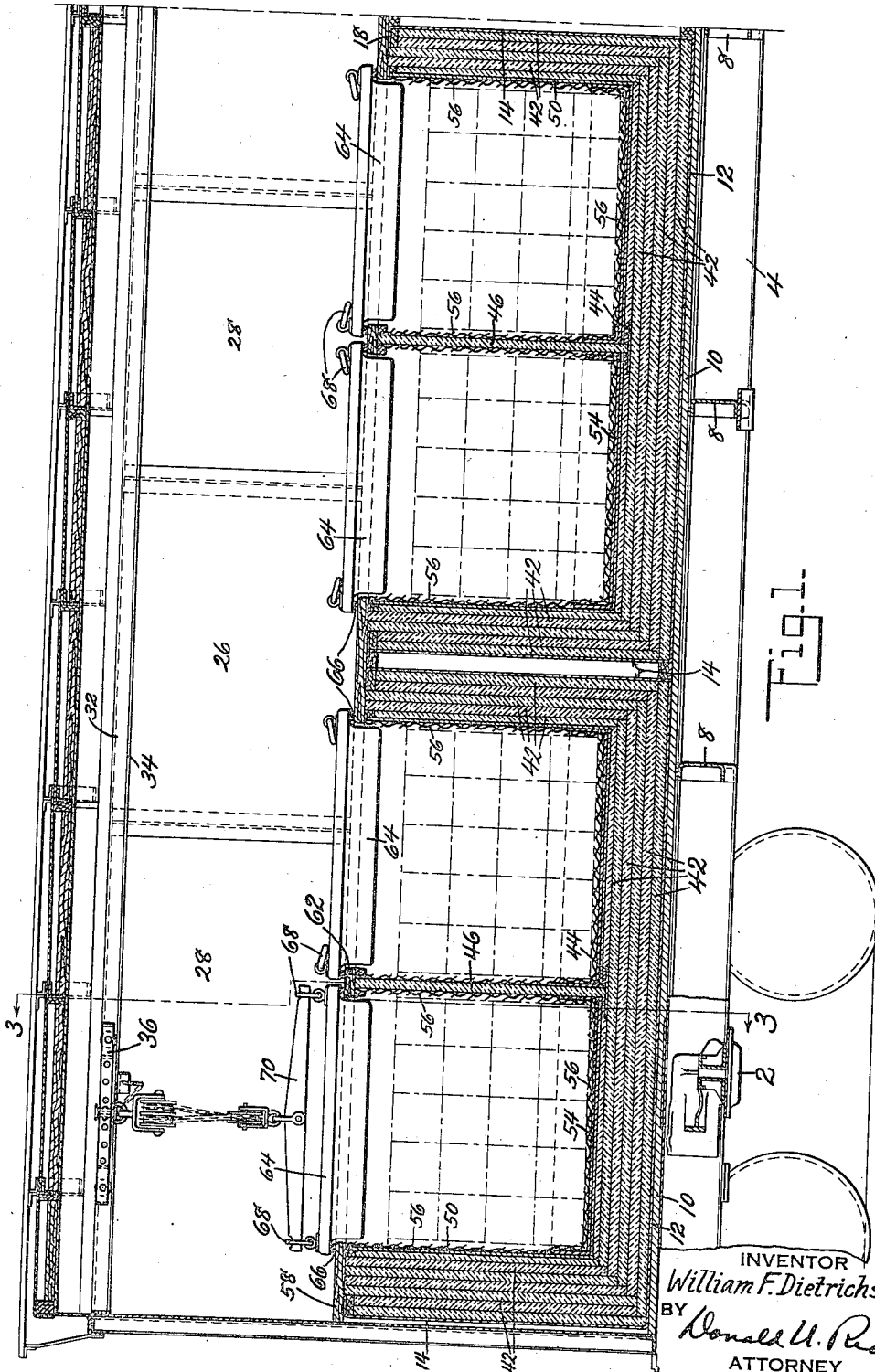
W. F. DIETRICHSON

2,226,699

DRY ICE CAR

Filed Feb. 17, 1937

4 Sheets-Sheet 1



Dec. 31, 1940.

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DRY ICE CAR

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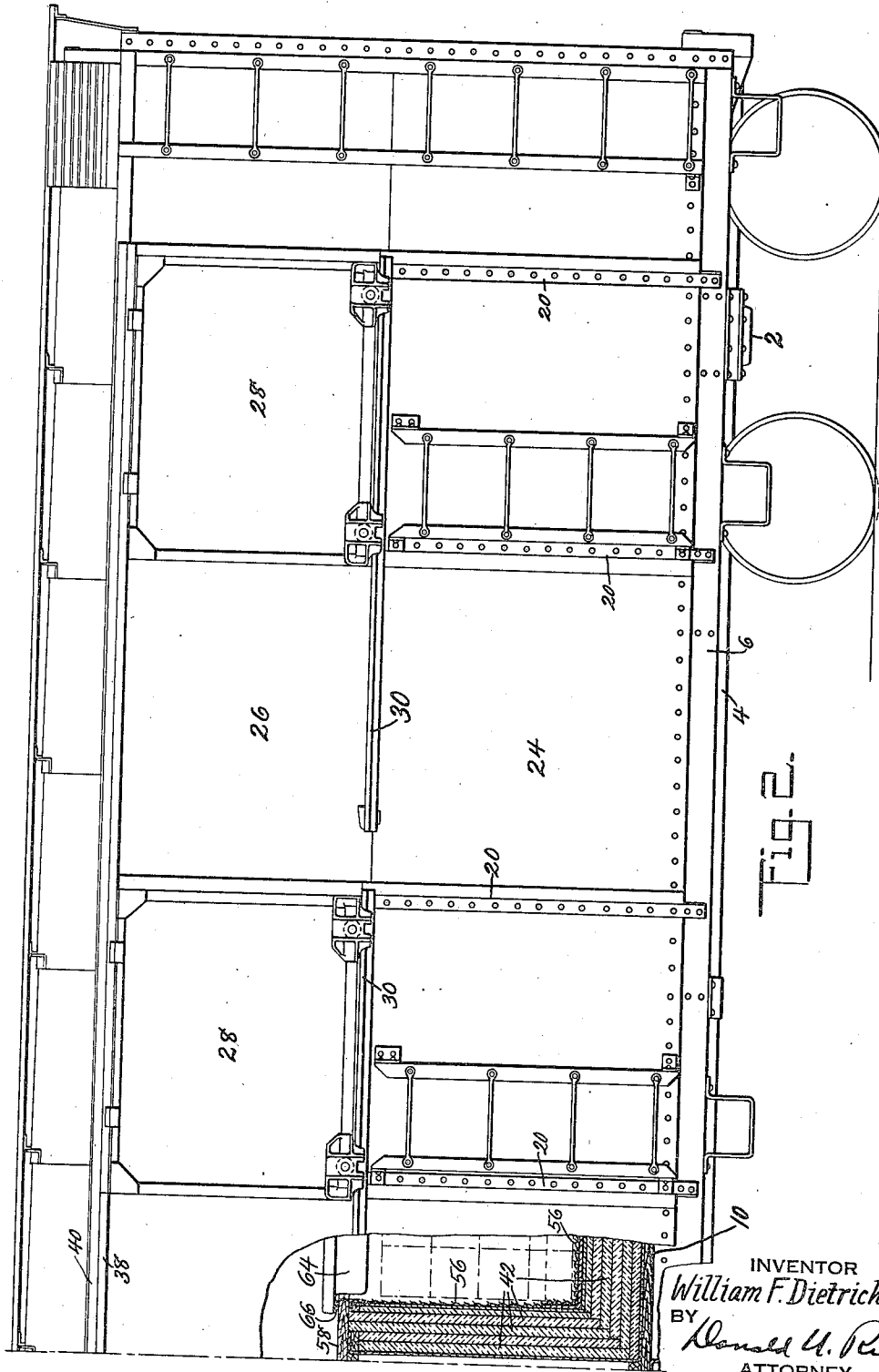


FIG. 2.

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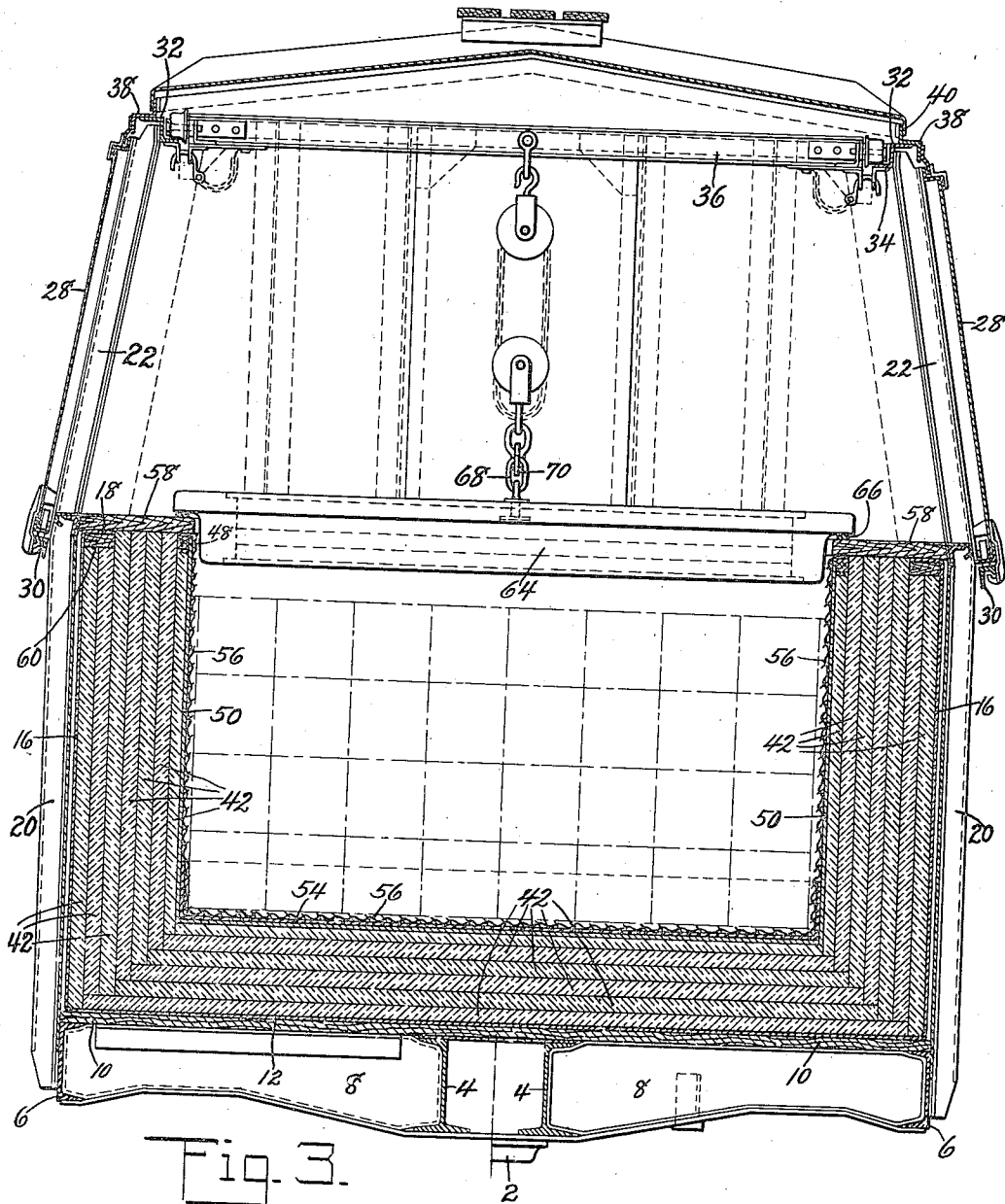


Fig. 3.

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4 Sheets-Sheet 4

Fig. 4

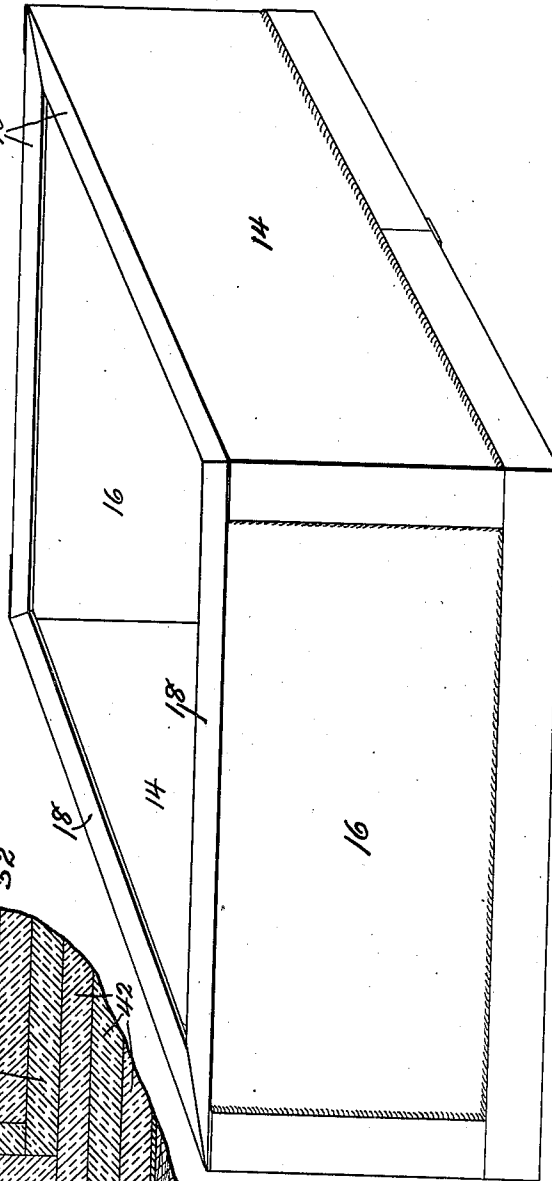
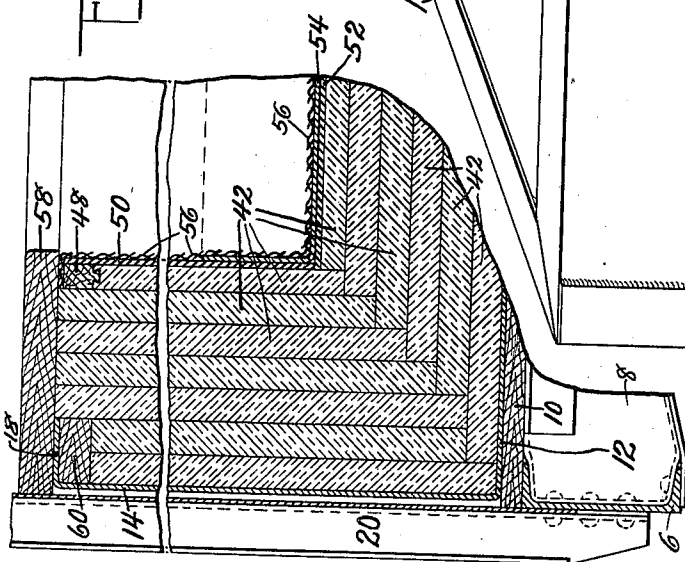


Fig. 5



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UNITED STATES PATENT OFFICE

2,226,699

DRY ICE CAR

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Application February 17, 1937, Serial No. 126,112

11 Claims. (Cl. 62-91.5)

This invention relates to car construction in general and in particular to cars built especially for transport of solid carbon dioxide.

Due to the extremely low temperature of solid carbon dioxide or dry ice difficulty has been encountered to properly insulate the dry ice. The low temperature causes rapid condensation and the insulation gradually becomes saturated with moisture thus greatly reducing the insulating effect of the material. In the ordinary form of dry ice car it has been almost impossible to prevent leakage of the heavy gas evolved from the dry ice, which gas escaping from the car carries considerable heat with it, and even though the car has been made relatively gas tight it gradually develops openings due to shocks sustained in transit. It is an object, therefore, of the invention to provide a dry ice car in which gas tight cells are provided.

A further object of the invention is the provision of a car having gas tight cells located therein independent of the car framing.

A still further object of the invention is the provision of a dry ice car of gas tight construction wherein the insulating material may be readily removed for reconditioning by driving out any moisture therein.

Another object of the invention is the provision of a heavily insulated compartment in which the insulation is protected from moisture absorption of a gas tight casing.

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:

Figure 1 is a longitudinal sectional view of approximately one-half a railway car showing the improved dry ice carrying members;

Fig. 2 is a side view of one end of the car with a portion broken away to show the relative position of the ice carrying compartment;

Fig. 3 is a transverse sectional view taken substantially on line 3-3 of Fig. 1;

Fig. 4 is a perspective view of the gas tight compartment, and

Fig. 5 is an enlarged sectional view showing the insulation arrangement within the compartment and the manner in which the compartment is sealed at the top.

Referring now to the drawings in detail it is seen that the car is of generally standard dimensions and mounted on the customary trucks by means of center bearing 2. The car underframe is of conventional design having spaced center sills 4, side sills 6 and cross members 8.

Mounted upon the center sills, side sills and cross members is a wood or other type of floor 10 forming a support upon which the improved gas tight compartments may be mounted.

The gas tight compartment as clearly shown in Figures 4 and 5 consists of a metallic box-like member having floor plate 12, side walls 14 and end walls 16 which are securely joined to each other at all seams by welding. The side and end walls are flanged inwardly at their upper edges as at 18 to provide a supporting ledge. This compartment is of a width slightly less than the overall width of the car underframe and is placed on the floor prior to the attachment of the car sides and ends to the underframe.

The car sides are preferably formed of Z-bar stakes 20 having the lower portion extending vertically, while the upper portion is inclined inwardly as at 22 in order that proper clearances may be obtained. The metal sheets 24 are attached to the vertical portions of the stakes forming a complete lower wall from end to end of the car, while sheets 26 are attached to the inclined portions of alternate stakes thus providing openings which may be closed by sliding doors 28 adapted to roll on tracks 30. The top edges of the stakes are secured to the vertically disposed web of Z-bar plate 32 which has the lower flange 34 directed inwardly providing a support for a traveling crane member 36. The upper flange of the plate is directed outwardly and provides a support to which the horizontal web of the roof Z-bar 38 may be secured. The roof is of any approved construction and is formed with a downwardly directed edge flange 40 adapted to be secured to the vertically directed flange of the roof Z-bar 38. It is thus seen that the sides may be fabricated in one piece and applied to the car underframe by merely driving rivets through the side stakes and side sills after which the preformed roof may be lowered into position and secured by riveting or otherwise securing the roof Z-bar to the outwardly directed flange of the plate.

To prepare each gas tight compartment for the carrying of dry ice it is insulated on the sides, ends and bottom by means of slabs 42 of any suitable insulating material of progressively varying sizes thus insuring the staggering of joints at all the corners as is clearly shown in the drawings. These slabs of insulating material are merely placed in position with each layer retaining the preceding layer in position without the use of any securing means in order

that the slabs may be easily removed without injury, if necessary, to recondition or replace. The upper layer of floor insulation is formed in two parts and slightly under cut at the adjacent edges in order that a suitable bearing member 44 of presswood or other suitable material may be used to distribute the load imposed thereon by means of partition 46, which is preferably formed of some strong yet light material such as presswood. The inner layer of insulation on the sides and end walls of the compartment is dovetailed or otherwise secured at the upper edge to a wood protecting strip 48 to which in turn are secured the upper edges of presswood side and end liners 50 which prevent any injury of the insulation. A piece of presswood 52 is likewise placed on the floor of the compartment and supports a metallic pan 54 which will assist in distributing the load to the floor insulation, while at the same time providing a water tight basin protecting the insulation. The dry ice compartments thus formed are preferably lined and protected against moisture by the application of canvas or other relatively flexible material 56 preferably secured in position by applications of white lead or some similar material, which upon hardening will form a water tight membrane. In order to complete the dry ice container and provide a support for the lids a framework of wood or other material 58 is provided which may be secured by screws or other means to the wood strip 48 and to the wood strip 60 positioned beneath the flange 18 of the gas tight compartment. This frame is provided with a strip 62 secured to the upper edge of the partition thus forming two complete bins in each gas tight compartment. In order to substantially seal each bin against heat and gas losses a heavily insulated lid or cover 64 is provided having sealing gaskets 66 adapted to rest upon the compartment framing. These lids are preferably provided with links 68 which may be placed over the ends of a lifting bar 70 carried by a differential hoist secured to traveling crane member 36. It is thus seen that the lids which weigh approximately four hundred pounds may be lifted directly without in any way straining the framework or disturbing the insulation of the compartments as would occur if hinges or counter-balancing springs were used.

It is thus seen from the preceding description that a construction has been provided wherein the possibility of moisture entering the insulation has been reduced to a minimum, while if moisture does enter the construction may be readily dismantled with a minimum amount of labor and the parts reconditioned for use. In reconditioning the compartment it is only necessary to remove the upper framework and lift out the liner with its presswood backing, after which the individual slabs of insulating material may be removed and dried for re-use. The compartments as previously mentioned are entirely free of the car structure and since they are formed in short lengths are not subject to damage that might arise from deflections of the car framing.

While the invention has been described in more or less detail and special reference made to certain insulating materials, it is, of course, obvious that changes in construction and in choice of insulating material may be made and all such changes are contemplated as fall within the scope of the following claims:

What is claimed is:
 1. A railway car or similar vehicle for the

transport of solid carbon dioxide having a substantially imperforate lower portion, side opening doors arranged above the imperforate lower portion, and a plurality of gas tight compartments substantially filling the lower portion of the car below said doors, said compartments being structurally independent of the adjacent car parts to permit deflection of the latter without damage to the compartments.

2. A railway car or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, side opening doors arranged above the imperforate lower portion, a plurality of gas tight compartments substantially filling the lower portion of the car below the doors, and slabs of insulating material removably stacked against the floor and side walls of each compartment to form a heavily insulated bin accessible only from the top.

3. A railway car or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, opening sliding doors arranged above the lower portion, a plurality of gas tight compartments substantially filling the lower portion of the car below the doors, and slabs of insulating material removably stacked against the floor and side walls of each compartment to form a heavily insulated bin accessible only from the top, said bin being sealed by a bodily removable cover.

4. A railway car or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, sliding side doors above the lower portion, a plurality of gas tight compartments substantially filling the lower portion of the car below the doors, slabs of insulating material removably stacked against the floor and side walls of each compartment to form a heavily insulated bin accessible only from the top, and a substantially impervious means lining said bin to prevent the entrance into the insulation of moisture or carbon dioxide gas, said impervious means being capable of movement relative to said side walls and floor of the compartment.

5. A railway car or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, high level side opening doors above the lower portion, a plurality of gas tight compartments substantially filling the lower portion of the car below the doors, insulation removably stacked against the floor and side walls of each compartment to form a heavily insulated bin accessible only from the top, a substantially impervious flexible means lining said bin, and a framework protecting the upper edge of the insulation, said framework and impervious means substantially sealing said insulation against ingress of moisture or carbon dioxide gas.

6. A railway car or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, high level side opening doors having their lower marginal edges terminating above the imperforate lower portion, a plurality of independent gas tight compartments substantially filling the lower portion of the car below said doors, each of said compartments being freely mounted in and non-rigidly connected with the car structure whereby they are substantially undisturbed by normal car structure distortions developed during transit.

7. A railway car or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, a plurality

of independent gas tight containers substantially filling the lower portion of the car below said doors, independent slabs of insulating material removably stacked in each container against the floor and side walls thereof to form a heavily insulated bin accessible only from the top, each of said containers being free of the car structure whereby said container and insulation will be substantially undisturbed by distortions of the car structure, and side opening doors arranged above said containers.

8. A railway car or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, a plurality of independent gas tight containers substantially filling the lower portion of the car below said doors, slabs of insulating material removably stacked in each container against the floor and side walls thereof to form a heavily insulated bin accessible only from the top, a substantially impervious protecting means lining said bin and protecting the insulation to prevent the entrance into the insulation of moisture or carbon dioxide gas, each of said containers being free of the car structure whereby said container and impervious protecting means will be substantially undisturbed by distortions of the car structure, and sliding side doors arranged above said containers.

9. A railway car or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, a plurality of independent gas tight containers substantially filling the lower portion of the car below said doors, said containers being supported by the

car and independent of the car structure, insulation removably stacked in each container against the floor and side walls to form a heavily insulated bin accessible only from the top, bodily removable covers sealing said bins, and angularly arranged side doors positioned above said containers.

10. A railway or similar vehicle for the transport of solid carbon dioxide having a substantially imperforate lower portion, high level side opening doors above the lower portion, a plurality of independent gas tight containers substantially filling the lower portion of the car below said doors, insulation removably stacked in each container against the floor and side walls thereof to form a heavily insulated bin accessible only from the top, and a substantially impervious protecting means lining said bin and protecting the insulation to prevent the entrance of moisture or carbon dioxide gas into the insulation, said impervious protecting means being formed in part by a metallic load distributing pan and in part by flexible material permitting vertical movements of the pan.

11. In a railway car or similar vehicle for the transport of solid carbon dioxide having a lower imperforate bottom portion, a plurality of independent gas tight compartments supported by and freely arranged in said lower imperforate bottom portion, slabs of insulating material stacked on the bottom and against the walls of said compartments, and a plurality of side doors positioned above said containers.

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