

Feb. 9, 1937.

G. C. WOODRUFF

2,070,346

INSULATED CONTAINER FOR CONTAINER CARS

Filed March 1, 1933

5 Sheets-Sheet 1

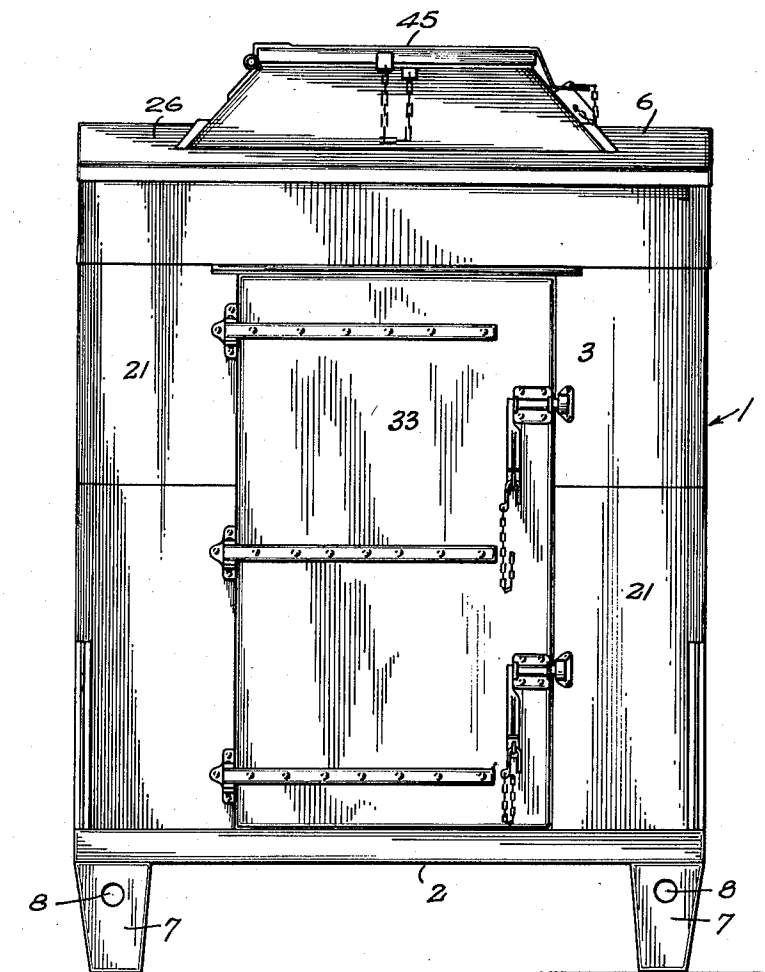


Fig. 1.

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By *Frederic S. Clarkson*
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5 Sheets-Sheet 2

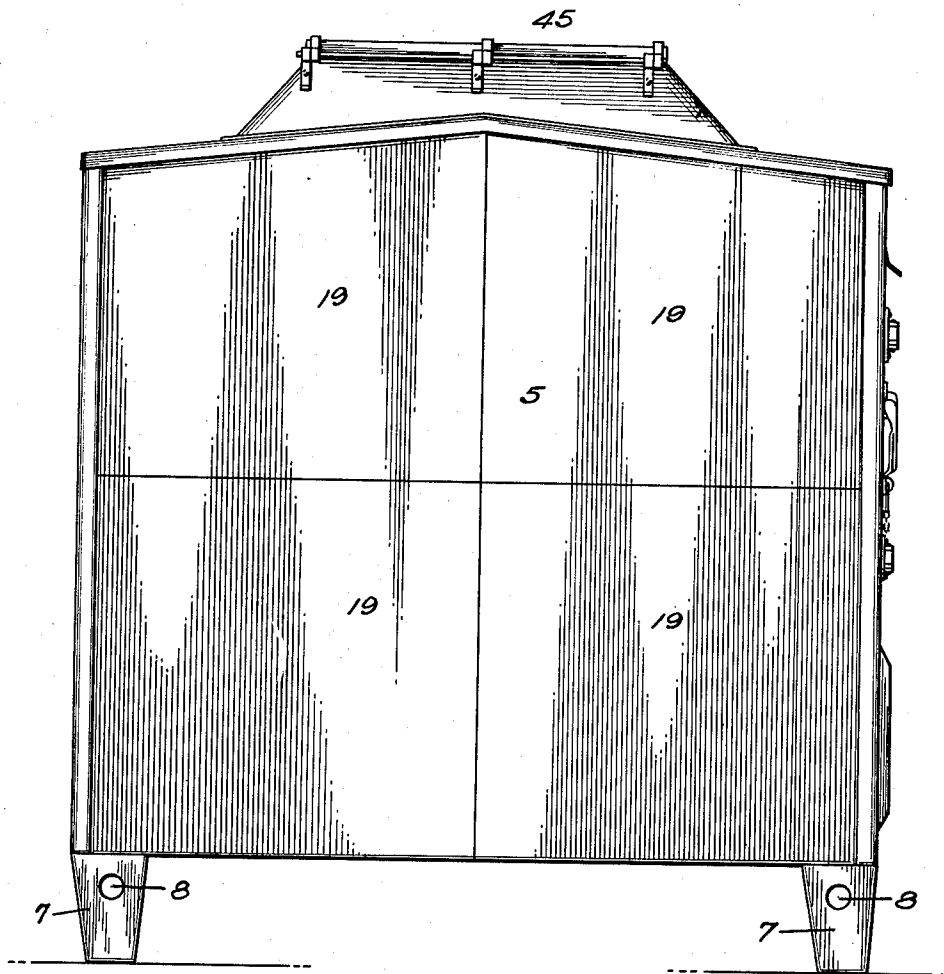


Fig. 2.

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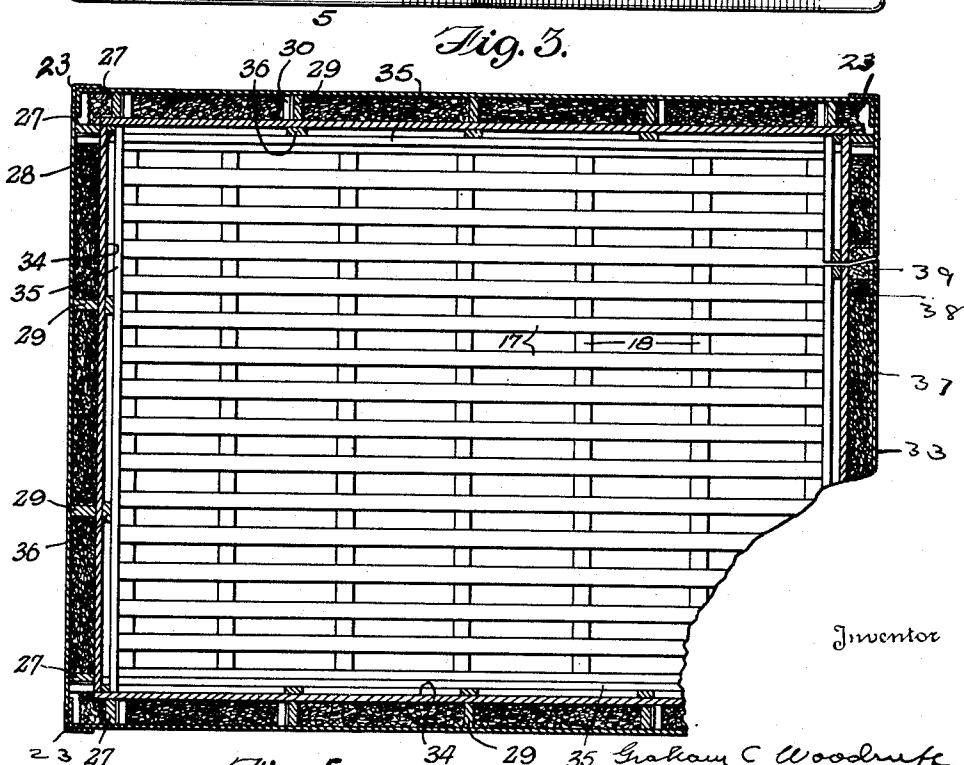
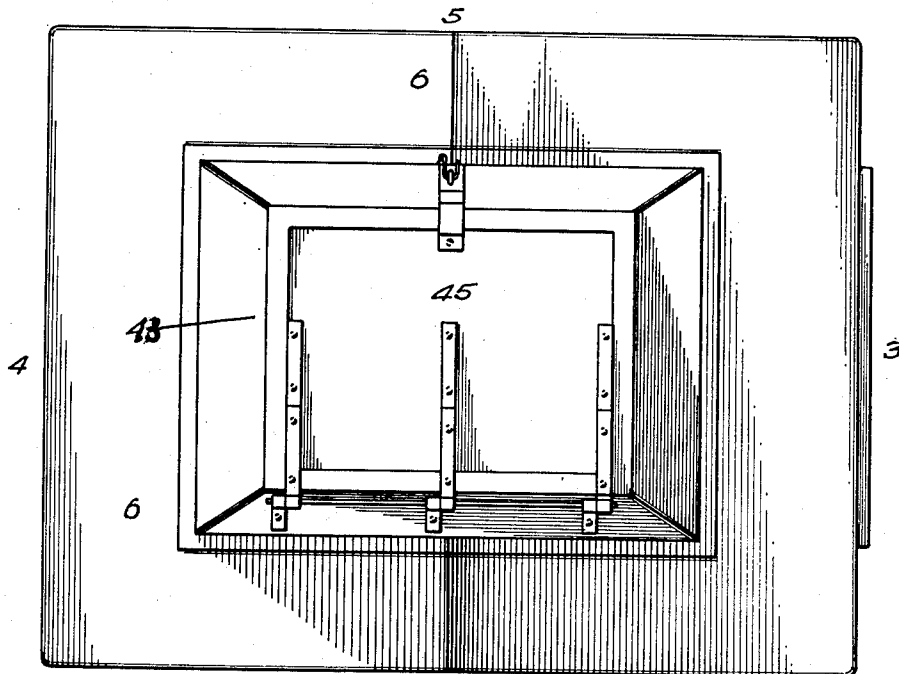
G. C. WOODRUFF

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5 Sheets-Sheet 3



Inventor

Fig. 5.

Graham C Woodruff
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5 Sheets-Sheet 4

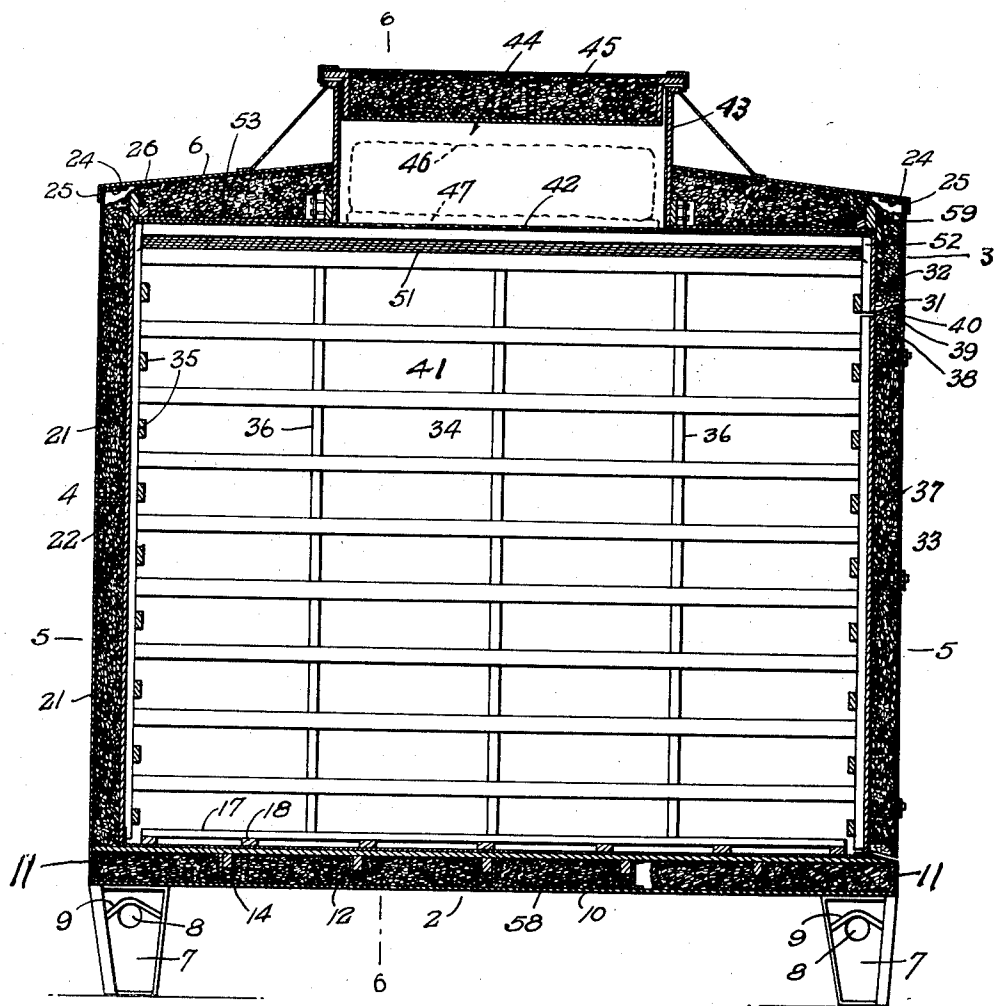


Fig. 4.

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5 Sheets-Sheet 5

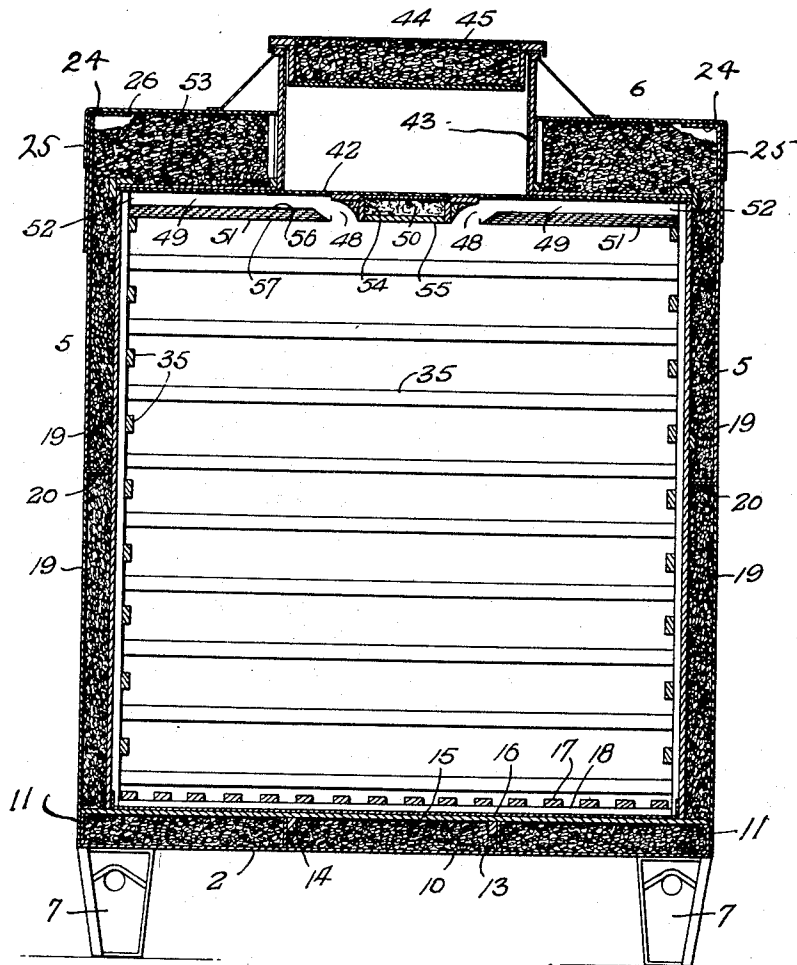


Fig. 6.

Inventor

Graham C Woodruff

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UNITED STATES PATENT OFFICE

2,070,346

INSULATED CONTAINER FOR CONTAINER CARS

Graham C. Woodruff, Bronxville, N. Y., assignor
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Application March 1, 1933, Serial No. 659,234

5 Claims. (Cl. 220—1.5)

This invention relates to insulated shipping containers for container cars of that type designed for the shipment of goods in less than car lots, and particularly to containers designed to be used in conjunction with drop side container compartment cars in which the containers, provided or not with supporting feet or members, are adapted to be shifted into and out of the car compartments on loading and unloading trucks or by suitable hoisting mechanism.

One object of the present invention is to provide an insulated container whereby goods stored in the container may be protected against deterioration due to heat transmission to or from the container, and which is adapted for use in conjunction with contained refrigerating means in a manner to prevent undue loss of cold from the container or waste through unduly rapid melting of ice, in the use of such refrigerant as the refrigerating medium.

A further object of the invention is to provide an insulated container which is largely constructed of metal components so constructed and combined as to produce a container which while light in weight is of great strength and durability.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Fig. 1 is an end elevation of a container embodying my invention.

Fig. 2 is a side elevation of the container.

Fig. 3 is a top plan view of the same.

Fig. 4 is a longitudinal section through the container.

Fig. 5 is a horizontal section on line 5—5 of Fig. 4.

Fig. 6 is a transverse section on line 6—6 of Fig. 4.

Referring now more particularly to the drawings, 1 designates a container of oblong or oblong rectangular form, that shown in the present instance being of oblong rectangular form, with or without supporting feet or the like, and in its structural organization comprising generally a bottom 2, front and rear end walls 3 and 4, side walls 5, and a roof 6. At its bottom the container is provided at each of its four corners with a supporting leg 7 which, as shown, may be constructed to serve the function of lift brackets for the engagement therewith of sling hooks whereby the container may be lifted and handled by

means of a crane, if required. To this end each leg 7 is formed with a hook receiving aperture 8 having a flange or lip over which extends a reinforcing and wear member 9 in the form of an abutment bar or plate welded to the lip and body of the leg. The hook receiving aperture and other features, however, may be omitted from each leg and other means for the attachment of crane elements may be employed.

The container is preferably one of a composite type of wood, metal and insulating material, the parts being so combined, arranged and connected and reinforced as to provide a container which is of great strength but of comparatively light weight, and which at the same time while of conventional external dimensions is not unduly restricted, if at all, in its storage capacity due to the use of its insulating elements. The bottom, top and body walls of this container are accordingly constructed of elements of sheet metal and wood combined and reinforced in a novel manner and associated with insulated material to maintain the interior of the container at a predetermined low temperature. This construction adapts the container to be provided or not with refrigerating means of a type hereinafter described or other suitable type, to serve as a refrigerator container to keep perishable goods at a low temperature or to simply serve as an insulated container to reduce to a minimum temperature changes due to heat exchange action.

The bottom 2 comprises an outer metallic sheet 10, longitudinal and transverse channeled metal sills and floor beams 11, 12 and 13 welded to each other, and wooden furring strips 14 secured to the metal floor beams. On the floor frame formed by the beams, sills and furring strips, a plywood floor 15 is laid, which is secured to the sills by cap screws and to the furring strips by wood screws. This plywood floor is covered with a galvanized steel facing 16 on which is a lattice-like floor rack or gratin, formed of series of wooden slats or strips 17 and 18 arranged at right angles to each other, on which rack or gratin the lading is supported.

The vertical walls 3, 4 and 5 are of generally corresponding construction, varying only as to details, as hereinafter described. The side walls 5, for example, are formed of sheet steel panels 19 having lapping marginal flanges 20 which are welded to each other to form reinforcing and spacing beams, and the end walls 3 and 4 are formed of similar panels 21 having lapping flanges 22 which are welded together to form reinforcing

and spacing beams, and at the corners of the body the vertical marginal flanges 23 of the side panels 19 lap within the vertical marginal flanges 23a of the end panels 21 and are welded thereto, these lapping flanges forming corner posts of requisite stiffness without material increase in weight. The upper edges of the wall sheets are likewise provided with flanges 24 at the eaves and these flanges lap and are welded to flanges 25 of the metallic sheets 26 of which the roof 6 is formed. The lower edges of the side and end wall sheets and edges of the bottom sheet 10 may, if desired, also be flanged and welded to stiffen such walls at their joints.

Arranged at the corners of the body are outer and inner wooden corner posts 27 and 28 and between these posts on the inner side of each vertical metal wall are intermediate posts 29 which are spaced inwardly from said walls, and these posts are fastened to angle brackets, or clips 30 which are welded to the floor sills 11 and to the metal wall panels. The end wall 3 is also provided with posts 31, one at each side of a doorway therein, and a connecting cross bar 32 which form the jambs and lintel comprising the frame of said doorway, which doorway is adapted to be closed by a hinged door 33. The posts 31 and the bar lintel piece 32 are preferably formed of pressed Z-bars to which the contiguous edges of the panels of the wall 3 may be welded. The posts 27, 28 and 29 further strengthen and reinforce the vertical body walls and also serve with the beams 20 and 22 as supports for an inner wall or lining 34 of plywood, which is secured to the said posts. To the plywood lining is applied a lattice-like fender grating formed of sets of wooden cross-strips 35 and 36 against which the lading may bear and which protect the plywood lining from injury. These gratings may also perform the function of ventilation grids to allow of a circulation of air between the top and bottom of the container and through the lading, particularly in the use of refrigerating means, as hereinafter described. The beams 20 and 22 also serve as spacers between the outer metal wall sheets and the lining sheets 34.

The door 33 is of hollow-walled construction like the vertical walls but has its sheet metal outer wall 37 welded to a pressed steel frame 38, said door being provided with wood furring 39 around its edges beveled as required to close against the correspondingly shaped faces of the door frame. The edges of the door may be provided with a sealing facing 40 of quilt and canvas or other suitable snug sealing and good insulating material. The door hinges and fastenings may be of any of the types in general use on containers of this character except that ball-bearing hinges are preferably used. A plywood panel and grating are provided at the inner side of the door to match the corresponding parts of the walls.

Extending beneath the container roof 6 over the storage space or chamber 41 of the container is an aluminum conductor plate 42. A portion of this plate 42 forms the bottom of a centrally disposed ice bunker or compartment 43 having an entrance opening 44 projecting outward through the roof 6 and adapted to be closed in an air-tight manner by an insulated door 45. The bunker 43 is designed to contain a charge of dry ice 46 which rests upon the plate 42 upon a resistance pad 47 laid upon the plate which is kept at a desired low temperature by the ice and acts as a surface cooler. Warm air rising from the

lading enters the inlet ends 48 of air ducts or channels 49 formed beneath the conductor plate and between the same and a central deflector 50 and hollow partitions 51 and flows toward the side walls 5, is chilled by contact with the conductor plate and flows through outlets 52 at the outer edges of the partitions 51 and downward and out into the lading in the storage chamber, through which it flows upward to the ducts for a repetition of the above-described cooling action, whereby a circulation of air is established and maintained as long as the conductor plate is cooler than the chamber to keep said chamber and the lading at the desired low temperature. The conductor plate 42 lies beneath a ceiling 53 formed of panels of a suitable composition board insulating material. The deflector 50 is formed by a portion of this ceiling 53, wooden framing members 54 and an underlying sheet 55 formed of layers of plywood and insulite. The partitions 51 are also formed of spaced walls 56 and 57 of layers of plywood and insulite, the wall 57 lying in the plane of the sheet 55 of the central deflector 50 and coacting therewith to form a sub-ceiling at the top of the storage chamber. A filling of insulation 58 is placed in the spaces between the outer sheet and floor of the container bottom, the panels and lining of the vertical walls, the ceiling and roof sheets and the walls of the deflector 50 and partitions 51 to insulate such elements against passage of heat or cold through them. The construction of the ice bunker, conductor plate and air circulating ducts may be of the same general character as disclosed in my copending application Serial No. 659,233, with certain exceptions or differences, and these parts of the container may be used or not accordingly as it is desired to employ the container as a refrigerator container or simply as an insulated container. The use of the container as a refrigerator container is fully set forth in my copending application aforesaid and need not be repeated here, as the refrigerating features are not herein claimed but constitute a subject-matter of invention claimed in said copending case. The present invention provides a container which, as stated, may be used as a refrigerator container or as an insulated-walled container and the claims of the present application are, therefore, directed to a construction of container whereby an insulated container of great strength and lightness and having maximum storage capacity for a container of given external dimensions may be produced at a comparatively low cost.

Metal ties 59 welded to the metal parts and suitably fastened to the wood parts, may be provided at the upper portions of the corners of the container to strengthen and reinforce the corners at these points, and if desired a door may be provided in each end wall of the container.

From the foregoing description taken in connection with the accompanying drawings, the construction, mode of operation and advantages of my improved refrigerator container will be readily understood and appreciated by those versed in the art without a further and extended description. While the construction disclosed is preferred it will, of course, be understood that changes in the form, proportion and details of construction of the parts of the container and the refrigerator unit may be made within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is:—

1. A container for container cars comprising a container body having a bottom wall formed of an outer metallic wall sheet, angle metal floor beams laid on said sheet, wooden framing members extending alongside and secured to the floor beams flush with the upper faces thereof, an upper wall sheet of plywood sheathing resting on the beams and framing members and secured to said framing members, insulating material filling the space between said outer and upper floor sheets, and a reinforcing metal sheet covering the upper face of the plywood sheathing.

2. A container for container cars comprising a body including bottom, side and end walls, the side and end walls being formed of sheet metal panels having flanges extending inwardly therefrom and secured at the joints to form corner stiffening beams, and the bottom wall being formed of an outer metallic sheet secured to said side and end walls, angle metal brackets welded to the inner faces of the panels, angle metal floor beams laid upon the outer metal bottom wall sheet and secured thereto, wooden framing members secured to said angle metal brackets and angle metal floor beams, inner side and end walls and bottom wall linings of plywood sheathing secured to said wooden framing members and securing the plywood sheathings in spaced relation to the metallic end and side wall and bottom sheets, a reinforcing metal sheet covering the upper face of the plywood sheathing of the bottom wall, and protective wooden gratings secured to and lining the inner surfaces of the side, end and bottom walls so formed.

3. A container for container cars comprising a body formed of bottom, side and end walls each including an outer wall surface formed of sheet metal panels, the panels of the side and end walls having flanges extending inwardly therefrom and welded at the joints to form corner stiffening beams, angle metal members welded

to the inner faces of the panels, wooden framing members secured to the angle metal members, inner linings of wood fastened to the wooden framing members and forming the inner wall surfaces of the respective walls, and a reinforcing metal sheet covering the inner lining of the bottom wall.

4. A container for container cars comprising a body formed of bottom, side and end walls each including an outer wall surface formed of sheet metal panels, the panels of the side and end walls having flanges extending inwardly therefrom and welded at the joints to form corner stiffening beams, angle metal members welded to the inner faces of the metal panels, wooden framing members secured to and extending inwardly from the angle metal members, an inner casing comprising continuous surfaces of plywood fastened to the said framing members and forming the inner wall surfaces of the bottom, side and end walls, and a reinforcing metal sheet covering the plywood inner wall surface of the bottom wall.

5. A container for container cars having bottom, side and end walls including outer wall surfaces formed of sheet metal panels, the panels of the side and end walls being provided with inwardly extending flanges arranged to overlap and welded together to form stiffening beams at the corners of the container, angle metal members secured to the inner faces of said panels, wooden framing members secured to and extending inwardly from the angle metal members, an inner casing forming the inner wall surfaces of the bottom, side and end walls each consisting of a continuous lining surface of plywood secured to the wooden framing members and spaced thereby and by the angle metal members from the outer walls, insulating material between the plywood and the walls, and a reinforcing metal sheet covering the plywood inner wall surface of the bottom wall.

GRAHAM C. WOODRUFF.