Oct. 17, 1961 W. A. BERTOLINI ET AL 3,004,682

CARGO CONTAINER

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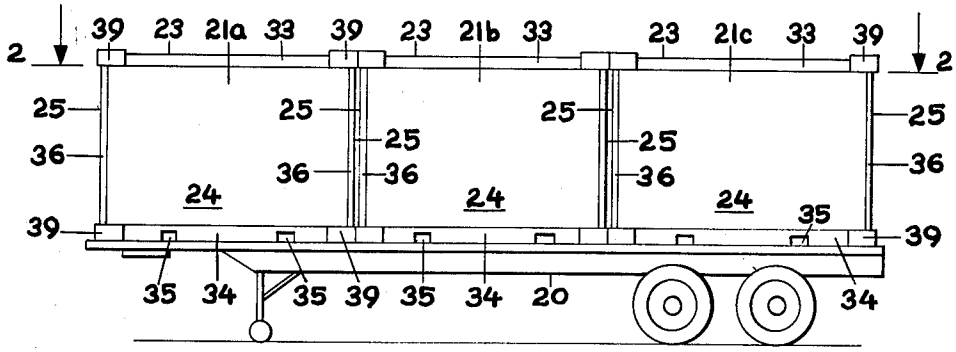

FIG. 1

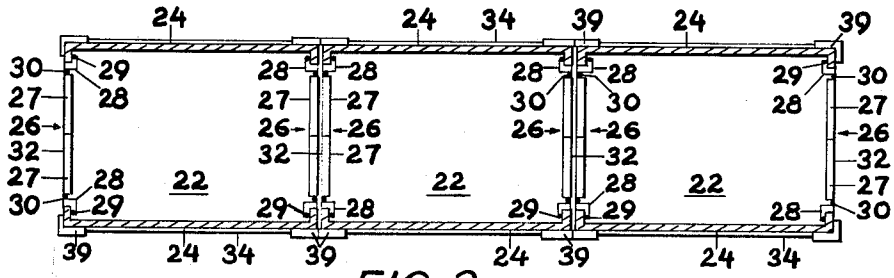

FIG. 2

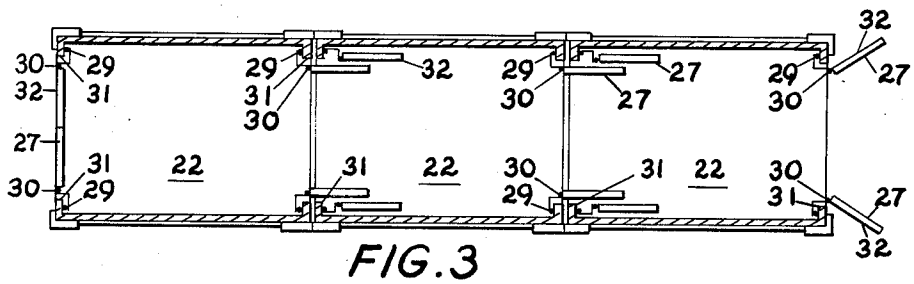

FIG. 3

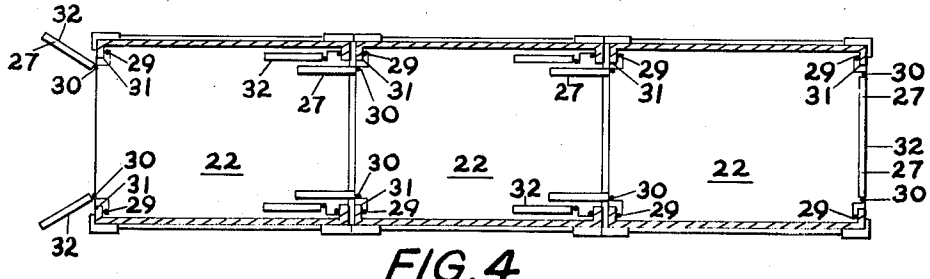

FIG. 4

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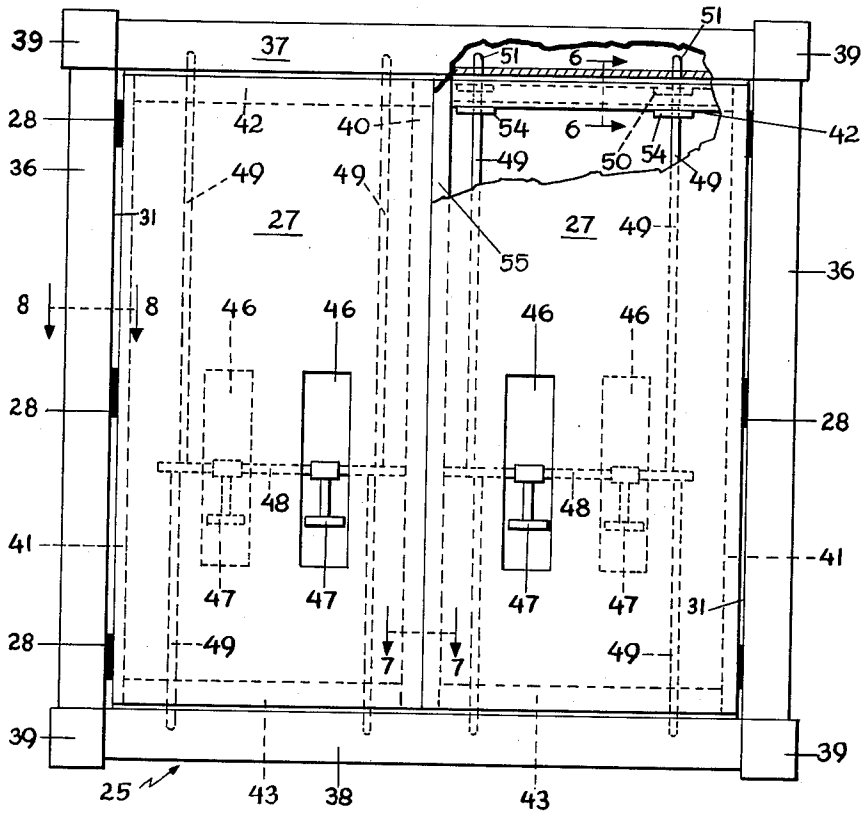

FIG. 5

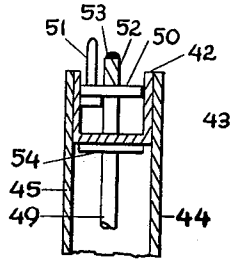

FIG. 6

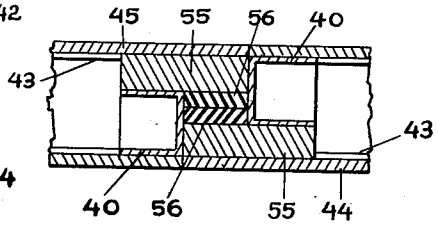

FIG. 7

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FIG. 8

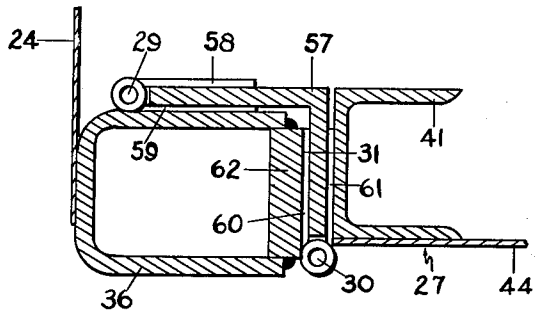


FIG. 9

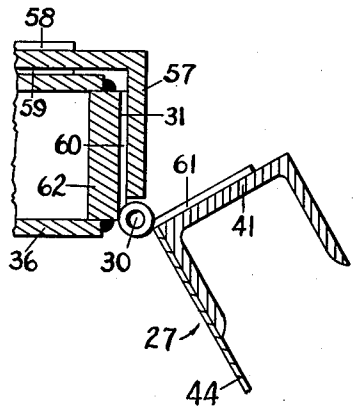
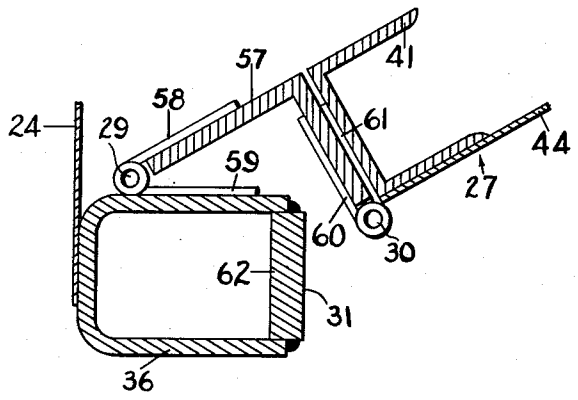


FIG. 10



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United States Patent Office 3,004,682 Patented Oct. 17, 1961

3,004,682
CARGO CONTAINER

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5 Claims. (Cl. 220—1.5)

This invention relates to cargo containers and more particularly to a container adapted for use in abutting relationship with at least one other like container.

It is an object of the present invention to provide a container with door means at both ends thereof whereby a plurality of such containers placed end to end may be loaded or unloaded from either direction.

It is another object of the present invention to provide a container with door means at both ends thereof, which door means are adapted to swing both inwardly and outwardly whereby a plurality of containers may be effectively utilized in an abutting end-to-end relationship and thru-loaded from either direction.

It is another object to provide a container with substantially identical door means at both ends thereof, which door means are adapted to swing both inwardly and outwardly and are provided with hinge means whereby the door means when swung outwardly take a position within the next adjacent container and substantially parallel to the inwardly swung door means of that adjacent container. Further thereto, it is an object of the present invention to provide the door means with retractable upper and lower edge seals which when in retracted position accommodate limited misalignment of containers when one door means are swung outwardly and into the door opening of the next adjacent container.

It is a still further object to provide a container with door means at both ends thereof, which door means are adapted to swing both inwardly and outwardly and are provided with door opening means on both sides thereof.

Other objects of the invention, as well as the advantages thereof, will become apparent from the following description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a side view of a flat-bed trailer on which have been mounted a plurality of containers constructed in accordance with the present invention;

FIG. 2 is a cross-sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view similar to FIG. 2 but with the doors of the containers opened in the direction to permit thru-loading from the right end;

FIG. 4 is a cross-sectional view similar to FIG. 2 but with the doors of the containers opened in the direction to permit thru-loading from the left end;

FIG. 5 is an end view partly in section showing the door means;

FIG. 6 is a cross-sectional view taken along line 6—6 of FIG. 5;

FIG. 7 is a cross-sectional view taken along line 7—7 of FIG. 5;

FIG. 8 is a cross-sectional view taken along line 8—8 of FIG. 5 and showing the hinge structure; and

FIGS. 9 and 10 are cross-sectional views similar to FIG. 8 but with the door means opened outwardly and inwardly respectively.

Referring to FIG. 1, there is shown a flat-bed trailer 20 having mounted or positioned thereon a plurality of containers 21*a*, 21*b* and 21*c*, all constructed in accordance with the present invention. The containers abut one another in end-to-end relationship and each comprises an individually sealable unit consisting of a base

or floor 22, a roof 23, side walls 24 and end walls 25 provided with substantially identical and aligned openings which in turn are provided with door means 26. The door means 26 preferably comprise a pair of inwardly and outwardly opening doors 27 which are hinged to the door openings by means of hinge structure 28 including two parallel hinge pins 29 and 30. The hinge pin 29 is disposed internally of the container and spaced from the edge 31 of the door opening a distance not less than the thickness of the door, while the hinge pin 30 is external of the container and somewhat in alignment with the outer surface 32 of the doors. It will be noted that the hinge structure 28 is thus so proportioned that the doors when swung inwardly as shown in FIGS. 3 and 4, and pivoting about the hinge pins 29, take a position within the container such that the outer surface 32 of the door is in alignment with or recessed from the edge 31 of the door opening. The outwardly swung doors of the next adjacent container pivoting about the hinge pins 30, take a position substantially parallel to the inwardly swung doors thereby affording thru-loading or unloading of a plurality of containers from either end while in position on a flat-bed trailer or other carrier.

During the loading operation, after the forward container 21*a* shown in FIG. 3 is loaded, the doors of that container are closed and locked. The forward doors of the middle container 21*b* are then closed and locked from within. That container is then loaded with cargo and the rear doors of that container are closed and locked from the outside. The forward doors of the rear container 21*c* are then closed and locked from within, after which that container is loaded, and the rear doors closed and locked. The unloading procedure is just the reverse. Similarly, when loading from the front end as would be the case if starting with the doors positioned as shown in FIG. 4, the rear container 21*c* is first loaded and the forward doors of that container are then closed and locked from the outside. The rear doors of the middle container 21*b* are then closed and locked from within and that container is loaded with cargo and the forward doors of that container are then closed and locked from the outside. The rear doors of the front container 21*a* are then closed and locked from within, after which that container is loaded and the front doors closed and locked from the outside.

Referring again to FIG. 1, the side walls 24 are joined to the roof 23 and the floor 22 by means of upper and lower cap members 33 and 34, respectively, which lower cap members 34 are provided with fork-lift pockets 35 to facilitate container handling. The side walls 24 are also welded, riveted or otherwise attached to corner posts 36 forming with a header 37 and a sill 38 the end walls 25 as shown in FIG. 5. The floor 22 is attached as by welding or other suitable means to the sill 38, while the room 23 is similarly attached to the header 37. Corner caps 39 complete the end wall structure.

Referring now to FIGS. 5 through 7, the door structure is shown to comprise a framework including vertical channels 40 and 41 welded or otherwise attached to upper and lower cross channels 42 and 43, and inner and outer skin panels 44 and 45 welded or otherwise secured to the vertical and cross channels. The panels 44 and 45 are provided with pockets 46 within which are recessed door operating handles 47, one of which handles is accessible from the inside of the container and one of which handles is accessible from the outside. The door handles 47 are carried by a cross shaft 48 which is operatively connected by lever or gear means not shown to vertically disposed push rods 49, the ends of which push rods extend through holes provided in the upper and lower cross channels 42 and 43 and have secured thereto plate members 50 as shown in FIG. 6. Each plate member

50 is provided with a plunger 51, attached thereto as by welding, which is adapted when in extended position to be received in corresponding holes provided in the header 37 and in the door sill 38 to thereby maintain the door is closed position. A bar 52 secured to the plate members 50 extends completely across the top and bottom of the door and is provided with a seal 53 adapted to engage the exposed lower surface of the header 37 and the exposed upper surface of the sill 38 when the doors are closed and the plungers 51 extended to their locking position. Plate members 54 spaced from the plate members 50 and secured to the push rods 49 act as stops to limit the travel of the plungers 51 and seals 53.

When the plungers 51 are retracted to their unlocked position, by operation of the door handles 47, the seals are retracted therewith and into the confines of the cross channels to thereby decrease the vertical dimension of the door and in so doing to accommodate a limited misalignment of containers when the doors of one container are swung outwardly and into the door opening of the next adjacent container.

The mating edges of the doors 27, as shown in FIG. 7, may comprise a flat plate member 55 secured as by welding to the inwardly disposed leg of the vertical channel 40 and extending beyond the edge of that channel to provide an exposed surface to which is secured a seal 56 adapted to engage a like seal similarly provided on the mating edge of the other door.

Referring now to FIG. 8, the hinge structure 28 for mounting the doors 27 is shown to comprise an angular or L-shaped hinge bar 57 which extends vertically for the entire distance between the header 37 and the sill 38. The hinge bar 57 is secured at one leg to a plurality of vertically spaced hinge plates 58 pivotally mounted by means of the hinge pins 29 to corresponding hinge plates 59 in turn secured to the inner surface of the corner post 36. The other leg of the hinge bar 57 is secured to vertically spaced hinge plates 60 pivotally mounted by means of the hinge pins 30 to corresponding hinge plates 61 in turn secured to the vertical door channel 41. When the doors are in closed position, the hinge plates 60, as shown in FIG. 8, abut the outer surface of a plate member 62, which defines the edge 31 of the door opening and which is welded or otherwise secured to the open end and runs the entire length of the C-shaped member comprising the corner post 36. As previously indicated, the doors pivot about the hinge pins 29 and 30 when opened inwardly and outwardly, respectively, and it will be noted that the legs of the L-shaped hinge bar 57 are so proportioned and the hinge pins 29 so positioned with respect to the edge 31 of the door opening that the outer surface of the inwardly opened door will take a position to define an opening at least as large as that defined by the edge 31 of the door opening. It will be noted further that the hinge pins 30 are positioned with respect to the outer surface 32 of the door so as to permit at least a 90° outward opening of the door. Means not shown are provided for locking the hinge plates 61 to the hinge bar 57 when the doors are swung about the hinge pins 29 as shown in FIG. 10, as well as for locking the hinge plates 60 and hinge bar 57 to the corner post plate member 62 when the doors are swung about the hinge pins 30 as shown in FIG. 9.

There is thus provided a container with identical door means at both ends thereof which are adapted to swing both inwardly and outwardly in such manner that a plurality of such containers placed end to end may be thru-loaded from either direction. It is apparent that such containers do not have a "front" or "back" end but may be placed on a carrier without regard thereto. They of course may be removed for separate loading or unloading, or they may be thru-loaded or unloaded from either direction while in place on a carrier.

Although shown and described in what is believed to be the most practical and preferred embodiment, it is apparent that departures therefrom will suggest themselves to those skilled in the art and may be made without departing from the spirit and scope of the invention. We therefore do not wish to restrict ourselves to the particular form of construction illustrated and described, but desire to avail ourselves of all modifications that may fall within the scope of the appended claims.

Having thus described our invention, what we claim is:

1. A plurality of like containers abutting one another in end-to-end relationship and comprising a base, a top, side walls and end walls, substantially identical and aligned openings in said end walls, door means of substantially identical size for closing said openings and adapted to be opened outwardly and inwardly, each of said door means including hinge means having a first hinge pin about which said door means swing when opened inwardly and having a second hinge pin parallel to said first hinge pin and about which said door means swing when opened outwardly, and retractable upper and lower edge means carried by said door means to accommodate limited misalignment of containers when the door means of one container are swung outwardly and into the door opening of the next adjacent container.

2. A cargo container adapted for use in abutting end-to-end relationship with at least one other like container and comprising a base, a top, side walls and end walls, substantially identical and aligned openings in said end walls, door means of substantially identical size for closing said openings, and means for mounting said door means and including an angular hinge bar, a first hinge plate pivotally connected to one leg of said hinge bar and secured to the outer edge of said door means, a second hinge plate pivotally connected to the other leg of said hinge bar and secured to the interior of the container at a point remote from the edge of said door opening.

3. A plurality of like containers abutting one another in end-to-end relationship and comprising a base, a top, side walls and end walls, substantially identical and aligned openings in said end walls, door means of substantially identical size for closing said openings and adapted to be opened outwardly and inwardly, each of said door means including hinge means having a first hinge pin about which said door means swing when opened inwardly and having a second hinge pin parallel to said first hinge pin and about which said door means swing when opened outwardly, said first hinge pin being disposed internally of the container and spaced from the edge of said door opening a distance not less than the thickness of said door means, and said second hinge pin being disposed externally of the container and substantially in alignment with the outer surface of said door means.

4. A plurality of like containers as set forth in claim 3 wherein said door means include retractable upper and lower edge means carried thereby to accommodate limited misalignment of containers when the door means of one container are swung outwardly and into the door opening of the next adjacent container.

5. A cargo container adapted for use in abutting end-to-end relationship with at least one other like container and comprising a base, a top, side walls and end walls, substantially identical and aligned openings in said end walls, door means of substantially identical size mounted in said openings and adapted to be opened outwardly and inwardly, each of said door means including hinge means having a first hinge pin about which said door means swing when opened inwardly and having a second hinge pin parallel to said first hinge pin and about which said door means swing when opened outwardly, said first hinge pin being disposed internally of the container and spaced

from the edge of said door opening a distance not less than the thickness of said door means and said second hinge pin being disposed externally of the container and substantially in alignment with the outer surface of said door means.

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