

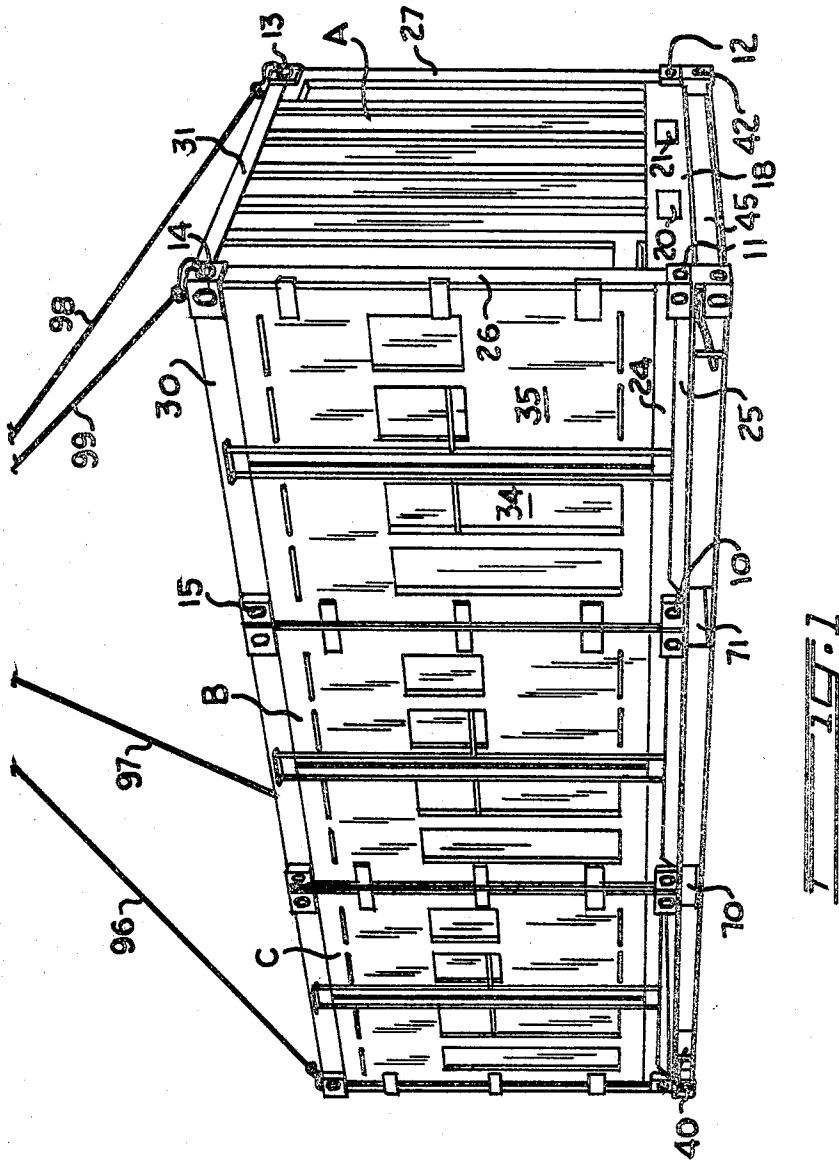
Nov. 25, 1969

J. B. SHERWOOD
ASSEMBLY OF FREIGHT CONTAINERS AND FOUNDATION
FRAME FOR USE THEREWITH

3,480,174

Filed Aug. 2, 1967

4 Sheets-Sheet 1



INVENTOR

JAMES B. SHERWOOD

BY

W. E. Sherwood

ATTORNEY

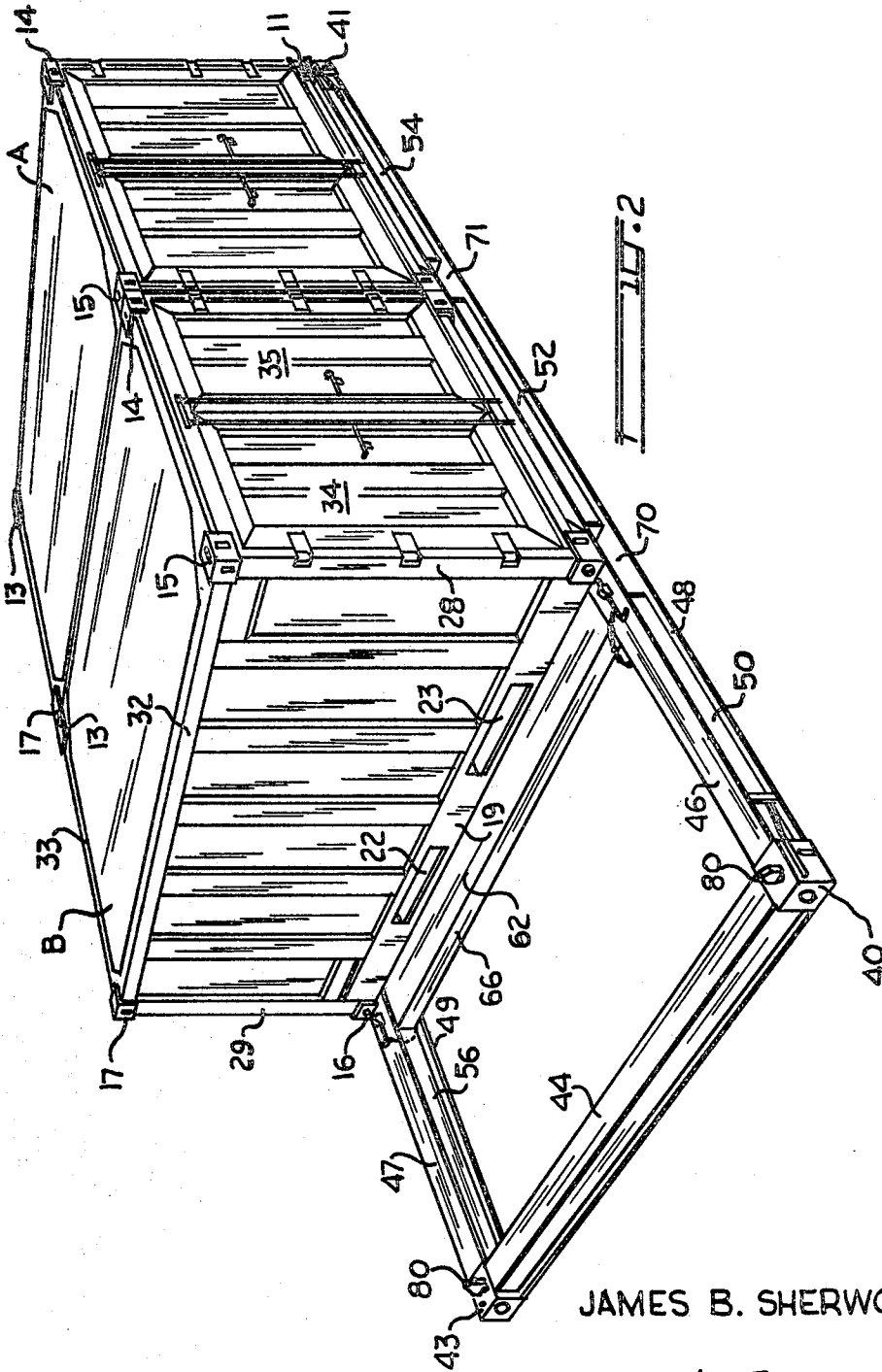
Nov. 25, 1969

J. B. SHERWOOD
ASSEMBLY OF FREIGHT CONTAINERS AND FOUNDATION
FRAME FOR USE THEREWITH

3,480,174

Filed Aug. 2, 1967

4 Sheets-Sheet 2



INVENTOR

JAMES B. SHERWOOD

BY

W. E. Sherwood

ATTORNEY

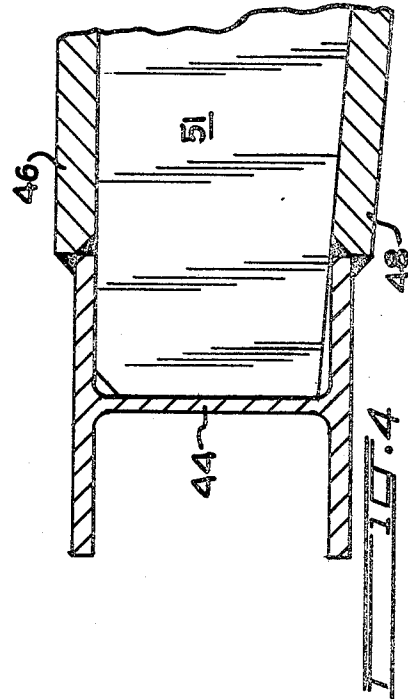
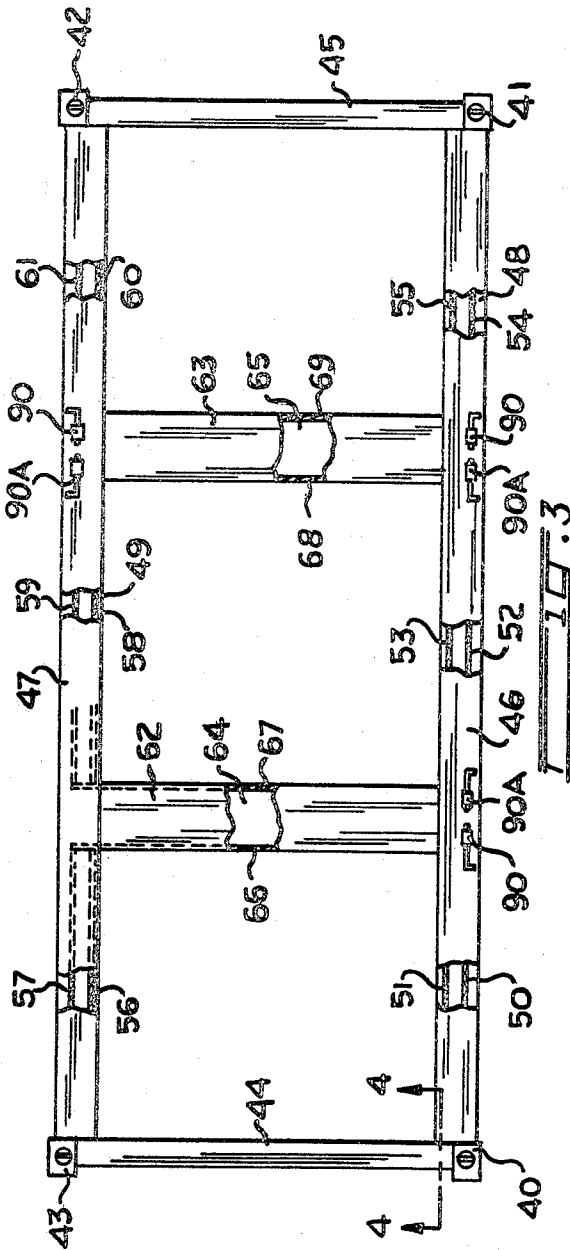
Nov. 25, 1969

J. B. SHERWOOD
ASSEMBLY OF FREIGHT CONTAINERS AND FOUNDATION
FRAME FOR USE THEREWITH

3,480,174

Filed Aug. 2, 1967

4 Sheets-Sheet 3



INVENTOR

JAMES B. SHERWOOD

BY *W. E. Sherwood*

ATTORNEY

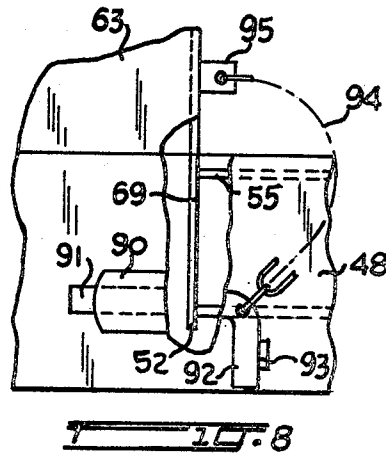
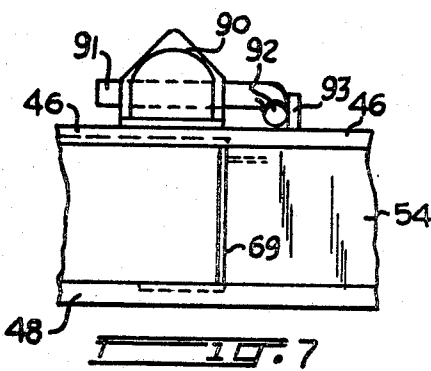
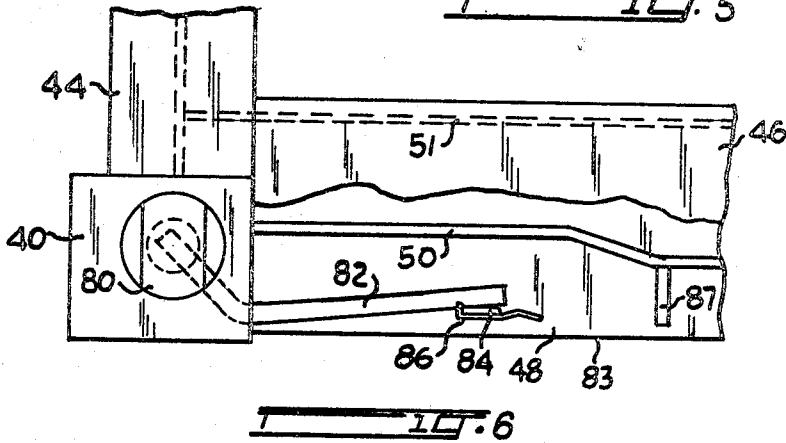
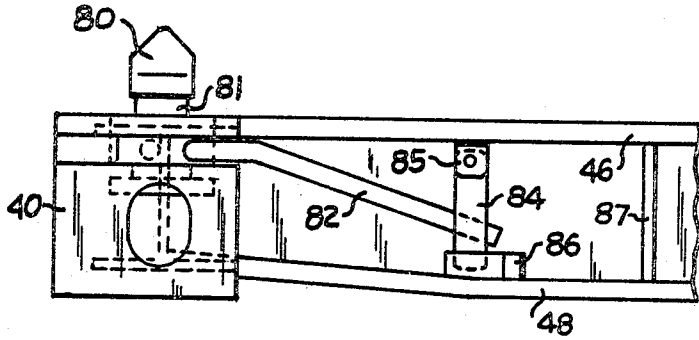
Nov. 25, 1969

J. B. SHERWOOD
ASSEMBLY OF FREIGHT CONTAINERS AND FOUNDATION
FRAME FOR USE THEREWITH

3,480,174

Filed Aug. 2, 1967

4 Sheets-Sheet 4



INVENTOR
JAMES B. SHERWOOD

BY

W. E. Sherwood

ATTORNEY

1

2

3,480,174

ASSEMBLY OF FREIGHT CONTAINERS AND FOUNDATION FRAME FOR USE THEREWITH

James B. Sherwood, London, England

(32 Rue Vaneau, Paris 7, France)

Filed Aug. 2, 1967, Ser. No. 657,858

Int. Cl. B65j 1/04

U.S. Cl. 220—1.5

7 Claims

ABSTRACT OF THE DISCLOSURE

A modular type assembly of a plurality of freight containers mounted upon a foundation frame in indexed relation thereto, is transportable as a single unit. The overall size of the assembly corresponds to the overall size of a single standard-sized, large freight container.

BACKGROUND OF THE INVENTION

Field of the invention

The rapidly increasing usage of freight containers having corner fittings for engagement by lifting means, for coupling to other containers, or for stacking of containers in tiers has necessitated the adoption of certain standards for such fittings by various groups, such as the International Standards Organization. In addition, the requirements for handling containers by trucks, railway cars, and ships; and particularly the type of cellular hull ship for receiving tiers of containers has led to adoption of a container having a standard overall size. One such standard-sized container, for example, comprises a 20 foot length, an 8 foot width and an 8 foot height. For many shippers, however, such a container is too large and a requirement thus exists for small containers which can be assembled into a single unit in which the handling capabilities of the single, large, standard-sized container can be preserved.

Description of the prior art

A typical form of container equipped with corner fittings is shown by Tantlinger Patent No. 3,085,707 and illustrates the mode of handling a conventional large, single container. In contrast therewith, the present assembly can be handled equally as efficiently, and at the same time makes possible the subdividing of the freight into separate lots which can originate from different shippers and be dispatched to different consignees. Moreover, the separate containers of the present assembly can be loaded or unloaded with freight while in position on the foundation frame, or can be detached from the frame for separate handling. This flexibility of usage of the apparatus forms a significant objective of the present invention.

SUMMARY OF THE INVENTION

The invention comprises an assembly of freight containers mounted upon a foundation frame and having overall length, width, and height dimensions corresponding to the equivalent dimensions of a single large standard-sized freight container. Each of the modular containers is adapted for separate emplacement upon and removal from the frame, and each such container is arranged for loading or unloading of freight with respect thereto while in position upon that frame. The invention also comprises a special foundation frame of light weight having means for securing containers thereto and means for indexing containers thereon.

BRIEF DESCRIPTION OF THE DRAWINGS

The objects of the invention will be more apparent when considered in conjunction with the following description and with the accompanying drawings in which:

FIG. 1 is a perspective view of the assembly while being lifted.

FIG. 2 is a perspective view of a partially loaded foundation frame and incomplete assembly.

FIG. 3 is a plan view of the foundation frame with portions broken away and with portions shown in dotted lines.

FIG. 4 is a section view taken on line 4—4 of FIG. 3.

FIG. 5 is a side elevation of one of the securing means associated with a corner fitting of the foundation frame.

FIG. 6 is a plan view of the securing means shown in FIG. 5.

FIG. 7 is a side elevation of one of the indexing means at an intermediate location along the foundation frame, and

FIG. 8 is a plan view, with parts broken away, of the indexing means shown in FIG. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, a plurality of equal sized containers, here shown as three, are constructed for ready positioning upon and removal from a foundation frame. Each container is provided with corner fittings such as shown at 10 to 15 (FIG. 1) and 16, 17 (FIG. 2), and each container has right-rectangular shaped tops and bottoms. The bottom frame portion of each container includes longitudinally extending side members 18, 19 through which spaced openings or pockets 20, 21 and 22, 23 respectively, are extended thus to provide for reception of a suitable lifting means, such as the forks of a lifting truck. In addition, the bottom frame of the container includes a pair of transverse end members, one of which is shown at 24 and which has an open space 25 thereunder for a purpose later to appear. Vertical frame members 26 to 29 of the container joint the respective bottom frame members of the same to upper frame members 30 to 33 thereof through the intermediary of the respective corner fittings.

Each container is provided with a pair of doors 34, 35 hinged in recessed manner upon the vertical frame members 26, 28 in such a way that the doors may be fully opened without interference with adjacent containers or with the foundation frame when the containers are assembled in place of that foundation frame. Each of the bottom corner fittings for each container is provided with suitably shaped recesses facing respectively downwardly for indexing with the foundation frame, toward an end of that frame, and toward a side of that frame. Similarly, each of the top corner fittings for each container has suitably shaped recesses facing respectively upwardly for indexing with a container or with a container assembly stacked thereon, toward an end of the foundation frame, and toward a side of that frame. In general, the recesses facing the ends or sides of the foundation frame are for the purpose of receiving lifting hooks for transporting the container or the container assembly.

Referring now to FIGS. 2 and 3 the invention includes an elongated right-rectangular shaped foundation frame which, for example, may have an overall length of twenty feet and an overall width of eight feet. At its four corners the frame is provided with corner fittings 40 to 43, the end pairs of which are joined by end frame members 44, 45 preferably of I-beam construction. The elongated side frame members, however, are of box-like construction for weight saving purposes and include flat upper strips 46, 47 and flat lower strips 48, 49 joined at their ends to the respective corner fittings and to the I-beams and generally lying in the same planes as the upper and lower surfaces of those corner fittings. Disposed inboard from the edges of these strips are pairs of vertically ar-

3

ranged walls 50, 51; 52, 53; 54, 55; 56, 57; 58, 59 and 60, 61 secured to the strips and forming a sturdy box-like structure without excessive weight. In general, the height of the frame walls is less than the width of the elongated side frame members and when the containers (as seen in FIG. 1) are assembled on the frame, the overall height of the assembly corresponds to the overall height of a standard-sized, large single container, namely eight feet.

For the purpose of reinforcing the foundation frame, particularly in the regions where separate containers abut, transverse upper strips 62, 63 and lower strips 64, 65 are joined at their ends to the respective upper side strips 46, 47 and lower side strips 48, 49. Vertically arranged walls 66, 67 and 68, 69 are attached to these transverse strips and to the ends of the adjacent pairs of vertical strips of the side frame members, as indicated by the dotted line example in FIG. 3. As a result, a pair of tunnel-like recesses or pockets 70, 71 extending from one side of the foundation frame to the other side is provided, and which pockets are adapted to receive a suitable lifting means such as the forks of a heavy duty lift truck and at regions where a substantially uniform frame loading is present.

Referring now to FIGS. 5 and 6, each of the corner fittings of the foundation frame is provided with a suitable means for securing one corner fitting of an end container to the frame, and as exemplified with respect to the fitting 40. Such a means includes a rotatable lug journaled in the corner fitting and having a tapered head 80 undercut as at 81. When such head is inserted into the downwardly facing recess of the corner fitting of the container and is then rotated about 90° as by means of handle 82, the corresponding corner of the container is firmly secured to the corner of the foundation frame. As this action occurs, the handle comes to rest position inboard of the outer edges 83 of upper and lower side strips 48, 46. A keeper bar 84 pivoted in a bracket 85 attached to the underside of upper strip 46 and engageable behind a projection 86 upstanding from the lower strip 48 serves to hold the handle against displacement. A protective web 87 extending between the upper and lower strips outboard of wall 50 also is provided to prevent dislodgement of the keeper bar, such as might otherwise occur if a loaded foundation frame were brushed against an obstruction.

When the two corner fittings of a given container in an end position upon the foundation frame are secured in this manner, the remaining two corner fittings of that container are indexed in their proper positions by a suitable means such as indicated in FIGS. 7 and 8. This indexing means may comprise a post 90, having a tapered upwardly projecting head and welded to the upper surface of the side frame member at a location above the transverse pocket in that frame. The post 90 has a bore therethrough for receiving a securing pin 91 which is rotatable and axially slidable with respect to the bore. As will be understood, the wall sections of the corner fitting of a container to be indexed closely surrounds the fixed post 90, and the securing pin 91 is adapted to project through an aperture in the wall of the container corner fitting as well as through the bore of post 90. The pin 91 is provided with a laterally extending end portion 92 adapted to abut against a stop 93 fixed to the upper surface of the side frame member. A suitable tethering means 94 attached to the pin 92 and to a bracket 95 on the wall 69 of the transverse reinforcing box structure serves to prevent loss of the pin 91.

The number of the described indexing means will, of course, be dependent upon the number of containers used with the assembly. As seen in FIG. 3 wherein the preferred number of three containers are to be employed, four such pins 90 (the fourth pin being omitted from the drawing in the interest of dotted line clarity) will be used, and are herein defined as "complementary indexing means." Similarly, when more than two containers

4

are to be used in the assembly, an additional or supplementary indexing means as indicated by pins 90A in FIG. 3 will be employed.

Manual access to the several indexing means may readily be had by reason of the construction of the bottoms of the containers each of which has an open space 25 at the two ends thereof as best seen in FIG. 1.

With the foregoing description in mind, the advantage of the present invention will now be apparent from the following description of a typical usage of the same. Assuming that the assembly is to have dimensions conforming to the dimensions of a standard-sized, single, large container of twenty foot length and eight foot width and that three containers A, B, and C are to be used, each of these containers will then have an overall width of about 80 inches and an overall length of 96 inches. Depending upon which side of the frame the door of a container is to face, the first container A will be moved (as by a fork lift truck or by hooks from an overhead crane engaging in appropriate corner fittings of the container) into register with the two securing lugs 80 and the two adjacent indexing posts at the right hand end of the frame. The lugs 80 are then rotated to secure the container A to the frame. Subsequently, container B is emplaced in indexed position with the four posts 90A and in side abutting relation to container A. Thereafter container C is emplaced in register with the other two securing lugs and the adjacent indexing posts and the lugs 80 are then turned to secure container C to the frame. In view of the tightly packed relation of the three containers, it normally is not essential to insert the securing pins 91 into the corner fittings of the containers, but in connection with ocean shipping, for example, such insertion of the securing pins is dictated.

With the containers assembled as thus described, the entire structure may then be lifted as a unit, as seen in FIG. 1, by means of hooks on cables 96 to 99 and deposited aboard a truck, railway car or ship as desired. During this lifting movement the upper corner fittings of the end containers A and C are tightly forced against the upper corner fittings of the central container B, such corner fittings of course being designed to accommodate such loadings.

What is claimed is:

1. An assembly of freight containers adapted to be lifted and handled as a unit and to occupy the equivalent space of a single standard-sized large freight container and comprising in combination, a plurality of containers each having right-rectangular shaped bottoms and tops and equipped with corner fittings at each of the top and bottom corners thereof, a right-rectangular shaped foundation frame having a corner fitting at each of its four corners, the overall width and length dimensions of said frame when fully loaded and including the corner fittings being substantially identical with the corresponding overall dimensions of the plurality of containers carried by said frame in substantially side-abutting relation to each other, each of said frame corner fittings having a securing means in engagement with a bottom corner fitting of a container disposed thereabove, said frame comprising a pair of side frame members attached at their respective ends to corresponding pairs of frame corner fittings, a pair of end frame members of shorter length than said side frame members and attached at their respective ends to corresponding pairs of said frame corner fittings, and an indexing means disposed on said side frame members intermediate the ends thereof and in engagement with the remaining two bottom corner fittings of containers whose two other bottom corner fittings are engaged by said securing means, said top corner fittings of said containers being adapted to engage a lifting means whereby the entire assembly may be lifted therewith as a unit.

2. An assembly as defined in claim 1 wherein each of said containers includes a door in an end wall thereof

5

adapted to open outwardly while the container is mounted on said frame, the said end wall of the container being located parallel to one of said side frame members.

3. An assembly of freight containers comprising in combination, a plurality of containers each having right-rectangular shaped bottoms and tops and equipped with corner fittings at each of said bottom and top corners thereof, a right-rectangular shaped foundation frame having a corner fitting at each of its four corners, each of said frame corner fittings having a securing means in engagement with a bottom corner fitting of a container disposed thereabove, said frame comprising a pair of side frame members attached at their respective ends to corresponding pairs of frame corner fittings, at least one of said side frame members having a pair of spaced openings therein for reception of forks of a lifting means, reinforcing members extending between said side frame members and defining the sides of said openings, a pair of end frame members of shorter length than said side frame members and attached at their respective ends to corresponding pairs of said frame corner fittings, a complementary first indexing means disposed on said side frame members intermediate the ends thereof, and in engagement with the remaining two bottom corner fittings of containers whose two other bottom corner fittings are engaged by said securing means, and a second indexing means disposed on said side frame members intermediate the ends thereof and in engagement with the four bottom corner fittings of a container whose bottom corner fittings are not engaged by either of said securing or said first indexing means, said top corner fittings of said containers being adapted to engage an alternative lifting means whereby the entire assembly may be lifted as a unit by said alternative lifting means.

4. An assembly as defined in claim 3 wherein the number of said containers comprises three.

5. An assembly as defined in claim 3 wherein said containers are of equal size.

6. An assembly as defined in claim 3 wherein the end walls of said containers are disposed parallel to the side frame members and are shorter than the side walls of said containers, said side walls being disposed parallel to the end frame members.

7. An assembly of freight containers comprising in combination, a plurality of containers each having right-rectangular shaped bottoms and tops and equipped with corner fittings at each of said bottom and top corners thereof, a right-rectangular shaped foundation frame having a corner fitting at each of its four corners, each of said frame corner fittings having a securing means in engagement with a bottom corner fitting of a container disposed thereabove, said frame including a pair of beams

6

forming the end frame members, a pair of side frame members each including a flat upper strip and a flat lower strip, two open-ended box-like reinforcing structures spaced longitudinally of said side frame members and located beneath the respective side confronting edges of containers mounted on said frame, said structures forming tunnels for reception of spaced forks of a lifting means, each of said structures including an upper flat strip and a lower flat strip attached at their respective ends to the upper and the lower strips of said side frame members, each of said structures having vertical side walls defining the sides of said tunnels, each of said side frame members having relatively short pairs of vertical walls attached to the corresponding upper and lower strips of said side frame members and located generally beneath the front and rear edges of the containers mounted on said frame thereby to form hollow, box-like sections of said side frame members in the spaces between the corresponding end frame members and adjacent reinforcing structures as well as between adjacent reinforcing structures, a complementary first indexing means disposed on said side frame members adjacent the junctions of one of said reinforcing structures with the side frame members, said first indexing means being in engagement with the remaining two bottom corner fittings of a container whose two other bottom corner fittings are engaged by said securing means, and a second indexing means disposed on said side frame members adjacent the junctions of each of said reinforcing structures with the side frame members, said second indexing means being in engagement with the four bottom corner fittings of a container whose bottom corner fittings are not engaged by either of said securing means or said first indexing means.

References Cited

UNITED STATES PATENTS

1,814,304	7/1931	Fitch.	
2,664,219	12/1953	Schmidt	220—1.5
3,004,682	10/1961	Bertolini et al.	220—23.4 X
3,061,134	10/1962	Fesmire et al.	220—4 X
3,085,707	4/1963	Tantlinger	220—1.5
3,159,111	12/1964	Gutridge et al.	105—366
3,163,127	12/1964	Gutridge et al.	105—366 X
3,317,219	5/1967	Hindin et al.	220—1.5 X
3,163,306	12/1964	Bennett et al.	220—1.5 X

RAPHAEL N. SCHWARTZ, Primary Examiner

U.S. Cl. X.R.

108—55; 294—67