June 17, 1969 L. C. LAFONT ET AL 3,449,801

CONTAINER COUPLING FITTINGS

Filed July 24, 1967 Sheet 1 of 4

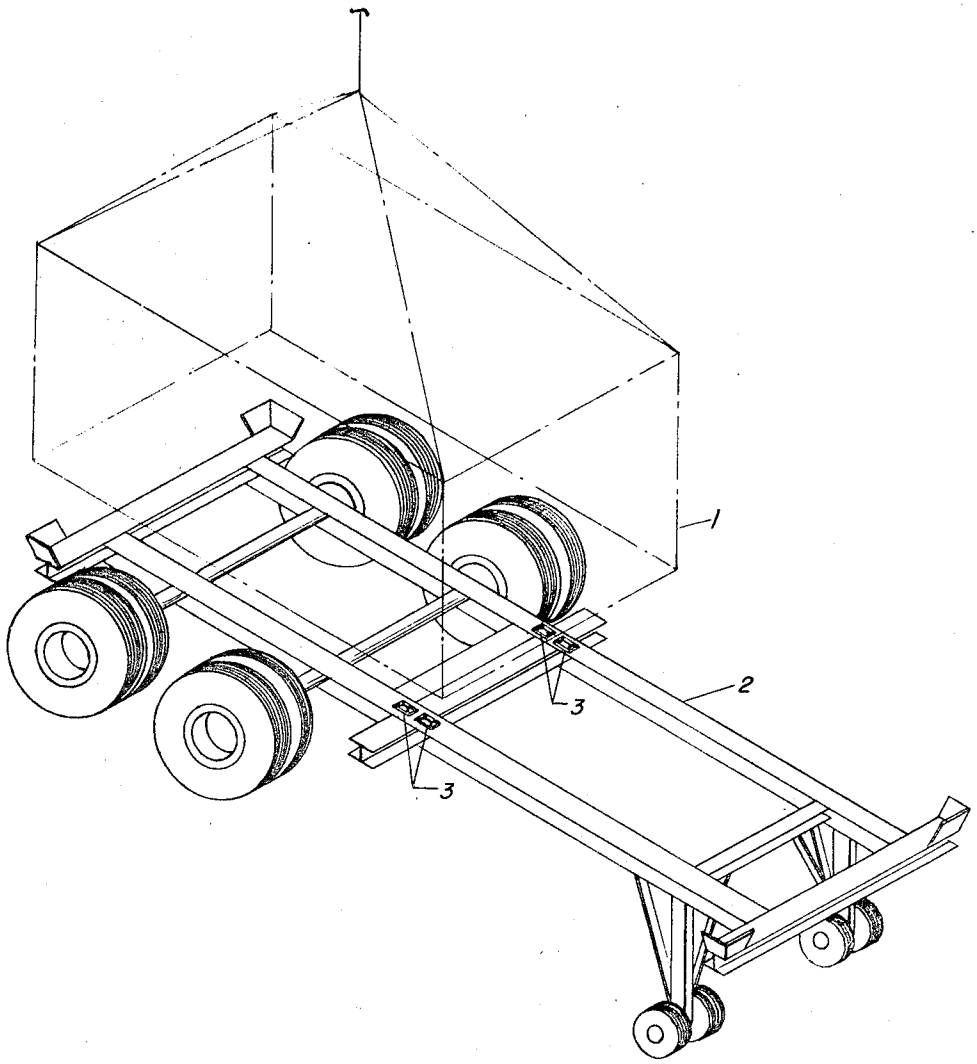


FIG. 1

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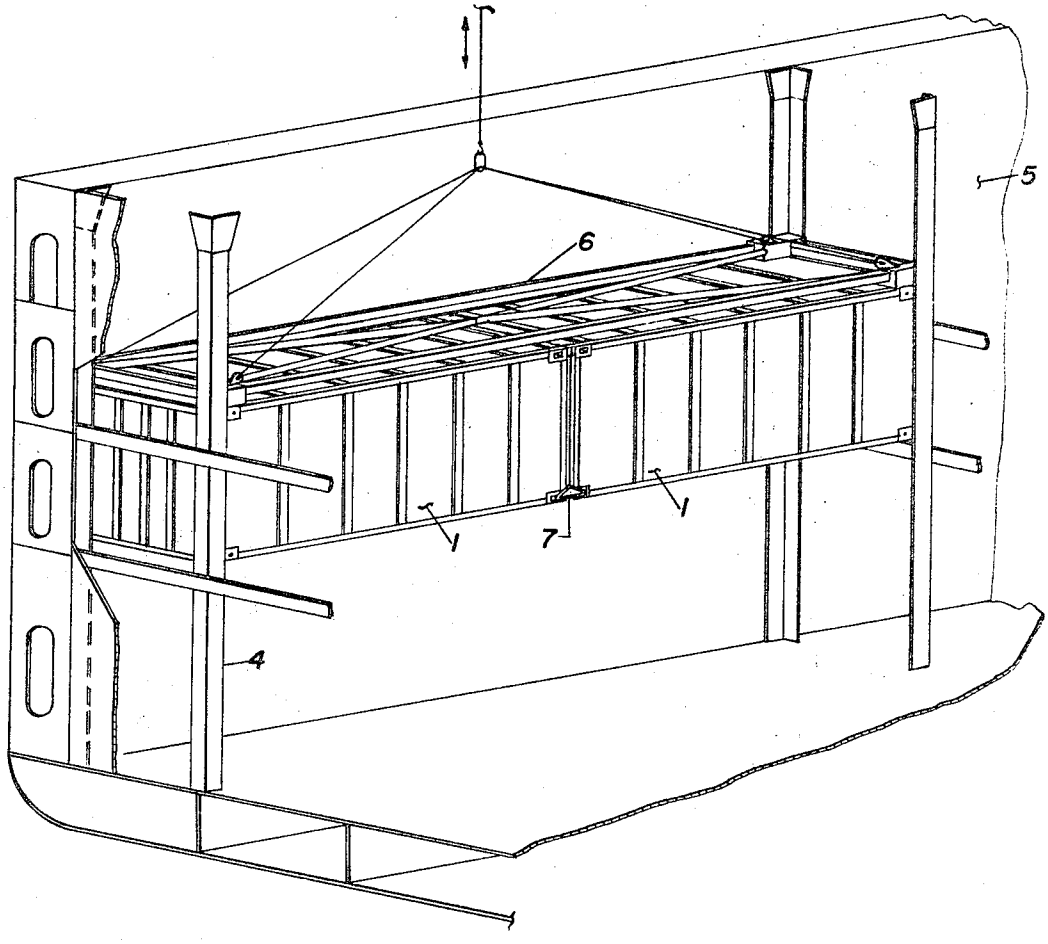


FIG. 2

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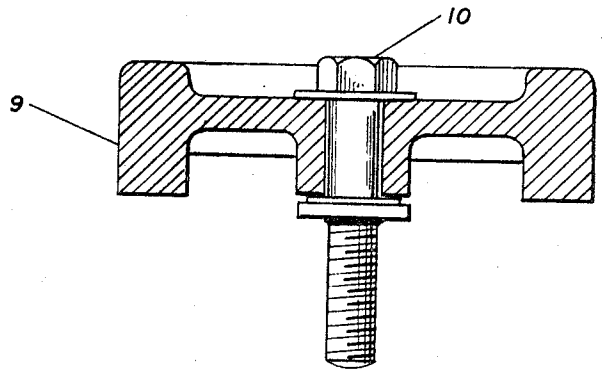


FIG. 4

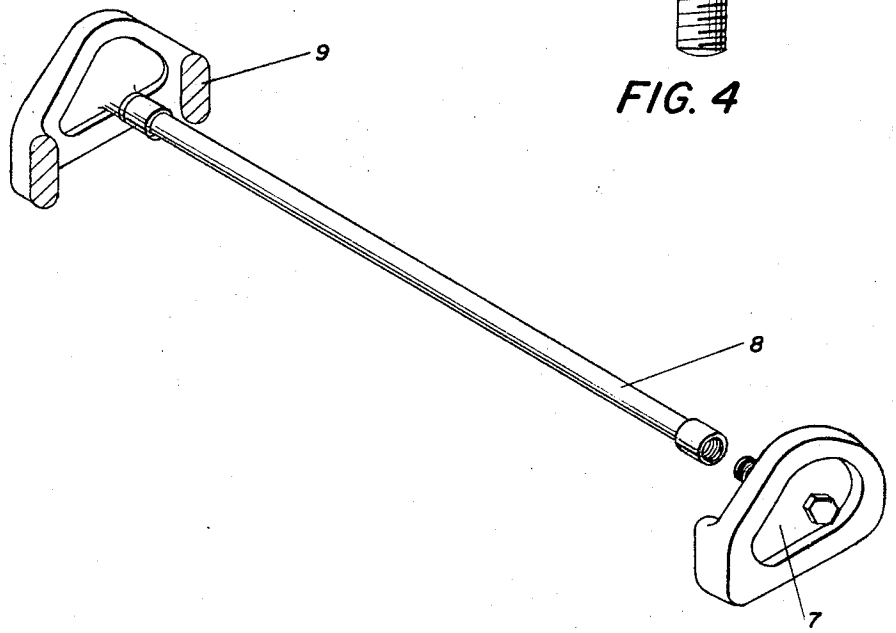


FIG. 3

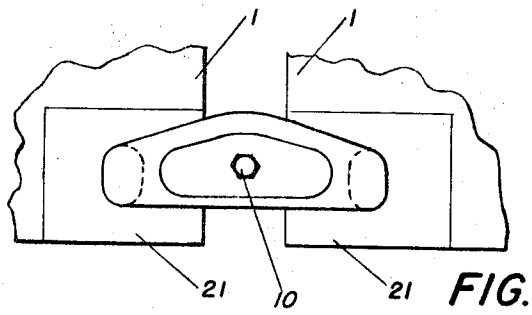


FIG. 5

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CONTAINER COUPLING FITTINGS

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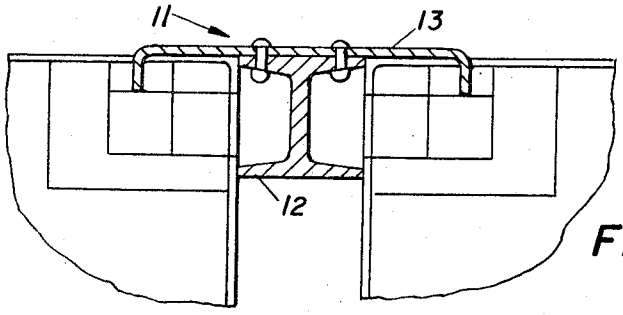


FIG. 8

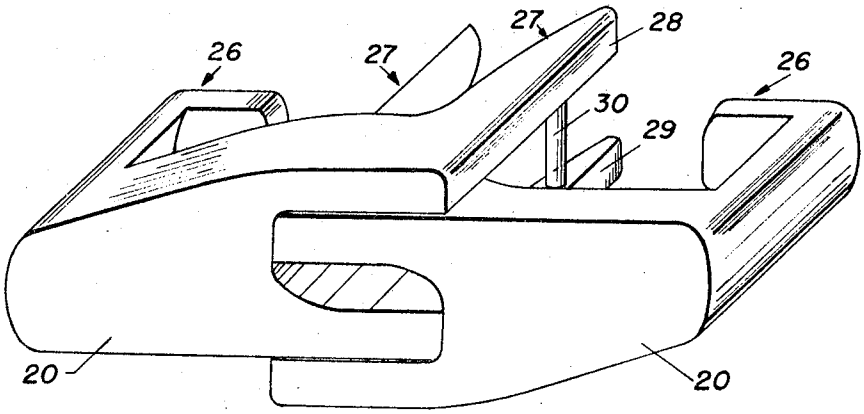


FIG. 7

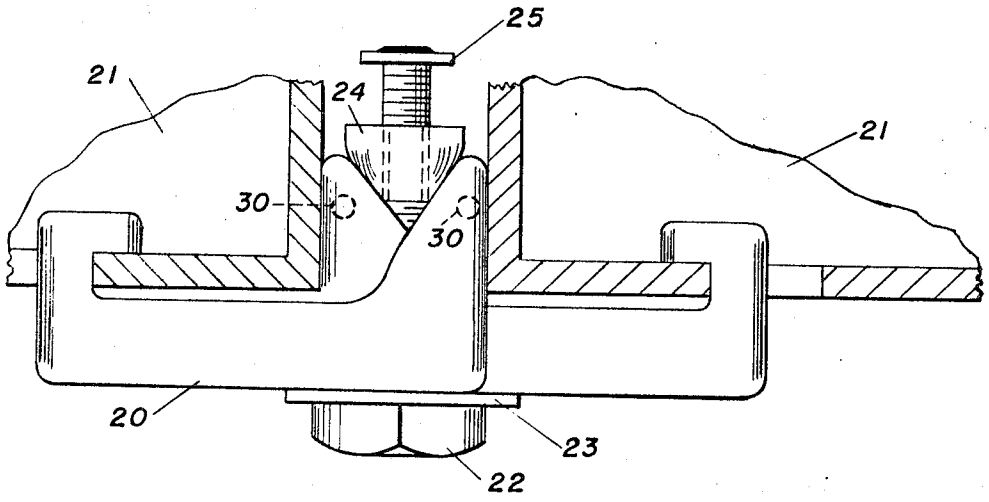


FIG. 6

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United States Patent Office 3,449,801
Patented June 17, 1969

3,449,801

CONTAINER COUPLING FITTINGS

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Int. Cl. B65j 1/08; B66c 1/42
U.S. Cl. 24—81 11 Claims

ABSTRACT OF THE DISCLOSURE

Fittings for coupling containers together to permit simultaneous handling and transporting of two containers. One embodiment includes two fittings spaced by a bar and located between bottom corner castings of 20 foot containers and thus coupling the containers and another embodiment includes the use of independent fittings, one at each lower corner of adjacent containers. Both embodiments utilize two top compression fittings located between top corner castings.

Summary of prior art

Conventional designs for cellular container ships and systems for the loading and discharging thereof are such that containers can only be loaded and discharged therefrom one at a time. On the other hand, fittings permitting the marrying of two containers together for over the road transportation are available, but these require that one container be backed into another to have the fittings enter the corner castings and then require manual turning of the fittings generally from the space between containers. Furthermore, it is not generally possible to simultaneously lift two containers thus married. Copending patent application entitled "Container Transporting and Handling System" Ser. No. 641,665, filed May 26, 1967, teaches a system for handling two containers simultaneously when properly married together, or for handling one container having a length equal to the total lengthwise dimensions of the two aforementioned smaller containers. In order to accomplish the coupling of two containers, connecting fittings are provided at the lower adjacent corner castings so as to marry the containers as a unit and provide the proper spacing therebetween so that the overall length is equal to that required for the particular cell guide design.

The aforementioned copending patent application teaches two types of bottom fittings and refers to a top spacer fitting used for coupling containers together for handling, transportation and storage. However, the units disclosed therein were first concepts developed to insure the technical feasibility of the entire system disclosed in the application.

Description of invention

The present invention covers bottom connecting fittings to permit the marrying of two or more containers in a spaced relationship by connecting the outside lateral faces of adjacent bottom corner castings and spacing the top adjacent edges of the containers.

One embodiment includes two fittings tied together with an elongate steel rod with at least one side removable from the steel rod. These fittings serve to structurally connect the containers together and yet maintain a space between them.

In another preferred embodiment, independent self adjusted fittings are used in each of the two bottom adjacent corner castings. These fittings also serve to structurally connect the containers together and yet maintain a space between them. Furthermore, the fittings do not require manual assembly each time used.

Both embodiments include a top compression fitting which serves to maintain the space between containers when lifting or lowering.

It is the principal object of the present invention to provide a bottom connector capable of carrying two containers together for handling or transporting without requiring the backing of one container into another.

It is another object of the invention to provide a bottom connector capable of taking the tensile stress induced therein when handling the married assembly.

It is yet another object of the present invention to provide a bottom connector capable of spacing two married containers such that the overall dimension of the assembly is equal to the overall dimensions of a larger standard container.

It is still another object of the present invention to provide a connector capable of being installed on the containers in a minimum period of time.

It is yet another object of the present invention to provide a connector not requiring manual operation from the space between containers.

It is still another object of the present invention to provide a top compression fitting capable of spacing two containers from one another and taking the induced compression load experienced when lifting or lowering the married assembly.

Other and further objects of the present invention will become apparent with the following detailed description thereof when taken in view of the appended drawings.

Description of drawings

FIGURE 1 is a diagrammatic perspective of a 20′ container being loaded on a 40′ chassis.

FIGURE 2 is a diagrammatic perspective of a vessel illustrating the use of the bottom connecting fitting during the ship loading or unloading operation.

FIGURE 3 is a perspective of one specific embodiment of the invention.

FIGURE 4 is a detail of the removable fitting of the same specific embodiment of the invention.

FIGURE 5 is a side view of the fitting attached to two containers of the same specific embodiment of the invention.

FIGURE 6 is a plan view of another specific embodiment of the invention.

FIGURE 7 is a perspective view of the relatively movably sections of the same specific embodiment of the invention.

FIGURE 8 is a perspective of one specific embodiment of the top compression fitting.

Detailed description of embodiments

Referring to FIGURE 1, a single 20 foot container **1** is shown being loaded on a 40 foot chassis **2**. Guides **3** on the chassis determine the landed position of the container.

Referring to FIGURE 2, two married 20 foot standard USASI/ISO containers **1**, which have true dimensions of 19′–10½″, 8′–0 by 8′–0″ overall each, are shown being lifted into or out of angle shaped cell guides **4** which are actually spaced 40′ apart, all in a ship **5**. The married containers, are lifted to and from the angle cell guides **4** by a single ship-based or shore-based crane cooperating with two independent spreader bars or a single spreader bar **6**. One bottom connecting fitting **7** is shown, a second is similarly located between the opposite adjacent bottom corner fittings. The top compression fittings **11** are located at the top adjacent corner castings.

Referring to the first embodiment, FIGURES 3, 4,

and 5, each bottom fitting is provided with cast hook like protrusions **9** for engaging the corner fittings on the containers. One side of the bottom assembly is provided with a removable fitting as shown in FIGURE 4. A stud **10** is used to engage the removable casting with rod **8**. Referring to the second and preferred embodiment FIGURES 6 and 7, two independent hook like cast pieces **20** are provided to engage the container corner castings **21** of adjacent containers. A bolt **22** is passed through each casting pair. The bolt threads engage corresponding threads in a wedge **24**. A keeper **25** is provided on the end of the bolt. The top spacer FIGURE 8 is used between top corner fittings of containers to transmit compressive loads only, the I section **12** being as deep as the corner castings and as wide as the space between containers.

Description of use of coupling fittings

Two twenty foot standard USASI/ISO containers (19'–10½" x 8' x 8') will be loaded aboard a 40' chassis As each container is landed aboard a chassis **2**, the chassis guides **3** direct the container into a specific position. After two containers are loaded on the chassis the overall length of the containers will be 40 feet, that is, each container is 19'–10½" long and the guides cause a space of 3 inches between landed containers.

In the first embodiment, the stud **10** of the corner fitting assembly shown in FIGURE 3 is loosened and fittings **7** are engaged in the containers' bottom corner castings. After engaging the fittings, the bolts are tightened. Subsequently, two compression fittings each of which consists of a steel I section spacer **12** topped with a light steel plate **13** curved to enter the top of the corner castings, are inserted between the top corner castings. The containers are then married and capable of being handled and stowed together as a unit.

In the second embodiment as shown in FIGURES 6 and 7, the hook like fittings for each corner casting are independent. After two 20 foot containers are landed on the 40 foot chassis **2**, the fittings are inserted in the side faces of the lower adjacent containers corner castings. This is accomplished by loosening stud **22** to retract it from wedge **24**. A keeper **25** is fitted to the end of the stud to prevent complete withdrawal of the stud and disassembly of the fitting. The fitting castings **20** may then be adjusted to fit into the container corner castings **21**.

As is best seen in FIG. 7, each fitting casting **20** has an outer end **26** in the form of a hook extending inward and back toward an inner end **27**. The inner end of each section has a U-shaped profile formed from a pair of legs **28** and **29**. When joined for operation, the sections of the fitting are mated so that one leg of each section is positioned intermediate the pair of legs associated with the other section. Each section of the fitting is also provided with a pin **30** serving to prevent the accidental separation of the two sections.

After the fitting is inserted into the container corner castings **21**, the bolt **22** is tightened thus drawing wedge **24** against the fitting casting to bring the side hole prongs together and expand the center spacers of the coupler, taking up any slack in the connection and bringing the containers together. After the bottom corner fittings are in place the compression pieces are inserted between the two containers at the top.

The married containers are then ready for handling or transporting as a single unit with a 40 ft. standard spreader.

Various modifications can be made to the herein disclosed system, for example, instead of consisting of an I section, the compression piece may be welded channels or steel blocks; containers may be handled side to side rather than end to end.

We claim:

1. Fittings for marrying two containers together in a spaced relationship to permit simultaneous handling and transporting of the two containers as one unit, the fittings comprising a pair of bottom fittings each having a pair of spaced protrusions for fitting into the adjacent corner castings of said containers, and each bottom fitting having a central portion of suitable strength to withstand vertical and horizontal loading forces transmitted within the plane of the bottom fitting, and securing means coupled to each bottom fitting for releasably and securely maintaining the protrusions in the respective corner castings during use wherein said securing means includes a bolt extending through at least one bottom fitting and having an enlarged stud-like member exposed at the outer face thereof so that said securing means can be actuated by operation of said stud, and threaded means on the opposite side of the bottom fitting from the stud-like member operatively cooperating with said bolt for securing the bottom fitting when said bolt is turned in one direction and for releasing the bottom fitting when the bolt is turned in the other direction and wherein each bottom fitting includes two relatively movable sections, each section having an outer end in the form of a hook extending inward and back toward the opposite container, and each section further including an inner end overlapping the corresponding inner end of the other section, the inner end of one of the sections having a U-shaped profile and the inner end of the other section having at least one leg fitting between the legs of the said U-shaped profile, said threaded means comprising activating means operated by said bolt and mechanically coupled to the inner ends of said section for operably forcing said sections in further overlapping relation so as to draw the hook portions into positive and secure engagement with the associated corner casting.

2. Fittings as set forth in claim **1** wherein the inner ends of the overlapping parts of said sections include crossing inclined planes extending within the space between the adjacent containers when said bottom fitting is held on the outer sides of the corner castings, and said actuating means including a wedge-like member fitted between the inclined planes having a threaded part receiving the bolt such that operation of said stud draws the wedge-like member along said inclined planes so as to draw the hook portions of said cooperating sections together.

3. Fittings as set forth in claim **2** wherein the inner end of each section has a U-shaped profile and arranged in mutual overlapping engagement with the inner end of the other section, said bolt passing through a space formed between the centermost legs of the overlapping configuration, each leg of the configuration being provided with an inclined plane crossing the inclined plane of the next adjacent leg, each inclined plane terminating in an abutment which engages, when the bottom fitting is fully seated, the side of the corner casting in which the hook part of the other section is seated.

4. A fitting for marrying two containers together in a spaced relationship to permit simultaneous handling and transporting of the two containers as one unit, the fitting comprising first and second fitting elements each having a first protrusion thereon serving to engage a respective one of said two containers and each having a second protrusion thereon serving to define a space between said two containers and stud means associated with said second protrusions on said first and second fitting elements which, when activated, exert a force on said second protrusions which causes said second protrusions to urge the two containers apart until said containers are encountered by, and restrained from further separating movements by, said first protrusions.

5. The fitting as recited in claim **4** wherein said second protrusions on said first and second fitting elements define overlapping inclined planes.

6. The invention as set forth in claim **5** wherein said stud means includes a wedge for contacting the respective surfaces of said inclined planes and for forcing said in-

clined planes to move relative to one another upon activation of said stud means.

7. The invention as set forth in claim 6 wherein each fitting element is so shaped and is so associated with its overlapping fitting element and said stud means so that the first protrusion thereof contacts one of said two containers and the second protrusion thereof contacts the other of said two containers.

8. The fitting as recited in claim 7 wherein said first protrusions on said first and second fitting elements are in the form of hooks adapted to engage the bodies of said two containers.

9. A method for marrying two containers together in a spaced relationship to permit simultaneous handling and transporting of the two containers as one unit, and comprising the steps of aligning the two containers with the desired space therebetween; applying a fitting to the bottom portions of the containers in the region of said space for rigidly holding said containers in the desired spacial relationship; and applying a compression fitting to the top portions of the containers in the region of said space for maintaining the space between the top adjacent edges of the containers when lifting or lowering same.

10. The method as set forth in claim 9 wherein said two containers are aligned on a vehicle specially adapted for alignment and spacing purposes.

11. The invention as recited in claim 9 wherein the predetermined space between the two containers is such that the total length of the composite unit is such that said unit can be conveniently housed in a container ship between cell guides of standard spacing.

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U.S. Cl. X.R.

105—366; 220—1.5