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[54] **CONTAINER-SUPPORTING APPARATUS FOR CONTAINER SHIP**
3 Claims, 5 Drawing Figs.

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248/240.4
[51] Int. Cl..... B63b 25/22
[50] Field of Search..... 114/72, 75,
73; 214/14, 15, 10.5; 248/119 R, 240.4, 284;
105/366 R, 366 A-366 E, 369 R, 369 A, 372;
211/49 R, 126, 169, 169.1, 170

ABSTRACT: Apparatus is provided for use in conjunction with vertical container corner guideways in the hold of a containerized ship to enable the number of container stacked in the hold to be greater than would normally be permitted within safe compression limits of the bottommost container. The apparatus comprises support fingers pivotally mounted adjacent each guideway and selectively operable by means of an air cylinder between a retracted position for permitting loading of lower containers in the hold and an extended position for engaging the corners of an upper container to keep its load from being superimposed in the lower containers.

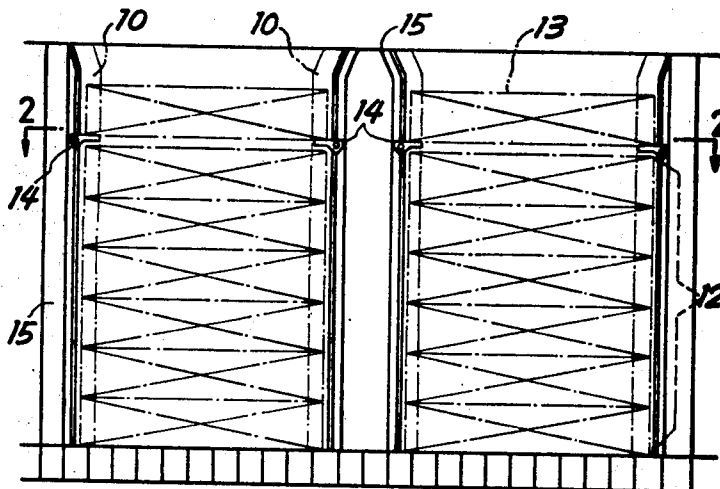


FIG. 1

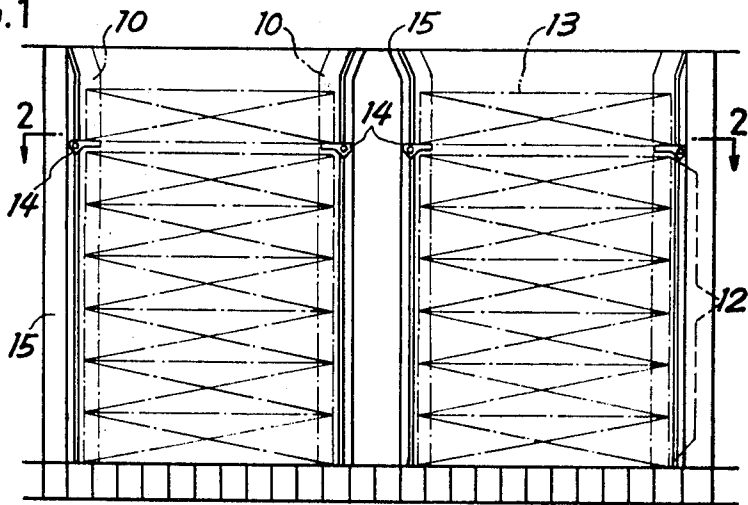


FIG. 2

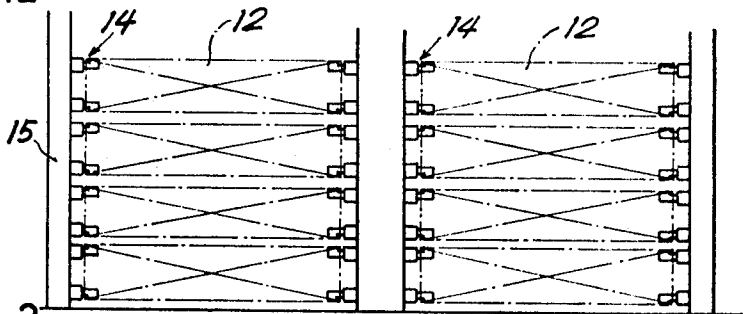


FIG. 3

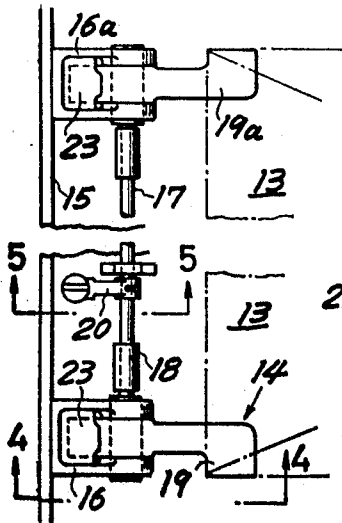


FIG. 4

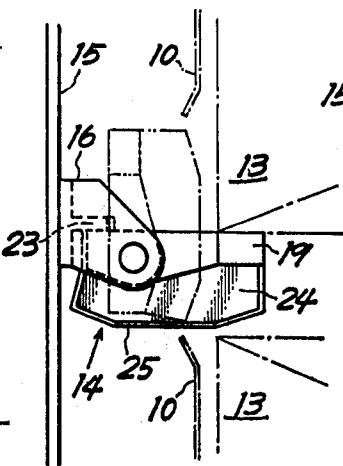
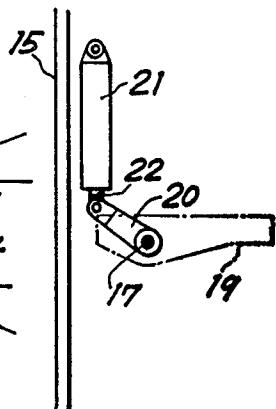


FIG. 5



CONTAINER-SUPPORTING APPARATUS FOR CONTAINER SHIP

This invention relates to a container-supporting apparatus for container ship, more particularly to an apparatus capable of stacking more than seven containers in the container cell of the hold.

In the conventional container ship, container guides are vertically provided in the container hold near or at the four corners of every container to be stored. The containers are loaded and stacked in superposed relation in the each container cell formed by the four container guides. In the container cell, it has not been permitted to stack more than six containers owing to strength of the container body. Therefore, the height of the container hold is limited and large container ship which may store more containers has not been built.

An object of this invention is to provide an apparatus for supporting upper containers than sixth container, whereby seven or more containers can be stored or stacked in the container cell without superposing the containers on the sixth container.

The supporting means in accordance with this invention has a strength enough to carry the upper containers than the sixth container in the container cell. The supporting means is adapted to retract from the container cell so as not to obstruct the movement of the sixth container and below and to project into the container cell to carry the seventh containers and over.

Further objects of this invention will become apparent by reference to the drawings and to the following description thereof.

FIG. 1 is a side view showing a container hold constructed in accordance with this invention;

FIG. 2 is a sectional view taken on line 2—2 in FIG. 1;

FIG. 3 is a plan view of the supporting means in accordance with this invention;

FIG. 4 is a sectional view taken on line 4—4 in FIG. 3; and

FIG. 5 is a sectional view taken on line 5—5 in FIG. 3.

Referring to the drawing, reference numeral 10 designates container guides of angle iron, which are provided in the container hold near the four corners of containers to be stored. The container guides are separated at top of the sixth container as shown in FIG. 4. It will be seen from FIG. 1 that first to sixth containers 12 are stacked in superposed relation in the each container cell and seventh container 13 is supported by supporting means 14 in accordance with this invention.

The supporting means comprise a pair of brackets 16 and 16a which are secured to a supporting structure 15 for the container guides 10 at the position adjacent to the both corners of one side of the container as shown in FIG. 3. Shafts 17 are coupled by joints 18 for the convenience of assembling, and being rotatably supported by the brackets 16 and 16a. A pair of supports 19 and 19a are fixed to the shafts 17 at the middle of each bracket. The supports 19 and 19a are so arranged that the end portions thereof may be projected under the corners of the container. On the shaft 17 is secured an arm 20 which is connected to a piston rod 22 of a hydraulic cylinder 21 fixedly provided on the supporting structure 15. On the opposite side of the container cell, same supporting means as above-mentioned structure are provided to support other corners of the container.

Operating of the hydraulic cylinder 21 causes the shafts 17

to rotate, which in turn causes the supports 19 and 19a to rotate to the retracted position shown by broken line in FIG. 4 or to the projected position shown by solid line. Stopping member 23 are provided for holding the supports in the horizontal state and receiving the weight of the seventh container 13. Under the each support 19, guide member 25 is provided through a plate 24. The guide member is adapted to form a surface in alignment with the container guides 10 when the support is retracted, thus forming a guiding surface for loading and unloading of the containers.

From the foregoing, it will be observed that this invention provides a novel apparatus which may store more than six containers in the container cell, and which enable to build large container ship without limitation of height of the container hold.

While particular embodiment of this invention have been illustrated and described herein, it is not intended to limit the invention to such a disclosure. For example, the supports 19 and 19a may be constructed to be reciprocated and to be operated by any other driving means than the hydraulic cylinder.

I claim:

1. In a container ship having a hold with vertically disposed container guides of angle iron defining guideways for directing vertical movement of containers during loading and unloading of the hold, and supporting structure disposed alongside said guides outside of said guideways, the improvement comprising:

a retractable support finger associated with each guideway, said finger being mounted on said supporting structure and displaceable between a retracted position alongside said guideway and an extended position into said guideway for engaging the bottom of one of the containers to support the same;

means carried by said supporting structure and connected to said support finger to displace said support selectively between said retracted and extended portions; and stop means on said supporting structure engageable against each support finger to limit its travel in its extended position and to accept at least a portion of the load applied by said one container, whereby said supporting structure provides vertical support for said containers independently of said angle iron guides.

2. Apparatus according to Claim 1 including a shaft journaled on said supporting structure and mounting said support finger for pivotal movement on an axis transverse to said guideway and between said positions, said support finger in its extended position extending from its mounting means forward into the guideway and rearward away from the guideway, and said stop means being located with respect to said mounting means to engage the top of the rearward portion of said support finger when said support finger is in its extended limit position.

3. Apparatus according to Claim 2 wherein said container guides comprise vertically spaced, longitudinally aligned angle irons to form an interrupted guideway with a surface for confronting the containers, and said support finger is mounted in said interruption and has a bottom surface, said mounting means being spaced from said guideway to cause said finger-surface to register with said guideway surface when said support finger is in its retracted position to provide a substantially continuous container-confronting guide surface.

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