June 30, 1942. W. P. KELLETT 2,287,886

CONTAINER SHIP

Filed May 17, 1940 3 Sheets-Sheet 1

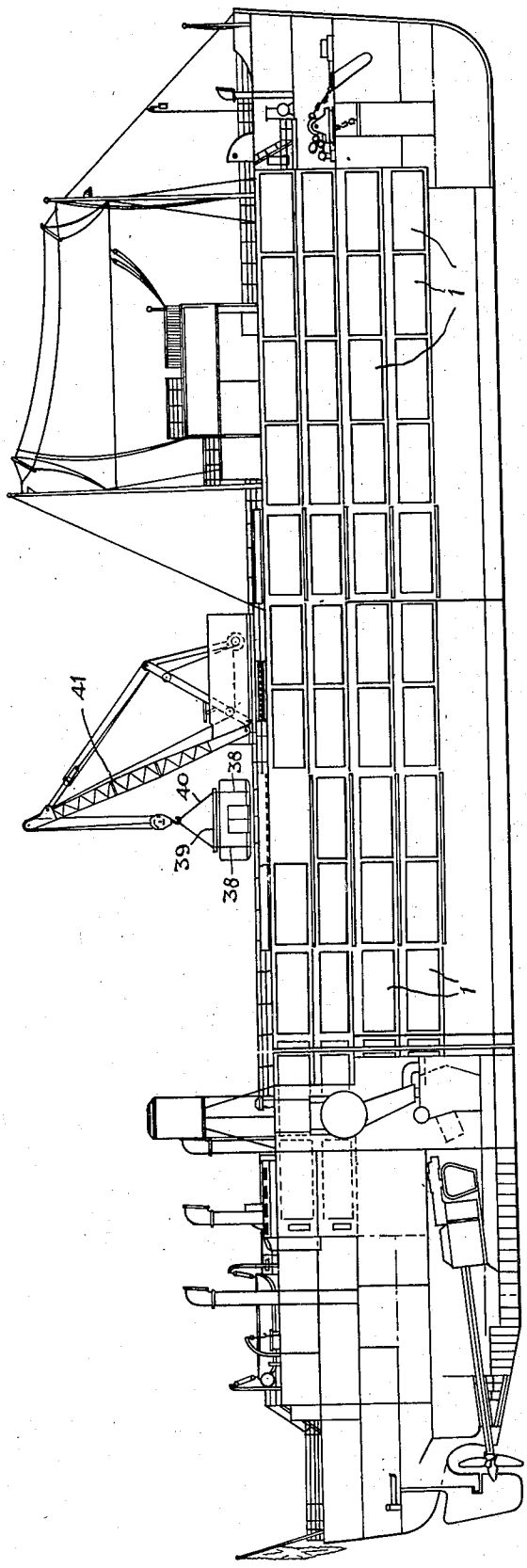


Fig. 1.

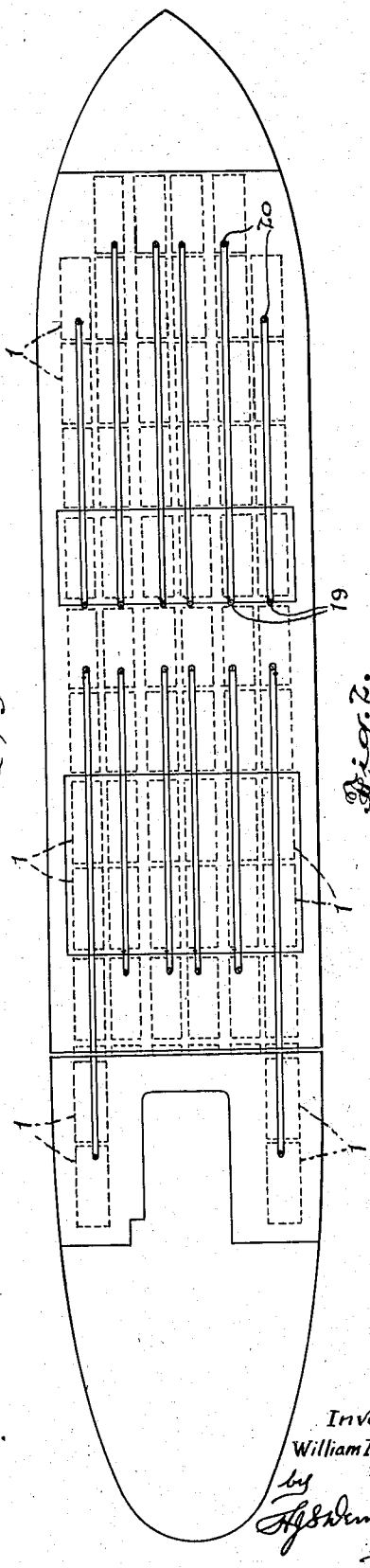


Fig. 2.

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CONTAINER SHIP

Filed May 17, 1940 3 Sheets-Sheet 2

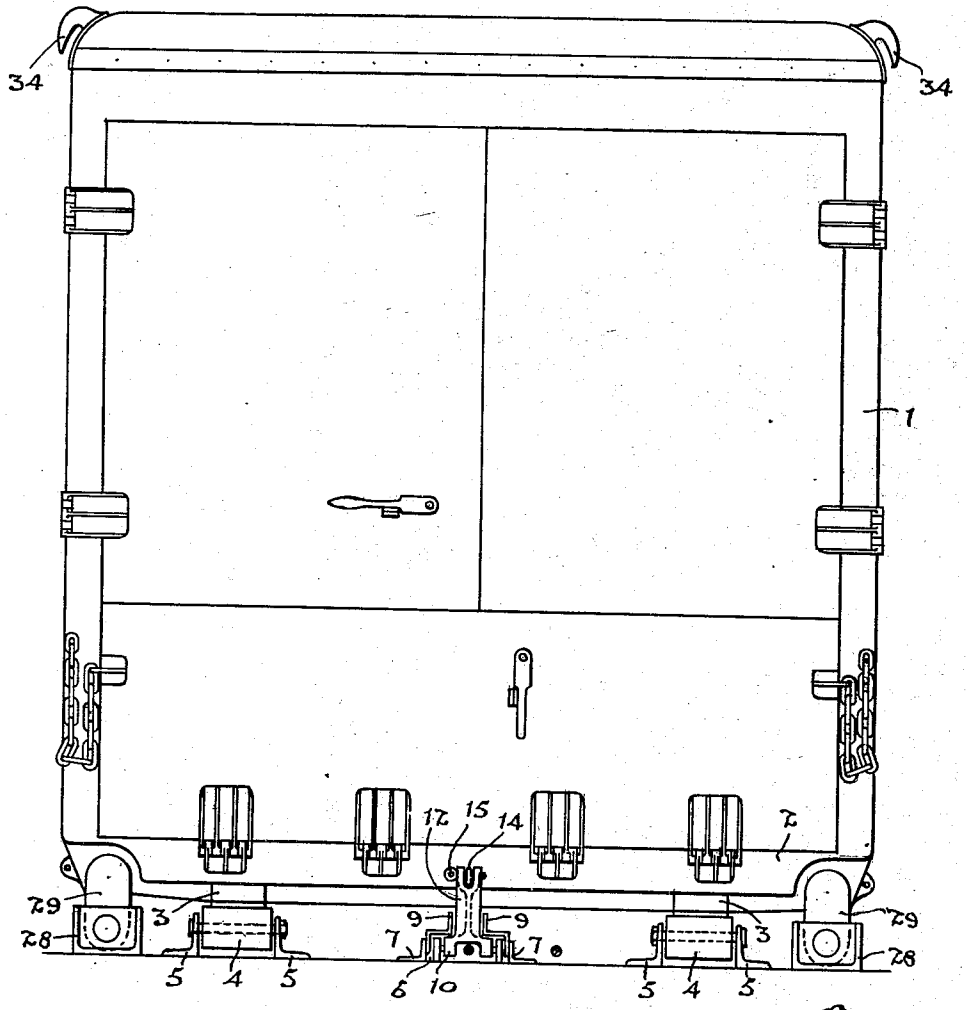


Fig. 3.

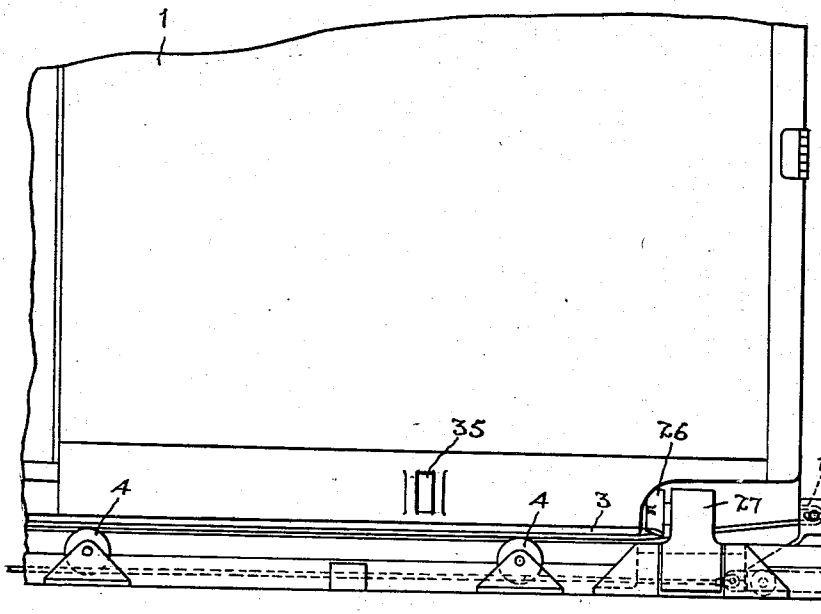


Fig. 4.

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CONTAINER SHIP

Filed May 17, 1940 3 Sheets-Sheet 3

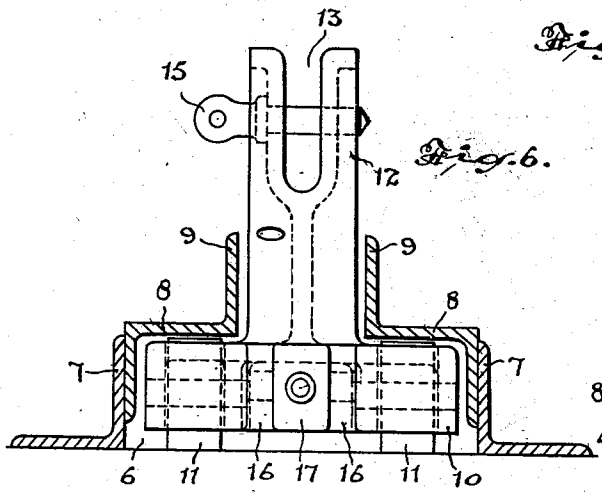


Fig. 6.

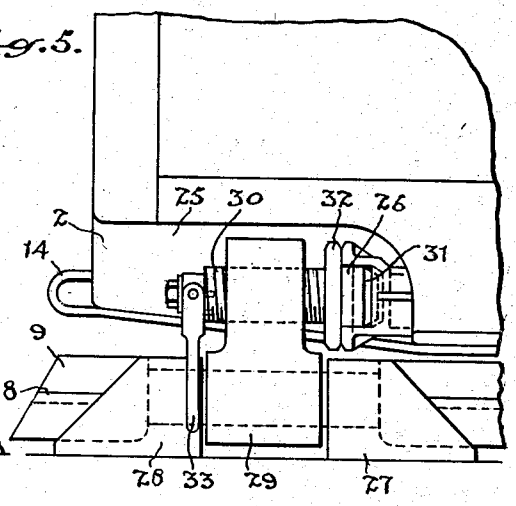


Fig. 5.

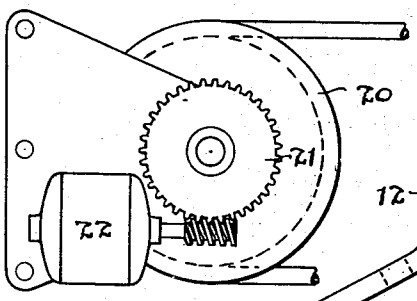


Fig. 8.

Fig. 7.

Fig. 11.

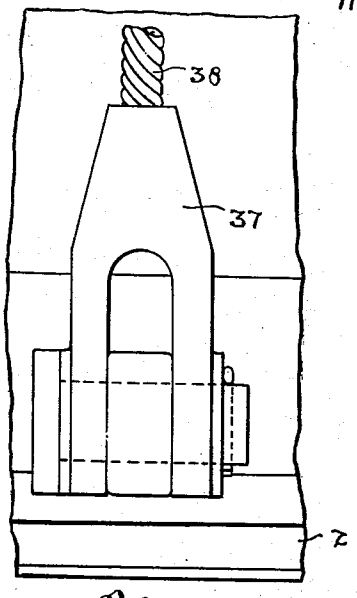


Fig. 10.

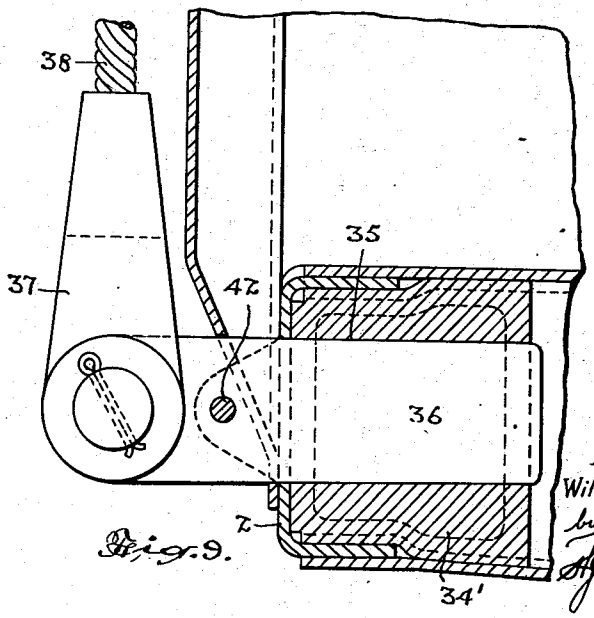


Fig. 9.

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Patented June 30, 1942

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UNITED STATES PATENT OFFICE

2,287,886

CONTAINER SHIP

William P. Kellett, New York, N. Y.

Application May 17, 1940, Serial No. 335,697

9 Claims. (Cl. 214—15)

The principal objects of this invention are to greatly facilitate the transport of freight where water-borne carriers may be utilized and to provide an equipment which will permit of the maximum amount of goods storage capacity while enabling the handling of the goods containers with the minimum of cost.

A further and extremely important object of this invention is to provide water-borne freight transfer equipment with the minimum of dead load or excess weight, thereby effecting material economy in operating cost.

A still further object is to obviate the losses due to unnecessary demurrage and loss of operation of rolling stock.

The principal features of the invention consist in the novel construction of a ship to accommodate the compact storage of wheeless goods containers wherein the decks are provided with rows of roller supports upon which the wheeless goods containers may be operated and the arrangement of guideways and trolleys to engage therewith and to be connected to the containers, such trolleys being operated by power-driven cables connected to said trolleys.

Further important features in the construction of the ship comprise the arrangement of locking jacks permanently mounted on the ship decks and adapted to interlock with the individual containers to secure them against longitudinal lateral or tilting movement.

A still further feature of importance consists in the novel construction of the containers and the means for lifting and lowering same whereby very rapid, accurate and dependable connections may be made with the hoisting apparatus to bodily lift the containers to and from the hold of the ship.

In the accompanying drawings Figure 1 is a longitudinal sectional elevational view of a ship constructed in accordance with this invention and showing the arrangement of containers housed therein and a container being loaded into the ship's hold.

Figure 2 is a plan of one of the decks illustrating the means for placing the containers in position.

Figure 3 is an enlarged end elevational view of a container arranged in position upon the deck of the container ship and illustrating the lower supporting means for shifting the container, the locking means for holding it in position and the guided power-operated means for moving the container over the deck.

Figure 4 is an enlarged side elevational view of the lower corner portion of a container as illustrated in Figure 3 showing the supporting rollers, the locking jack and the hauling trolley for moving the container over the deck.

Figure 5 is an enlarged side elevational view of the corner structure of the container and the pivotal locking jacks for rigidly holding the container in position.

Figure 6 is an enlarged end elevational view of the container-moving trolley showing the trolley guideway in section.

Figure 7 is an enlarged side elevational detail of the container-shifting trolley.

Figure 8 is an enlarged diagrammatic plan view of the individual driving means for operating the cables for placing the containers in position on the decks.

Figure 9 is a sectional elevational detail illustrating the preferred form of means for lifting the containers, the socket portion of the container being shown in section.

Figure 10 is a side elevational view of the device shown in Figure 9.

Figure 11 is a diagrammatic plan of a driven sheave for operating the means for placing the containers on the decks of the ship.

In the transportation of freight over long distances it has for many years been found desirable to utilize the great bulk capacity of ship transport where such may be used as against overland transport, and enormous costs are involved in transferring goods from rail to ship and ship to rail, and it has been found desirable in certain places to actually trans-ship loaded trains by boat in order to effect material saving in rail haulage.

Where such practices have been effected it will be readily understood that very considerable waste has occurred in carrying railway rolling stock by ship transport.

The present invention has been devised for the purpose of accommodating the maximum quantity of goods from rail transport without breaking bulk or, in other words, removing the goods from the cars, and without the cost and other losses due to shipping the entire rolling stock by boat.

In carrying this invention into effect the railway rolling stock is provided with detachable goods containers which can be removed from the car structures. These containers are preferably of half or quarter carload size and are illustrated particularly in Figures 3 and 4 of the drawings herein, Figure 3 being an end view and Figure 4 being a partial side view.

The container 1 is of a suitable box-like form having a rigid base structure 2 which is provided with longitudinal skids or runners 3 arranged adjacent to either side which are adapted to engage and rest upon rollers 4 which are arranged in longitudinal rows on the several decks of the ship which is illustrated in Figures 1 and 2, the rollers being supported between suitable brackets, here shown in the form of angle iron supports 5.

Midway between each pair of longitudinal rows of the rollers 4 are arranged longitudinal guideways 6 which are preferably fabricated by spaced-apart angle irons 7 and Z bars 8. These structures are particularly illustrated in Figures 3 and 6.

The upright inner legs 9 of the Z-bars 8 are spaced apart and form an open channel. Within each of the guideways 6 is arranged a trolley 10 which is provided with paired rollers 11 arranged at either side of the guideway to roll between the deck surface and the horizontal portion of the Z-bars. The central portion 12 of the trolley extends upwardly through the channel between the spaced-apart upright flanges of the Z-bars and this extension 12 is provided with an open vertical slot 13 adapted to receive a looped draw bar 14 which is mounted at each end of the containers 1. A link pin 15 extends through a suitable transverse hole in the slotted upper end of the trolley to engage the looped drawbar and lock it to the trolley, so that the container may be pushed to the required location on the ship's deck or pulled to the hatchway in the loading or unloading operations.

Each end of the trolley is provided with a pair of lugs 16 between which a cable end 17 is adapted to be inserted and to be fastened by a suitable coupling pin 18.

The cables for operating the trolleys 10 extend longitudinally of the guideways formed by the angles 7 and Z-bars 8, the ends being connected to the opposite ends of the trolleys and the looped extremities of the lengths of cable extend around sheaves 19 and 20. The sheaves 20 are preferably mounted in brackets on the deck and these are preferably individually operated by electrically driven worm drive gears 21 operated by motors 22, though of course it will be understood that other means of driving these cables may be arranged.

It will be understood of course that several hatchways will be provided in the decks of a ship for the loading and unloading of cargo and at each deck there will be provided suitable covers to close the hatchway and the looped cables for manipulating the goods containers will extend across the hatchway covers and the sheaves 19 will be detachably secured so that when a hatchway cover is to be removed the sheave 19 may be detached or uncoupled from its mooring to the deck and the looped cable may be drawn back clear of the cover to allow the cover to be removed, or it may be desired to have the sheaves arranged in fixed positions and when it is desired to clear the cable from the hatch cover it will be merely necessary to withdraw one of the anchor pins 18 connecting the trolley to the cable end, and the loose end of the cable may then be drawn through the sheaves and pulled clear of the hatch cover.

It will be readily appreciated that when loading and a container has been placed upon the hatch cover of the deck in proper alignment with the cable guideway the trolley may be coupled to the draft coupling 14 in the manner described and, by the operation of the motor drive of the sheave 20 at the far end, the trolley will be drawn along in its guideway so as to push the container in a direct line to the position it is to occupy when the ship is loaded. The skids 3 on the underside of the container will be retained in alignment with the rows of rollers 4 and the container will move smoothly to its required position.

Each of the containers is preferably provided with a recessed corner structure 25 at each corner of its under or base structure and within such recesses are arranged the locking sockets 26 which are of substantially bell shape construction and open at one side.

Mounted on the deck in a position to register with the socketed ends of the containers with the various containers arranged in closely assembled relation are the locking jacks 27. These are formed of rigid end brackets 28 rigidly secured to the deck between which is pivotally mounted the swinging arm 29 which is adapted to swing up into the recessed portion 25 of the containers. This swinging arm carries a threaded jack screw 30 which has a bevelled end 31 backed by a flange 32, the bevelled end being adapted to be seated in the socket member 26 by the turning of the jack screw which is provided with a turning handle 33.

When the containers are in position these jack screws are swung upwardly and then operated to lock securely in the socket member 26 so that the containers are locked securely in position against longitudinal, lateral or tipping movement. These are arranged on the decks in such a manner as to enable the containers being housed in close associated relation as diagrammatically illustrated in Figures 1 and 2, and it will be readily appreciated that with such an arrangement of container structure and deck equipment for handling and locking the containers in position the maximum amount of transportable goods may be housed in a very safe and effective manner.

It is preferable to provide specific means for the raising and lowering of the containers and, as illustrated in Figure 3, the containers are provided with hook structures 34 at the top side which may receive slings, but the preferred construction for raising and lowering is illustrated particularly in Figures 9 and 10, and the base structure is here formed with blocks 34' having horizontal recesses 35 therein which may be of rectangular form or otherwise.

The recesses 35 are adapted to receive pins 36 which are hingedly mounted in the clevis members 37 secured to short cable lengths 38 suspended from a spreader member 39 forming part of the slings 40, as illustrated particularly in Figure 1, where a container is shown suspended in a sling from the hoisting device 41.

By means of this device the spreader carried in the sling is swung over the container to be lifted and the pins 36 are simply inserted into the recesses 35 in the containers and a lock pin 42 is placed in position extending through a pair of lugs arranged one at each side of the recess 35, passing through a hole in the pin. This lock pin merely prevents the carrying pin from being accidentally withdrawn. The carrying pins are directly suspended from the sling spreader and carry the containers to the desired position, then by merely drawing the lock pins and pull-

ing the lifting pins 36 out the container is free.

It will be understood that the container can be lifted from the docks or from trains arranged alongside the ship, or they can be taken from the ship and loaded directly on the trains so that the least possible effort is required and the least amount of time will be expended in trans-shipping the containers, which of course are loaded with the goods to be transported at their point of origin.

The container method of transport is extremely mobile. Goods may be packed directly in a warehouse. The container may be rolled or skidded either directly on to a railway car or on to a truck and delivered to a railway car, being locked thereon by means similar to the jacks herein described and transported to the point of contact with a water borne carrier. The containers are merely unlocked from decks of the cars or trucks, lifted on to the ship and deposited by means of the hoisting equipment in whatever position they are required to be stored. They are drawn by means of the mobile cable equipment described over the rollers mounted on the decks and guided by means of the slotted guide member and then securely locked in position where they are held from movement throughout the voyage, and on arrival at the port of destination the containers are then moved to the hatches by the moving cable equipment and again lifted and placed upon wheel transports for movement to their final destination.

The equipment described is extremely simple and is of such a rugged nature as to withstand considerable abuse. There will undoubtedly be a great saving in labour in the handling of these containers as against the handling of railway cars. There will be an enormous saving in transport costs of dead loads, and an enormous increase of the pay load of the ships will be effected.

What I claim as my invention is:

1. A container ship having a plurality of decks each provided with parallelly arranged longitudinal guide channels on the upper surface, guide means operating in said guide channels, rows of rollers arranged on said decks either side of said channels, cables arranged in said channels and operatively connected to said guide means therein, containers arranged to be moved over the rollers installed on said decks, and means forming a detachable push-pull connection selectively between either end of the container and said guide means.

2. A container ship having arranged on each of its decks a plurality of parallelly spaced longitudinally slotted guides, wheeled trolleys movable within said guides each having a rigid upward extension, cables for moving within said guides and operatively connected to said trolleys, means for operating said cables, containers having draft couplings at opposite ends, and means for selectively interlocking the upwardly projecting portion of each of said trolleys with the draft coupling at either end of the container in a push-pull connection.

3. A container ship of the type adapted for the accommodation of goods containers on the decks, guide means being arranged to direct the containers into position on the various decks together with actuating means for moving the containers along the guide means, characterized in that said guide means comprises a plurality of parallelly spaced guides mounted directly on the decks each formed with inwardly turned and upwardly extending flanges spaced above the deck surface and presenting therebetween a central longitudinal slot, said actuating means comprising trolleys supported on deck-engaging wheels at either side of the central slot within said guides and having extensions projecting upwardly through said slots, cables slidably arranged in said guides and having the ends thereof connected to said trolleys, means arranged at the ends of said guides for guiding said cables, containers having draft connections at the ends adapted to engage the upstanding members of said trolleys to be propelled thereby, means forming rolling supports for said containers, and means for locking said containers in fixed positions in relation to the decks.

4. A container ship of the type adapted for the accommodation of goods containers on the decks, guide means being arranged to direct the containers into position on the various decks together with actuating means for moving the containers along the guide means, characterized in that said guide means comprises a plurality of slotted parallel guides arranged longitudinally of the decks thereof, rows of transversely journalled rollers arranged either side of said guides to form rolling supports for containers, trolleys operating on the deck surface within said guides for moving the containers over said rollers, and locking jacks fixedly mounted on said decks at spaced intervals and adapted to engage and hold said containers.

5. A container ship of the type adapted for the accommodation of goods containers on the decks, guide means being arranged to direct the containers into position on the various decks together with actuating means for moving the containers along the guide means, characterized in that said guide means comprises a plurality of parallelly arranged longitudinal guideways on the decks, rows of roller supports arranged on said decks either side of said guideways, jack members pivotally mounted on the decks arranged in groups of four adapted to engage the four corners of the containers and to be interlocked therewith, and means operating in said guideways for moving the containers along the guideways in either direction longitudinally of the ship.

6. A container ship having a plurality of parallelly arranged longitudinally slotted guideways mounted directly on the upper surface of the decks, sheaves mounted on vertical axes arranged at either end of said guideways, cables extending around said sheaves and resting on the floor surface of the decks and having a portion thereof enclosed within said guideways, roller trolleys mounted within said guideways for rolling contact with the deck surface, and containers having draft connections at either end adapted to engage said trolleys which are moved thereby longitudinally of the ship.

7. A container ship having hatchways leading to the several decks, slotted guideways extending from said hatchways longitudinally of the decks, driving cables arranged within said guideways and extending across the hatch opening, sheaves arranged at the far side of said hatchways to guide said cables, sheaves arranged at the opposite ends of said guideways and power-driven to operate said cables, trolleys slidably mounted in said guideways, and containers having a centrally arranged draft rigging at each end to engage said trolleys.

8. In a container ship of the container-carrying type having guideways, characterized in that said guideways comprise spaced-apart angle irons secured directly to the upper surface of the decks, and Z-bars secured to said angle irons having their inner flanges spaced apart forming a longitudinal slot, trolleys arranged to travel in said guideways having rollers riding directly on the deck surface and having a central portion extending upwardly through the slot space between the Z-bars, and containers having a draft rigging extending from each end adapted to engage the upstanding portion of said trolleys.

9. A container ship having in combination, a hatchway extending from side-to-side and communicating with the various deck levels, means on the upper side of each deck extending both fore and aft directly from the hatchway for guiding a plurality of transversely spaced rows of containers longitudinally over the deck surface, and means for pushing and pulling containers from any point intermediate of the width of the ship in a longitudinal direction directly to or from said hatchway, whereby transverse shifting of the containers within the ship interior is obviated, said means for pushing and pulling said containers to and from said hatchway including cables extending across said hatchway and detachably engageable with containers forwardly and rearwardly of the hatchway selectively for both push-pull operation of the container and being retractible to clear the hatchway, and cable-operating means on each deck arranged at one side of said hatchway.

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