April 27, 1948. L. D. SMITH 2,440,307

SHIP HOLD.

Filed April 4, 1945 5 Sheets-Sheet 1

Fig. 1.

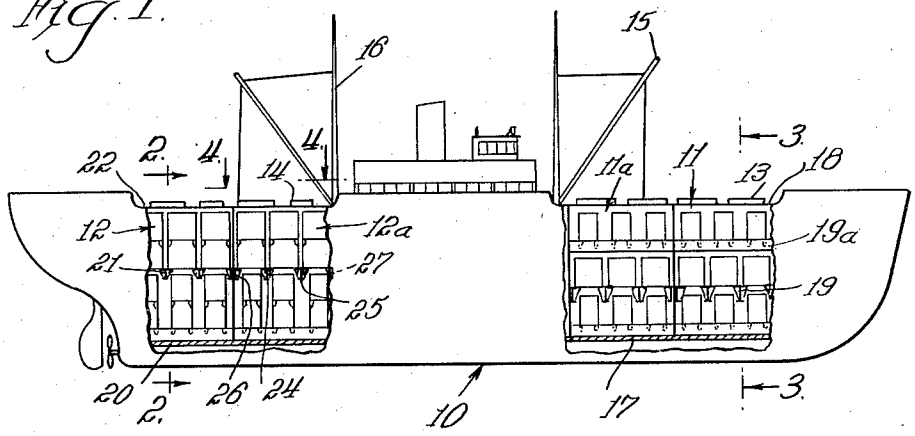


Fig. 2.

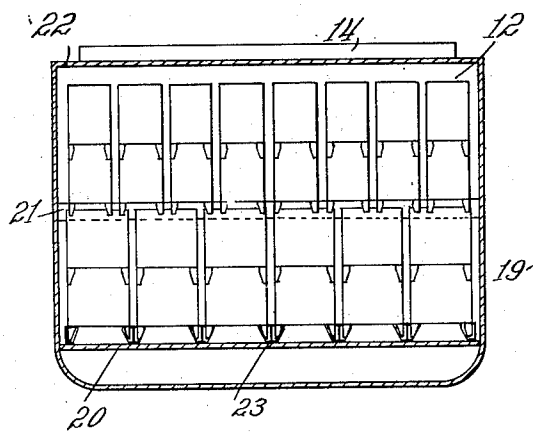
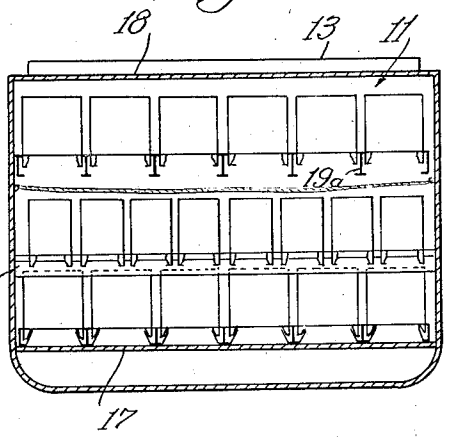


Fig. 3.



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SHIP HOLD

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Fig. 4.

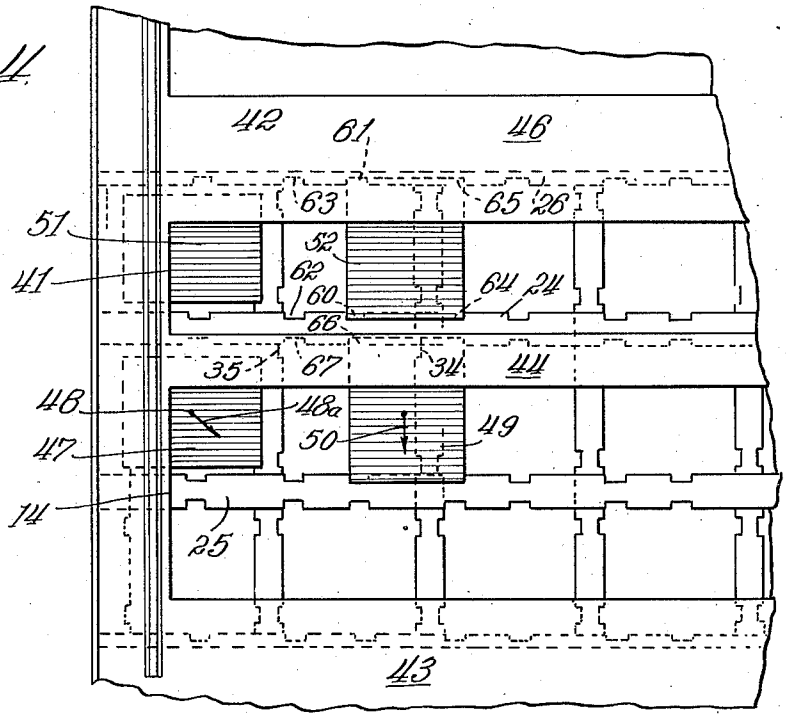
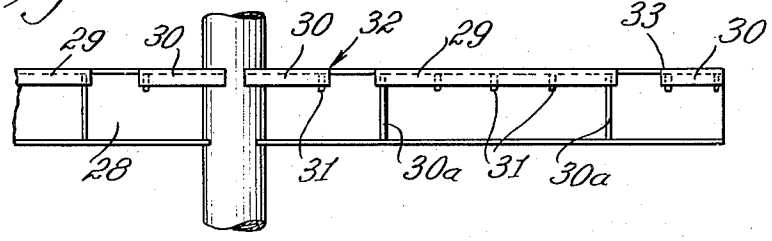


Fig. 6.



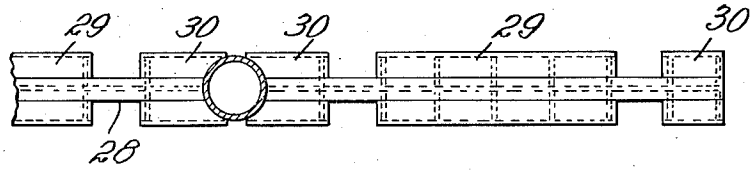


Fig. 7.

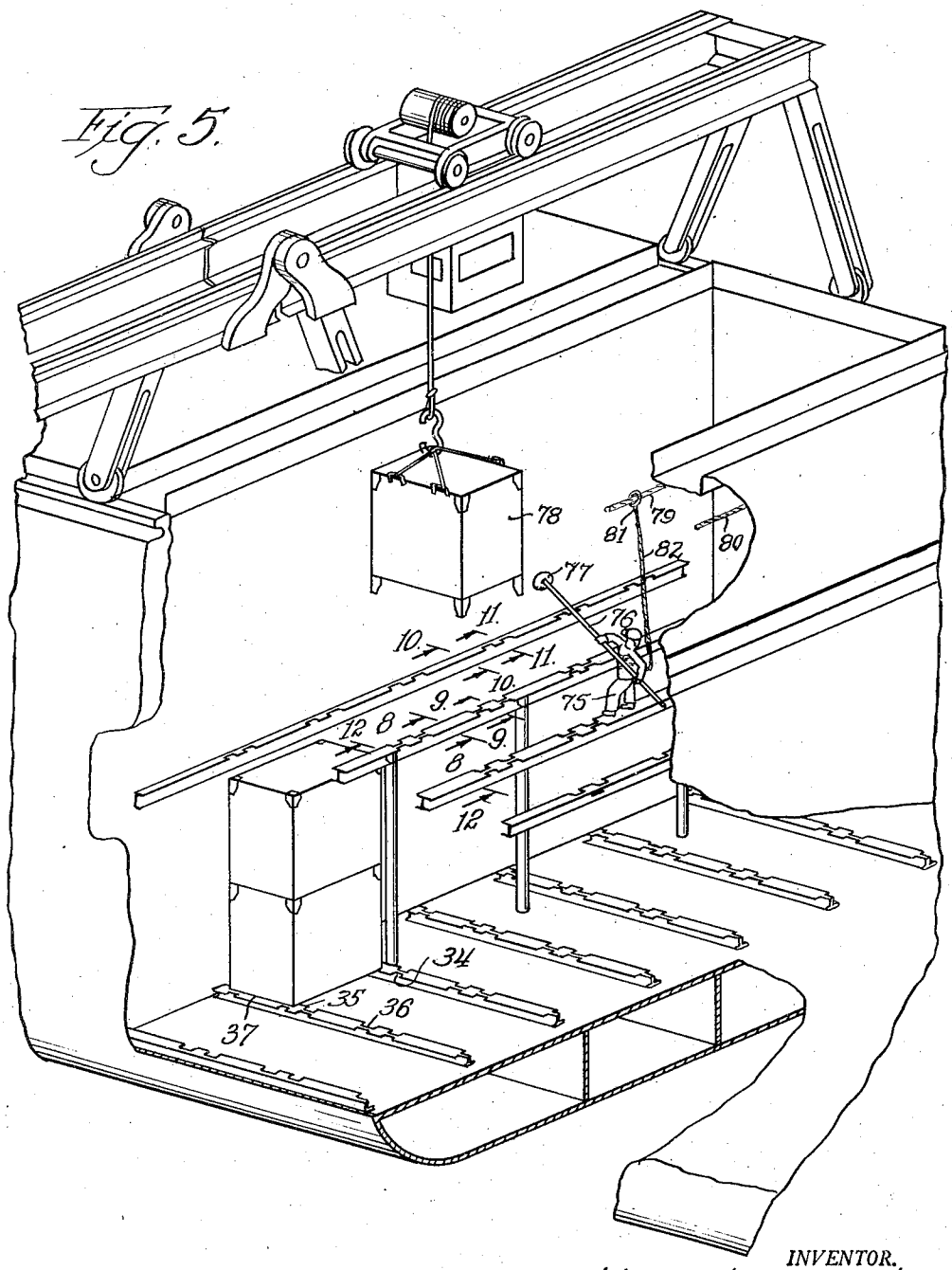
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Fig. 5.



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Fig. 8.

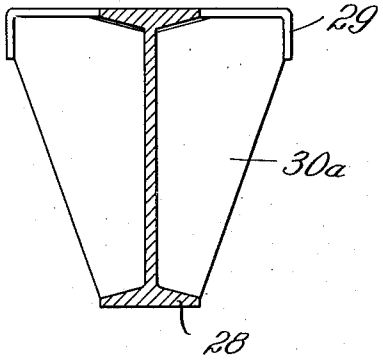


Fig. 9.

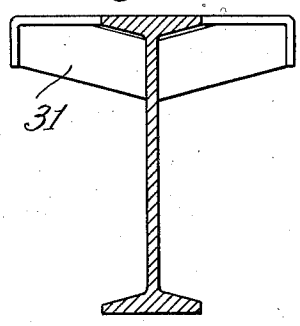


Fig. 10.

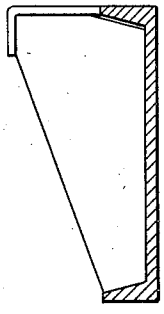
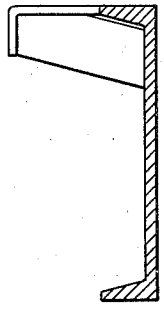


Fig. 11.



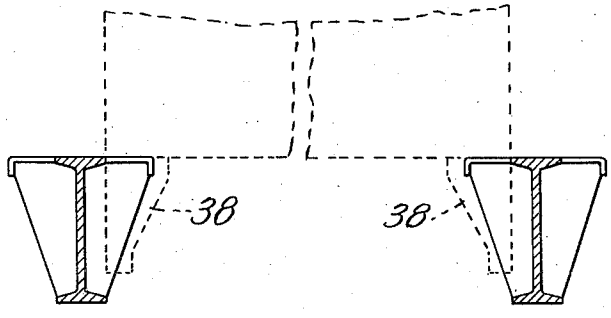


Fig. 12.

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SHIP HOLD

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Fig. 13.

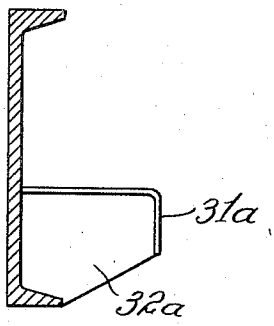


Fig. 14.

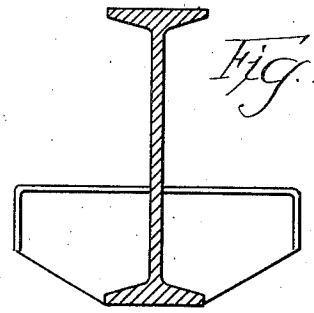


Fig. 15.

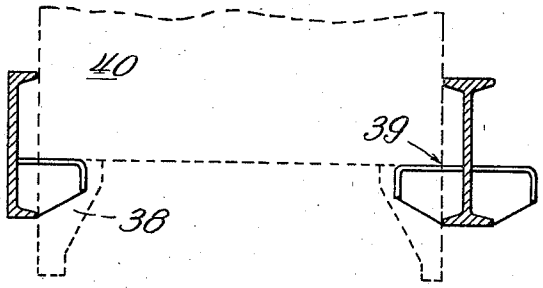


Fig. 17.

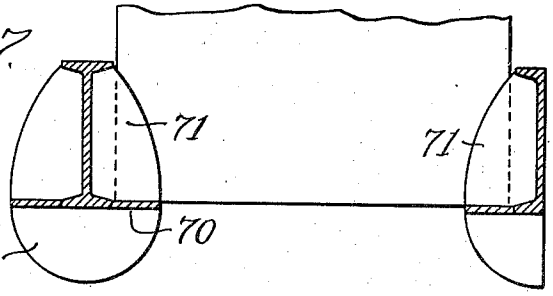


Fig. 18.

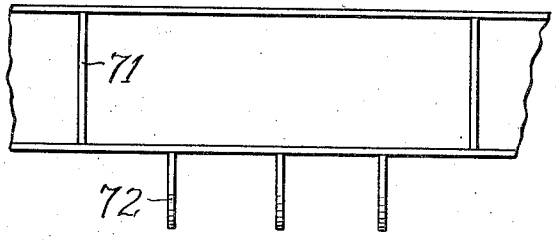
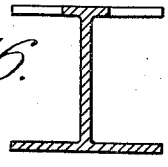


Fig. 16.



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Patented Apr. 27, 1948

2,440,307

UNITED STATES PATENT OFFICE

2,440,307

SHIP HOLD

Leathem D. Smith, Sturgeon Bay, Wis.; Alva Smith administratrix of said Leathem D. Smith, deceased

Application April 4, 1945, Serial No. 586,521

14 Claims. (Cl. 114—72)

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The invention described in this application relates to a ship hold construction for stowing containers of uniform size and shape and to a ship having such a hold. The principal feature of the invention resides in a deck of beams uniformly spaced from one another, each beam having uniformly spaced holding means for supporting one side of a uniformly sized container. This application is a continuation in part of applicant's copending application Serial No. 532,240, filed April 22, 1944.

However, this invention is one of several inventions relating to a development for rendering practical a container ship, and while these inventions are patentably distinct and are embodied in separate patent applications, they nevertheless are sufficiently related to warrant a description of the entire development appearing in a single application. This will be done here.

The applicant was requested by the president of a company operating ships on the Great Lakes to propose a solution of the package freight handling problem which was steadily becoming more acute on the ships operated by this company. The cost of freight handling in and out of the ships had risen from 36 per cent to 66 per cent of the gross revenue of the steamship company and, in addition, damage and pilferage claims on freight was amounting to nine per cent of the gross revenue.

The old method of handling freight on a between decks ship on the Great Lakes was through side ports by hand trucks, a force of about 300 men being required for the special operation of loading and discharging of each vessel. A between decks ship is one in which a cargo hold is covered by a weather deck of substantial area. A hatch is centrally positioned in this weather deck and between the weather deck and the bottom of the hold, which is sometimes called the tank top of a double bottom vessel, there are one or more between decks having equally large or smaller hatches cut therethrough. These between decks and the weather deck assist in providing requisite strength to the hull. Various methods were tried to improve on this basic operation of these same ships. The utilization of belt conveyors and elevators to convey the freight to the various holds was generally in force, but because of increasing labor rates of pay, overtime, and some loss of efficiency, the percentage of their revenues for freight handling was as stated above. It was apparent that ship operators had gone as far as was practically possible toward improving the basic method of freight

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handling in this type of ship. Moreover, the method of handling freight in coastal vessels by means of booms and slings did not reduce the amount of manual labor required in loading an equivalent amount of merchandise.

More specifically, labor consumption results from the following operations. A crew of men is required in the hold of the ship during either loading or unloading operations. If the loading is taking place through a hatch, a crane is used to lift the merchandise from the wharf over the side of the vessel and down through the hatch to the deck level at which the merchandise is to be stowed. At that level, the merchandise must be moved by hand to some position on the deck, and the only mechanical aids are hand or power driven trucks. If the freight is being loaded through a side port, each freight truck must have one operator and wherever the operator sets the merchandise, other men must stow it tightly in the hold so that it will not shift during rolling at seat. Frequently the packages must be stacked and in many instances, they must be lashed to either bulkhead, deck or stanchion.

Secondly, cargo handling on the wharf requires the services of a large crew of men. If the cargo is moving by truck through side ports in the ship, the trucks must be loaded, and if the ship is being loaded through hatches, the packages must be relayed to a point at the side of the ship where the ship boom hook can get over the package.

Finally, many transit companies use a large crew of men to sort package merchandise so that the packages can be loaded in the ship holds in accordance with the particular destination of each.

In addition to labor costs and losses arising from pilferage and damage in handling, transit companies incur considerable expense in rearranging cargo in ship holds. In seaworthy vessels, the holds are deep and it is not feasible at sea to rearrange cargo as between holds or even within a hold. Such rearrangement is frequently necessary for freighters engaged primarily in cargo movements because they cannot foresee at the time of stowing one cargo what shipments they may pick up at the next port of call. Thus, a ship out of New York for Bombay may have half a hold destined for Alexandria and half a hold destined for Lisbon. If both shipments are to be placed in the same hold, the Alexandria shipment will be placed at the bottom of the hold and the Lisbon shipment in the upper part. On arrival at Lisbon, the ship owners

may direct the captain to take on a half a hold of merchandise destined for Port Said. If this shipment must be placed in the same hold, the captain must make an election. Either he must take the Alexandria cargo out of the hold at Lisbon, then load the Port Said cargo at the bottom of the hold and reload the Alexandria cargo, or he may load the Port Said cargo on top of the Alexandria cargo and at Alexandria unload and reload the Port Said cargo. If this rearrangement of cargo could take place at sea, the time spent in port would be reduced and such time saved is money earned because a vessel earns money only at sea.

The foregoing considerations indicated that an entirely new method of small cargo handling was required, but any radical departure from standard practices would only block the entire development unless the new method could be somewhat oriented with present practices so that the transition could be gradually effected over a period of many years.

Another factor of controlling importance that influenced the selection of a method of handling cargo movements involving a ship movement was the nature of cargo movements. Generally speaking, it is less costly to move freight by water than by rail. However, only a few shipments from a point of origin, such as a factory, can move to a destination solely by water. The vast majority of shipments must move to a wharf by some other form of conveyance such as a railroad or a truck. Transfer to a ship necessitates labor handling at the wharf and the cost of this handling may offset whatever saving may be obtained by a water voyage. It is this handling that has become so costly that shippers loading merchandise either on a railroad car or a truck frequently find it less expensive to route the shipment directly to its destination by rail or truck even though an intermediate water haul is available. By reducing wharf-warehouse sorting costs and wharf loading costs, the formerly existing advantage of water carriers in cheaply hauling merchandise may be restored.

Uniformly sized containers having a strength sufficient to defeat all ordinary pilfering and to protect merchandise from all ordinary damage due to buffeting and handling suggested themselves. Such containers have been used by certain United States railroads for shipments from the consignor's shipping platform directly to the consignee's platform. Such containers for consignor-consignee shipments by water will completely eliminate sorting problems at the wharf and by equipment described in other patent applications, may be handled very rapidly at a wharf with little manual labor. Moreover, such containers may advantageously be used by ship transit companies in movements between their own warehouses at various ports of call because while the sorting problem remains, it may be isolated in a restricted, guarded space in the warehouse, and once a container is loaded, it may be moved onto a ship very rapidly, and the contents will be protected from theft and from damage due to mishandling.

Starting therefore with a container having a size and shape comparable to the steel shipping containers at present used by railroads, namely, eight to nine feet long by six to seven feet wide by six feet high, applicant has designed a cargo hold for a ship which is particularly adapted to stow such containers and has provided the container with certain features which cooperate with holding means in such a hold. Additionally, applicant has designed a ship particularly adapted to utilize a plurality of such holds, together with a ship crane which will handle the containers without assistance from manual labor both in port and at sea.

Identifying the objectives of this development in relationship with four concurrently filed patent applications, the first objective is to provide a ship hold of an open type construction, any part of which may be reached by the hook of a crane so that all lateral movement of cargo in a ship hold may be performed by the crane without the assistance of manual labor. This general objective is obtained in the present application. The features that attain this objective are comparatively large hatches in the weather deck of a ship hold which are so related to the dimensions of the uniformly sized container and to the distance between the side walls and bulkheads of the hold to the edge of the hatch coamings that a cable holding a container centrally of its top may drop the container through the hatch and then move it horizontally in the hold until the cable is close to the hatch coaming, at which point one side of the container will be quite close to either the bulkhead or the side wall of the hold. Positioning the containers close to bulkheads or side walls conserves hold cubic. A second feature is the provision of fixed position beams which are positioned in one or more planes in a hold to form beam decks. These beams are spaced from each other by a distance greater than the narrow dimension of the container so that the container may be passed downwardly between them to the bottom of the hold or to a lower deck of beams, and these beams are further spaced from each other by a distance slightly less than the long dimension of the container or else have projecting from themselves, holding means which will support the lower, short edges of the containers when they are positioned so that their long dimension spans two adjacent beams. Thus, the beams are regularly spaced either by permanent mounting in the hold or by being mounted in regularly spaced holding means. In the latter case, the beams may be removed so that the hold may be used to accommodate bulk merchandise or cargo having a size so great that containers may not be used. Other features include the exact form of the holding means for the containers which are mounted on the beams and the arrangement of ship holds to one another. Beams have been used on ships to support merchandise in the past, but equally spaced beams in fixed position or removably placed in equally spaced beam holders in fixed position, having groups of container holding means, are features of this development.

The advantages derived from this hold construction in conjunction with the uniformly sized containers are: (1) lashing of containers in position is unnecessary; (2) all movements of the containers may be performed by the ship crane; (3) the fixed horizontal position of each group of container holding means enables a crane operator to develop great skill in quickly dropping containers into position or picking them up. Other advantages are mentioned in the description.

The second application entitled "Shipping container," Serial No. 592,376, discloses a container that may be knocked down and that may be stacked on a like container whether open or knocked down. These containers have legs so that they can be supported above a floor whereby

a truck may be placed beneath them for moving them, and the legs are designed to center the container with respect to a container upon which it is being rested or with respect to holding means on beams in one of applicant's ship holds. The container has large lifting eyelets or rings rigidly fixed in upright position in the leg recesses and they are adapted to receive power controlled gripping fingers mounted on a crane.

The third general object of this development is to provide a ship having sufficient strength to be seaworthy and yet have a large number of these large open holds which are not strengthened by between decks or a large weather deck. Applicant, in association with another, has designed a ship having cabins forward and aft with cargo space centrally of the hull. To compensate for the loss of hull strength due to the absence of between decks and a large weather deck, a rectangular beam running lengthwise of the ship is positioned at each "ship sheer," a term used in this application to identify the area of the ship where the sheer strake intercepts the weather deck. These beams are reinforced by vertical webs extending down to the hold bottom, which webs are spaced so as to receive between them the short dimension of containers. See application, Serial No. 586,522.

The fourth general object of this development is to provide a ship crane that can unload a vessel with minimum assistance from labor and from equipment positioned on a wharf. The fourth application, Serial No. 596,124, discloses a bridge mounted travel crane mounted on the ship sheers and having a vertically movable boom which will hold a container in fixed relationship laterally to the ship hold so that containers may be moved at sea when there is a slight roll on the vessel without damaging the containers or the ship. The bridge mounted travel crane has a lateral extension which enables the crane to get above a wharf or above a barge. This extension is not fixed but movable.

The drawings in the present application comprise five sheets and include the following figures:

Figure 1 is a schematic view of a conventional sea-going ship in longitudinal cross section and illustrates forward and rear holds constructed according to applicant's invention;

Figure 2 is a view taken on the line 2—2 of Figure 1 and illustrates a hold having one intermediate deck of applicant's beam construction;

Figure 3 is a view taken on the line 3—3 of Figure 1 and illustrates a hold having two decks of applicant's beam deck construction;

Figure 4 is a view taken on the line 4—4 of Figure 1 and illustrates the relationship of the holding means on the beams to the hatch coaming;

Figure 5 is a perspective view of the hold illustrated in Figure 2 and illustrates the advantages of loading and unloading uniformly sized containers from applicant's deck beam construction;

Figure 6 is a side elevation of a portion of applicant's beam;

Figure 7 is a plan view of a portion of applicant's beam;

Figure 8 is a sectional view of applicant's I or double-sided beam taken on the line 8—8 of Figure 5 (although the beams actually shown in Figure 5 are for drafting reasons of the type illustrated in Figure 16);

Figure 9 is a sectional view of applicant's I beam taken on the line 9—9 of Figure 5;

Figure 10 is a sectional view of applicant's C beam for use adjacent a bulkhead taken on the line 10—10 of Figure 5;

Figure 11 is a sectional view of applicant's C beam taken on the line 11—11 of Figure 5; and

Figure 12 is a sectional view taken on the line 12—12 of Figure 5;

Figures 13, 14 and 15 are sectional views of an alternative construction of applicant's I and C beams wherein the container supporting means are depressed, thereby permitting the upper arms of the beams to provide lateral support for the containers;

Figure 16 is a sectional view of a wide flanged I beam having cut-out portions to receive the legs of the containers; and

Figures 17 and 18 are respectively, sectional and side views of a third type of beam.

Continuing to refer to the drawings, in Figure 1, the numeral 10 identifies an oceangoing vessel of the present day conventional type having forward holds 11 and 11*a* and after holds 12 and 12*a* with a plurality of hatches 13 and 14 and loading cranes 15 and 16. The forward hold 11 has a bottom deck 17, hatch deck 18, deck of I cross beams 19 and deck of longitudinal beams 19*a*, while the stern hold 12 has a bottom deck 20, a single deck of I cross beams 21, and a hatch deck 22.

Figure 2 schematically shows a sectional view of the after hold 12 which is partly loaded with equally sized containers having one dimension, the length, greater than the other horizontal dimension, the width. A perspective view of the containers is shown in Figure 5. The bottom deck 20 supports seven equally spaced parallel I (including two C) beams 23 running lengthwise of the vessel. Intermediate the bottom deck 20 and the hatch deck 22 is the deck 21 composed of two I beams, 24 and 25, and two C beams, 26 and 27, all mounted transversely of the vessel—see Figure 1.

Generally speaking, the I beams are used to bridge open space in a hold while the C beams are used to abut against bulkheads. The two uses for the two types of beams are illustrated in Figure 5. For the actual construction of these beams see Figures 6 through 18 wherein four embodiments of the beams are illustrated.

In Figures 6 and 7, 28 identifies the standard I beam. Along the outer edges of the upper cross member of the I beam 28, are buttwelded supporting flange plates 29 and spacer flange plates 30. The ends of the supporting flange plates are supported by a plurality of webs 30*a* extending down to the lower cross arm of the I beams (see also Figure 8), while the spacer flange plates 30, upon which no great weight is intended to rest, and intermediate portions of the supporting flange plates 29, are supported by smaller web members 31. The containers have legs at their outer corners and it is intended that the distance between the points 32 and 33 be slightly greater than the width of the containers, referring to Figures 6, and, referring to Figure 4, it is intended that the distance between the points 34 and 35 be slightly greater than the length of the container. Returning to Figure 5, the spaces 35 and 36 may therefore be described as seats to hold complementary supporting members of the containers. When a container is mounted across two beams, its outside short lower edges will be supported along the line 37 of Figure 5. Container legs 38 are shown mounted in supporting sockets in Figure 12 and it will be appreciated that in the case of the rolling of the ship the

container legs 38 will bind against the beam and hold the container in position.

An alternative construction for the beams is illustrated in Figures 13, 14 and 15. In these figures the supporting plates 31*a* are buttwelded to the web of the I beam in the lower portion thereof and are supported by smaller supporting webs 32*a*, which rest upon the lower arm of the I beam. This construction is believed to more effectively resist movement of the container when the ship is rolling. This is illustrated in Figure 15 where it is seen that the center of gravity of the container is much lower with respect to the two adjacent supporting I beams. In this situation, if the roll is to the right, the container will tend to pivot around the point 39 in which event not only will the portion 40 of the container engage the upper cross arm of the I beam, but the leg 38 of the container will engage the lower cross arm of the I beam.

In lowering a container into the hold beneath the beam deck 21 of Fig. 22, the container may be picked up on the wharf when its length is parallel to the width of the vessel and may be lowered between the beams of the deck 21 without turning the container. This constitutes an important advantage of the hold structure shown in Fig. 2 and the rear hold of Fig. 1, and emphasizes the importance of the container stacking feature. Applicant is working primarily on ships used on the Great Lakes where the most common holding depth—that is the distance from the bottom of the weather deck to the tank top or hold bottom—is in the neighborhood of twenty-eight feet. By having just one deck of beams and stacking the containers two high in the lower hold, the containers do not have to be turned 90 degrees inside the hold in order to go in between deck beams in reaching a lower part of the hold. Contrast this with what is necessary to load and unload the hold illustrated in Fig. 3. The containers resting on the tank top may be lifted upwardly between the beams of the beam deck 19 without turning them, but before they can be raised above the second beam deck they must be turned 90 degrees. This turning of the container by 90 degrees greatly delays loading and unloading. In the case of very deep holds in oceangoing ships, however, an arrangement of beam deck such as that shown in Fig. 3 may be necessary.

Figure 4 is designed to bring out two important elements of this invention, namely, the regular spacing of the holding means on the I beams of any given deck, and secondly, the relationship of hatch coamings to the beams. Touching upon these points in order, the holding recesses such as 60 and 61, which face each other on adjoining beams, are equally spaced from the adjoining holding means 62 and 63 for the next adjacent container and are equally spaced from the holding means 64 and 65 which will hold the other two legs of the same container. It happens that the holding means on the opposite side of the beam 24, namely, the means 66 and 67, are in transverse alignment with 60 and 62, but this is not necessary. It is easier to construct a ship in the manner shown where one has a hold which is unbroken by obstacles. But in oceangoing ships, particularly those designed to carry passengers as well as freight, holds are frequently of irregular shape and it may be desirable to have the holding means along one side of the beam out of alignment with the holding means along the other side of the beam. What is important, however, is that the holding means along one side of a beam be in transverse alignment with the holding means on the adjacent facing beam.

The relationship of these beams to the hatches is of great importance. In concurrently filed patent applications, the applicant is disclosing a structure making possible ocean-going ships having large hatches and additionally disclosing the use of a bridge mounted travel crane which can place the crane operator directly above the load to be lifted out of the hold as well as over the wharf. These beams carrying regularly spaced holding means, however, can be used on ships having relatively small hatches which, however, extend almost the width of the ship. Continuing to look at Figure 4, the hatches 14 and 41 cover a single hold having bulkheads 42 and 43. The width dimensions of both hatches 14 and 41 will pass a container. The hatch deck areas 43, 44 and 46 are quite large and by means of reinforcement below the deck, are sufficient to provide the necessary structural strength at the hatch deck level to meet stress requirements of the hull of an oceangoing vessel. By arranging the hatch coamings with respect to the supporting beams of the beam deck 21 and the bottom 20 so that the center of the top of a container in position on the supporting beams is always beneath a hatch opening, it is possible to load the containers by means of a crane. Thus, the container 47 has a top center 48. In order to remove it from the bottom deck, it is raised straight upwardly until its legs clear the beams 25. Then the hoist moves in the direction of the arrow 48*a* until the edges of the hatch coaming are cleared, at which time vertical movement continues. In order to remove the container 49 which rests upon the beams 24 and 25, it is raised just sufficiently so that its legs clear these beams, whereupon it is moved in the direction of the arrow 50 until it clears the edges of the hatch coamings and is lifted clear.

In the case of introducing or removing a container through the hatch 41 a slightly different situation arises. The container 51 is resting near the bottom of the hold. It is raised and removed through the hatch 41 in exactly the same way that the container 47 was removed. But the container 52 must first be raised so that its legs clear the beams 24 and 26 and must then be turned 90° in order that its width may pass through the short dimension of the hatch 41.

The relationship of the hatch coamings to the beams may therefore be said to be such that diagonals connecting the holding means for any given container must intersect at a point which is open to the sky when the hatch covers are removed.

In Figures 17 and 18, a type of container support is shown for a container which has no legs. In this structure, flanges 70 having a length approximating that of one dimension of the container are buttwelded to the lower edge of an I beam and are supported at their ends by gussets such as 71 which are buttwelded to the lower, upper head and web of the beam. Intermediate auxiliary supporting members 72 provide additional strength. The legless containers are held between the gussets 71.

As disclosed in the copending application, applicant's container ship development contemplates the use of a bridge mounted travel crane having a vertically movable lift beam which is movable only in a vertical path. This beam has at its bottom gripping fingers which are con-

trolled from the cab of the crane and hence it is wholly unnecessary to have anyone in the hold. Where, however, a standard construction bridge mounted travel crane which utilizes a cable is used, a crane operator will require assistance from men in the hold in order to exactly seat the legs of a container in the holding means, whether they be in the hold bottom or on deck beams. Referring to Figure 5, a man **75** is shown using a pike pole **76** with a buffer at the end thereof, **77** for assisting in guiding the container **78** as it moves into seating relationship on the beam deck. In order to safeguard a man working on a beam, applicant provides above the beams fairly taut cables such as **79** and **80** with rings thereon **81**. Before going into the hold, the operator, who is carrying a safety belt, hooks a lead line **82** to the ring **81**, and this protects him in the event that he missteps and falls.

The space defined by the flanges **29** and **30**, for example see Fig. 7, constitutes a holding means for preventing lateral movement of the container. It is this holding means which automatically removes the need of lashing. The holding means is not merely a supporting means although it may perform this function, as for example the leg holding element shown in Fig. 6 of co-pending application No. 592,376. The term "holding means" may or may not include the function of supporting. It does include the function of resisting lateral movement of a container positioned on the beams. These "holding means" can assume a wide variety of forms. Fundamentally the "holding means" on the beam is complementary to the "holding means" on the container and because applicant's particular container was designed to have legs, the leg may be looked upon as a male element and the slots in the beams (either notches in the beams themselves or spaces between flanges) constitute the female member. It is evident that a pair of recesses could be put in the bottom of the containers to receive upstanding studs mounted on the beams. Applicant's idea turns on a uniformly sized container (or possibly a plurality of sizes which are multiples of some common dimensions) having on themselves at predetermined positions, means for locking themselves to locking or holding means on the beams.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A ship hold comprising a bottom, side walls, bulkheads, a substantially horizontal row of equally spaced holding means for supporting one side of alignable containers having uniform width and length, a second substantially horizontal row of similarly spaced holding means facing the first row and substantially parallel thereto, said rows of holding means being in a common horizontal plane, and a pair of similarly spaced holding means in a different horizontal plane in said hold and at substantially right angles to the first two rows.

2. A ship hold for firmly holding against lateral movement containers having depending legs, comprising a bottom, side walls, bulkheads, a weather deck, a deck of pairs of parallel spaced beams mounted on the hold walls intermediate the bottom and the weather deck, and pairs of leg sockets complemental to the legs of said containers permanently associated with each pair of beams, a pair of sockets on one beam being in transverse alignment with a pair of sockets on the other beam of the same pair.

3. A ship hold for parallelepiped shipping containers having a length greater than the width and having a leg depending from each bottom corner, comprising a bottom, side walls, bulkheads, a substantially horizontal row of pairs of leg sockets mounted on a portion of the hold and positioned at a selected height in said hold for supporting the width side of said containers, a second row of pairs of leg sockets mounted on a portion of the hold and positioned in facing or normal alignment to the pairs of leg sockets of the first row, said rows lying in a common horizontal plane and being spaced from each other to receive the length side of a container, a pair of similarly spaced rows of similarly aligned pairs of sockets mounted on a portion of the hold in a lower horizontal plane in said hold at a distance greater than the height of a container and at substantially right angles to the first two rows, whereby said containers may be dropped downwardly between the upper level of leg sockets directly into the lower level of leg sockets without turning the containers about a vertical axis.

4. A ship hold comprising a bottom, side walls, bulkheads, a substantially horizontal row of equally spaced holding means for supporting the width side of alignable containers having a length greater than their width, a second row of similarly spaced holding means in facing or normal alignment to the holding means of the first row, said rows lying in a common horizontal plane and being spaced from each other to receive the length side of a uniformly sized container, a pair of similarly spaced rows of similarly spaced holding means in a second horizontal plane in said hold, said rows of the second level of holding means being at right angles to the rows in the first level whereby uniformly sized containers having a length greater than the width may be passed between the holding means of the upper row and rested in the holding means of the lower row.

5. A ship hold for parallelepiped shipping containers having a length greater than their width and having a leg depending from each bottom corner, comprising a bottom, side walls, bulkheads, a weather deck, spaced rows of groups of leg sockets, complemental to and identically arranged and spaced with the legs of a container for receiving the latter, permanently mounted on the hold bottom so as to prevent lateral movement of the container in all directions, said groups of leg sockets having their width dimension parallel to the axis of the ship, and parallel rows of similar groups of leg sockets permanently mounted on a portion of the ship hold in a common plane intermediate the bottom and the weather deck and at a distance above the hold bottom greater than the height of a container, and with the width dimension of each group at right angles to the ship axis.

6. A ship hold for parallelepiped containers having a depending leg at each bottom corner, comprising a bottom, side walls, bulkheads, weather deck, spaced rows of groups of leg sockets permanently mounted on the hold bottom, the sockets of each group complemental to and identically arranged with the legs on a container, a deck of pairs of equally spaced transverse beams mounted on the side walls in between the hold bottom and the weather deck, and pairs of leg sockets complemental to the legs of said containers permanently associated with each pair of beams, a pair of sockets on one beam being in

transverse alignment with a pair of sockets on the other beam of the same pair.

7. A ship hold for stowing uniformly sized, parallelepiped containers having a leg depending from each bottom corner comprising a bottom, side walls, a weather deck, and an intermediate deck of parallel beams spaced from each other by a distance approximately equal to one horizontal dimension of the containers, adjacent beams having facing, outwardly extended flanges for supporting one side of a container, the length of each flange being slightly less than the distance between the legs of a container so that the bottom side of a container may be supported on the flange while the legs are engageable with the ends of the flange to hold the container against lateral movement.

8. A ship hold for stowing parallelepiped containers having legs at their four lower corners comprising a bottom, side walls, a weather deck, a deck of parallel beams, and outwardly extended flange members mounted on said beams, said flange members having a length somewhat less than the distance between two container legs so that the side bottom of the container may be rested on the flange.

9. A ship hold for stowing parallelepiped containers having legs at their four lower corners comprising a bottom, side walls, a weather deck, a deck of parallel beams, each beam comprising a vertical web with upper and lower heads, flanges having a length for supporting one bottom side of a container between its legs attached to an edge of said head, and supporting gussets between said flange and the lower head of said beam.

10. A ship hold for stowing parallepiped containers having their legs at their four lower corners comprising a bottom, side walls, a weather deck, a deck of parallel I beams, flanges having lengths for supporting one bottom side of a container between its legs extending outwardly from the webs of said I beams, and gussets supporting said flanges.

11. A ship hold for stowing parallelepiped containers having legs at their four lower corners

comprising a bottom, side walls, a weather deck, a deck of parallel I beams having a broad upper head, and notches cut in said upper head to receive the legs of containers.

12. A ship hold for stowing parallelepiped containers having legs at their four lower corners comprising a bottom, side walls, a weather deck, a deck of parallel I beams, a flange extending outwardly from the edge of the lower head of said I beams, and gussets supporting said flange.

13. A ship hold, a deck of parallel beams disposed between the top and bottom of said hold, said beams being spaced by a distance sufficient to support the narrow sides of containers having a length greater than the width so that container can be dropped between two adjacent beams when its long side is parallel to the beams, and means mounted beneath the deck of the beams for holding a container against lateral movement in vertical alignment with the space thereabove.

14. A ship hold for firmly holding against lateral movement shipping containers of uniform size and supported by legs identically arranged, comprising a bottom, side walls, bulkheads, a weather deck, a deck of spaced beams mounted on the hold walls intermediate the bottom and the weather deck, and groups of leg sockets, complemental to and identically arranged and spaced with the legs on a container, permanently associated with said beams so as to prevent lateral movement of the container in all directions.

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