Nov. 2, 1971 P. A. ANKER-NILSEN 3,616,776

STORABLE 'TWEEN DECKS

Filed Oct. 7, 1969

FIG. 1.

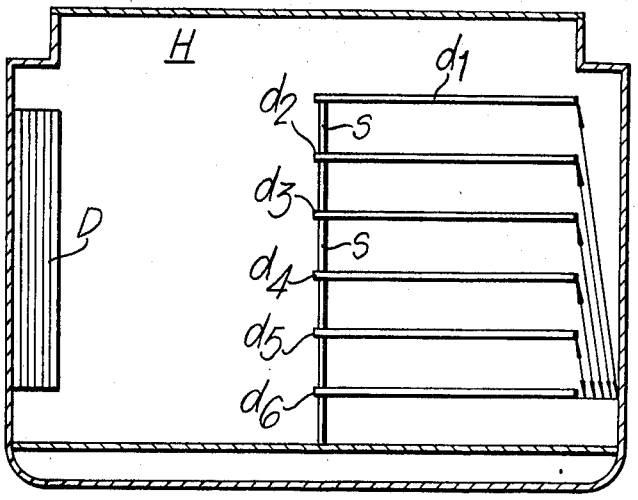


FIG. 4.

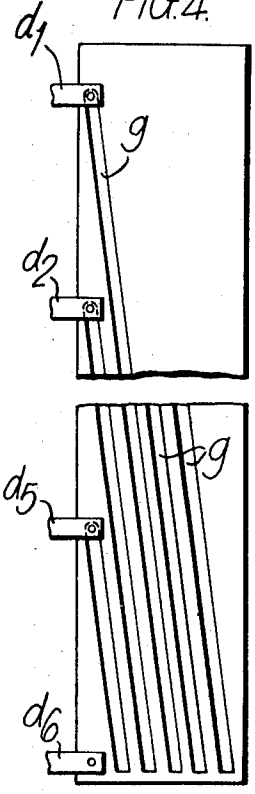


FIG. 2.

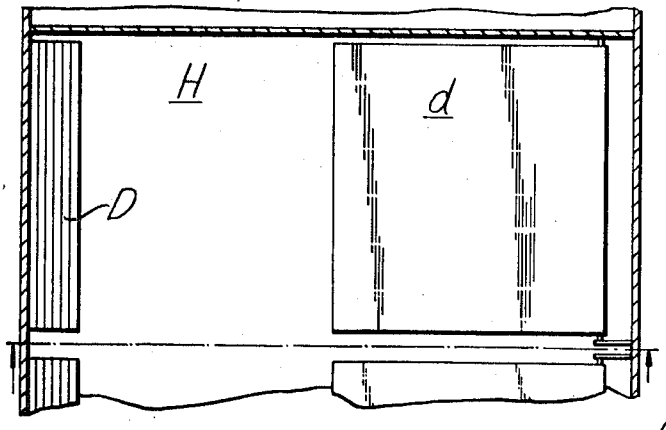


FIG. 3.

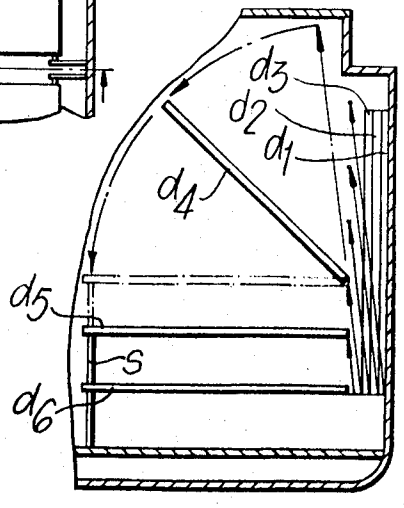
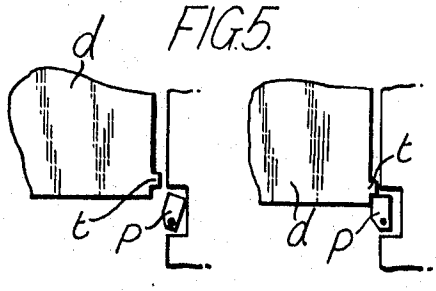


FIG. 5.



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STORABLE 'TWEEN DECKS

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Int. Cl. B63b 25/18
U.S. Cl. 114—76 8 Claims

ABSTRACT OF THE DISCLOSURE

Storable 'tween decks for a cargo ship comprising a plurality of deck members, each of which is movable from a stored position to a use position. In its stored position, the deck member is positioned vertically and generally parallel with the side of the hold section and with the other deck members located in that stored position. In its use position, the deck member extends generally horizontally in the hold section. The edge of each deck member lowermost when the deck member is in a stored position is guided generally vertically at the side of the hold section during movement of the deck member between its stored and use positions. Spacing means are provided at the edge of each deck member which is uppermost in stored position and also at its lowermost edge to space the decks when in use position.

The present invention relates to disposable 'tween decks to be arranged in holds, such decks when they are not in use being able to be stowed side by side as more or less compact units and placed so that they are out of the way, the hold thereby being substantially free from obstructions and thereby can be used for, for instance, bulk load. In horizontal position the hold of the ship can be utilised for collective shipment, as for instance autos, containers or the like.

A great number of proposals for such disposable 'tween decks have been made. These have for instance been proposed suspended in wires as a unit under the upper fixed deck and can be lowered down to obtain desired position as 'tween decks. It is further known to hinge-connect such 'tween decks with one edge to the ship side so that the deck can be swung in along the side or be swung out to a horizontal serviceable position where suspension or support of the free edge of the deck is arranged.

The invention relates to a further development of such 'tween decks whereby substantial advantages are obtained above what is previously known of such structures. More specially the invention relates to disposable 'tween decks in holds, said decks being of the kind comprising a convenient number of plain decks which in stowed position lie as a unit substantially vertically along the ship side, bulk head or the like, and which can be brought out into the horizontal serviceable position in various heights where the decks are given support.

In accordance with the invention it is proposed that each deck at its in stowed position lower edge is provided with means for cooperation with substantially vertically extending guidings or provided with members for engagement with and support of said means in desired height level of said edge, and that the decks at another convenient place remote from said members are provided with supporting elements, as for instance legs or brackets, which could be swung down or brought in position for support of the deck in horizontal serviceable position.

Thereby is obtained a structure which by simple and solid means makes possible arrangement of resp. stowing away of an arbitrary number above each other disposable 'tween decks. This can be carried out by means of for instance wires or built-in hydraulic means. In stowed away position the decks will occupy a minimum of space and are located in a position where they are in a small extent subject to damage or mean an obstruction for for instance bulk load. In active position they are solidly supported at the desired height levels without further fixing elements being necessary for bracing of the decks.

To have a better understanding of the invention reference is had to the following description under reference to the drawing where an embodiment is schematically shown. It should, however, be pointed out that the example disclosed and described is only meant to elucidate the inventive idea and every expert in this field of the technique can immediately propose a series of modifications as to details without thereby exceeding the scope of the invention.

FIG. 1 is a cross section through a ship provided with 'tween decks according to the invention.

FIG. 2 shows FIG. 1 seen in plan.

FIG. 3 shows schematically how the decks are brought into service position.

FIG. 4 shows schematically the guidings for the decks.

FIG. 5 shows an example of how the members for cooperation with the guiding means of the decks can be arranged.

In FIG. 1 the decks are at the one side of the hold H shown in stowed away position at D while the decks at the other side of the central plane of the hold are brought into active or service position. In the example disclosed there are arranged six disposable 'tween decks d_1–d_6. All decks are at their innermost edge provided with means, for instance journalling means, which slide in a substantially vertically extending groove or guiding arranged at the ship side or at a thwartships extending bulk head.

In the example shown each of the disposable 'tween decks has an extension corresponding to the half width of the hold and the length corresponding to the length of the hold or a section thereof, as will be seen from the elevation of FIG. 2.

FIG. 3 shows the decks during the process of being brought into active position. From stowed away position as shown at D to the left in FIG. 1 each deck is first swung out, that means the deck which in active position lies lowermost, down to the position shown in FIG. 3 at the same time as the supporting leg S is brought down so that its lower end rests against the tank top. Said deck d_6 has no guiding but only hinge-connection and may be carried out more solidly thereby better to protect the other decks against bulk loading. Thereafter the next deck d_5 is lifted out in its guidings and is swung down parallel with d_6 resting on the supporting legs which here are shown at the free edge of the decks. The inner end is locked during the lifting up to the top of each guiding by convenient means. In the same way the decks d_4, d_3, and d_2 are lifted up and swung out until all decks are brought in active position as shown to the right in FIG. 1.

FIG. 4 shows schematically how the guidings can be arranged for the guiding means of the 'tween decks.

FIG. 5 discloses schematically how the locking means for the support of resp. deck at desired height level can be arranged. The decks in the example disclosed are provided with journalling means sliding in grooves or guidings at both sides of the inner edge lying near the ship side. In connection with the guidings or grooves there is arranged a pawl p which can be brought to engagement under the journalling means t. The cooperation can be carried out automatically by means not shown in the drawing. It will be understood that the means used to secure the inner edge of the 'tween decks in desired height posi-

tion in the grooves or guidings optionally can be modified. Thus the grooves can be provided as racks or provided with a row of holes or the like for cooperation with protrusions, pawls, pins, or the like for the locking of resp. 'tween deck to desired height level. With adjustable supporting legs thereby is possible to obtain an arbitrary height level for each disposable deck. The supporting legs preferably are arranged so that they rest directly above each other with the lower free end engaging the top of the leg lying beneath, so that all legs for the disposable decks form through-going columns.

The invention further can be adapted so that the disposable decks in stowed away position do not lie against the ship side but along the bulk head extending thwartships or alongships.

Bringing the 'tween decks into active position or bringing them back to stowed position can be carried out by convenient power means as for instance cranes, wire, blocks or the like, but preferably this is carried out by means of hydraulic built-in compact unities. Further the guidings of the decks can be provided with means for the cooperation with mechanical or hydraulic means to secure a positive positioning at the bringing out or stowing away of the decks to or from the beforehand chosen deck height levels.

What is claimed is:

1. In a cargo ship having a hold section provided with storable 'tween decks, the improvement wherein: said storable 'tween decks comprise a plurality of substantially planar deck members, each of said deck members being moveable from a stored position at a side of said hold section wherein said deck member is positioned vertically and generally parallel with said side of said hold section and with other deck members located in said stored position to a use position extending generally horizontally in said hold section; guide means located adjacent said side of said hold section and extending in a generally vertical direction adjacent said side; a guide member secured adjacent the first edge of each of said deck members which first edge is lowermost when said deck member is positioned in said stored position and which first edge is adjacent said side of said hold section when said deck member is in said use position, said guide member cooperating with said guide means for guiding said first edge in said generally vertical direction during motion of said deck member between said stored and use positions; first spacing means adjacent the second edge of said deck member which is uppermost when said deck member is positioned in said stored position and which second edge is remote from said side of said hold section when said deck member is in said use position for spacing said second edge of each deck member from the second edge of a subadjacent deck member when said deck member and subadjacent deck member are in said use position; second spacing means adjacent said first edge of said deck member for spacing said first edge of each member from the first edge of a subadjacent deck member when said deck member and subadjacent deck member are in said use position; and means for securing said deck members in said vertical, stored, position, whereby when the deck members are in their vertical stored, position, the area between the stored deck members is otherwise unobstructed thereby.

2. 'Tween decks according to claim 1 wherein said hold section extends athwart said ship, and wherein said side of said hold section is adjacent the side of said ship whereby said deck elements are stored in said stored position generally parallel to and adjacent the side of said ship.

3. 'Tween decks according to claim 1 wherein said first spacing means comprises a first spacing member moveable from a first position generally parallel to said deck member to a second position extending generally perpendicularly from the lower side thereof adjacent said second edge.

4. 'Tween decks according to claim 3 wherein said first spacing member is pivotally secured to said deck member.

5. 'Tween decks according to claim 1 wherein said guide means comprises a plurality of pairs of generally vertical tracks, one track of each pair of guide tracks located adjacent an extremity of a said first edge of a said deck member for guiding that edge during movement of said deck member between said stored and said use positions.

6. 'Tween decks according to claim 1 wherein said first and second spacing means are adjustable to permit variation in the vertical disposition relative to said hold of said deck members positioned in said use position.

7. 'Tween decks according to claim 2 wherein the width of each of said deck members is about one half the width of the hold section whereby, when the deck members are in their stored, vertical position, the deck members form two sides of the hold section, the hold section being otherwise unobstructed by the stored deck members.

8. 'Tween decks according to claim 2 wherein the length of said deck members is about the same as the length of said hold section.

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