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(54) ARRANGEMENT FOR SUPPORTING CONTAINERS TO BE TRANSPORTED ON THE DECK OF A CARGO SHIP

ANORDNUNG ZUM TRAGEN VON AN BORD EINES FRACHTSCHIFFES ZU TRANSPORTIERENDEN BEHÄLTERN

AGENCEMENT POUR SUPPORTER DES CONTENEURS QUI DOIVENT ÊTRE TRANSPORTÉS SUR LE PONT D'UN NAVIRE DE CHARGE

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Description

[0001] The object of the present invention is an arrangement for supporting containers to be transported on the deck of a cargo ship, which arrangement comprises hatch covers to be placed on top of the cargo compartments of the cargo ship, on top of which hatch covers containers are transported, as well as lashing bridges that are transverse to the cargo ship, which are fixed to the transverse members between the cargo compartments, and on which lashing bridges the containers are supported with lashing bars, and which hatch covers are disposed between the lashing bridges in such a way that they can be lifted off and lowered back into their positions.

[0002] On a cargo ship containers are transported in a cargo compartment below hatch covers and also on deck on top of the hatch covers in a number of rows and lines and also in a number of layers one on top of the other. In the cargo compartment are guide rails, on which the containers are supported when at sea. On deck are detachable hatch covers, with which the hold below is closed. The containers above deck are transported on top of the hatch covers. The transverse support structures on deck, so-called lashing bridges, for the containers must be installed at such a distance from each other that the hatch cover can, in connection with unloading and loading the cargo of the ship, be removed and lowered back with a crane.

[0003] After the containers have been loaded onto the ship, at least some of the containers that are on top of a hatch cover are fixed at their ends to a lashing bridge with lashing bars and turnbuckles. Each lashing bar is fixed at one of its ends to one corner of a container and at the other end to a turnbuckle, which in turn is fixed at its other end to a lashing bridge. The fixing is tightened by rotating the turnbuckle.

[0004] When the ship inclines in the swell of the sea, forces that are longitudinal, transverse and also vertical to the ship and that are exerted by the lashing bars of the containers act on the lashing bridges.

[0005] Lashing bridges known in the art are, in their dimensions, of the type that the support structures of them on the member between the cargo compartments are relatively narrow compared to the width of the member below the lashing bridge (in other words, the structure of the bridge is short in the longitudinal direction of the ship). The reason is the space reserved for the hatch cover in a conventional structure - the hatch cover rests supported on the same member.

[0006] Known lashing bridge arrangements are presented, for example, in the following patents: KR20070115383 and EP0815004.

[0007] KR 20130084447 A discloses a hatch cover structure where a separate guide structure has been attached to the outer surface of hatch cover. There are no recesses made to the hatch cover structure. This sets a limitation to the structural width of the lashing bridge structure.

[0008] Owing to the narrowness of lashing bridges in earlier solutions, the structures of them become heavy in order to achieve sufficient strength. Furthermore, the vibration of the hull caused by the running of the engine of the ship might cause strength problems and vibration problems in conventional lashing bridge structures.

[0009] The aim of the current invention is to achieve a better arrangement than before for supporting containers to be transported on the deck of a cargo ship. The arrangement according to the invention is characterized in that the ratio of the greatest width of the support structures of a lashing bridge disposed on a transverse member to the width of the transverse member is at least 0.8 at one or more points of the lashing bridge, and that at the point of the support structures of the lashing bridge the necessary recesses) are made in the hatch cover that is compatible with the lashing bridge.

[0010] One preferred embodiment of the arrangement according to the invention is characterized in that the ratio of the greatest width of the support structures of a lashing bridge disposed on a transverse member to the width of the transverse member is at least 1 at one or more points of the lashing bridge.

[0011] Another preferred embodiment of the arrangement according to the invention is characterized in that the hatch cover is provided with support brackets extending over the transverse member.

[0012] With the wider structure according to the invention, a lashing bridge can be made to be more lightweight than before and at the same time it is possible to reduce the harmful tendency of a lashing bridge to vibrate. The structure is inexpensive to fabricate, and also implementation of lashing bridges that are higher than before becomes possible with a structure according to the invention.

[0013] In the following, the invention will be described in more detail by the aid of some preferred embodiments with reference to the attached drawings, wherein

Fig. 1 presents part of a conventional lashing bridge, a hatch cover and a container stack when two lashing bars are connected.

Fig. 2 presents a whole conventional lashing bridge and one stack of containers stacked on top of a hatch cover.

Fig. 3 presents a conventional lashing bridge and containers supported on it, as viewed in the transverse direction of the ship.

Fig. 4 presents a lashing bridge according to the invention and containers supported on it, as viewed in the transverse direction of the ship.

Fig. 5 presents an axonometric and greatly simplified view of the recesses of the hatch covers and the support structures of the lashing bridge that extend

into them.

[0014] Figs. 1-3 present prior art, so that these are not described in much detail here. The purpose of them is to illustrate the current state of the art. Fig. 1 thus presents a part of a lashing bridge 1, on which some of the containers 5 are supported with lashing bars 6. A container stack is on top of the hatch cover 4. Containers are also transported in the cargo compartments below the hatch covers. Lashing bridges are of different heights. Typically they extend from the level of the weather deck of the ship to a height of two, three or four containers. When the ship is traveling at sea, the container stack exerts large forces in the lashing bars 6 fixed to the containers and onwards into the lashing bridge 1. These forces are transmitted into the hull of the ship (into the transverse member 2) via the structures of the lashing bridge.

[0015] In Fig. 2 it is seen that the lashing bridge 1 extends from one side of the ship to the other, i.e. the ends of the lashing bridge rest on a longitudinal member of the ship or on the frame structures of the side. The lashing bridge is supported on top of the transverse member 2 between the cargo compartments. The invention is limited to that part of the lashing bridge that is situated in the area between the cargo compartments and the hatch covers.

[0016] Fig. 3 presents a lashing bridge 1 as viewed in the transverse direction of the ship. It is seen in it that the largest width of the lashing bridge is clearly narrower than the transverse member 2 between the cargo compartments 3.

[0017] Fig. 4 presents a solution according to the invention. In it the width L of the lashing bridge is greater than before. It is advantageous that the support structures of a lashing bridge are as wide as possible, particularly for transmitting forces in the longitudinal direction of the ship into transverse member 2. The width of the transverse member, on top of which the lashing bridge is supported, that is between the cargo compartments 3 is marked with the letter B. The invention is characterized in that L/B is at least 0.8. Also a type of embodiment is possible wherein the support structures of the lashing bridge are as wide as, or even wider than, the width B of the transverse member, in other words $L/B \geq 1$. In this case it is obvious that a conventional hatch cover cannot be installed into its position, because a suitable bearing surface for it will not remain on the transverse member 2.

[0018] Owing to the wider support structures of the lashing bridge, recesses 7 are made in the hatch cover at the point of the support structures of the lashing bridge. The support structures of the lashing bridge, which are disposed at the point of the recesses of the hatch cover, can simultaneously function as guide pillars when lifting the hatch cover with a crane. Furthermore, these structures can function as horizontal limiters of a hatch cover, i.e. the support structures keep the hatch cover in the correct location on the hatch coaming as the ship makes way and when the ship inclines.

[0019] It is also possible that a hatch cover is shorter in length, in which case it must be provided with e.g. support brackets (not presented in the figures) that extend over the transverse member 2.

[0020] It is obvious to the person skilled in the art that the invention is not limited to the embodiments described above, but that it can be varied within the scope of the claims presented below. Thus, for example, also tube profiles and/or bars, in addition to plate structures and box structures, can also be used in the support structures of a lashing bridge. Likewise, it is possible that also narrower transverse support structures can be in use in the same lashing bridge, in addition to structures according to the invention. The lashing bridge comprises at least one of the elements according to the invention.

[0021] The characteristic features possibly presented in the description in conjunction with other characteristic features can if necessary be used separately to each other.

Claims

1. Arrangement for supporting containers (5) to be transported on the deck of a cargo ship, which arrangement comprises hatch covers (4) to be placed on top of the cargo compartments (3) of the cargo ship, on top of which hatch covers containers (5) are transported, and which arrangement also comprises lashing bridges (1) that are transverse to the cargo ship, which are fixed to the transverse members (2) between the cargo compartments (3), and on which lashing bridges (1) the containers (5) are supported with lashing bars (6), and which hatch covers (4) are disposed between the lashing bridges (1) in such a way that they can be lifted off and lowered back into their positions, **characterized in that** the ratio of the greatest width (L) of the support structures of a lashing bridge (1) disposed on a transverse member (2) to the width (B) of the transverse member is at least 0.8 at one or more points of the lashing bridge, and that at the point of the support structures of the lashing bridge (1) the necessary recesses (7) are made in the hatch cover (4) that is compatible with the lashing bridge (1).

2. Arrangement according to claim 1, **characterized in that** the ratio of the greatest width (L) of the support structures of a lashing bridge (1) disposed on a transverse member (2) to the width (B) of the transverse member is at least 1 at one or more points of the lashing bridge.

3. Arrangement according to claim 1 or 2, **characterized in that** the hatch cover (4) is provided with support brackets extending over the transverse member (2).

Patentansprüche

1. Einrichtung zum Tragen von Containern (5), die auf dem Deck eines Frachtschiffes zu transportieren sind, wobei die Einrichtung Lukenabdeckungen (4) umfasst, die auf den Frachträumen (3) des Frachtschiffes zu platzieren sind und auf diesen Lukenabdeckungen Container (5) transportiert werden, wobei die Einrichtung auch Laschbrücken (1) in Querrichtung zum Frachtschiff umfasst, die an den Querträgern (2) zwischen den Frachträumen (3) befestigt sind, und auf den Laschbrücken (1) die Container (5) mit Zurrstangen (6) gestützt werden und die Lukenabdeckungen (4) so zwischen den Laschbrücken (1) angeordnet sind, dass sie angehoben und wieder zurück in ihre Positionen heruntergelassen werden können, **dadurch gekennzeichnet dass** das Verhältnis der größten Breite (L) der Trägerkonstruktionen einer auf einem Querträger (2) angeordneten Laschbrücke (1) zur Breite (B) des Querträgers mindestens 0,8 an einem oder mehreren Punkten der Laschbrücke beträgt, und dass an der Stelle der Trägerkonstruktionen der Laschbrücke (1) die erforderlichen Aussparungen (7) in der mit der Laschbrücke (1) kompatiblen Lukenabdeckung (4) vorgesehen sind.

2. Einrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das Verhältnis der größten Breite (L) der Trägerkonstruktionen einer auf einem Querträger (2) angeordneten Laschbrücke (1) im Verhältnis zur Breite (B) des Querträgers an einem oder mehreren Punkten der Laschbrücke mindestens 1 beträgt.

3. Einrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Lukenabdeckung (4) mit Stützträgern ausgestattet ist, die sich über den Querträger (2) erstrecken.

Revendications

1. Dispositif pour supporter des conteneurs (5) à transporter sur le pont d'un navire de charge, lequel dispositif comprend des panneaux de cale (4) qui sont à placer en haut des compartiments de charge (3) du navire et en haut desquels les conteneurs (5) sont transportés, et lequel dispositif comprend également des ponts d'amarrage (1) qui sont transversaux par rapport au navire, qui sont fixés aux traverses (2) entre les compartiments de charge (3) et sur lesquels les conteneurs (5) sont supportés avec des barres d'amarrage (6), et lesquels panneaux de cale (4) sont disposés entre les ponts d'amarrage (1) de manière à pouvoir être soulevés puis abaissés pour revenir dans leur position, **caractérisé en ce que** le rapport de la largeur maximale (L) des structures de support d'un pont d'amarrage (1) disposé sur une traverse (2), sur la largeur (B) de la traverse est d'au moins 0,8 en un ou plusieurs points du pont d'amarrage, et **en ce qu'**au niveau du point des structures de support du pont d'amarrage (1), les cavités nécessaires (7) sont réalisées dans le panneau de cale (4) qui est compatible avec le pont d'amarrage (1).

2. Dispositif selon la revendication 1, **caractérisé en ce que** le rapport de la largeur maximale (L) des structures de support d'un pont d'amarrage (1) disposé sur une traverse (2), sur la largeur (B) de ladite traverse est d'au moins 1 en un ou plusieurs points du pont d'amarrage.

3. Dispositif selon la revendication 1 ou 2, **caractérisé en ce que** le panneau de cale (4) est pourvu de consoles de support qui s'étendent sur la traverse (2).

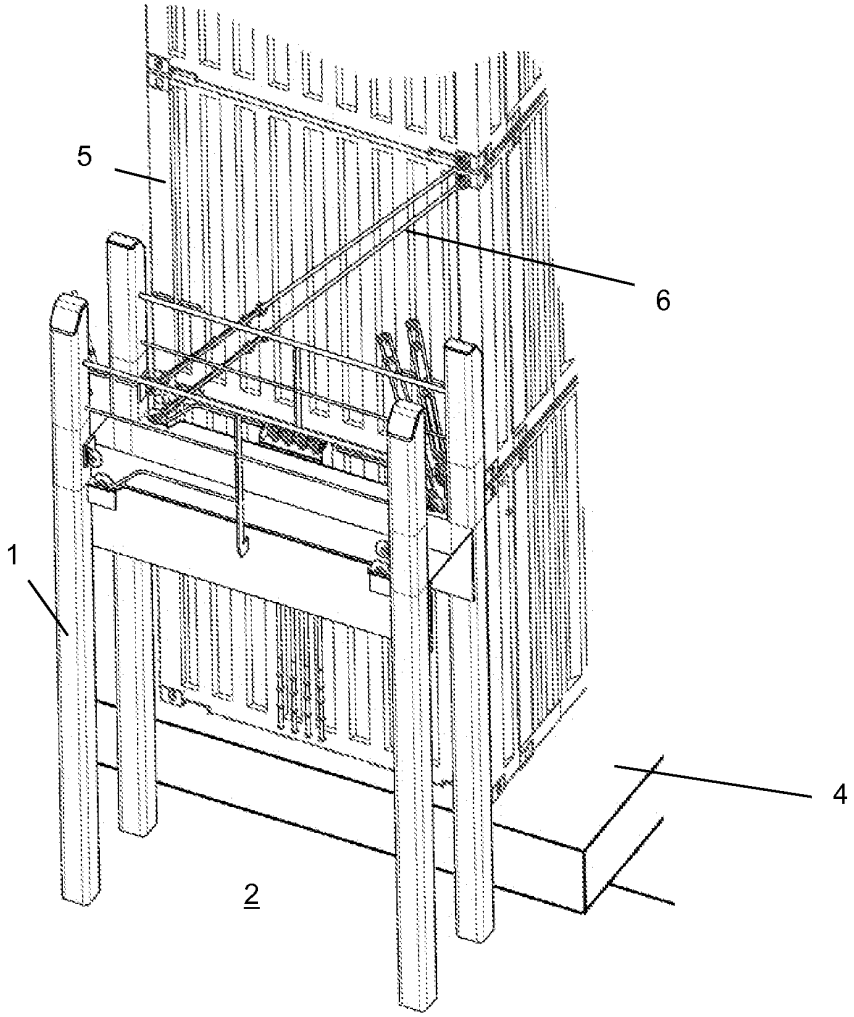

Fig. 1
Prior Art

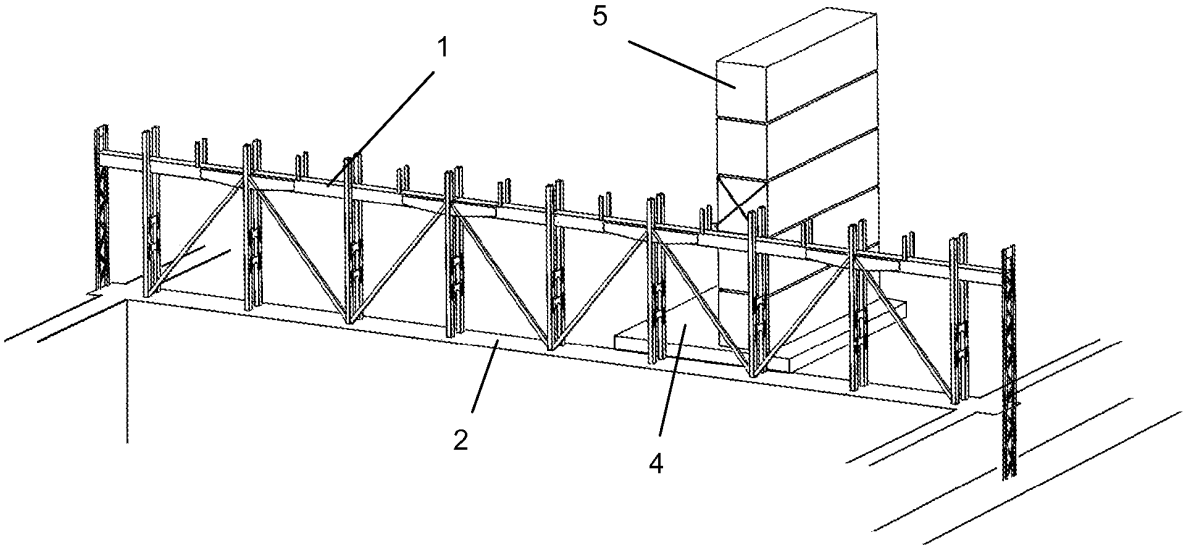

Fig. 2
Prior Art

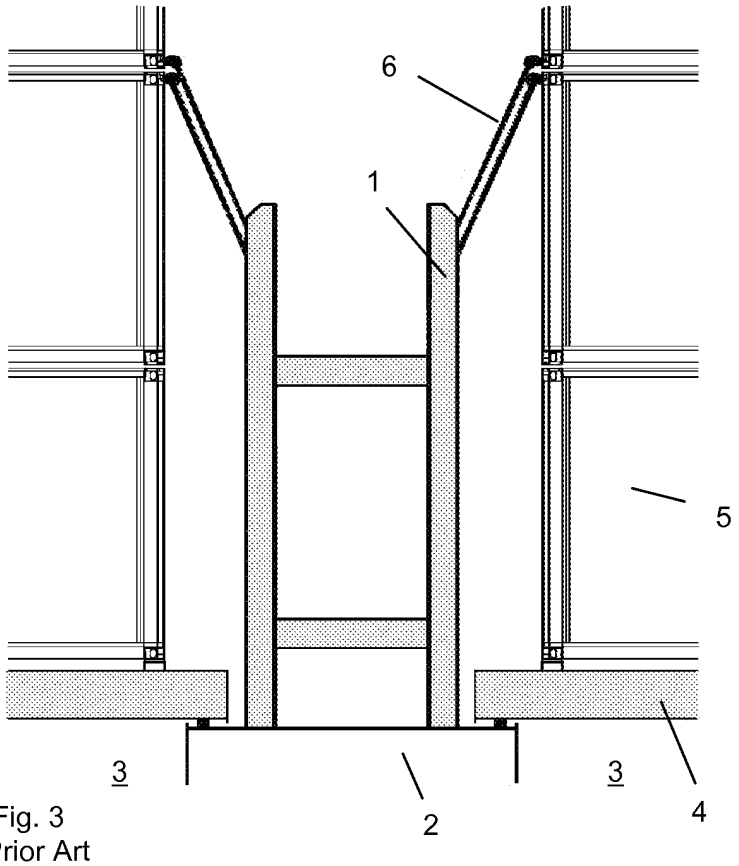

Fig. 3
Prior Art

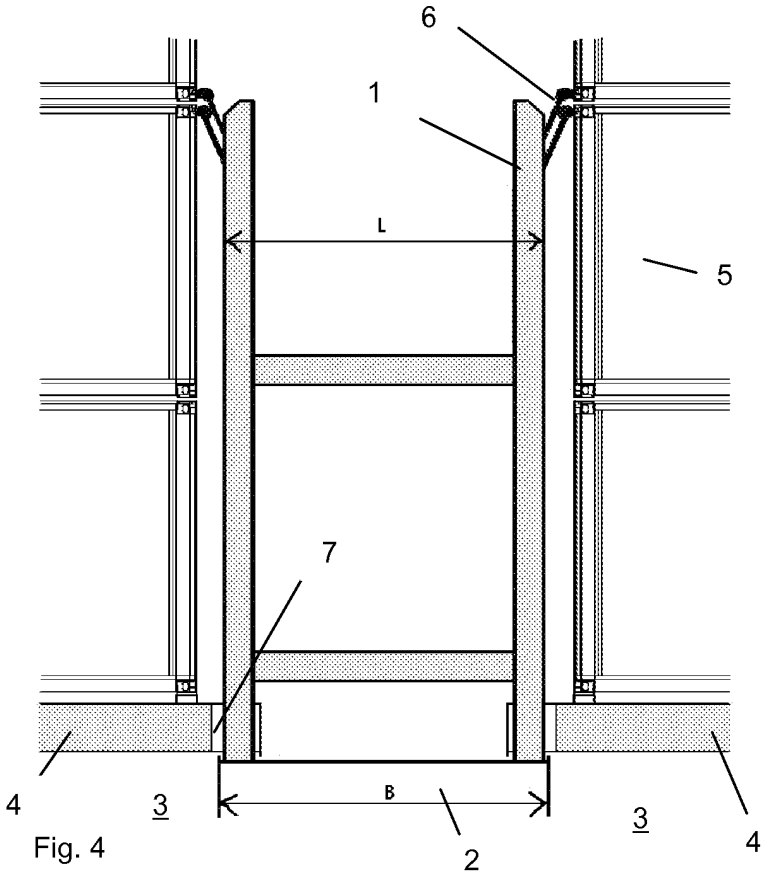

Fig. 4

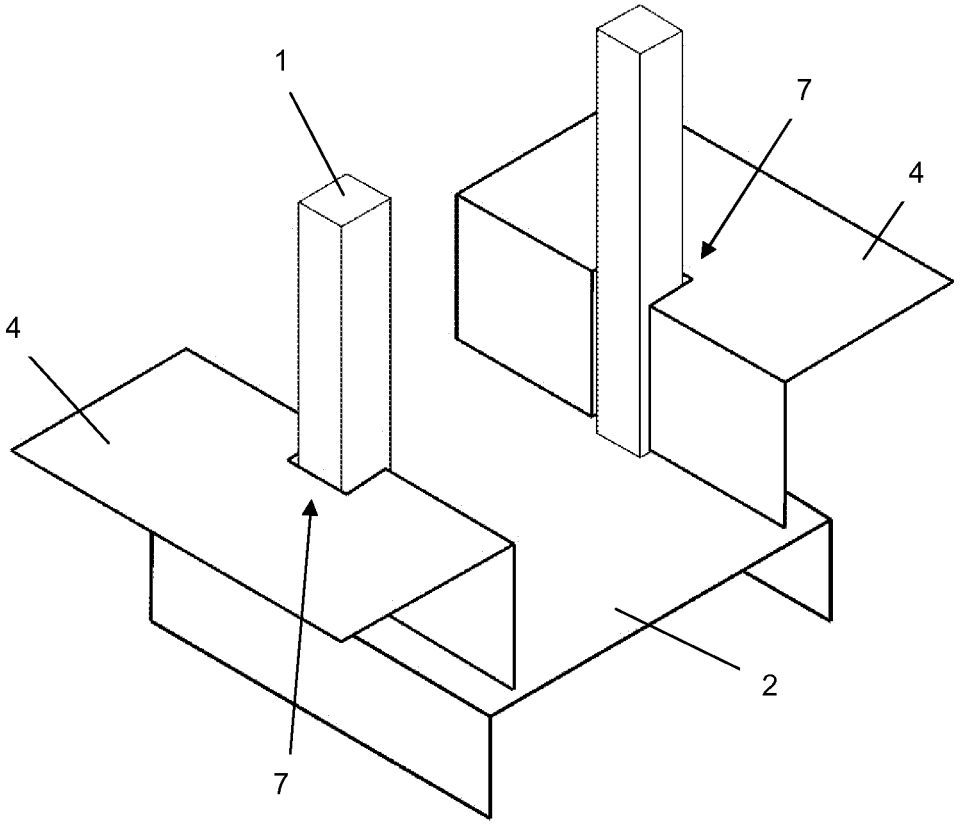

Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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