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Description

BACKGROUND OF THE INVENTION

[0001] The invention relates to a ship comprising a cargo space on the bottom of which there is a bottom plate, whereby above the level formed by the bottom plate there are a plurality of container supports for receiving and securing containers and cargo transportation stands to the cargo space, the upper end of the container supports being at a distance equal to the height of the container supports from the bottom plate.

[0002] Ships of this kind are well known (see for example DE 19708824) and generally they are called container carrier ships.

[0003] Said ships are particularly well suited for transporting containers, but they cannot be used for transporting, for instance, so-called bulk goods. In principle, bulk goods may be any loose/bulk goods: typically it could be e.g. coke, grain or kaolin, but it may also consist of scrapped steel.

[0004] Applicability of said ships for transporting goods transportation stands is also limited to some extent, because they are not suitable for transporting long and/or heavily loaded, e.g. loaded with steel coils, goods transportation stands. The reason for not being suitable for use of this kind is that heavily loaded goods transportation stands would bend and could at the same time be damaged as the upper level of the container supports is higher up than the bottom plate of the ship.

[0005] Expanded use of the container carrier ship to cover also transportation of bulk goods would be desirable in many cases, but in practice, no viable solution has been found so far.

BRIEF DESCRIPTION OF THE INVENTION

[0006] The object of the invention is to provide a ship that is suitable for transporting both containers and bulk goods.

[0007] This is achieved with a ship according to the invention, which is characterized in that on top of the bottom plate of the cargo space is arranged a levelling construction, on top of which there is arranged a protective plate, in which there are provided lead-through points for the container supports so that the container supports are surrounded by the protective plate and an upper level of the protective plate is at a level of the upper end of the container supports.

[0008] The basic idea of the invention is to utilize a levelling construction whereby the bottom level of the cargo space is raised higher so that, in view of the mass of the protective plate, only small amounts of a hard-wearing protective plate suitable for handling of bulk goods will be needed, whereby the bottom of the cargo space will be at the same time technically easy to manufacture by using readily available standard materials which are cheaper than the protective plate. The levelling construction

is adapted to provide adequate support for the protective plate. Thus, the container supports must not rise above the bottom of the cargo space of the ship, because in that case the cargo space of the ship could not be unloaded with a grab, which could easily get caught to the container supports and cause damage. Hence, the surface formed by the protective plate, the container supports and optional sealant has to be even and strong.

[0009] Advantageously, the levelling construction is a levelling plate in which there are provided through holes for the container supports and which surrounds the container supports. Advantageously, the levelling plate is made of material lighter than steel plate.

[0010] Advantageously, the protective plate is a steel plate.

[0011] Advantageously, a sealant is arranged between the walls of the through holes and the container supports. The sealant prevents the access of transported bulk goods and moisture beneath the levelling plate.

[0012] The protective plate is preferably welded to the container support in order to hold the protective plate in place, whereby it is most preferable to weld the protective plate also to support pieces that are secured, advantageously by welding, to the bottom plate of the cargo space to ensure good attachment of the protective plate to the bottom plate. Sealant is added around the support pieces between the support pieces and the levelling plate to prevent the access of the transported bulk goods and moisture beneath the levelling plate. Similarly, sealant is added between the level formed by the upper surface of the support pieces and the upper surface of the protective plate to prevent access of the transported bulk goods and moisture beneath the protective plate. Preferably, the sealant may be rubberized bitumen, because it is easy to apply to the point to be sealed, among other things.

[0013] Preferred embodiments of the ship according to the invention are disclosed in the attached claims 2 to 15.

[0014] The most important advantage of the ship according to the invention is that, in addition to containers and various goods transportation stands, it may be used for transporting bulk goods, whereby the bottom of the cargo space of the ship is reinforced to endure the handling of bulk goods. An essential advantage is also that it is easy to provide.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] In the following, the invention will be described in greater detail by means of a preferred embodiment with reference to the attached drawings, in which

Figure 1 illustrates a ship of the invention in side view, Figure 2 shows the ship in Figure 1 seen along section line II - II of Figure 1,

Figure 3 is a perspective, cross-sectional view of the structure of the cargo space bottom of the ship in

Figure 1,
Figure 4 is a side view of the structure in Figure 3 and
Figure 5 illustrates the structure in figure 4 seen
along section line V - V in Figure 4.

DETAILED DESCRIPTION OF THE INVENTION

[0016] The ship of Figure 1 is suitable for transporting containers 1 and stands. For that purpose, on the bottom 3 of the ship's cargo space 2, there are arranged a large number of container supports, on top of which the containers 1 are secured. Reference numeral 5 denotes the container supports in Figure 2. For the sake of simplicity, only a few container supports 5 are depicted in Figure 2. The container support may be called a container shoe.

[0017] The structure of the bottom 3 of the ship's cargo space 1 appears from Figures 3 to 5. The bottom 3 of the cargo space comprises an even, continuous bottom steel plate 4, on top of which is welded (or otherwise fixedly secured or arranged) a plurality of container supports 5. Figures 3 to 5 only show one container support 5. The container support 5 of the figure comprises four attachment points 6 for attachment means, wherewith the container (or alternatively a goods transportation stand) is attached to the bottom of the cargo space. Attachment means are not shown, because they may be, and preferably also are, of a conventional type. The attachment points 6 are recesses, in which the attachment means are engaged. It is possible to attach corners of four containers to the container support of Figure 3. Alternatively, it is conceivable to use container supports having attachment points for attaching the corners of only two containers, or only one attachment point allowing attachment of the corner of only one container.

[0018] The thickness S of the bottom plate 4 is 10 mm, for instance. Typically S is 8 to 12 mm, depending on the ship. The height H1 of the container support 5 protruding from the bottom plate 4 is 30 mm, for instance, whereby the upper end of the container support is at a distance H1 from the level defined by the bottom plate. The height H1 of the container support 5 may vary depending on the type of the container support.

[0019] On top of the bottom plate 4 there is a levelling plate 7. The levelling plate 7 is provided by a plurality of levelling plate portions set side by side. The levelling plate portions need not be attached to the bottom plate 4, but they are preferably loose on top of the bottom plate 4. The levelling plate portions may be 1.2 m x 2 m in size, or in any other available plate size. The levelling plate 7 may preferably be a plywood plate, waterproof plywood being particularly preferable. The levelling plate 7 substantially covers the entire bottom plate 4, whereby its surface area substantially corresponds to that of the bottom plate. The surface area of the levelling plate 7 is, however, smaller than the surface area of the bottom plate 4, because holes (through holes) are provided in the levelling plate at the location of container supports 5. Edges or walls of the holes are denoted by reference

numeral 8 in Figure 4. Between the walls of the holes 8 in the levelling plate 7 and the container support 5 there is a gap that is filled with sealant M1. As the sealant M1 it is preferable to use rubberized bitumen, because it is easy to pour in when warm, and consequently it is easy to provide a structure that seals to the effect that moisture has no access beneath the levelling plate 7. Alternatively, the sealant M1 may be silicon. In addition, the levelling plate 7 should comprise through holes (not shown) at the location of manholes, if any, as well as through holes (not shown) for other required lead-through points.

[0020] The thickness S1 of the levelling plate 7 is 20 mm, for instance. The thickness S1 of the levelling plate 7 is preferably selected according to the height of the container support 5. The higher the container support 5, the thicker the levelling plate 7 to be used.

[0021] On top of the levelling plate 7 there is a protective plate 9. The protective plate 9 consists of several juxtaposed protective plate portions. The protective plate portions may be e.g. 2 m x 4 m in size, or in any available plate size. The protective plate may preferably be a steel plate consisting of several steel plate portions welded to one another. Steel resists well the wear, to which the cargo space is subjected when it is used for bulk goods. Like the levelling plate 7, the protective plate 9 covers substantially the entire bottom plate 4, whereby its surface area substantially corresponds to that of the bottom plate. The protective plate 9 comprises holes at the location of container supports 5. The diameter of the holes, which may be called lead-through points 12, is slightly longer than the length of a side of the container support 5, whereby minor gaps will be formed between the container support 5 and the protective plate 9. The protective plate 9 is welded to the container support 5, through which (in addition to the support pieces 11 described below) the protective plate is partly attached to the bottom plate 4. Welding points are denoted by reference numeral 10 in Figure 3. The welds are provided in the midpoint of all sides of the container support 5. Small gaps between the container shoe 5 and the protective plate surrounding it are filled with sealant M2. The width of the gaps, i.e. the width of the sealant M2, is 10 mm, for instance.

[0022] The upper surface of the protective plate 9 is at the same level with upper end (upper surface) of the container support 5, whereby the thickness S2 of the protective plate 9 is the height H1 of the container support 5 minus the thickness S1 of the levelling plate 7. If H1 is 30 mm and S1 is 15 mm, the thickness of the protective plate 9 is 15 mm. It is conceivable that the thickness of the protective plate is preferably 15 to 20 mm. In that case the thickness of a filler plate 7 is preferably 20 to 80 %, and more preferably 40 to 75 % of the height H1 of the container support 5, depending on the height of the container support.

[0023] It also appears from Figures 3 to 5 that on top of the bottom plate 4 there are arranged support pieces 11. The support pieces 11, which are preferably pieces of steel, are welded to the bottom plate 4. Weld joints are

depicted in Figure 3 by reference numeral 14. The height H2 of the support pieces 11 is greater than thickness S1 of the levelling plate 7 but smaller than the total thickness S1 + S2 of the levelling plate 7 and the protective plate 9. The protective plate (protective plate portions) is welded to the support pieces 11, whereby the protective plate 9 is also attached to the bottom plate (i.e. in addition to container support 5) through the support pieces 11. Weld joints are depicted in Figure by reference numeral 13. The purpose of the support pieces 11 is thus to attach the edge areas of the protective plate 9 (protective plate portions) to the bottom plate 4 and to support the protective plate (protective plate portions) and to provide an even and strong protective plate 9. As it appears from Figures 3 to 5, the support pieces are placed in alignment on top of the bottom plate 4. The levelling plate 7 (levelling plate portions) will be at a short distance, for instance 5 mm, from the support pieces 11. Between the upper surface of the support pieces 11 and the protective plate 9 there is sealant M3, as is also around the support pieces, see Figure 4. The sealant M3 is not shown in Figure 3 in order to better reveal the structure of the bottom 3. However, in Figures 3 and 5 the sealant M3 is shown.

[0024] The width L of the support pieces 11 is 20 mm, for instance. It is assumed that the width L is preferably 10 to 30 mm and more preferably 10 to 20 mm. If the width L is excessive, the grab wherewith bulk goods is unloaded from the cargo space may get caught to the sealant M3 and the edge of the protective plate close to the support piece 11, and thus damage the protective plate 9.

[0025] The number and exact location of the support pieces 11 are not described herein, because they are ship-specific and it is not difficult for a person skilled in the art to design the location and number of the support pieces to be suitable for the use.

[0026] In the above the invention is only described by way of example and therefore it should be noted that the details of the invention may differ in a variety of ways from the presented example within the scope of the attached claims. Thus, for instance, the material of the levelling plate and the means of sealing the area around the container supports, may deviate from what is set forth. The levelling plate may be, for instance, a plate of rubber mixture or cast stone material, such as concrete. When made of rubber or cast stone material, the levelling plate may more adequately be called a levelling construction.

Claims

1. A ship comprising a cargo space (2) on the bottom (3) of which there is a bottom plate (4), whereby above the level formed by the bottom plate there are a plurality of container supports (5) for receiving and securing containers and cargo transportation stands to the cargo space (2), the upper end of the container supports (5) being at a distance equal to the height

(H1) of the container supports (5) from the bottom plate (4), **characterized in that** on top of the bottom plate (4) of the cargo space is arranged a levelling construction (7), on top of which is arranged a protective plate (9), in which there are provided lead-through points (12) for the container supports (5) so that the container supports are surrounded by the protective plate (9) and an upper level of the protective plate (9) is at a level of the upper end of the container supports (5).

2. The ship of claim 1, **characterized in that** the levelling construction is a levelling plate (7), in which there are provided through holes (8) for container supports (5).

3. The ship of claim 2, **characterized in that** between the walls defining the through holes (8) in the levelling plate (7) and the container supports (5) there is arranged a sealant (M1).

4. The ship of claim 1 or 2, **characterized in that** the protective plate (9) is welded (10) to the container supports (5).

5. The ship of claim 1 or 2, **characterized in that** on top of the bottom plate (4) there is attached a number of support pieces (11), on which the protective plate (9) is welded.

6. The ship of claim 5, **characterized in that** the height (H2) of the support pieces (11) is greater than the thickness (S1) of the levelling plate (7) and smaller than the total thickness (S1 + S2) of the levelling plate and the protective plate (9).

7. The ship of claim 6, **characterized in that** between the upper surface of the support pieces (11) and the upper surface of the protective plate (9) there is arranged sealant (M3) such that the upper level of the sealant is roughly on the same level with the upper surface of the protective plate.

8. The ship of any one of the preceding claims 5 to 7, **characterized in that** the width (L) of the support pieces (11) is 10 to 30 mm.

9. The ship of claim 2, **characterized in that** the levelling plate (7) consists of several levelling plate portions and the protective plate (9) consists of several protective plate portions.

10. The ship of claim 2, **characterized in that** the levelling plate (7) is made of material lighter than steel plate.

11. The ship of claim 2, **characterized in that** the levelling plate (7) is of plywood.

12. The ship of any one of the preceding claims 2 to 11, **characterized** in that the thickness (S1) of the levelling plate (7) is 20 to 80 % of the height (H1) of the container support (5).
13. The ship of claim 12, **characterized in that** the thickness of the levelling plate (7) is 40 to 75 % of the height (H1) of the container support (5).
14. The ship of claim 1, **characterized in that** the protective plate (9) is of steel plate.
15. The ship of claim 3 or 7, **characterized in that** the sealant (M1, M3) is rubberized bitumen.

Patentansprüche

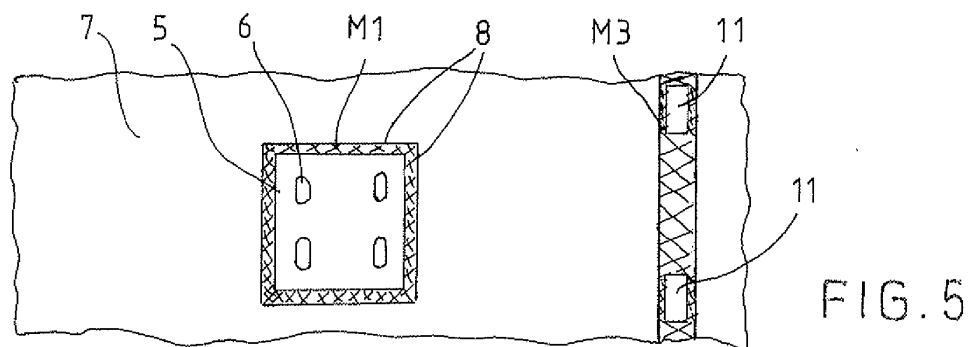
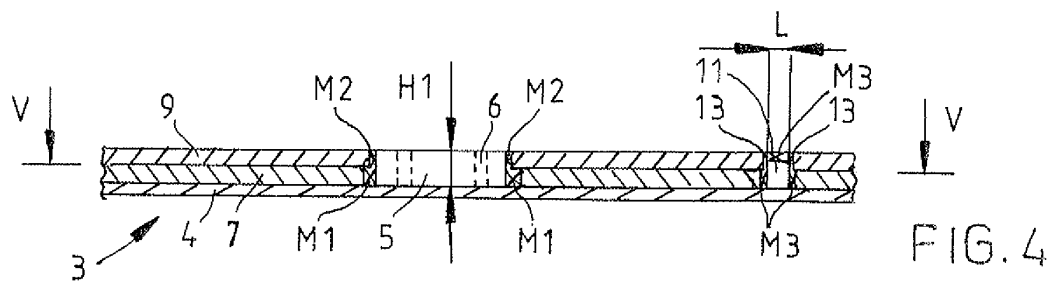
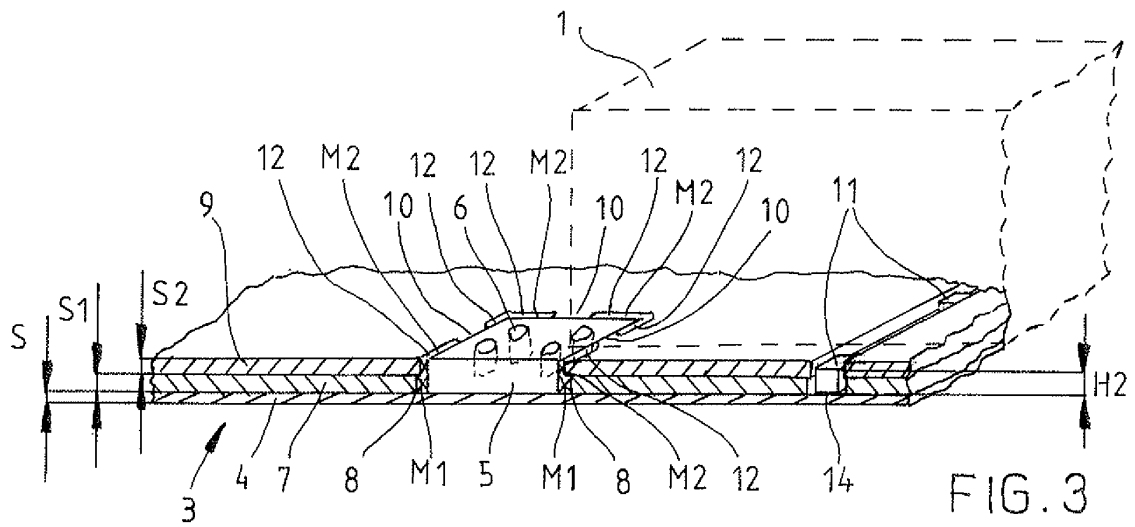
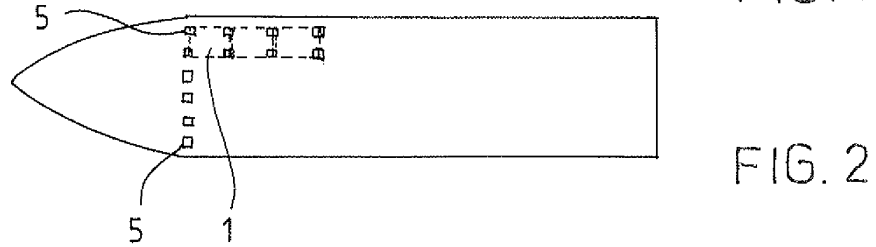
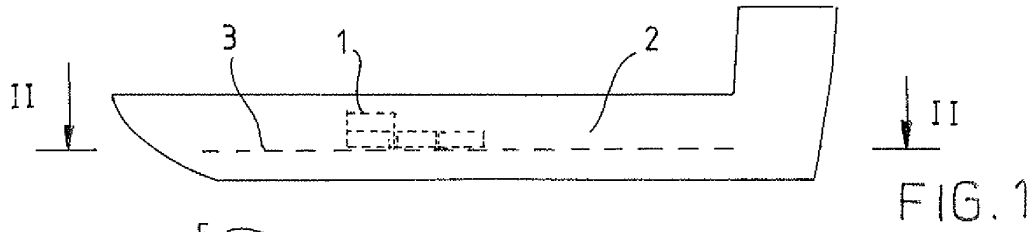
1. Schiff, das einen Frachtraum (2) umfasst, an dessen Boden (3) sich eine Bodenplatte (4) befindet, wobei sich oberhalb der durch die Bodenplatte gebildeten Ebene mehrere Containerauflagen (5) befinden, um Container und Frachtbeförderungsgestelle aufzunehmen und an dem Frachtraum (2) zu befestigen, wobei sich das obere Ende der Containerauflagen (5) in einem Abstand, welcher der Höhe (H1) der Containerauflagen (5) gleich ist, von der Bodenplatte (4) befindet, **dadurch gekennzeichnet, dass** oben auf der Bodenplatte (4) des Frachtraums eine Nivellierkonstruktion (7) angeordnet ist, auf der eine Schutzplatte (9) angeordnet ist, in der Durchführungspunkte (12) für die Containerauflagen (5) bereitgestellt werden, so dass die Containerauflagen durch die Schutzplatte (9) umschlossen werden und sich eine obere Ebene der Schutzplatte (9) auf einer Ebene des oberen Endes der Containerauflagen (5) befindet.
2. Schiff nach Anspruch 1, **dadurch gekennzeichnet, dass** die Nivellierkonstruktion eine Nivellierplatte (7) ist, in der Durchgangslöcher (8) für Containerauflagen (5) bereitgestellt werden.
3. Schiff nach Anspruch 2, dadurch gekennzeichnet, dass zwischen den Wänden, welche die Durchgangslöcher (8) in der Nivellierplatte (7) definierten, und den Containerauflagen (5) ein Dichtungsmaterial (M1) angeordnet ist.
4. Schiff nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schutzplatte (9) an die Containerauflagen (5) geschweißt (10) ist.
5. Schiff nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** oben auf der Bodenplatte (4) eine Anzahl von Auflagestücken (11) befestigt ist, an welche die Schutzplatte (9) geschweißt ist.

6. Schiff nach Anspruch 5, **dadurch gekennzeichnet, dass** die Höhe (H2) der Auflagestücke (11) größer als die Dicke (S1) der Nivellierplatte (7) und kleiner als die Gesamtdicke (S1 + S2) der Nivellierplatte und der Schutzplatte (9) ist.
7. Schiff nach Anspruch 6, **dadurch gekennzeichnet, dass** zwischen der oberen Fläche der Auflagestücke (11) und der oberen Fläche der Schutzplatte (9) ein Dichtungsmaterial (M3) derart angeordnet ist, dass sich die obere Ebene der Dichtungsmaterial grob auf der gleichen Ebene mit der oberen Fläche der Schutzplatte befindet.
8. Schiff nach einem der vorhergehenden Ansprüche 5 bis 7, **dadurch gekennzeichnet, dass** die Breite (L) der Auflagestücke (11) 10 bis 30 mm beträgt.
9. Schiff nach Anspruch 2, dadurch gekennzeichnet, dass die Nivellierplatte (7) aus mehreren Nivellierplattenabschnitten besteht und die Schutzplatte (9) aus mehreren Schutzplattenabschnitten besteht.
10. Schiff nach Anspruch 2, **dadurch gekennzeichnet, dass** die Nivellierplatte (7) aus einem Werkstoff hergestellt ist, der leichter als Stahlblech ist.
11. Schiff nach Anspruch 2, **dadurch gekennzeichnet, dass** die Nivellierplatte (7) aus Sperrholz ist.
12. Schiff nach einem der vorhergehenden Ansprüche 2 bis 11, dadurch gekennzeichnet, dass die Dicke (S1) der Nivellierplatte (7) 20 bis 80 % der Höhe (H1) der Containerauflage (5) beträgt.
13. Schiff nach Anspruch 12, **dadurch gekennzeichnet, dass** die Dicke der Nivellierplatte (7) 40 bis 75 % der Höhe (H1) der Containerauflage (5) beträgt.
14. Schiff nach Anspruch 1, **dadurch gekennzeichnet, dass** die Schutzplatte (9) aus Stahlblech besteht.
15. Schiff nach Anspruch 3 oder 7, **dadurch gekennzeichnet, dass** das Dichtungsmaterial (M1, M3) gummiertes Bitumen ist.

Revendications

1. Navire comprenant un espace de transport (2) au fond (3) duquel on trouve une plaque de fond (4), moyennant quoi, au-dessus du niveau formé par la plaque de fond, on trouve une pluralité de supports de conteneur (5) pour recevoir et fixer des conteneurs et des supports de transport de marchandise sur l'espace de transport (2), l'extrémité supérieure des supports de conteneur (5) étant à une distance égale à la hauteur (H1) des supports de conteneur

- (5) en partant de la plaque de fond (4), **caractérisé en ce que** sur la partie supérieure de la plaque de fond (4) de l'espace de transport, on agence une construction de mise à niveau (7), sur la partie supérieure de laquelle est agencée une plaque de protection (9), dans laquelle on prévoit des points d'attaque (12) pour les supports de conteneur (5), de sorte que les supports de conteneur sont entourés par la plaque de protection (9) et un niveau supérieur de la plaque de protection (9) est à un niveau de l'extrémité supérieure des supports de conteneur (5).
2. Navire selon la revendication 1, **caractérisé en ce que** la construction de mise à niveau est une plaque de mise à niveau (7), dans laquelle on trouve des trous de passage (8) pour les supports de conteneur (5).
3. Navire selon la revendication 2, **caractérisé en ce que**, entre les parois définissant les trous de passage (8) dans la plaque de mise à niveau (7) et les supports de conteneur (5), on dispose un produit d'étanchéité (M1).
4. Navire selon la revendication 1 ou 2, **caractérisé en ce que** la plaque de protection (9) est soudée (10) aux supports de conteneur (5).
5. Navire selon les revendications 1 ou 2, **caractérisé en ce que**, sur le dessus de la plaque de fond (4), on fixe un certain nombre de pièces de support (11) sur lesquelles la plaque de protection (9) est soudée.
6. Navire selon la revendication 5, **caractérisé en ce que** la hauteur (H2) des pièces de support (11) est supérieure à l'épaisseur (S1) de la plaque de mise à niveau (7) et inférieure à l'épaisseur totale (S1 + S2) de la plaque de mise à niveau et de la plaque de protection (9).
7. Navire selon la revendication 6, **caractérisé en ce que**, entre la surface supérieure des pièces de support (11) et la surface supérieure de la plaque de protection (9), on dispose un produit d'étanchéité (M3) de sorte que le niveau supérieur du produit d'étanchéité est approximativement au même niveau que la surface supérieure de la plaque de protection.
8. Navire selon l'une quelconque des revendications 5 à 7, **caractérisé en ce que** la largeur (L) des pièces de support (11) est de 10 à 30 mm.
9. Navire selon la revendication 2, **caractérisé en ce que** la plaque de mise à niveau (7) se compose de plusieurs parties de plaque de mise à niveau et la plaque de protection (9) se compose de plusieurs parties de plaque de protection.
10. Navire selon la revendication 2, **caractérisé en ce que** la plaque de mise à niveau (7) est réalisée avec un matériau plus léger qu'une plaque d'acier.
11. Navire selon la revendication 2, **caractérisé en ce que** la plaque de mise à niveau (7) est en contreplaqué.
12. Navire selon l'une quelconque des revendications 2 à 11, **caractérisé en ce que** l'épaisseur (S1) de la plaque de mise à niveau (7) représente de 20 à 80% de la hauteur (H1) du support de conteneur (5).
13. Navire selon la revendication 12, **caractérisé en ce que** l'épaisseur de la plaque de mise à niveau (7) représente de 40 à 75% de la hauteur (H1) du support de conteneur (5).
14. Navire selon la revendication 1, **caractérisé en ce que** la plaque de protection (9) est réalisée avec une plaque en acier.
15. Navire selon la revendication 3 ou 7, **caractérisé en ce que** le produit d'étanchéité (M1, M3) est du bitume caoutchouté.



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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