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The invention relates to a method to enlarge a ship, and to an enlarged ship.

Due to their maximum width of 32.3 m, maximum length of 294.3 m and their maximum draught of 12.04 m, Panamax container ships are able to go through
5 the locks of the Panama Canal and are hence able to pass through the Panama Canal. Nonetheless, the profitability of these ships is significantly less than ships with a greater beam on routes which do not include the Panama Canal. In particular, this is because it is more cost-efficient to operate wider and slower ships whose required ballast for stability is significantly reduced in favor of the cargo
10 due to the enormous increase in fuel prices. Furthermore, after the conversion of the Panama Canal which is slated to be finished after 2016, larger ships of the Neopanamax class will be able to pass through the canal with maximum ship dimensions of 49 m in width, 366 m in length and a maximum 15.2 m draught.

15 It is already known to increase the cargo capacity of container ships by installing an additional hull section. Limits to this are set in that the ship's hull is designed for loads acting on the ship's hull with the original length. Consequently, a lengthening of the ship may require expensive reinforcement of the hull. The comparatively low transverse stability of the ship is not improved by the lengthening.

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It is already known to widen the ship by welding on widenings that include chambers at the outside of the side walls of the ship at the height of the water line or below. The transverse stability of the ship is increased by means of these sponsons; however, the cargo capacity is not enhanced.

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Also known is the widening of the ship by welding on a support structure with ship side walls that are shifted outward on the outside of the ship's hull. The support structure supports widenings of the main deck which increases the stowage capacity on the deck. No additional stowage capacity for containers is created below
30 low deck.

US 3,397,663 A and JP S55 19641 A describe methods for increasing the tonnage of ships in which the ship's hull is lengthened by at least one additional rear

ship section which is installed between a middle ship section and a rear ship section.

The known ship widenings require a major deployment of steel with a corresponding increase in the dead weight, which is reflected in the conversion cost, fuel consumption and corresponding pollutant emissions.

Against this background, the objective of the invention is to provide a method for widening ships which makes possible ships with a greater cargo capacity, more favorable fuel consumption, and that get by with a reduced quality of steel. Furthermore, the objective of the invention is to create a larger ship with a greater cargo capacity, more favorable fuel consumption and reduced quantity of additionally installed steel.

The objective is achieved by a method with the characteristics of claim 1. Advantageous embodiments of the method are cited in the dependent claims.

In the method according to the invention for enlarging a ship:

- a container ship, conbulker, multipurpose ship, lash ship or another ship with a large open deck is widened, wherein
- a front ship section comprising the bow and a rear ship section comprising the stern are separated from a middle ship section comprising at least part of the cargo space,
- the front ship section and the middle ship section are moved apart from each other in the longitudinal direction,
- the middle ship section is divided in the longitudinal direction into at least two middle ship parts,
- the middle ship parts are moved apart from each other in the transverse direction of the ship,
- an additional middle part is installed between the moved-apart middle ship parts to form a wider middle ship section,

- an additional ship section widening toward the rear is mounted between the front ship section and the widened middle ship section, and
- the rear ship section is mounted on the rear of the widened middle ship section by welding, wherein the rear ship section is welded with the middle ship section.

5 In the method according to the invention, the cargo capacity is increased both on deck and below deck by the installation of the additional middle part in the ship. In a container ship, many more additional container berths can accordingly be

10 provided than is the case with the known method in which only additional berths are created on deck. By widening the ship, the transverse stability of the ship's hull is increased so that the required ballast for stability can be significantly reduced in favor of the cargo. This reduces fuel consumption and pollutant emissions. The additional middle part is inserted in an area of the ship which is ex-

15 posed to comparatively low stress so that the widening of the ship gets by with a comparatively low deployment of steel. This lowers conversion costs and also has an advantageous effect on fuel consumption and the pollutant emissions of the wider ship. Furthermore in widening the ship, the sides of the ship relevant to the hull strength with the outer shell, wing bulkheads and hatchway side coaming

20 in the middle ship section are not changed, which would be associated with a large use of material and could result in an impairment of the strength since these components form a complex strength system. Through the additional ship section which widens toward the rear and is mounted between the front ship section and the widened middle ship section, the cargo capacity can be increased on the deck

25 and below the deck. Since the additional ship section widens toward the rear, the widened ship is provided with a streamlined shape which positively affects the fuel consumption and pollutant emissions. Furthermore, the engine room with the ship engine, deckhouse, stern, propeller and rudder system (shaft and rudder system or rudder propeller) are not affected by the conversion to the extent that

30 they are located in the rear ship section. The ship propulsion system can generally be retained unchanged since the conversion only slightly affects the required energy, and the ship propulsion system is usually designed for high performance

in any case. Furthermore, a new propeller is generally unnecessary since the ship travels more slowly due to the enlargement.

According to a preferred embodiment, the front ship section in front of the cargo
5 space is separated from the middle ship section. This allows the majority of the cargo space, or the entire cargo space, to be widened. According to another embodiment, the front ship section, including the collision bulkhead and in front of the subsequent transverse bulkhead, is separated from the middle ship section. After the conversion, the collision bulkhead terminates the widened and length-
10 ened cargo space at the front.

According to another embodiment, the rear ship section in front of the engine room is separated from the middle ship section. In this embodiment, the engine room is not affected by the conversion. According to another embodiment, the
15 rear ship section, including the front bulkhead of the engine room behind the preceding transverse bulkhead, is separated from the middle ship section. During the conversion, the engine room is also sealed by the front bulkhead, and after the conversion, the front bulkhead separates the engine room from the enlarged cargo space. According to a preferred embodiment, the rear ship section includ-
20 ing the deckhouse is separated from the middle ship section. In this embodiment, the deckhouse is not affected by the conversion.

According to one embodiment, the middle ship section is divided into at least two parts at a distance from the longitudinal middle axis of the ship. Along the longi-
25 tudinal middle axis, ships have a reinforced keel area which is frequently provided with a central pipe tunnel on the inside through which the cable and pipe systems run. With this procedure, interference with the pipe tunnel can be avoided. The additional middle part is preferably reinforced corresponding to the original keel area in order to form the new keel area. According to another embodiment, the
30 middle ship section is divided along the longitudinal middle axis of the ship. Preferably, the additional middle part is provided with reinforcements corresponding to the original keel area so that the converted ship has a widened, reinforced keel area. According to another embodiment, the middle ship section is divided on

both sides into three parts at a distance from the longitudinal middle axis. The middle part divided in this context is removed and replaced with a wider, additional middle part. The additional middle part preferably has reinforcements in the keel area. The conversion is in fact more involved, however it leads to savings in material and weight if the keel area is only reinforced where necessary.

According to another embodiment, the additional middle part comprises at least one prefabricated section which is installed between the two middle ship parts of the middle ship section. This improves the production processes.

According to another embodiment, the two middle ship parts are moved apart from each other further than the additional middle part is wide, and the two middle ship parts are moved together after insertion of the additional middle part so that they abut the inserted middle part, and the middle ship parts are then connected to the additional middle part. This facilitates the installation of the additional middle part.

According to another embodiment, the additional ship section is prefabricated and installed between the front ship section and middle ship section. This further improves the production processes.

According to another embodiment, the front ship section and middle ship section are moved apart from each other to a distance exceeding the length of the front ship section before inserting the additional ship section and, after inserting the front ship section, are joined so that they abut the front ship section and are subsequently connected thereto. This further facilitates the installation of the additional ship section.

According to another embodiment, the side and floor walls of the additional ship section are connected at the front to the side and floor walls of the front ship section, and at the rear to the side and floor walls of the widened middle ship section. This creates streamlined transitions from the front ship section to the middle ship section.

According to another embodiment, the rear ship section and the middle ship section are moved apart from each other after the separation of the rear ship section, and the rear ship section and the widened middle ship section are moved together and then connected to each other after the widening of the middle ship section.

- 5 This makes it easier to move apart the middle ship sections and install the additional middle part.

According to another embodiment, the rear ends of the side walls of the widened middle ship section are connected by means of connecting walls to the rear ship section. The connecting walls increase the strength of the connecting area between the widened middle ship section and rear ship section. In addition, the connecting walls can seal both sides of the widened middle ship section at the rear. According to another embodiment, the distance of the connecting walls to each other decreases toward the rear. Preferably, the connecting walls are installed at a sharp angle relative to the longitudinal axis of the ship so that they extended to the rear and toward the side walls of the rear ship section. This creates a gradual, streamlined transition from the middle ship section to the rear ship section.

20 According to another embodiment, the chambers between the connecting walls and ship body are closed at the bottom by widenings in the ship floor on both sides. It is furthermore preferable for the side connecting walls to curve at the bottom toward the widenings of the ship floor on both sides. Preferably, the curvature of the connecting walls is adapted at the front and rear to the curved transition from the side walls to the ship floor in the area of the middle ship section and the rear ship section. According to another embodiment, the chambers between the connecting walls and ship body are closed at the bottom by widenings in the ship floor.

30 According to one embodiment, the ship is provided with reinforcements on the sheer strake. According to one embodiment, the reinforcements are flat irons. According to another embodiment, the reinforcements are affixed to the main sheer strake. According to another embodiment, the reinforcements are affixed

to the middle ship section. The reinforcements compensate for greater stress on the ship arising from the greater length.

According to another embodiment, the forecastle of the ships is lengthened. According to one preferred embodiment, the lengthening of the forecastle is created by welding on additional plates.

According to another embodiment, the bulbous bow is removed and replaced with a bulbous bow optimized to the shape of the enlarged ship. This reduces fuel consumption and pollutant emissions.

According to another embodiment, the bridge wing is widened so that its width corresponds to the width of the widened middle ship section. The widened bridge wing is advantageously design for mooring.

According to the invention, a containership, a conbunker, a multipurpose ship, a lash ship or another ship with a largely open deck is enlarged. The method is advantageously useful particularly for ships with a largely open deck because the structures affected by the conversion of these types of ships are particularly suitable for conversion.

According to another embodiment for a container ship, or a conbunker, or a multipurpose ship, the widened middle ship section and/or the additional ship section is provided with additional hatch coamings and covered with additional hatch covers.

To shift the ship sections, conventional hydraulic or pneumatic heavy duty transport systems with sliding carriages are preferably use. Alternatively, the ship sections can for example be floated in dock, shifted, and then set down.

To separate the ship sections from each other and the parts of the middle ship section, cutting torch systems are preferably used.

Preferably welding methods are used to connect the different ship structures, in particular while installing, or respectively building on the middle part, the additional ship section, the rear ship section, the connecting walls and the widenings of the ship floor and the main deck. Riveted connections are also possible.

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In particular, the middle part comprises additional sections of the double floor, transverse bulkheads and if applicable a longitudinal bulkhead. In a container ship, it furthermore comprises additional sections of transverse coamings and galleries. The additional section of the double floor, transverse bulkheads and if applicable transverse coamings and galleries are connected to the corresponding structural parts of the moved-apart middle ship parts in order to enlarge them. The longitudinal bulkhead is preferably connected to transverse bulkheads, such as to the collision bulkhead of the bow and the front bulkhead of the engine room.

15 The additional ship element comprises in particular an additional section of the double floor, additional sections of the side walls of the ship as well as an additional section of the main deck. Additional transversal bulkheads and sections of longitudinal bulkheads are also included as well as additional hatches and transverse coamings and galleries.

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Furthermore, the objective is achieved with a ship according to claim 12. Advantageous embodiments of the ship are cited in the subclaims.

The container ship, conbulker, multipurpose ship, lash ship or another ship with a large open deck according to the invention has:

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- a middle ship section, comprising at least part of the cargo space, which is widened by an installed middle part extending in the longitudinal direction of the ship,
- an additional ship section which widens toward the rear and is installed between a front ship section comprising the bow and the widened middle ship section, and

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- a rear ship section which comprises the stern, is less wide than the widened middle section ship section and by welding, wherein the rear ship section is welded with the middle ship section.

5 The ship possesses the advantages listed in conjunction with the explanation of the method.

According to another embodiment, the rear ship section comprises the engine room with the ship engine, the deckhouse, the stern, and the rudder and propeller
10 system.

According to another embodiment, the front ship section comprises the collision bulkhead, and/or the rear ship section comprises the front bulkhead of the engine room and/or the deckhouse.

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According to one embodiment, the middle part is installed offset relative to the longitudinal middle axis of the ship.

According to another embodiment, the rear ends of the side walls of the widened
20 middle ship section are connected to the rear ship section by means of connecting walls whose distance from each other gradually decreases toward the rear.

According to another embodiment, the sheer strake is provided with reinforcements. According to another embodiment, the main deck sheer strake is provided
25 with reinforcements. According to another embodiment, the reinforcements are located in the middle ship section. According to a preferred embodiment, the reinforcements are flat irons. The reinforcements are preferably welded on.

According to another embodiment, the ship has a bulbous bow optimized to the
30 shape of the widened ship.

According to another embodiment, the ship has a widened bridge wing which is adapted to the width of the widened middle ship section.

According to another embodiment, the forecastle has extensions to the rear.

The invention will be further explained below with reference to the accompanying drawings of a ship according to the invention and various conversion phases. In

5 the drawings:

Fig. 1 shows a cross-section of a conventional ship with widenings by means of sponsons;

10 Fig. 2 shows a cross-section of a conventional ship with widenings and additional container berths on deck;

Fig. 3 shows a cross-section of a ship according to the invention with an installed middle part in the cargo space;

15 Fig. 4 shows a side view of the same ship;

Fig. 5 shows a plan view of the same ship;

20 Fig. 6 shows an enlarged detail view of the inner floor of the same ship at the connecting area of the middle and rear ship sections;

Fig. 7 shows an enlarged detail view of the main deck of the same ship at the connecting area of the middle and rear ship sections;

25 Fig. 8 shows an enlarged detail view of the main deck of the same ship at the connecting area of the front and middle ship sections;

Fig. 9 shows a cross-section of the middle ship section of the same ship;

30 Fig. 10 shows a cross-section of a middle ship section of the same ship after dividing in a longitudinal direction and pushing apart the two middle ship parts;

Fig. 11 shows a cross-section of a widened middle ship section after the installation of the middle part;

In the following explanation of different ships, correspondingly designated parts
5 are provided with the same reference numbers.

Furthermore, the areas of the ship changed by the conversion are darker.

Fig. 1 to 3 show a Panmax container ship with an original cargo capacity of 4,300
10 standard containers (twenty-foot equivalent units/TEU).

According to Fig. 1, the ship 1 is widened by building sponsons 2, 3 onto the outside of the side walls 4, 5 of the ship's hull 6. The sponsons extend above and below the water line. The transverse stability of the ship 1 is increased and the
15 required ballast water is reduced by means of this widening. This does not create additional cargo capacity.

Fig. 2 shows an additional widening of the same ship 1. Structures 7, 8 are mounted on the side walls 4, 5 of the ship's hull 6 which are provided on the
20 outside with additional side walls 9, 10. At the top, the structures 7, 8 bear widenings 11, 12 of the main deck 13, and at the bottom, they are closed by additional floor walls 14, 15. Berths for additional containers are thereby created on the deck on both sides of the original ship's hull 6. In the example, the widening of the ship requires the use of about 5,000 tons of steel. The cargo capacity of
25 the ship is thereby increased by about 450 standard containers.

Fig. 3 shows a widened ship 1 according to the invention. A middle part 18 is installed in the middle ship section 16 along the longitudinal middle axis 17 of the ship 1. This gives the ship additional container berths on deck and below deck.
30 The widening of the middle ship section requires the use of about 2,000 tons of steel. This increases the cargo capacity by about 650 standard containers.

According to Fig. 4 and 5 the widened middle ship section 16 terminates at the front behind the collision bulkhead 18 of the bow and at the rear in front of the front bulkhead 20 of the engine room 21 in which the ship's engine is arranged. This is because when widening the ship 1, first the bow 22 including the collision
5 bulkhead 19 as the front ship section 23 is separated from the middle ship section 16, and a rear ship section 25 extending from the stern 24 to the front bulkhead 20 is separated from the middle ship section 16. When separating the rear ship section 25, the engine room 21, engine, shaft system 26, propeller 27, rudder system 28 and deckhouse 29 are not interfered with. Then the front ship section
10 23 was moved forward by about 8 m in the longitudinal direction, and the rear ship section 25 was moved to the rear by a small distance of for example 0.50 m in the longitudinal direction.

Then the middle ship section 16 was divided into two middle ship parts 30, 31 in
15 the longitudinal direction, and the two middle ship parts 30, 31 were moved apart in the transverse direction 32 of the ship 1. The division of the middle ship section 16 and pushing apart of the middle ship parts 30, 31 is shown in Fig. 9 to 11. Then the middle part 18 was placed in one or more sections between the middle ship parts 30, 31, and these were moved together until coming to rest on the
20 middle part 18. Then the middle ship parts 30, 31 were welded to the middle part 18.

Furthermore, the bulbous bow was replaced with a new bulbous bow 33 adapted to the new bow shape according to Fig. 4.

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In addition, an additional ship section 34 widened at the rear was inserted between the middle ship section 16 and the front ship section 23. The middle ship section 16 additional ship section 34 and front ship section 23 were moved together and welded to each other. The gap between the front ship section 23 and
30 middle ship section 16 is closed by the additional ship section 34, and a smooth streamlined transition is created between these sections.

Furthermore, the rear ship section 25 was moved up to the widened middle ship section 16. According to Fig. 6, the ship inner floor 35, and correspondingly the ship outer floor 36, of the ship floor 37 were provided with widenings 38, which gradually expand toward the front, on the front end of the rear ship section 25.

5 The widenings 38, 39 of the ship floor 37 terminate smoothly at the front against the outer edges of the ship floor 37 of the widened middle ship section 16, and die to the rear with the original width at a section of the ship floor 37 of the rear ship section 25.

10 Furthermore, the rear ship section 25 is welded to the widened middle ship section 16. Connecting walls 40, 41, whose distance from each other decreases toward the rear, were attached to the rear ends of the side walls 9, 10 of the widened middle ship section 16 according to Fig. 4 and 5, and the rear ends of the connecting walls are welded to the side walls 9, 10 of the rear ship section 25.

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The widenings 38, 39 of the ship floor 37 seal the chamber between the connecting walls 40, 41 and the ship's hull at the bottom.

According to Fig. 7, widenings 42, 43 of the main deck 13 were mounted on both
20 sides of the front end of the rear ship section 25, and they are connected at the front to the outer edge areas of the main deck of the middle ship section 16, and their width decreases toward the rear until they terminate at the original main deck 13 of the rear ship section 25. The widenings 42, 43 of the main deck 16 seal the chamber between the connecting walls 40, 41 and the ship's hull at the
25 top.

The connecting area between the middle ship section 16 and rear ship section 25 is reinforced by the connecting walls 40, 41 and widenings 38, 39 of the ship floor 37 and main deck 13. Furthermore the edge areas projecting from the rear
30 ship section 25 of the middle ship section 16 are sealed, and an even, streamlined transition is produced between the middle ship section 16 and the rear ship section 25.

In the area of the middle part 18 and the additional ship section 34, the hatches 44 are enlarged, or respectively additional hatches 45 are created, and additional berths for containers 47 are provided in the cargo space 46 and on the deck 13. Extensions 48 of the hatch coamings 49, or respectively additional hatch coamings 50, are installed which bear additional hatch covers. This is shown particularly in Fig. 8.

According to Fig. 11, the main sheer strake 51, 52 of the ship 1 is provided on both sides with reinforcements 53, 54.

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It can be seen in Fig. 5 that the forecastle 55 of the ship has reinforcements 56, 57 on both sides to the rear.

Fig. 3 shows that the bridge wing 58 is widened on both sides so that its width corresponds to the width of the widened middle ship section 16.

The different profitability of the ships from Fig. 1 to 3 is in particular illustrated by a comparison of the energy efficiency transport index (EETI). This compares the consumption of fuel to the cargo, consisting of containers that are each loaded with 14 tons, and the length of operation. The comparative value in kilograms of marine diesel oil (MDO)/TEU 14 x day is 30.4 for the ship in the first figure, 29.9 for the ship in the second figure, and 26.2 for the ship according to the invention. The comparative value of the ship according to the invention is similar to the comparative values of newly constructed ships with a ship's hull which is wider from the start.

25

List of Reference Numbers

	1	Ship
	2, 3	Sponson
5	4,5	Side walls
	6	Ship's hull
	7, 8	Structures
	9, 10	Side walls
	11, 12, 38, 39, 42, 43	Widenings
10	13	Deck
	14, 15	Floor walls
	16	Middle ship section
	17	Longitudinal middle axis
	18	Middle parts
15	19	Collision bulkhead
	20	Front bulkhead
	21	Engine room
	22	Bow
	23	Front ship section
20	24	Stern
	25	Rear ship section
	26	Shaft section
	27	Propeller
	28	Rudder system
25	29	Deckhouse
	30, 31	Middle ship parts
	32	Bulbous bow
	34	Additional ship section
	35	Ship inner floor
30	36	Ship outer floor
	37	Ship floor
	40, 41	Connecting walls
	44, 45	Hatches

	46	Cargo space
	47	Berths
	48, 56, 57	Extensions
	49, 50	Hatch coamings
5	51, 52	Sheer strake
	53, 54	Reinforcements
	55	Forecastle
	58	Bridge wing

Patentkrav

1. Fremgangsmåde til udvidelse af et skib, hvor

- 5 • et containerskib (1), et Conbulk-skib, et skib til flere formål, et Lash-skib eller et andet skib med stort, åbent dæk, gøres bredere, og hvor
- en forreste skibssektion (23), som omfatter en bov (22), og en bageste skibssektion (25), som omfatter en hæk (24), adskilles fra en midterste skibssektion (16), som omfatter i det mindste en del af et lastrum (46),
- 10 • den forreste skibssektion (23) og den midterste skibssektion (16) adskilles fra hinanden, set i længderetningen,
- den midterste skibssektion (16) - set i længderetningen (17) - deles i mindst to midterskibsdele (30, 31),
- midterskibsdelene (30, 31) adskilles fra hinanden set i skibets (1) tværretning (32),
- 15 • der mellem de to fra hinanden adskilte midterskibsdele (30, 31) indbygges en yderligere midterdel (18), så at der dannes en bredere midterste skibssektion (16),
- en yderligere skibssektion (34), som bliver bredere hen agter ud, installeres mellem den forreste skibssektion (23) og den i bredden udvidede midterste skibssektion (16), og
- 20 • den bageste skibssektion (25) påbygges på den i bredden forøgede midterste skibssektion (16) ved hjælp af svejsning, og at den bageste skibssektion (25) svejses sammen med den midterste skibssektion (16).

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2. Fremgangsmåde ifølge krav 1, hvor den forreste skibssektion (23) - indbefattet et kollisionsskot (19) foran et efterfølgende tværskot - adskilles fra den midterste skibssektion (16).

30 3. Fremgangsmåde ifølge krav 1 eller 2, hvor den bageste skibssektion (25) - indbefattet det forreste kollisionsskot (20) i motorrummet (21) bag ved et foran indrettet tværskot - adskilles fra den midterste skibssektion (16).

4. Fremgangsmåde ifølge et af kravene 1 til 3, hvor den midterste skibssektion (16) i en afstand fra en længdemidterakse (17) i skibet (1) deles i mindst to midterskibsdele (30, 31).
- 5 5. Fremgangsmåde ifølge et af kravene 1 til 3, hvor den yderligere midterdel (18) i det mindste udgøres af en i forvejen fremstillet sektion, som er indbygget mellem de to midterskibsdele (30, 31) i den midterste skibssektion (16).
6. Fremgangsmåde ifølge et af kravene 1 til 5, hvor den yderligere skibssektion
10 (34) er præfabrikeret og indbygget mellem den forreste skibssektion (23) og den midterste skibssektion (16).
7. Fremgangsmåde ifølge et af kravene 1 til 6, hvor de bageste ender af nogle sidevægge (9, 10) i den bredde-udvidede midterste skibssektion (16) forbindes
15 med den bageste skibssektion (25) ved hjælp af nogle forbindelsesvægge (40, 41), hvis afstand fra hinanden bagud gradvis aftager.
8. Fremgangsmåde ifølge krav 7, hvor hulrum mellem forbindelsesvægge (40, 41) og skibsskroget lukkes ved bunden ved hjælp af udvidelser (38, 39) af skibsdækket på begge sider, og/eller hvor hulrummene mellem forbindelsesvæggene
20 (40, 41) og skibsskroget lukkes foroven ved hjælp af bredere udformede dele (42, 43) af et hoveddæk (13).
9. Fremgangsmåde ifølge et af kravene 1 til 8, hvor en ræling (51, 52) forsynes
25 med afstivninger (53, 54).
10. Fremgangsmåde ifølge et af kravene 1 til 9, hvor en bak (55) i langsgående retning forsynes med forlængelser (56, 57), og/eller en bulbstævn fjernes og erstattes med en bulbstævn (33), som er optimeret til formen af det udvidede skib,
30 og/eller hvor en brovinge (58) gøres bredere, så at dens bredde kommer til at svare til bredden af den i bredden udvidede midterste skibssektion (16).

11. Udvidet containerskib (1), Conbulk-skib, skib til flere formål, Lash-skib eller andet skib med stor grad af "åbent dæk" og med

- 5 • en midterste skibssektion (16), der omfatter i det mindste en del af et last-
rum (46), som er udvidet ved hjælp af en midterste del (18), som strækker
sig i skibets længderetning (17),
- en yderligere skibssektion (34), som bliver bredere hen mod agterenden,
og som er indrettet mellem en forreste skibssektion (23) omfattende en bov
(22), og en bredere udformet midterste skibssektion (16), og
- 10 • hvor en bageste skibssektion (25), som omfatter en agterstavn (24), er
mindre bred end den bredere udformede midterste skibssektion (16) og er
påmonteret sidstnævnte ved svejsning, og hvor den bageste skibssektion
(25) er sammensvejst med den midterste skibssektion (16).

15 12. Skib ifølge krav 11, hvor den midterste del (18) er indbygget forskudt i forhold
til skibets længdeakse (17).

13. Skib ifølge krav 11 eller 12, hvor de bageste ender af nogle sidevægge i den
i bredden udvidede midterste skibssektion (16) er forbundet med den bageste
20 skibssektion (25) ved hjælp af nogle forbindelsesvægge (40, 41), hvis afstand fra
hinanden gradvis aftager i agter retningen.

14. Skib ifølge krav 13, hvor hulrum mellem forbindelsesvæggene (40, 41) og
skibsskroget er lukket forneden ved hjælp af udvidelser (38, 39) på begge sider
25 af et skibsdæk (37), og/eller hvor kamre mellem forbindelsesvæggene (40, 41)
og skibsskroget er lukket ved toppen ved hjælp af ret bredt udformede dele (42,
43) i et hoveddæk (13).

15. Skib ifølge et af kravene 11 til 14, hvor en ræling (51, 52) har afstivninger
30 (53, 54).

16. Skib ifølge et af kravene 11 til 15, som har en forstørret bovvulst (33), som
er tilpasset til den ret bredt udførte midterste skibssektion (16), en yderligere

skibssektion (34) og et overgangsområde mellem den i bredden udvidede midterste skibssektion (16) og den slankere bageste skibssektion (25), og/eller hvor bredden af en brovinge (58) er justeret efter bredden af den bredde-udvidede midterste skibssektion (16), og/eller hvor bakken (56) har forlængelser i agterret-

5 ningen.

1

Fig. 1

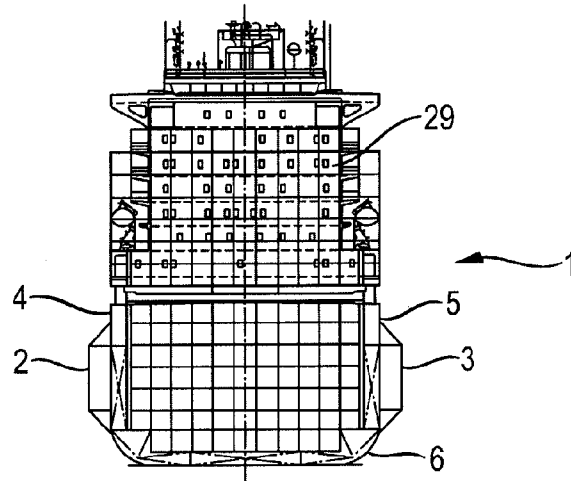


Fig. 2

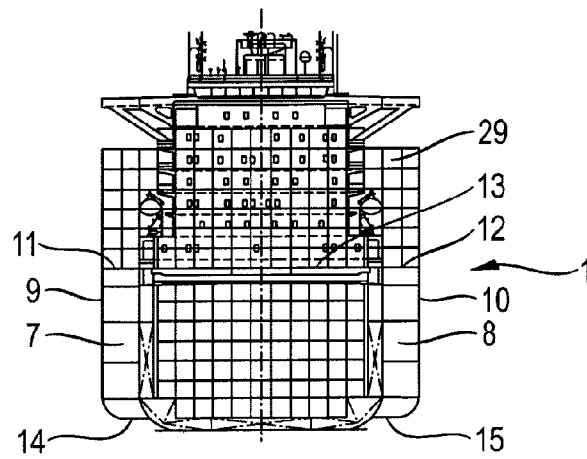


Fig. 3

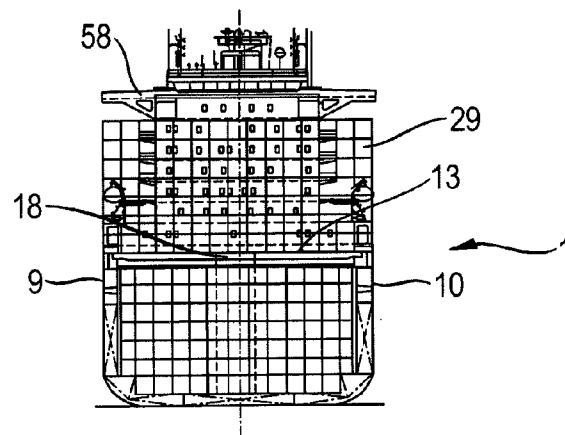


Fig. 4

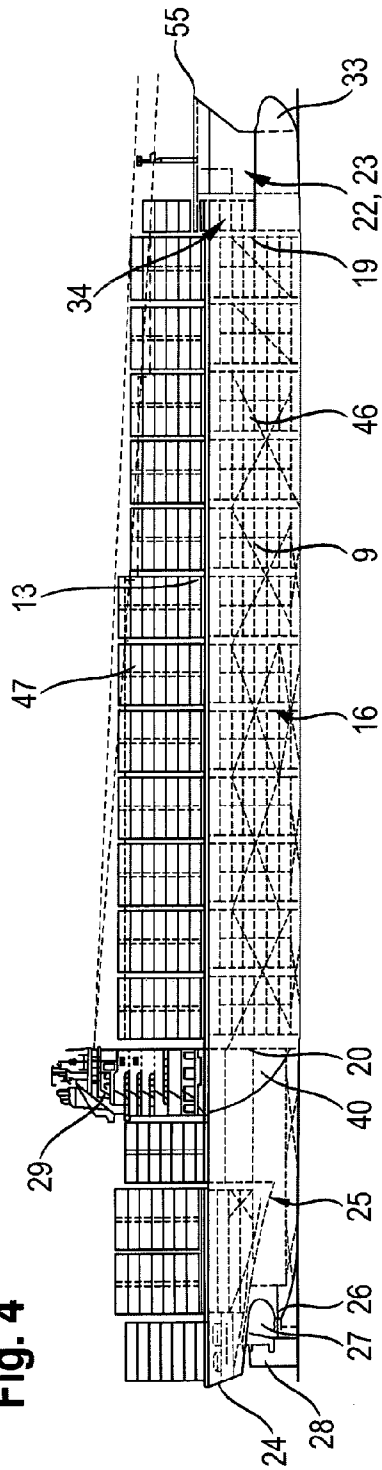


Fig. 5

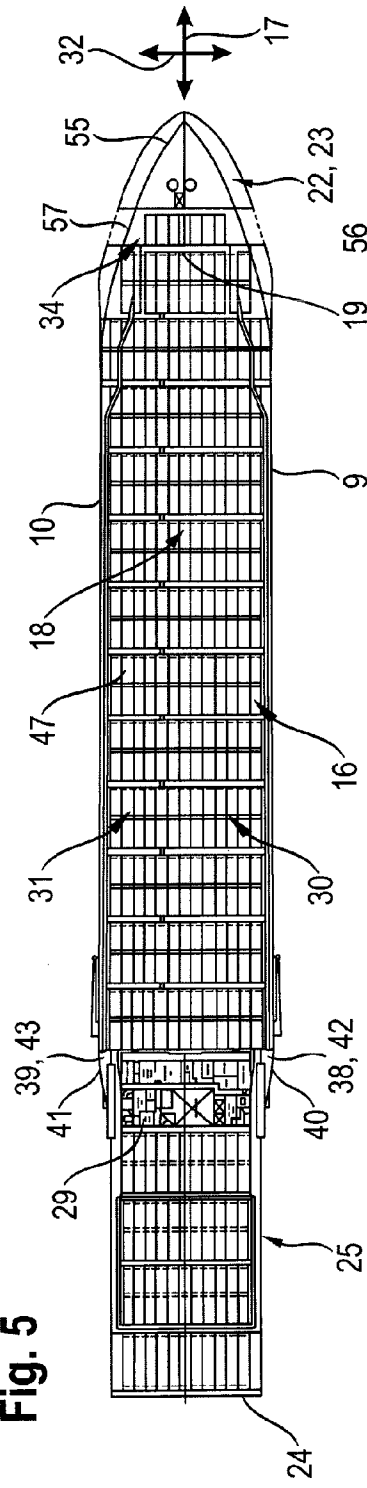
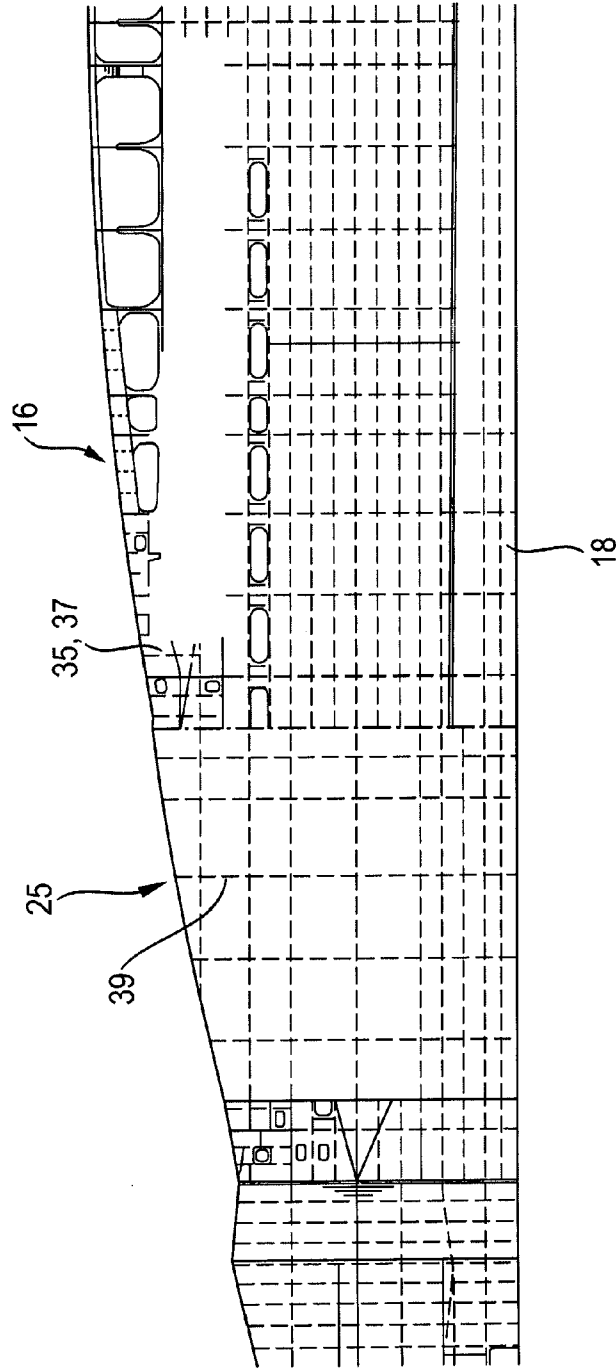
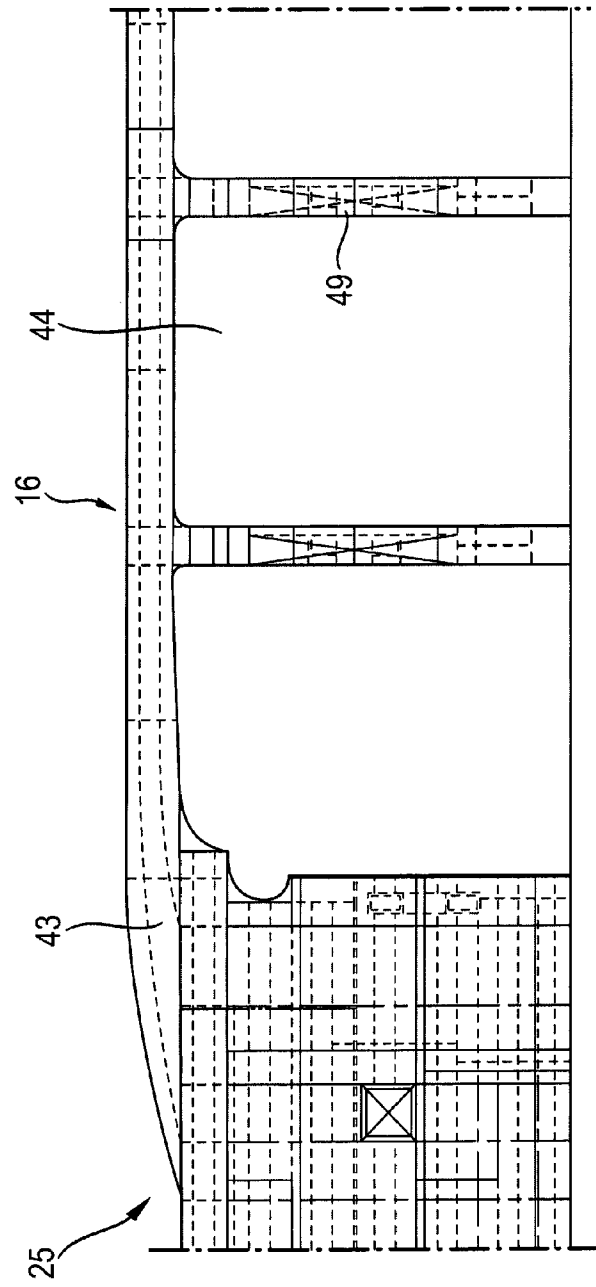


Fig. 6



4

Fig. 7



5

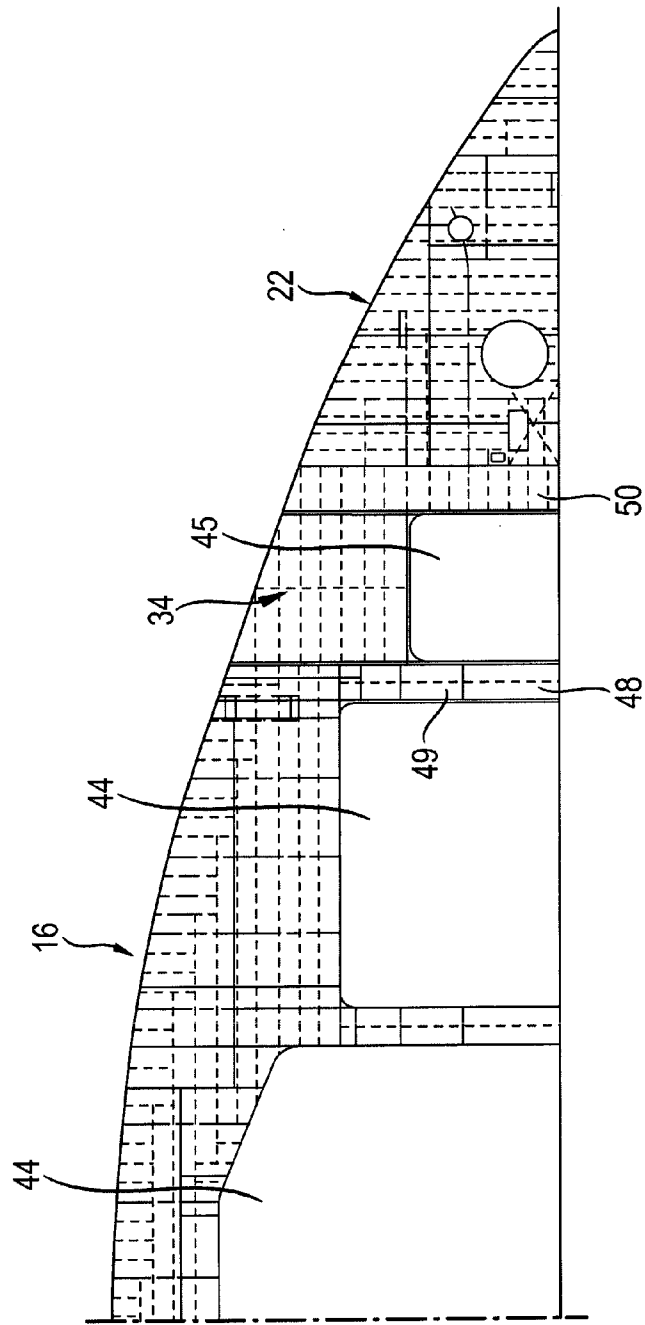


Fig. 8

6

