Structure for the transport, installation and dismantling of an oil rig deck and method for using one such structure

This invention relates to a structure for the transport, installation and dismantling of an offshore oil rig deck.

This invention relates to a process for the transport, installation and dismantling of an offshore oil rig deck.

In the extraction of oil it is known that an oil rig which comprises a deck bearing in particular operating equipment and accommodation is positioned above an oilfield.

The deck is supported by a supporting assembly comprising legs which bear against the sea bed or floating columns anchored to the sea bed.

Several methods are used to transport, instal and dismantle oil rig decks.

One known method comprises using lifting cranes mounted on barges to transfer the rig deck from the transport barge to the supporting assembly. This method, which is the one in most widespread use at the present time, has limitations. The first of these limitations is the lifting capacity of the lifting cranes, which may make it necessary to construct the deck in several sections, significantly increasing the manufacturing cost of the deck and the cost of installing and dismantling the said deck on the oil rig. The second limitation lies in the fact that this method makes it necessary to have a relatively large favourable weather window in order to be able to carry out this operation at sea under satisfactory conditions.

Another known method comprises installing the oil rig deck as a single block on the supporting assembly by causing it to float. The deck is then placed over the supporting assembly by means of either a ballasting system or a mechanical system.

The main disadvantage of ballasting or deballasting systems lies in the fact that they depend on sea conditions, which makes it difficult to use them in areas where the favourable weather windows are relatively short.

In general the mechanical systems used hitherto to instal and dismantle oil rig decks are faster than ballasting or deballasting systems.

Furthermore, a structure for the transport, installation and dismantling of a fixed oil rig deck which comprises a U-shaped floating hull fitted with at least three legs for lifting that hull and designed to bear against the sea bed and a shuttle which can move along the said legs on the hull and intended to be applied to the underside of an oil rig deck is known from FR-A-2 837 461.

Thus when the rig deck is installed or dismantled the legs are lowered to bear against the sea bed and the deck is lifted by the shuttle, which is itself lifted by the hull.

In the case of oilfields in deep water this type of structure cannot be used for the installation or dismantling of an oil rig deck because the legs have to be in contact with the bottom in order to lift the deck, which is impossible in the case of such fields.

The object of the invention is to overcome these disadvantages by providing a structure which can be used for the transport, installation or dismantling of a fixed or floating oil rig, in both shallow water and deep water.

For this purpose, the invention relates to a structure for the transport, installation and dismantling of an offshore oil rig deck characterised in that it comprises:

- a floating hull fitted with legs which can move vertically with respect to the hull as it floats, by means of moving mechanisms, and
- associated with each of the said legs, a shuttle which is intended to be applied against the underside of the deck and which can be moved on the corresponding leg between a low position on the floating hull and a high position lifting the rig deck, each shuttle being fitted with means for locking onto the corresponding leg.

According to particular embodiments,

- each movement mechanism comprises two opposing plates mounted on the corresponding leg and each comprising a set of teeth on each lateral surface and also at least two opposing assemblies carried on the hull each comprising a pinion which is driven in rotation and acts together with a set of teeth;
- at each leg the hull comprises means for guiding a corresponding shuttle between the low and high positions respectively,

- each shuttle is formed of a body comprising a vertical limb extending substantially parallel to the corresponding leg and provided at the top with a plate which extends substantially perpendicularly to the said limb and comprises an opening having a cross-section of a shape matching the transverse cross-section of the leg and also, at the bottom, a horizontal bearing plate supporting the deck,

- locking means are mounted on the plate of each shuttle,

- the locking means for each shuttle comprise at least one opposing rack which can be moved by at least one operating system between a retracted position and a locking position in which it engages one of the sets of teeth on the corresponding leg,

- the guide means for the shuttle on each leg comprise two columns extending substantially parallel to the corresponding leg and two passages made in the bearing plate of the said shuttle, each passage having a cross-section matching the transverse cross-section of the corresponding column,

- the hull is generally U-shaped,

- the U-shaped floating hull comprises two opposite and parallel side limbs each of which bear at least one leg and are connected together through a central limb,

- the two side limbs and the central limb float,

- the length of the central limb can be adjusted according to the width of the deck,

- the two side limbs comprise two floats and the central limb comprises a transverse beam supported by the said side limbs which can slide on the said beam, according to the width of the deck.

The open part of the hull comprises a gate formed of two opposing sections of beam which can each slide on a float between an open position to position at least one supporting column beneath the deck and a closed position while the said deck is being transported.

The invention also relates to a process for the transport and installation of an oil rig deck to its work site, characterised in that it comprises the following stages:

- through the use of floating transport means, bringing the rig deck into the vicinity of a floating structure comprising a U-shaped hull fitted with legs which can be moved vertically with respect to the floating hull and shuttles associated with each of the legs which can be moved on the corresponding leg,

- placing the floating structure beneath the deck,

- lowering the legs,

- locking each shuttle to the corresponding leg,

- placing the deck on the shuttles and removing the transport means,

- lifting the deck through the shuttles and the legs while the hull remains afloat;

- moving the structure supporting the deck to bring the deck above its support,

- lowering the shuttles by the legs in order to place the deck on its support,

- lowering the legs and the shuttles to release the deck from the structure, and

- removing the structure from the work site.

The invention also relates to a process for the dismantling and transport of an oil rig deck on a work site to floating transport means, characterised in that it comprises the following stages:

- bringing a floating structure comprising a U-shaped hull fitted with legs which can move vertically with respect to the floating hull and shuttles associated with each of the legs which can be moved on the corresponding leg, to the work site,

- lowering the legs,

- locking each shuttle on the corresponding leg,

- lifting the deck from its support through the shuttles and the legs, while the hull remains afloat,

- moving the structure supporting the deck to remove the deck from its support,

- placing transport means within the structure and below the deck,

- lowering the shuttles through the legs to place the deck on the transport means,

- lowering the legs and the shuttles to release the deck from the structure, and

- removing the deck from the structure by the transport means.

The invention will be better understood from a reading of the following description provided purely by way of example with reference to the appended drawings, in which:

- Figure 1 is a diagrammatical view in elevation of a floating oil rig in its working position,

- Figures 2 and 3 are diagrammatical perspective views of a structure for transport, installation and dismantling according to the invention in the position receiving the deck of the oil rig and in the position in which the deck is installed respectively,

- Figure 4 is a diagrammatical perspective view of a shuttle for the structure,

- Figure 5 is a partial view in vertical cross-section of the mechanical means for moving a leg of the structure,

- Figure 6 is a view in cross-section along the line 5-5 in Figure 5,

- Figure 7 is a diagrammatical view in vertical cross-section of the means for locking a shuttle onto a leg of the structure according to the invention,

- Figures 8A to 8E are diagrams showing the various stages in the transport and installation of a rig by the structure according to the invention,

- Figure 9 is a side view of a variant structure,

- Figure 10 is a diagrammatical perspective view of a variant of the structure for transport, installation and dismantling according to the invention, and

- Figures 11 and 12 are two diagrammatical perspective views of the structure in Figure 10 showing the movement of a gate closing off the front part of the structure.

In general the invention applies to all types of fixed or floating oil rigs in shallow or deep water.

In what follows the description will be provided with respect to a floating platform for oil extraction in deep water.

Figure 1 shows diagrammatically a floating oil rig indicated as a whole by the reference numeral 1 which conventionally comprises a deck 2 provided with normal operating equipment and accommodation. This deck 2 is mounted on a supporting column 3 forming a float which is secured to the sea bed, not shown, by anchor lines 4.

A structure indicated by the general reference 10 and illustrated in Figures 2 and 3 is used to effect the transport, installation (commissioning) and dismantling (decommissioning) of deck 2 of oil rig 1 from transport means 5 (Figure 8A), such as a barge, to support column 3 or vice versa.

In these figures the general dimensions of structure 10 and the proportions between the various components comprising that structure have not necessarily been respected in order to simplify understanding of the drawing.

In general, structure 10 comprises a U-shaped floating hull 11 comprising two opposing parallel side limbs 11a connected together by a central limb 11b. The two side limbs 11a and central limb 11b float. Hull 11 is fitted with legs 12 which can move vertically with respect to that hull 11 when afloat. In the embodiment illustrated in Figures 2 and 3, hull 11 has four legs 12 located in pairs on each side limb 11a of said hull 11.

As shown in Figures 2, 3 and 5, in this embodiment each of legs 12 has a triangular cross-section. These legs 12 may also have a square or circular cross-section.

Each leg 12 is conventionally formed of three booms 14 connected together by a lattice of metal struts 15 (Figure 6) and associated with mechanical means imparting movement designated by general reference 20 (Figures 2, 3 and 5) for each leg 12. Mechanical means 20 imparting movement are housed in a loadbearing framework 16 (Figure 5), also known to those skilled in the art as a "jack-house", which is supported by hull 11.

As illustrated in Figures 5 and 6, mechanical means 20 for moving each leg 12 comprise two opposing plates 21 each mounted on a boom 14 of corresponding leg 12 and each have on each side face a set of teeth 22 forming a

double rack on the two beams 14. Mechanical means 20 imparting movement also comprise a number of assemblies 25 located on either side of each plate 21, according to the height of the latter. Each assembly 25 comprises a motor and gearbox unit 26 driving a pinion 27 which engages a set of teeth 22 in corresponding plate 21. In the embodiment illustrated in Figures 4 and 5 the two sets of teeth 22 on each plate 21 are associated with six pinions 27 each caused to rotate by a motor and gearbox unit 26.

Structure 10 also has in association with each of legs 12 a shuttle indicated by general reference 30 which can move on corresponding leg 12 between a low position bearing on floating hull 11, as shown in Figure 2, and a high position, as shown in Figure 3. Shuttles 30 associated with legs 12 are moved simultaneously by legs 12.

As illustrated in Figure 4, each shuttle 30 comprises a body 31 having a vertical limb 32 extending substantially parallel to booms 14 of corresponding leg 12. In the embodiment illustrated in Figures 2 to 4, vertical limb 32 comprises two vertical parallel beams 32a.

Limb 32 is provided at the top with a plate 33 extending substantially perpendicular to said limb 32 and also at the bottom a horizontal bearing plate 35 supporting deck 2 of platform 1, as will be seen below.

Plate 33 comprises an opening 34 having a cross-section of shape matching the transverse cross-section of corresponding leg 12, in this particular case a triangular cross-section. Plate 33 is connected to bearing plate 35 by stiffening struts 36.

Each shuttle 30 is provided with means 40 for locking onto corresponding leg 12.

These locking means 40, which are illustrated in greater detail in Figure 7, comprise at least one opposing rack 41 and preferably at least one opposing rack 41 for each plate 21. Opposing rack 41 can be moved by means of at least one drive member 42 and preferably by two drive members 42 comprising for example hydraulic or pneumatic jacks so as to move opposing rack 41 between a retracted position and a locking position in which it engages one of the sets of

teeth 22 on corresponding leg 12. The assembly comprising opposing rack 41 and drive means 42 is mounted on plate 33 on each shuttle 30.

Finally, at each leg 12 hull 11 has means 50 for guiding corresponding shuttle 30 between the low (Figure 2) and high (Figure 3) positions respectively.

As illustrated in these Figures 2 and 3, guide means 50 for shuttle 30 for each leg 12 comprise two vertical columns 51 extending substantially parallel to corresponding leg 12. Each column 51 acts together with a passage 52 provided in bearing plate 35 of shuttle 12 and each of these passages 52 has a cross-section of shape matching the cross-section of corresponding column 51. The two columns 51 are connected together by means of a connecting plate 53 extending substantially perpendicular to said columns 51, which comprise a central passage 54 (Figure 3) having a cross-section of a shape matching the transverse cross-section of corresponding leg 12, and in this particular case a triangular cross-section. Connecting plate 53 forms a guide for corresponding leg 12.

While shuttle 30 moves between a low position and a high position on leg 12, bearing plate 35 of shuttle 30 is guided by columns 51 and in the low position illustrated in Figure 2 plate 31 of shuttle 30 bears against the upper extremity of each column 51.

In a preferred embodiment the length of central limb 11b of hull 11 can be adjusted according to the width of deck 2 of oil rig 1. For this purpose this central limb 11b may comprise two sections between which one or more intermediate sections 11c may be fitted in order to alter the length of this central limb 11b.

Deck 2 is transported to and installed on structure 10 at a work site in the following way.

Structure 10 is floated close to the work site with legs 12 raised so as not to slow its movement.

First of all, and as shown in Figure 8A, floating transport means, such as a barge 5, brings deck 2 of rig 1 close to floating structure 10. Barge 5 is positioned between the two side limbs 11a of hull 11, legs 12 of that hull 11 being in an intermediate position or in a fully raised position.

Then these legs 11 are lowered and each shuttle 30 is locked to corresponding leg 12 according to the height of the lift, but preferably to the top extremity of the said leg. Shuttles 30 are locked onto legs 12 by operating jacks 42 so that opposing racks 41 engage adjacent teeth 22.

Deck 2 is placed on the bearing plates 35 of shuttles 30 by ballasting barge 5 and barge 5 is then removed. Where barge 5 does not have a ballasting system, shuttles 30 are locked to legs 12 and legs 12 are raised in order to lift deck 2 off barge 5.

Deck 2 is lifted by shuttles 30 and legs 12, while hull 11 of structure 10 remains afloat. In order to do this motor and gearbox units 26 are operated to drive pinions 27 which engage sets of teeth 22 on plates 21 on each leg 12 to move shuttles 30 into a high lifting position for deck 2 by means of legs 12, as shown in Figure 8C. As legs 12 are moved to raise deck 2 by means of shuttles 30, each shuttle 30 is guided by columns 51 which slide in passages 52. These columns 51 also make it possible to maintain bearing plates 35 in a substantially horizontal position and prevent shuttles 30 from tipping under the weight of deck 2. Structure 10 supporting deck 2 is moved in order to bring deck 2 above its support comprising supporting column 3.

Shuttles 30 are lowered by means of legs 12 to place deck 2 on supporting column 3, as shown in Figure 8D. In order to perform this operation motor and gearbox units 26 are operated in reverse to cause pinions 27 to rotate and lower legs 12.

In the course of positioning the deck on supporting column 3 (Figures 8D and 8E), this supporting column 3 penetrates deeper into the water because of the weight of deck 2. Legs 12 and shuttles 30 continue to descend so that the weight of deck 2 is wholly taken up by supporting column 3.

Once deck 2 has been placed on supporting column 3, legs 12 are lowered, with the result that deck 2 can thus be released from structure 10 (Figure 8E).

Structure 10 is then removed from the work site.

Dismantling and transport of deck 2 from the work site to the transport means comprising barge 5 takes place by performing the operations mentioned briefly above in reverse order.

First of all, hull 11 of floating structure 10 is brought to the work site and legs 12 of that hull 11 are lowered. Shuttles 30 are locked to legs 12 and hull 11 is moved to bring supporting column 3 between side limbs 11a of hull 11 and to place shuttles 30 beneath deck 2.

Shuttles 30 are lifted up legs 12 by means of movement mechanisms 20. Bearing plates 35 come into contact with deck 2 and deck 2 is raised, after which floating structure 10 supporting deck 2 is moved to remove deck 2 from supporting column 3. Barge 5 is positioned between side limbs 11a of hull 11 beneath deck 2. Through legs 12 shuttles 30 are lowered to place deck 2 on barge 5 and these legs 12 and shuttles 30 are lowered to release deck 2 from structure 10, deck 2 now resting on barge 5.

Barge 5 supporting deck 2 is then removed from structure 10.

A variant of structure 10 is illustrated in Figure 9.

In this embodiment the lower extremities of two adjacent legs 12, that is to say legs on the said side limb 11a of hull 60, comprises a stabiliser 60 connecting the two lower extremities together.

Another variant of structure 10 is illustrated in Figures 10 to 11, Figure 10 showing the rear part of structure 10 and Figures 11 and 12 the front part of said structure 10 respectively through which supporting column 3 for deck 2 is inserted, as will be seen below.

In these figures components which are common to the previous embodiment have been indicated by the same reference numbers.

In this embodiment, structure 10 comprises a floating hull 71 which is also generally U-shaped and which has two side limbs 71a and a central limb 71b connecting the two side limbs 71a.

The two side limbs 71a are formed from two floats 72a extending parallel to each other with a free space between them and central limb 71b comprises a transverse beam 72b carried by said side limbs 71a, as illustrated in

Figure 10. Preferably, transverse beam 72b comprises a lattice of tubes 75 connected together by longitudinal members 76.

Side limbs 71a of structure 10 can be moved by sliding with respect to each other on transverse beam 72b in such a way as to adjust the space between them according to the width of deck 2.

In order to achieve this each float 72a forming a side limb 71a comprises means 73 for movement on transverse beam 72b comprising for example an assembly comprising for example guide rails and a rack and pinion system, which are not shown and are of a known type.

Furthermore, each float 72a comprising side limbs 71a is provided with means, not shown, for locking onto transverse beam 72b in such a way as to maintain the spacing between side limbs 71a constant at a particular size.

As shown in Figures 11 and 12, the open part of hull 71, that is to say opposite central limb 71b, comprises a gate indicated as a whole by general reference 80.

This gate 80 comprises two opposing lengths of beam 81 which can move by sliding each upon a float 72a.

The two lengths of beam 81 can be moved between a position closing off the entry to structure 10, as shown in Figure 11 in which they approach and come into contact with each other, and a withdrawn position, as illustrated in Figure 12, in which they open up the entrance to structure 10 for positioning supporting column 3 beneath deck 2.

In order to do this each float 72a, each comprising a side limb 71a of hull 71, comprises means 82 for moving each length of beam 81. These means 82 comprise for example an assembly comprising guide bearers and a rack and pinion system or any other means of a known type.

Finally, each float 72a also comprises means, not shown, for locking the corresponding length of beam 81 in the closed position or the open position.

As in the preceding embodiment, hull 71 is also fitted with legs 12 which can move vertically with respect to the said hull 71 when afloat by means of movement mechanisms and, in association with each of the said legs a shuttle 30

intended to be applied against the underside of deck 2 which can be moved by corresponding leg 12 between a low position on floating hull 71 and a high position lifting deck 2 of rig 1, each shuttle 30 being provided with means for locking onto corresponding leg 12.

Transport and installation of deck 2, as well as the dismantling of this deck 2 with hull 71, are carried out in the same way as in the previous embodiment except that it is necessary to open and close gate 80 to position deck 2 on shuttles 30 and also to position supporting column 3 beneath deck 2.

In this embodiment hull 11 is provided with rigidity through transverse beam 72b forming central limb 71b of hull 71 and also by gate 80 in the closed position.

In this closed position of gate 80, the two lengths of beam 81 are locked together by appropriate means, of a known type, not shown.

The two side limbs 71a formed by the two floats 72a may be disconnected from central limb 71b, thus making it possible to reduce the space required to store these limbs.

The structure according to the invention has the advantage that it is capable of transporting, installing and dismantling an oil rig deck in shallow water or deep water without any modification and in complete safety.

CLAIMS

1. A structure for the transport, installation and dismantling of the deck (2) of an offshore oil rig (1), characterised in that it comprises ,

- a floating hull (11 ; 71) fitted with legs (12) which can move vertically with respect to the floating hull (11 ; 71) by means of moving mechanisms (20), and

- associated with each of the said legs (12) a shuttle (30) designed to be applied to the underside of the deck (2) and capable of being moved by the corresponding leg (12) between a low position on the floating hull (11 ; 71) and a high position lifting the deck (2) of the rig (1), each shuttle (30) being fitted with means (40) for locking onto the corresponding leg (12).

2. A structure according to Claim 1, characterised in that each moving mechanism (20) comprises two opposing plates (21) mounted on the corresponding leg (12) and each comprising on its side surfaces a set of teeth (22) and also at least two opposing assemblies (25) carried on the hull (11 ; 71) each comprising a pinion (27) driven in rotation and acting together with one of the sets of teeth (22).

3. A structure according to Claim 1 or 2, characterised in that at each leg (12) the hull (11 ; 71) comprises means (50) for guiding the corresponding shuttle (30) between the low and high positions respectively.

4. A structure according to any one of Claims 1 to 3, characterised in that each shuttle (30) comprises a body (31) comprising a vertical limb (32) extending substantially parallel to the corresponding leg (12) and provided at the top with a plate (33) extending substantially perpendicular to the said limb (32) and comprising an opening (34) having a cross-section of shape matching the transverse cross-section of the leg (12) and also at the bottom thereof a horizontal bearing plate (35) supporting the deck (2).

5. A structure according to any one of Claims 1 to 4, characterised in that the locking means (40) are mounted on the plate (33) of each shuttle (30).

6. A structure according to any one of Claims 1 to 5, characterised in that the means (40) for locking each shuttle (30) comprise at least one opposing rack (41) which can be moved by drive means (42) between a retracted position

and a locking position in which it engages one of the sets of teeth (22) on the corresponding leg (12).

7. A structure according to any one of Claims 1 to 6, characterised in that the means (50) for guiding the shuttle (30) on each leg (12) comprise two columns (51) extending substantially parallel to the corresponding leg (12) and two passages (52) provided in the bearing plate (35) of the said shuttle (12), each passage (52) having a cross-section of shape matching the transverse cross-section of the corresponding column (52).

8. A structure according to any one of the preceding claims, characterised in that the hull (11 ; 71) is generally U-shaped.

9. A structure according to any one of the preceding claims, characterised in that the floating U-shaped hull (11 ; 71) comprises two opposite parallel side limbs (11a ; 71a) each bearing at least one leg (12) and connected together by a central limb (11b ; 71b).

10. A structure according to Claim 9, characterised in that the two side limbs (11a) and the central limb (11b) float.

11. A structure according to Claim 10, characterised in that the length of the central limb (11b) can be adjusted in relation to the width of the deck (2).

12. A structure according to Claim 9, characterised in that the two side limbs (71a) are formed of two floats (72a) and the central limb (71b) is formed of a transverse beam (72b) carried by the said side limbs (71a) which can move by sliding on the said beam (72b) according to the width of the deck (2).

13. A structure according to Claim 12, characterised in that each float (72a) comprises means (73) for movement on the transverse beam (72b) comprising for example an assembly comprising guide rails and a rack and pinion system.

14. A structure according to Claim 12 or 13, characterised in that each float (72a) comprises means for locking onto the beam (72b).

15. A structure according to any one of Claims 12 to 14, characterised in that the open part of the hull (71) comprises a gate (80) formed from two opposing lengths of beam (81) which can move by each sliding on a float

(72a) between an open position for locating at least one supporting column (3) beneath the deck (2) and a closed position when the said deck (2) is being transported.

16. A structure according to Claim 15, characterised in that each float (72a) comprises means (82) for moving each section of beam (81) comprising for example an assembly comprising guide rails and a rack and pinion system.

17. A structure according to Claim 15 or 16, characterised in that each float (72a) has means for locking the corresponding length of beam (81).

18. A structure according to any one of the preceding claims, characterised in that the lower extremities of the two legs (12) carried by each side limb (11a ; 71a) of the hull (11 ; 71) are connected together by a stabiliser (60).

19. A process for the transport and installation of a deck (2) of an oil rig (1) to a work site, characterised in that it comprises the following stages ,

- through the use of floating transport means (5), bringing the rig (1) deck (2) into the vicinity of a floating structure (10) comprising a U-shaped hull (11 ; 71) fitted with legs (12) which can be moved vertically with respect to the floating hull (11 ; 71) and a shuttle (30) associated with each of the legs (12) and which can be moved on the corresponding leg (12),
- placing the floating structure (10) beneath the deck (2),
- lowering the legs (12),
- locking each shuttle (30) to the corresponding leg (12),
- placing the deck (2) on the shuttles (30) and removing the transport means (5),
- lifting the deck (2) through the shuttles (30) and the legs (12) while the hull (11 ; 71) remains afloat,
- moving the structure (10) supporting the deck (2) to bring the deck (2) above its support (3),
- lowering the shuttles (30) by the legs (12) in order to place the deck (2) on its support (3),
- lowering the legs (12) and the shuttles (30) to release the deck (2) from the structure (10), and
- removing the structure (10) from the work site.

20. A process according to Claim 19, characterised in that the deck (2) is placed on the shuttles (30) by ballasting the transport means (5).

21. A process according to Claim 19, characterised in that the deck (2) is placed on the shuttles (30) by lifting the legs (12) and the shuttles (30).

22. A process for the dismantling and transport of a deck (2) of an oil rig (10) from a work site to transport means (5) by floating, characterised in that it comprises the following stages:

- bringing onto the work site a floating structure (10) comprising a U-shaped hull (11 ; 71) fitted with legs (12) which can move vertically with respect to the floating hull (11 ; 71) and a shuttle (30) associated with each of the legs (12) which can move over the corresponding leg (12),
- lowering the legs (12),
- locking each shuttle (30) onto the corresponding leg (12),
- lifting the deck (2) off its support (3) using the shuttles (30) and the legs (12), the hull (11 ; 71) remaining afloat,
- moving the structure (10) supporting the deck (2) to remove the said deck (2) from its support (3),
- moving the transport means (5) into the structure (10) beneath the deck (2),
- lowering the shuttles (30) by means of the legs (12) to place the deck (2) on the transport means (5),
- lowering the legs (12) to move the shuttles (30) to release the deck (2) from the structure (10), and
- removing the deck (2) from the structure (10) by the transport means (5).