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Hauber

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[54] **METHOD FOR HANDLING A BARGE FOR TRANSFERRING LARGE HEAVY CARGO MODULES**

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[52] **U.S. Cl.** **214/152,** 61/46.5, 214/14

[51] **Int. Cl.** **E02b 17/02**

[58] **Field of Search** ..... 214/12, 13, 14, 15 R, 152; 61/46.5

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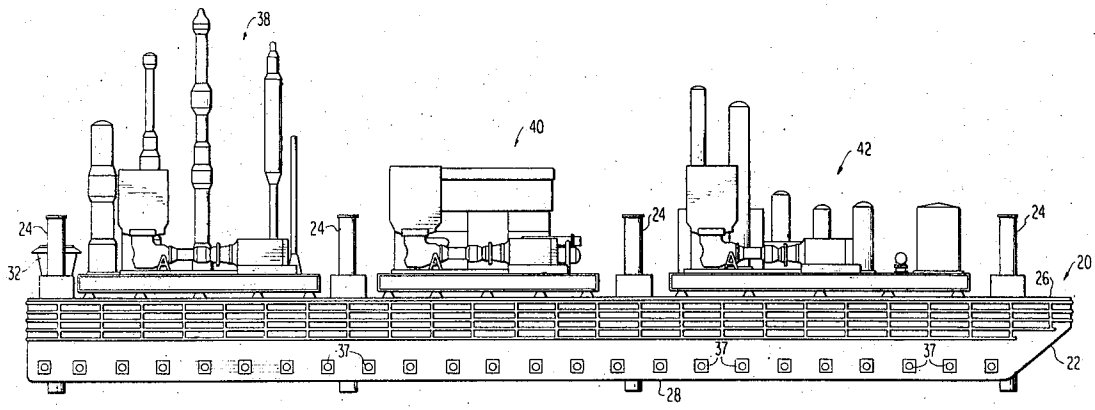
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[57] **ABSTRACT**

A method of handling a barge for transferring large, heavy cargo modules onto the barge from a dock facility or off of a barge onto a dock facility including the steps of positioning the barge, buoyantly supported upon a body of water, contiguous to a dock facility; lowering a plurality of columns vertically through a corresponding plurality of wells in the hull of the barge and into engagement with the water bed adjacent the dock; extending a plurality of columns into the water against the weight of the barge, until the columns have reached a firm foundation. Following the step of extending the columns into the water bed sufficiently to support the barge, opening at least one valve positioned within a corresponding at least one passage through the hull of the barge to permit the ambient water to seek its own level within the interior of the barge and thus render the barge independent of normal buoyancy and tidal influences. Next the barge is vertically adjusted upon the columns until the deck of the barge is in generally planar horizontal alignment with the dock facility. The cargo modules may then be transfered onto or off of the barge. Once the transfer is completed, then at least one valve positioned within the hull of the barge is closed and finally the plurality of columns are raised to enable the barge to again be buoyantly supported upon the body of water.

In the event a particularly heavy construction module is going to be loaded from a dock facility onto a barge ballast may be added to the barge prior to extending the columns into the water bed. Moreover, the amount of ballast utilized may be selected to correspond to the weight of the construction module to be loaded in order to minimize the possibility of relative vertical movement of the barge deck with respect to a dock as the module is loaded onto the barge.

17 Claims, 10 Drawing Figures



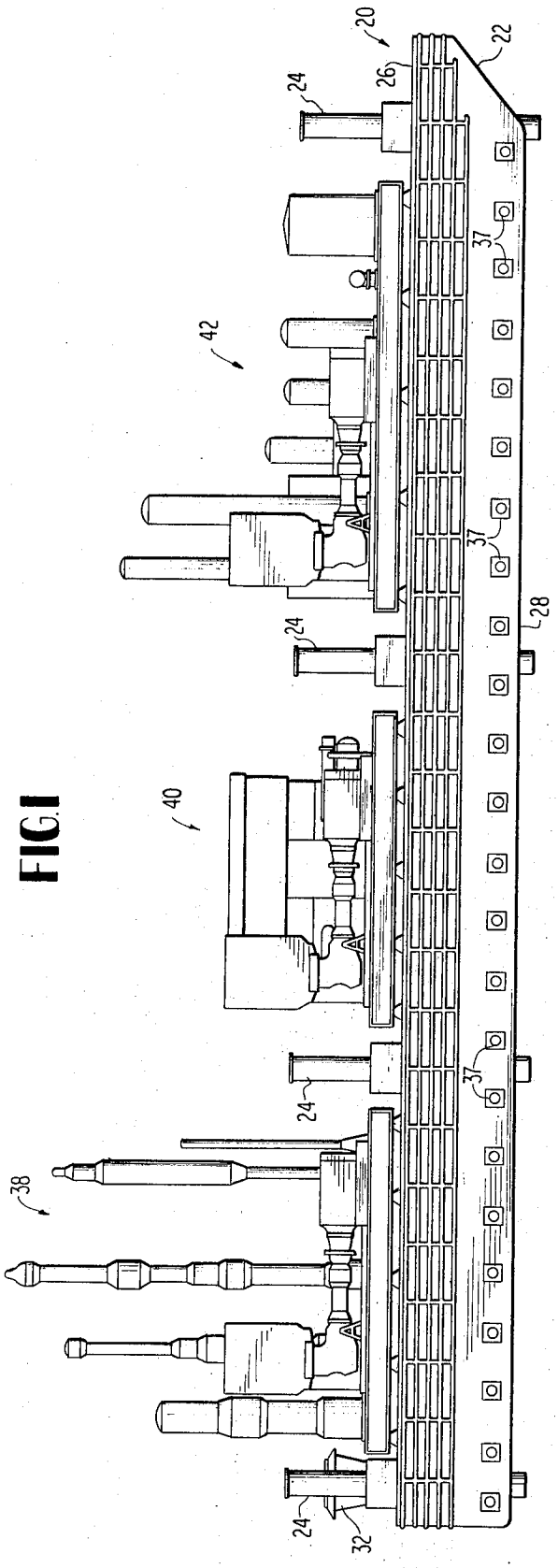


FIG. 1

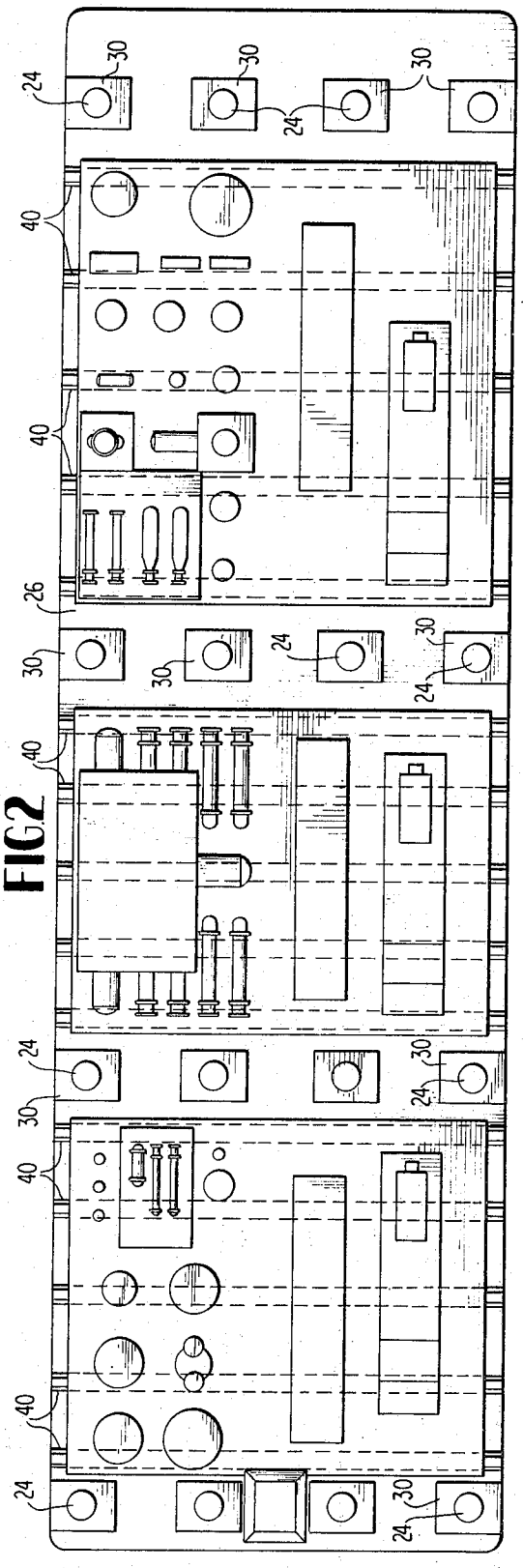


FIG. 2

FIG.3

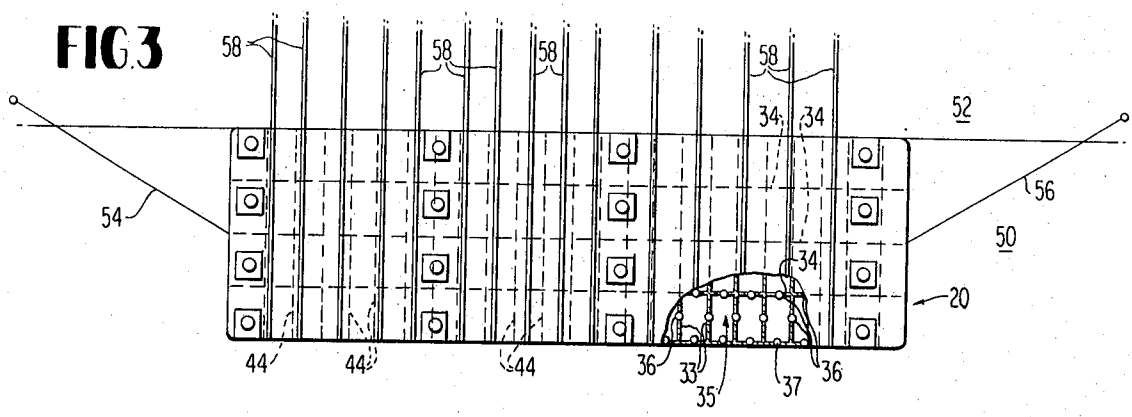


FIG.4

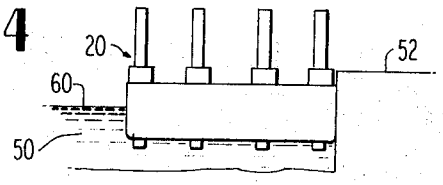


FIG.5

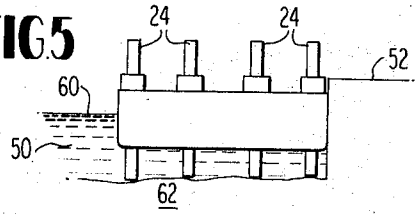


FIG.6

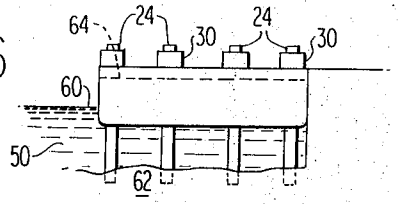


FIG.7

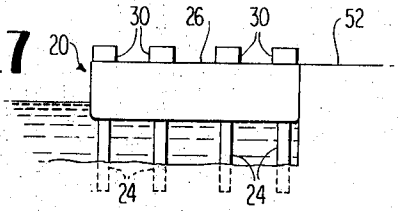
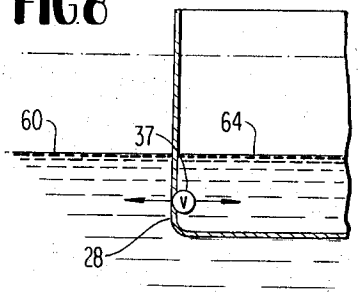


FIG.8



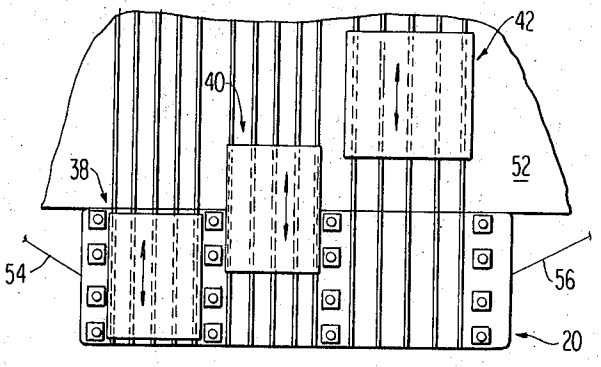
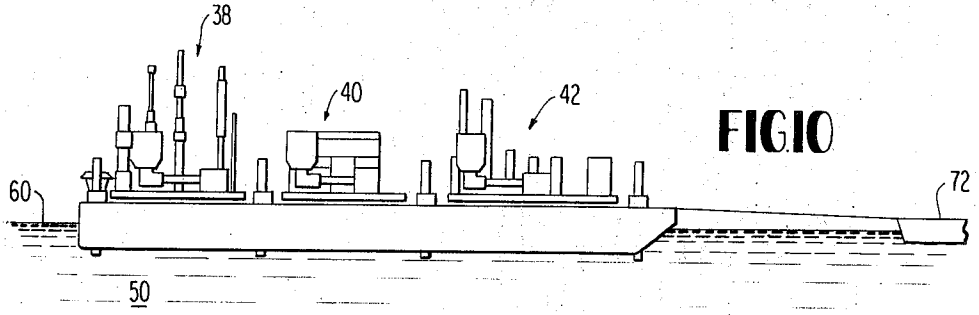


FIG.9

FIG.10



METHOD FOR HANDLING A BARGE FOR TRANSFERRING LARGE HEAVY CARGO MODULES

BACKGROUND OF THE INVENTION

This invention relates to a method for handling a barge during a cargo transfer operation. More specifically the invention pertains to a method for transferring large, heavy construction modules from a dock facility onto a barge or from a barge onto a dock facility.

The subject invention is believed to possess a wide range of applicability in varying instances where it may be necessary to transfer large and therefore typically heavy objects from a dock facility onto a barge or from a barge onto a dock facility. An illustrative example, however, where the subject invention provides a particular degree of utility may be observed with reference to the transportation of construction modules for a liquid natural gas plant.

In this connection a growing concern has risen in connection with the supply/demand ratio for natural gas as a fuel for domestic heating and/or power generation in the United States. This situation is particularly critical in the heavily populated regions along the eastern seaboard. Hope for the future, however, exists in connection with the development of technology regarding the conversion, transportation and storage of liquid natural gas.

More particularly, as natural gas deposits are tapped at offshore locations methane may be readily separated from heavier gasses and pumped by gas compressors through a pipeline to a point near the sea-coast where a deep sea shipping port exists or can be built. At this location a gas liquification plant may be constructed where the natural gas may be refrigerated down to minus 260° to 265° C. At this temperature natural gas will condense by a volumetric ratio of 600 to 1 into a liquid. In the liquified state it becomes economically and physically possible to transport the natural gas from a remote place of origin to a location of demand.

It will readily be recognized, however, that a seaport created adjacent an offshore producing formation may well be situated in a remote location where it would be extremely difficult to fabricate a liquid natural gas processing plant. This difficulty stems from a lack of labor, both skilled and unskilled, equipment suppliers, transportation, favorable temperature for fabrication the year round, etc.

In order to obviate or minimize these disadvantages, it has been proposed in the past to fabricate and assemble huge units or modules comprising the liquid natural gas processing plant at a desirable facility and transport the units to remote areas of the globe for use.

In this connection, in at least one instance it has been proposed to shop-assemble a gas liquification plant in an industrial area upon a barge, transport the barge to a remote source of natural gas and then raise the barge on caissons to provide for an offshore liquid natural gas processing facility.

In at least one other instance it has been proposed to construct a processing plant upon a barge which may then be towed to a desired remote site, adjacent a shore line, and sunk to establish a suitable processing plant.

While the above two concepts provide at least a degree of theoretical appeal in terms of a means to utilize labor, equipment suppliers, transportation and year round fabrication facilities, it will be appreciated that

such concepts dictate sacrificing a barge for each plant constructed. It would, therefore, be highly desirable to provide a process for utilizing desirable fabrication facilites to construct a liquid natural gas plant, transport the plant to a remote location and then recover the barge for subsequent reuse.

It has been found, however, that when a liquid natural gas plant is constructed in a limited number of modules, to facilitate on site assembly, the modules are extremely large and heavy and may weigh on the order of three thousand tons or more each. Such modules are extremely difficult to manipulate following construction. In this connection dock cranes are not presently known which would be suitable to handle this amount of weight. Further, even if such devices were available, the weight ratio of a typical barge to a module may be on the order of 1 to 300. Therefore, the barge would tend to pitch and/or roll unless the module were located directly over the center of gravity of the barge. In sum, transferal of such large modules from a dock facility onto a barge presents considerable difficulties.

It would therefore be highly desirable to provide a method for transferring large cargo modules, such as modules for liquid natural gas plants, onto a barge for transportation to a remote location and removal of the unit at a predetermined site. It would be particularly desirable to transfer the modules onto the barge while minimizing the possibility of pitching and rolling of the barge during the loading and unloading operation. Further it would be highly desirable to provide a method for loading and unloading the modules onto a barge without necessitating the construction of excessively large crane structures. Further it would be highly desirable to load and unload large heavy constructed modules onto and off of a barge by a process which would provide a maximum degree of predictability and safety and which may be performed over a sufficient time frame in order to accommodate unforeseen difficulties during the loading or unloading operation.

OBJECTS OF THE INVENTION

Objects:

It is therefore a general object of the invention to provide a novel process for handling a barge during the transfer of large, heavy cargo modules which will obviate or minimize problems of the type previously described.

It is a particular object of the invention to provide a process for transferring large heavy cargo modules onto or off of a barge without the utilization of extremely large crane structures.

It is a further object of the invention to provide a novel process for transferring large cargo modules onto or off of a barge wherein the tendency of the barge to pitch and/or roll will be minimized.

It is yet a further object of the invention to provide a novel process for transferring large cargo modules onto and/or off of a barge wherein tidal influences of the body of water adjacent the dock are minimized.

It is another object of the invention to provide a novel process for transferring large cargo modules onto and/or off of a barge which will provide a maximum degree of predictability and safety.

It is yet another object of the invention to provide a novel process for transferring large cargo modules onto and/or off of a barge which will permit a time frame suitable to accommodate unforeseen difficulties.

Brief Summary:

A process for handling a barge according to a preferred embodiment of the invention which is suitable to accomplish at least some of the foregoing objects comprises the steps of positioning a barge, buoyantly supported upon a body of water, contiguous to a dock facility. A plurality of columns vertically extending through a corresponding plurality of wells within the hull of the barge are then lowered into engagement with the water bed adjacent to the dock. The next step comprises extending the plurality of columns into the water bed against the weight of the barge until the columns have reached a firm foundation.

Once the barge is firmly positioned upon the columns at least one valve in the hull is opened to permit the ambient body of water to seek its own level interiorly and exteriorly of the barge hull to thus render the barge independent of normal buoyancy and tidal influences. The barge is then ready to be vertically adjusted upon the plurality of columns until the deck of the barge is brought into general coplanar vertical alignment with the dock.

Since sea water is free to pass into and out of the barge hull, buoyancy forces occasioned by rising and falling of the tides will not be imparted to the barge and the deck thereof may be maintained in a coplanar posture with the dock indefinitely. Cargo may thus be transferred onto or off of the barge without encountering disruption of the coplanar alignment of the barge deck with the dock.

Once the cargo is either loaded or unloaded, then the at least one valve in the hull may be closed and the plurality of columns raised to again buoyantly support the barge upon the body of water.

THE DRAWINGS

Other objects and advantages of the present invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings wherein:

FIG. **1** is a side elevational view of a transport barge including a plurality of vertically adjustable support columns;

FIG. **2** is a plan, deck view of the transport barge shown in FIG. **1** and discloses the placement upon the barge of the three separate cargo modules which are suitable, when combined, to comprise a liquid natural gas plant;

FIGS. **3–10** disclose sequential views of a process of handling a barge in order to transfer heavy cargo modules onto and off of the barge as follows:

FIG. **3** discloses a barge which has been brought into a contiguous position with respect to a dock facility including the vertical alignment of a plurality of skids upon the deck of the barge with a corresponding plurality of skids on the dock;

FIG. **4** discloses an end view of the barge positioned continguous to the docking facility;

FIG. **5** discloses an end view of the barge wherein a plurality of support columns have been lowered onto the water bed;

FIG. **6** discloses extending the plurality of columns into the water bed against the weight of the barge and raising the hull of the barge into general coplanar alignment with the dock facility;

FIG. **7** discloses vertically adjusting the barge with respect to the dock facility to bring the dock thereof into final coplanar alignment with the dock;

FIG. **8** discloses opening at least one valve within the hull of the barge to permit the ambient body of water to seek its own level interiorly and exteriorly of the barge hull to render the barge independent of normal buoyancy and tidal influences while the barge is supported upon the columns in coplanar alignment with the dock;

FIG. **9** discloses transferring large cargo modules, such as modules of a liquid natural gas plant, onto or off of the barge; and

FIG. **10** discloses the columns raised and the barge buoyantly supported upon the surface of a body of water so that the large cargo modules may be transported to a preselected site.

DETAILED DESCRIPTION

General Structure:

Referring now to the drawings and particularly to FIGS. **1** and **2** thereof, a transport barge **20** is illustrated. A sloping bow **22** is fashioned into an otherwise generally rectangular box structure to enable the barge to be more readily towed through a body of water.

The barge **20** is provided with a plurality of uniformly spaced columns **24** which extend within wells (not shown) fashioned through the deck **26** and hull **28** of the barge. A jack house **30** surrounds each column **24** and serves to enhouse a jacking assembly which is operable to vertically raise and lower the columns with respect to the barge deck and hull.

The jacking assembly per se does not comprise an aspect of the subject invention and conventional commercial units may be utilized. In this connection at least one unit that is suitable for the intended purpose comprises a pair of longitudinally space remotely actuatable clamps which surround the column. Longitudinally extending between the clamps are a plurality of hydraulic cylinders. The clamps may be alternately actuated and by timely actuation of the cylinders the columns **24** may be raised or lowered by an ambulatory process.

A jack control house **32** may be provided on the stern of the barge in order to coordinate actuation of the jacks and thus the vertical raising and lowering of the columns **24** with respect to the barge **20.**

The hull **28** of the barge may be interiorly compartmented by uniformly spaced transverse partitions **33,** note FIG. **3,** and longitudinally extending partitions **34.** The crisscrossing partitions **33** and **34** define compartments **35** which serve as water ballast reservoirs for the barge.

In order to provide fluid communication among the uniformly spaced compartments **35,** each transverse and longitudinal partition **33** and **34** respectively is provided with a plurality of remotely actuatable gate valves **36,** one in each compartment **35.** Moreover, the barge hull **28** is constructed with a plurality of gate valves **37** which are positioned about the periphery of the hull to provide fluid communication between each ballast compartment about the perimeter of the barge and the ambient sea.

The water ballast compartments **35** functionally cooperate with the plurality of vertically adjustable columns **24** in a functional manner to facilitate transferring cargo onto or off of the barge at a dock facility in

an operational mode which will be discussed in detail hereinafter.

While a barge of the foregoing type is suitable to transport numerous variant large and heavy cargoes, at least one specific anticipated application comprises transporting liquid natural gas plant components to a remote site. In this connection FIGS. 1 and 2 disclose placement upon the deck of the barge a compression and liquification module **38**, a compression and cooling module **40**, and a compression treatment and dehydration module **42**.

In order to facilitate loading and unloading of such large modules, the deck of the barge is provided with a plurality of transversely extending mutually parallel skid rails **44** which underlie the modular cargo units **38–42**.

As previously discussed, the liquid natural gas plant modules **38–42** are fabricated in large units in order to minimize assembling of components at a remote location. Therefore, each of the individual modules may be enormous and weigh in the neighborhood of 6,000,000 pounds or more. Modules of this size are extremely bulky and difficult to move and manipulate once constructed. In this connection it is believed that dock cranes do not currently exist of a size suitable to handle this much weight.

Further, a significant problem exists in connection with transferring the modules onto a barge due to the possibility of pitching and/or rolling a barge, which itself may only weigh in the neighborhood of 20,000,000 lbs. If a module of such weight is placed on the barge away from the center of gravity thereof, it is highly likely that the barge may pitch or roll and slide the module into the sea.

The subject invention comprises a process for facilitating the loading and unloading of large cargo modules onto and off of a transportation barge which will obviate or minimize these and other previously noted difficulties.

Cargo Loading:

Referring now to FIG. **3**, there will be seen that an intial step for loading a free floating barge with large cargo modules comprises maneuvering the barge within a body of water **50** into a posture wherein either the port or starboad side of the barge is positioned contiguous to a dock facility **52**. Final positioning is facilitated by utilization of fore and aft mooring lines **54** and **56** which are suitable to draw the barge **20** into abutment with the dock **52**.

In the event that skids are utilized to facilitate transferal of the cargo between the dock and barge, deck skid rails **44** should be brought into vertical alignment with dock skid rails **58**.

The next step in handling the barge for facilitating transfer of cargo comprises lowering the plurality of support columns **24** through the wells in the barge deck and hull until the columns come to rest upon the bed **62** of the body of water, note FIG. **5**.

The vertical columns **24** may then be further extended or jacked into the water bed adjacent the dock, note FIG. **6**, by operation of the jacks within jack housings **30**. The lowermost ends of the vertical columns **24** will then descend into the water bed against a downward force provided by the weight of the barge until the columns have reached a firm foundation. Further jacking will merely serve to lift the barge out of the body of water.

In order to facilitate the firm placement of the columns **24** within the bed of the body of water ballast, such as water **64**, may be pumped into the barge hull to add weight to the barge and greatly increase the magnitude of the downwardly directed force imparted to columns **24**.

In this connection where the weight of the cargo is known, it may be desirable to ballast the barge at least in the amount of the weight of the cargo to be subsequently placed upon the barge deck to ensure that the columns **24** are set deep enough to offset any rolling pitching tendency that may be occasioned by placing a heavy module upon the barge deck away from the center of gravity of the barge.

Moreover, it may be desirable to allow the barge to stand or rest in a weighted condition upon the vertical columns **24** a sufficient period of time to further ensure the avoidance of pitching and rolling tendencies of the barge during a loading operation.

Once the columns **24** are firmly implanted within the water bed **62**, the barge may be completely supported thereupon independent of any buoyancy forces. The barge **20** may then be vertically adjusted to bring the deck **26** into horizontal coplanar alignment with the dock facility **52**, note FIG. **7**.

Prior to or subsequent to this final vertical adjustment operation, one or more of the gate valves **37** may be opened which serves to control the flow of fluid through passages in the hull **28** of the barge. Further, in the event the hull **28** is compartmented as previously described, the compartment values **36** may also be opened to provide uniform fluid communication through out the barge. With the gate valves thus opened, water is permitted to seek its own level within the interior of the barge hull with respect to the ambient body of water, note FIG. **8**.

Since water may flow into and out of the barge without imparting any buoyancy force to the barge, rising and falling of the tides will not tend to raise and lower the deck **26** of the barge **20** with respect to the dock facility **52**. As a consequence the deck **26** is maintained constantly in a horizontal coplanar posture with respect to the dock **52**. This maintenance of a coplanar relationship permits large heavy cargo modules, such as construction modules **38–42**, to be skidded on skid rails **58** and **44** by jacking or pushing techniques which may extend over a time frame of **24** to **48** hours or longer, note FIG. **9**.

Once the large cargo modular units **38, 40** and **42** have been skidded onto the barge the valves **37** and **36** are closed and any water within the interior of the hull is pumped overboard. The barge is then buoyantly supported upon the surface **60** of the body of water **50**. The columns **24** may then be raised against the buoyancy of the barge **20**.

In order to provide desirable towing characteristics, trim ballast may be added about the periphery of the barge in the peripheral hull compartments **35**. With the barge thus loaded, one or more towing vessels **72** may be coupled to the bow of the barge to tow the barge to a preselected construction site, note FIG. **10**.

Cargo Unloading:

Once the loaded barge has been transported to a preselected construction site, large cargo modules such as liquid natural gas plant components **38, 40** and **42** may be transferred from the barge onto a construction base or dock facility by buoyantly maneuvering the port or

starboard side of the barge contiguous to a dock or construction facility and mooring the barge to the dock. In the event that the barge and the dock are provided with transversely extending skid rails these may be vertically aligned.

The next step is to lower the plurality of support columns **24** through the wells extending through the barge deck and hull and onto the water bed adjacent the dock facility. The columns **24** are then jacked into the water bed until a firm foundation is reached.

As with the loading operation, it may be desirable to allow the barge to rest or set in this posture wherein a load is applied to the columns **24** in order to ensure that the barge is firmly supported upon the water bed. In this connection the hull valves **37** and compartment valves **36** may be opened to permit water to seek its own level within the interior of the barge with respect to the ambient body of water and thus remove all buoyancy from the barge to completely load columns **24.**

The barge **20** may then be vertically adjusted or jacked into a posture wherein the barge deck **26** is brought into coplanar alignment with the dock. The cargo modules **38, 40** and **42** may then be pushed, pulled or transferred onto the dock facility.

Once the cargo has been removed the hull valves **37** and compartment valves **33** may be closed. Water is pumped from the interior of the barge to recreate a buoyant hull against which the columns **24** may be withdrawn from the water bed. Select compartments **35** within the hull are then ballasted for trim and the barge is transported back to a convenient fabrication facility to obtain another load.

SUMMARY OF MAJOR ADVANTAGES OF THE INVENTION

With reference to the foregoing description in conjunction with the accompanying drawings it will be appreciated that the subject method of handling a barge for transferring heavy cargo modules onto or off of a barge provides a process wherein the deck of the barge may be brought into coplanar alignment with a dock facility and maintained in that posture independent of tidal influences for an indefinite period of time so that extremely large cargo modules may be pushed or pulled onto the barge. Since the deck of the barge and the dock are coplanar the modules may be jacked onto or off of the barge and it becomes unnecessary to attempt to utilize dock cranes.

Moreover, the subject process provides a means for firmly fixing the barge deck with respect to the dock upon columns **24** which are firmly implanted within the bed of the body of water so that any tendency of the barge to pitch or roll as large, heavy cargo modules are loaded onto the barge is minimized.

Because the barge is positioned in coplanar alignment with the dock facility, independent of any tidal influences, loading and unloading of the barge by a skidding operation may be conducted over a time frame sufficient to accommodate unforeseen difficulties and indeed a large construction module may partially rest upon the barge and partially rest upon the dock for an indefinite period of time without occasioning the possibility of sliding into the adjacent body of water.

It will further be appreciated that by practicing the above described novel process a method is provided for transferring large cargo modules onto or off of a barge which provides a maximum degree of predictability and safety.

While the invention has been described with reference to preferred embodiments it will be appreciated by those skilled in the art that additions, deletions, modifications and substitutions, or other changes not specifically described may be made which will fall within the purview of the appended claims.

What is claimed is:

1. A method of handling a barge for transferring heavy cargo modules onto or off of the barge comprising the steps of:

positioning a barge, buoyantly supported upon a body of water, contiguous to a dock facility;

lowering a plurality of columns vertically through a corresponding plurality of well openings within the hull of said barge and into engagement with the water bed adjacent said dock;

extending said plurality of columns into the water bed against the weight of said barge until the columns have reached a firm foundation;

opening at least one valve positioned within a corresponding at least one passage through the hull of said barge to permit water to seek its own level within the interior of the barge hull with respect to the ambient body of water;

vertically adjusting said barge with respect to said plurality of columns until the deck of said barge is brought into generally coplanar horizontal alignment with said dock so that cargo may be transferred onto or off of said barge;

closing said at least one valve positioned within the hull of said barge; and

raising said plurality of columns to enable said barge to again be buoyantly supported upon the body of water.

2. A method of handling a barge for transferring heavy cargo modules onto or off of the barge as defined in claim **1** and further comprising the step of:

adding ballast to said barge prior to extending said plurality of columns into the water bed against the weight of said barge.

3. A method of handling a barge for transferring heavy cargo modules onto or off of said barge as defined in claim **1** wherein said step of opening at least one valve positioned within a corresponding at least one passage through the hull of said barge comprises:

opening a plurality of valves positioned within a corresponding plurality of passages through the hull of said barge for providing fluid communication between the body of water exterior of the hull and a plurality of compartments uniformly spaced throughout the interior of the hull of said barge.

4. A method of handling a barge for transferring heavy cargo modules onto and off of said barge as defined in claim **1** wherein:

said step of positioning a barge includes;

adjusting said barge until skid rails on the deck of said barge are brought into vertical alignment with skid rails on the dock, and

said step of vertically adjusting includes;

raising or lowering the barge with respect to the dock until the skid rails on the deck of said barge are brought into horizontal coplanar alignment with the skid rails on the dock.

5. A method of handling a barge for transferring heavy cargo modules onto and off of said barge as de-

fined in claim 4 wherein cargo is transferred onto or off of said barge by:

skidding the cargo upon the vertically and horizontally aligned skid rails onto or off of the barge.

6. A method of handling a barge for transferring large, heavy cargo modules from a dock onto said barge for transportation over a body of water to a preselected site comprising the steps of:

positioning a barge, buoyantly supported upon a body of water, contiguous to a dock facility;

lowering a plurality of columns vertically through a corresponding plurality of wells in the hull of said barge and into engagement with the water bed adjacent said dock;

jacking said plurality of columns into the water bed against the weight of the barge until the columns have reached a firm foundation;

opening at least one valve positioned within a corresponding at least one passage through the hull of said barge to permit water to seek its own level within the interior of the barge hull with respect to the ambient body of water and thus render said barge independent of normal buoyancy and tidal influences;

jacking said barge with respect to said plurality of columns until the deck of said barge is brought into generally coplanar horizontal alignment with said dock facility;

transferring at least one construction module from said dock facility onto said barge;

closing said at least one valve positioned within the hull of said barge; and

raising said plurality of columns to enable said barge to be towed to a preselected site.

7. A method of handling a barge for transferring large, heavy cargo modules from a dock facility onto said barge as defined in claim 6 and further comprising the step of:

adding ballast to said barge prior to jacking said barge and the deck thereof with respect to said plurality of columns into coplanar alignment with said dock facility.

8. A method of handling a barge for transferring large heavy cargo modules from a dock facility onto said barge as defined in claim 7 wherein said step of adding ballast comprises:

flooding the interior of said barge hull with at least enough water to equal the anticipated weight of the construction modules to be transported.

9. A method of handling a barge for transferring large, heavy cargo modules from a dock facility onto a barge as defined in claim 7 wherein said step of adding ballast comprises:

adding water to a plurality of compartments uniformly spaced within the hull of said barge.

10. A method of handling a barge for transferring large, heavy cargo modules from a dock facility onto a barge as defined in claim 9 wherein said step of adding water comprises:

establishing free fluid communication among the said plurality of uniformly spaced compartments within the hull of said barge, and

establishing free fluid communication between at least one of said plurality of compartments and the body of water exterior of the hull.

11. A method of handling a barge for transferring large, heavy cargo modules from a dock facility onto said barge as defined in claim 10 wherein said steps of establishing free fluid communication among said compartments and between at least one compartment and the body of water exterior of the hull comprise:

opening at least one valve within passages which provide fluid communication among said compartments and between said at least one compartment and said body of water exterior of the hull.

12. A method of handling a barge for transferring large, heavy cargo modules from a dock facility onto said barge as defined in claim 11 and further comprising the step of:

closing said at least one valve within said passages which provide fluid communication between said at least one compartment and said body of water exterior of the hull following the addition within the hull of at least enough water to equal the anticipated weight of the construction modules to be transported and prior to the step of jacking said barge on said plurality of columns until the deck of said barge is brought into general coplanar alignment with said dock.

13. A method of handling a barge for transferring large, heavy cargo modules from a dock facility onto said barge as defined in claim 7 wherein said step of opening at least one valve positioned within at least one corresponding passage through the hull of said barge comprises:

opening a plurality of valves positioned within a corresponding plurality of passages through the hull of said barge for providing fluid communication between the body of water exterior of the hull and a plurality of ballast compartments uniformly spaced within the interior of the hull of said barge.

14. A method of handling a barge for transferring large, heavy cargo modules onto said barge as defined in claim 6 wherein:

said step of positioning a barge includes:

adjusting said barge until skid rails on the deck of said barge are brought into vertical alignment with skid rails on the dock, and

said step of jacking said barge includes:

raising and lowering said barge with respect to the dock until the skid rails on the deck of said barge are brought into horizontal coplanar alignment with skid rails on the dock.

15. A method for handling a barge for transferring large, heavy cargo modules from a dock facility onto said barge as defined in claim 6 and further comprising the step of:

ballasting selective compartments within the hull of said barge, following the step of raising said plurality of columns, to achieve a desired trim of said barge prior to transporting the construction modules over a body of water to the preselected site.

16. A method for handling a barge for transferring large, heavy cargo modules from said barge onto a preselected dock facility comprising the steps of:

positioning a barge, buoyantly supported upon a body of water and carrying large, heavy construction modules, contiguous to a dock facility;

lowering a plurality of columns vertically through a corres-ponding plurality of wells in the hull of said barge and into engagement with the water bed adjacent said dock facility;

jacking said plurality of columns into the water bed against the weight of said barge until the columns have reached a firm foundation;

opening at least one valve positioned within a corresponding at least one passage through the hull of said barge to permit water to seek its own level within the interior of the barge hull with respect to the ambient body of water and thus render the barge independent of normal buoyancy and tidal influences;

jacking said barge with respect to said plurality of columns until the deck of said barge is brought into general coplanar horizontal alignment with said dock facility;

transferring said at least one construction module from said barge onto said dock facility;

closing said at least one valve positioned within the hull of said barge; and

raising said plurality of columns to enable said barge to be buoyantly supported upon the body of water.

17. A method of handling a barge for transferring large, heavy cargo modules from a barge onto a dock facility as defined in claim **16** and further following said step of raising said plurality of columns:

ballasting at least a portion of the interior of the barge hull to bring the barge to proper trim for transportation upon the body of water.

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