Jan. 10, 1961 J. I. GRANT ET AL 2,967,400

METHOD AND APPARATUS FOR ERECTING OFFSHORE PLATFORM

Filed Aug. 8, 1955 6 Sheets-Sheet 1

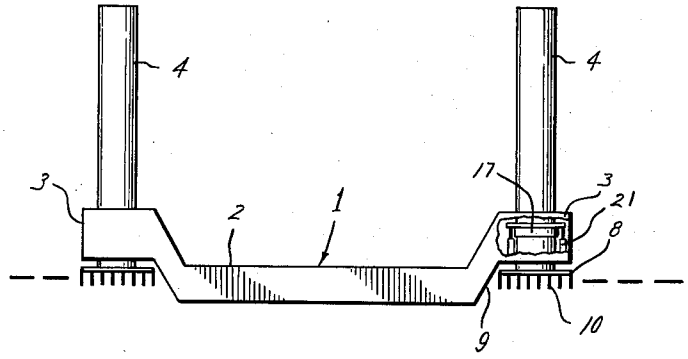


Fig. 1

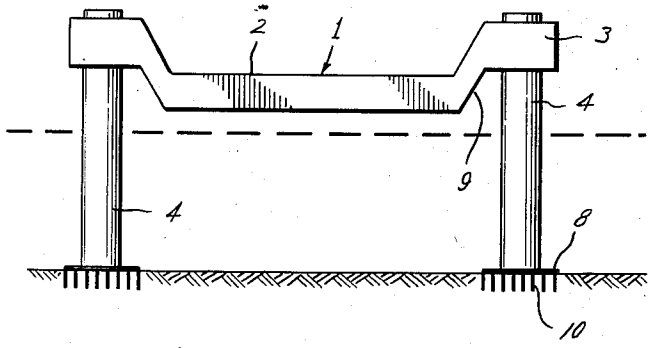


Fig. 2

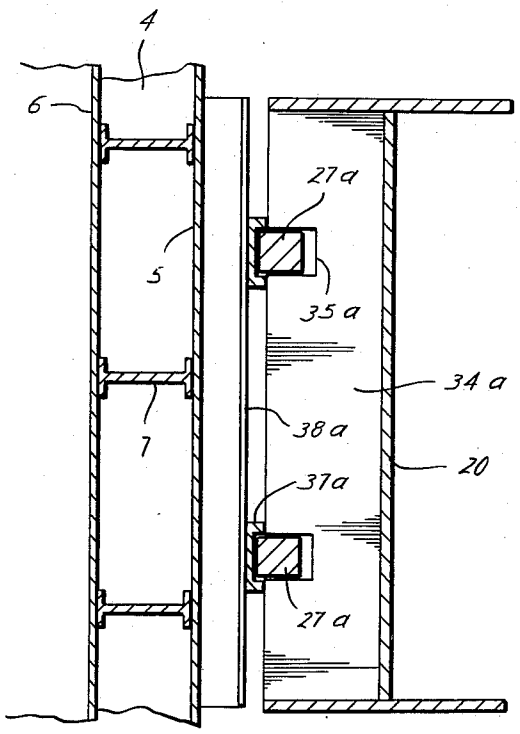


Fig. 12

James I. Grant
William E. Joor, II
INVENTORS

BY Melvin R. Steidham

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METHOD AND APPARATUS FOR ERECTING OFFSHORE PLATFORM

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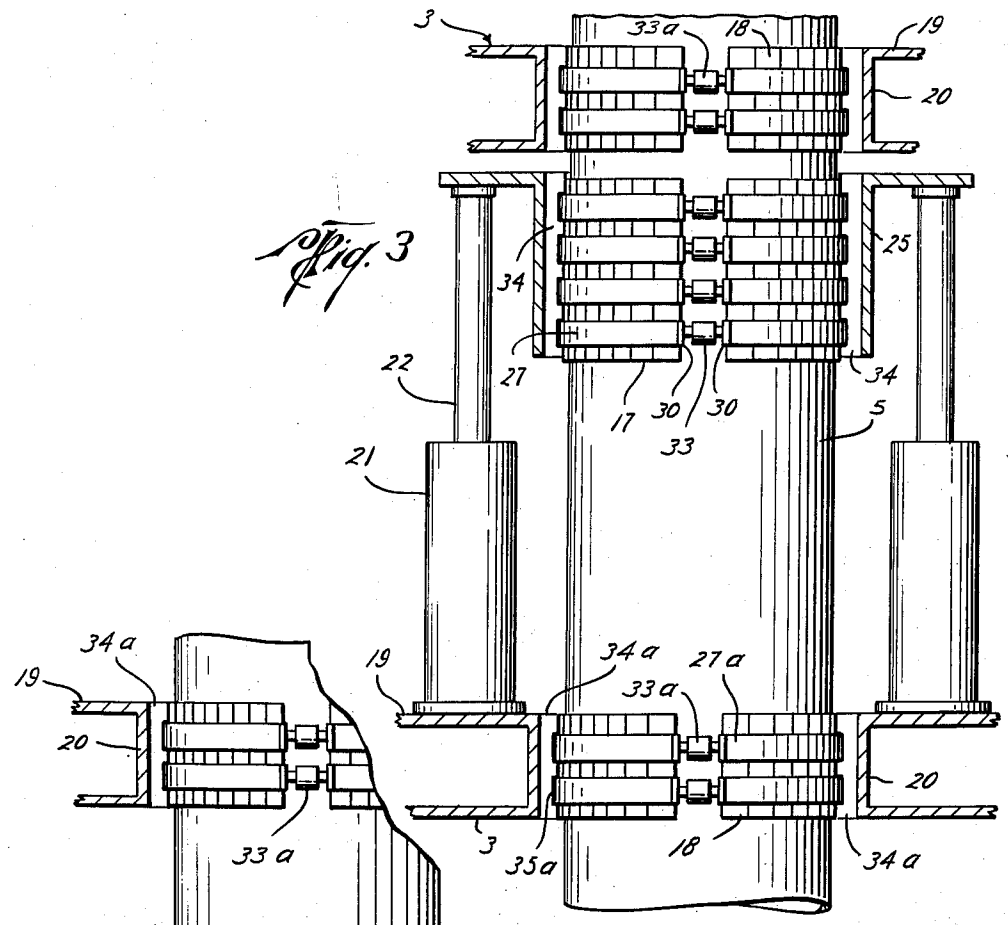


Fig. 3

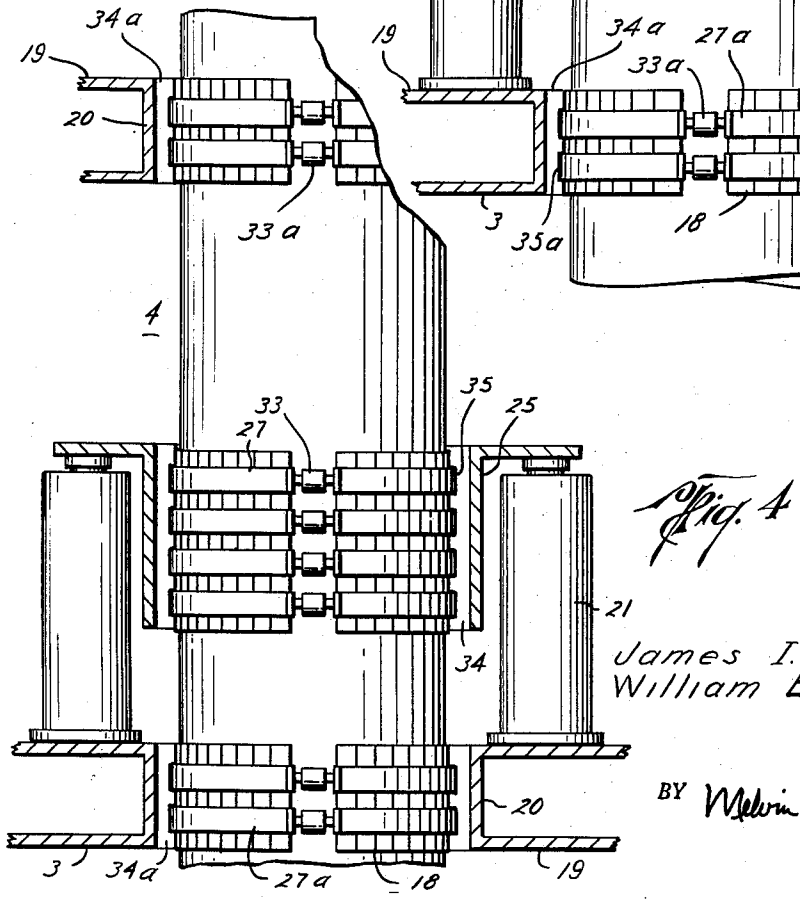


Fig. 4

James I. Grant
William E. Joor, II
INVENTORS

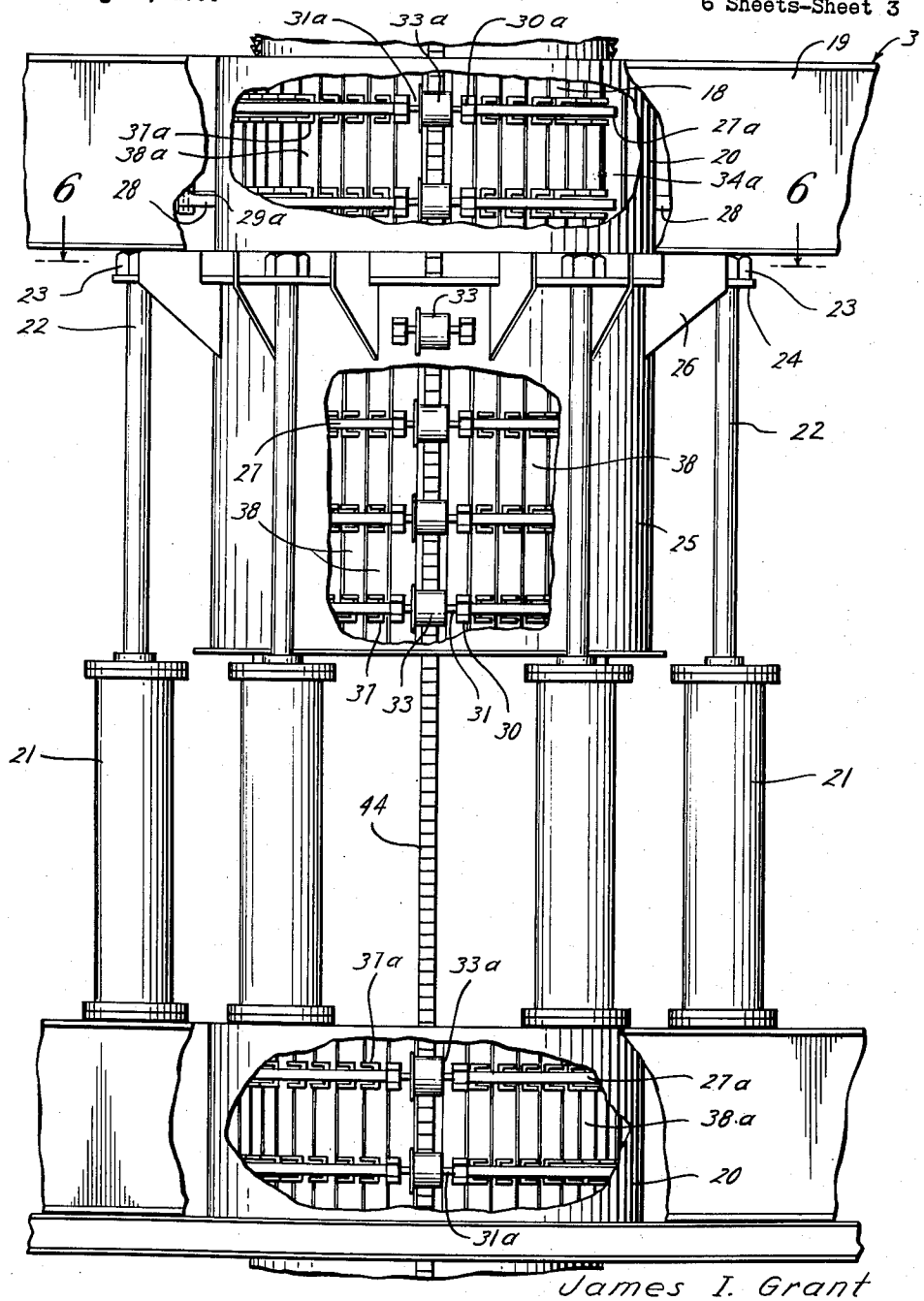
BY Melvin R. Stidham

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METHOD AND APPARATUS FOR ERECTING OFFSHORE PLATFORM

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James I. Grant
William E. Joor, II
INVENTORS

Fig. 5

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Fig. 6

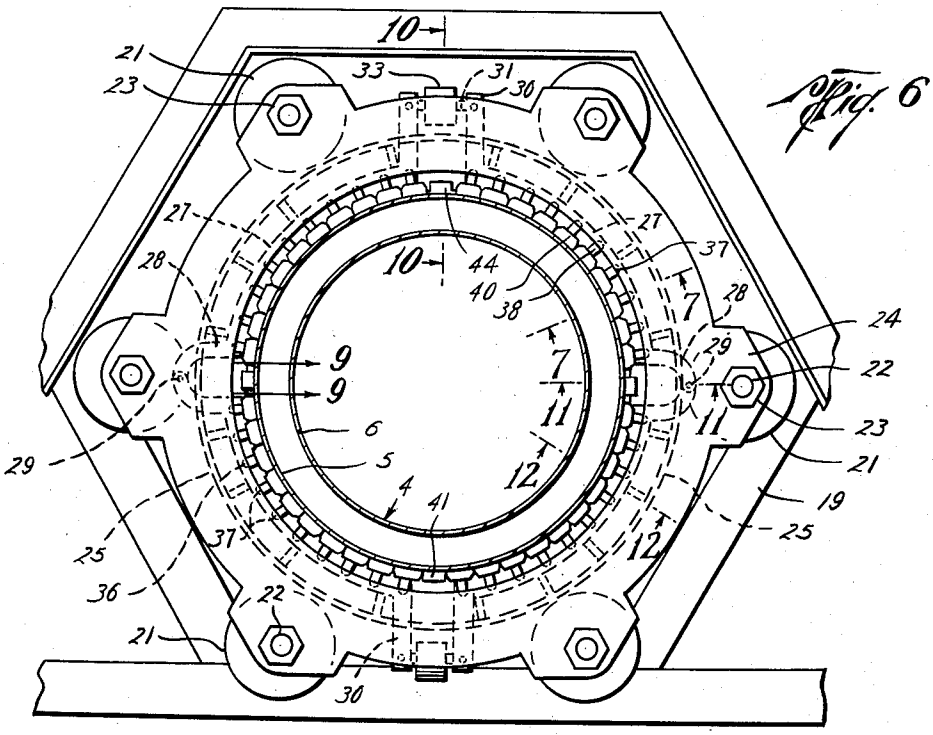


Fig. 7

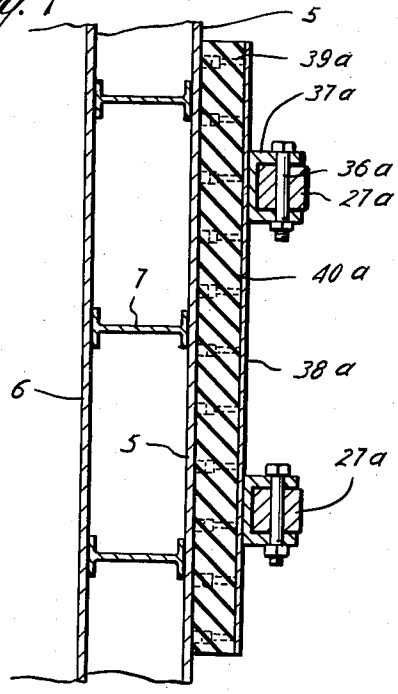
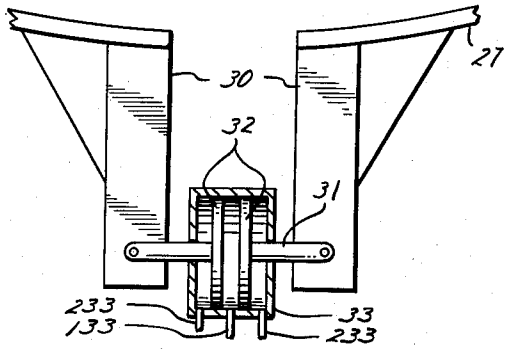


Fig. 8



James I. Grant
William E. Joor, II
INVENTORS

BY Melvin R. Stidham

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METHOD AND APPARATUS FOR ERECTING OFFSHORE PLATFORM

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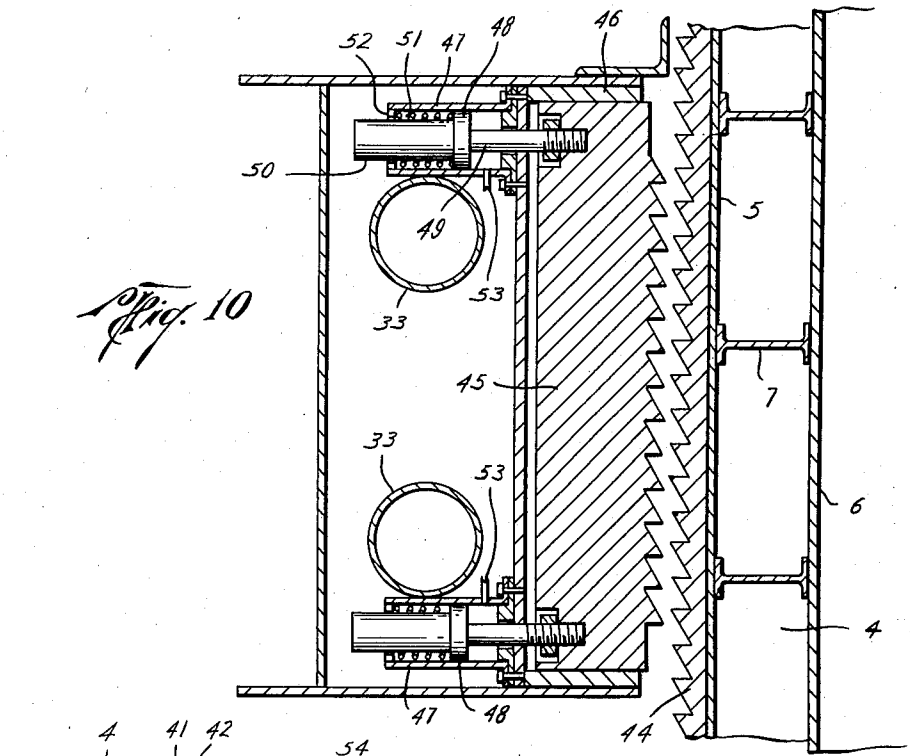


Fig. 10

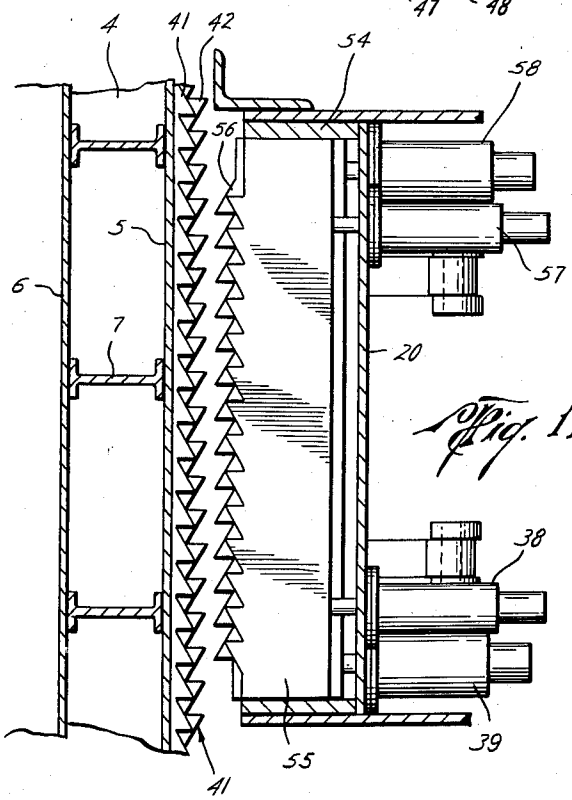
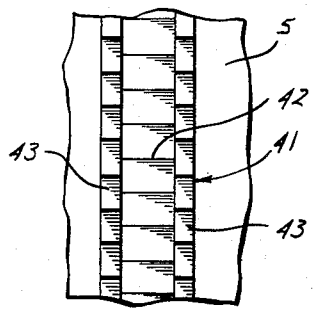


Fig. 11

Fig. 9



James I. Grant
William E. Joor, II
INVENTORS

BY Melvin R. Stidham

ATTORNEYS

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METHOD AND APPARATUS FOR ERECTING OFFSHORE PLATFORM

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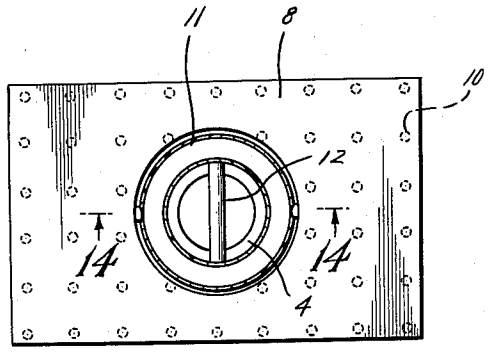
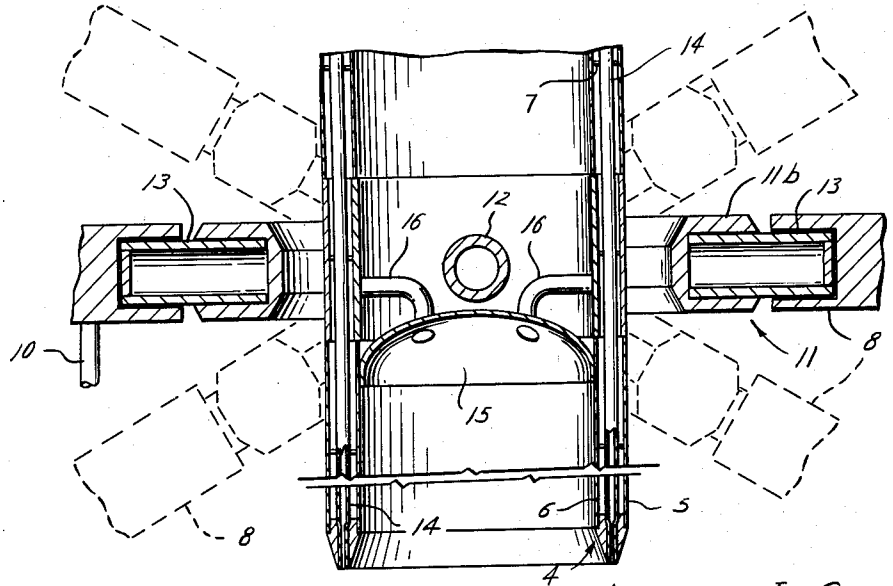


Fig. 13

Fig. 14



James I. Grant
William E. Joor, II
INVENTORS

BY Melvin R. Stidham

ATTORNEYS.

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Patented Jan. 10, 1961

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METHOD AND APPARATUS FOR ERECTING OFFSHORE PLATFORM

James I. Grant, 6200 Kansas St., and William E. Joor II, 1306 Ben Hur Drive, both of Houston, Tex.

Filed Aug. 8, 1955, Ser. No. 526,837

3 Claims. (Cl. 61—46.5)

This invention relates to offshore drilling platforms and, more particularly, to the method and apparatus for converting selectively a floating barge into a stationary platform supported on the bottom of a body of water.

With the increasing interest in the exploration and development of the petroleum potential beneath oceans, lakes and other bodies of water there is a concommitant demand for portable platforms which can be floated to an offshore drilling site and there positioned as a stationary drilling platform. Prior to our invention, it was customary to prefabricate such platforms and their supporting structural piers and then to tow them on one or more barges to an offshore drilling site where the piers were lowered into the water and the platforms attached thereto and erected by means of sub-aqueous assembly methods. However, the prohibitive costs and hazard incident to the erection of such structural platforms render them of little utility in waters deeper than 30 or 40 feet.

Recently, floating platforms and barges carrying vertical columns adapted to be lowered into engagement with the ocean floor to support the barge thereon have come into more frequent use. However, the mechanism employed for raising and lowering these columns did not lend themselves to positive control for fine adjustment and elevation of the platform. Moreover, these columns were not sufficiently braced against radial movement thereof so that there was a tendency under wave action for them to vary from the vertical and become angularly disposed. The moments of force thus created often cause them to become locked in their wells. Further, it was found that a great number of columns were required to provide sufficient stability for the desired function.

It is, therefore, an object of our invention to provide an improved structure which may be prefabricated ashore having self-contained means which support the structure as a stable drilling platform on the ocean floor.

It is a further object of our invention to provide an offshore drilling platform having vertical columns which may be raised or lowered a predetermined amount under positive control.

It is a further object of our invention to provide means and method for lowering or raising vertical columns while maintaining continuously a positive control over the direction and extent of the movement of such columns.

In carrying out our invention, we provide on a floating barge or similar structure, a plurality of vertical columns which, while the barge is afloat, are retained in elevated position by means of friction clamps. When it is desired to raise or lower the columns a movable friction gripper cooperates with the friction clamps to move the vertical columns longitudinally in an alternating clutch, pull and reach procedure.

That is, the columns are normally gripped by the stationary members but when the columns are being raised or lowered, they are, in turn, gripped by the traveling reciprocating grippers, released by the stationary members, moved by the traveling grippers through a predetermined stroke, and then gripped by the stationary member while the traveling member releases its grip and returns to initiate a second stroke. When the columns are lowered into engagement with the bottom of the body of water the continued relative movement between the columns and the barge will raise the barge up off the surface of the water to form a stationary drilling platform.

While our invention may differ in specific forms, we have shown in the accompanying drawings a typical embodiment in which the details of our invention will be better understood when used in connection with the following description.

In the drawings, Fig. 1 is a side view of a drilling barge showing the columns in elevated position; Fig. 2 is a side view of a drilling barge showing the columns in lowered position; Fig. 3 is a side view of our device for raising and lowering the columns showing the movable gripper in uppermost position; Fig. 4 is a side view of our device for raising and lowering the columns showing the movable gripper in its lowermost position; Fig. 5 is a detailed view partially in section of our invention; Fig. 6 is a section view taken along line **6—6** of Fig. 5; Fig. 7 is a partial section view taken along line **7—7** of Fig. 6; Fig. 8 is a partial section view showing a hydraulic band cylinder forming a part of our invention; Fig. 9 is a partial section view taken along line **9—9** of Fig. 6; Fig. 10 is a partial section view taken along line **10—10** of Fig. 6; Fig. 11 is a partial view in section taken along line **11—11** of Fig. 6; Fig. 12 is a partial section view taken along line **12—12** of Fig. 6; Fig. 13 is a top view of one of the column footings; and Fig. 14 is a section view taken along line **14—14** of Fig. 13.

Referring now to the drawings, there is shown an offshore drilling barge **1** comprising a buoyant hull section **2** and, at the fore and aft extremities thereof, extensions **3** which are elevated above the normal surface of the body of water and sealed from the main hull section **2** so that there are two spaced extensions at each fore and aft extremity of the barge. Carried on each elevated extension **3**, so as to be longitudinally movable therethrough, is a vertically disposed spud or column **4**.

Each spud or column **4** (Figs. 13 and 14) comprises an outer cylinder **5** and an inner cylinder **6** which are internally braced throughout the length thereof, by means of annular I-beams **7**, to provide a unitary, rigid structure. Mounted adjacent the lower extremity of each column **4** is a wide footing **8** of sufficient area to provide a substantial foundation for a drilling platform. Each spud **4** is normally retained, by means hereinafter described, in its upwardly extended position shown in Fig. 1 with the wide footing **8** situated within the recess **9** beneath the elevated extensions **3** created by their upwardly offset relationship with the hull **2**. Consequently, the recessed footings provide, when the barge **1** is afloat, a free, unobstructed hull bottom to facilitate navigation. When a drilling site is reached, the columns **4** are adapted to be lowered relative to the barge **1**, by other means to be described, until first, the wide footings **8** are firmly seated on the ocean floor and then, the hull **2** is raised clear of the surface of the water to convert barge **1** into a stationary platform as shown in Fig. 2, from which drilling, submarine exploration or other sub-aqueous operations may be conducted.

Projecting downwardly from the lower surface of each footing **8** is a plurality of tines or piles **10** which are adapted to penetrate into the soft sand or mud of the ocean floor when the columns **4** are lowered, in order to insure that the footings are firmly anchored as stable supports for the columns **4**. It is contemplated that the piles **10** may be formed of pipe, provided with a

conduit therethrough, for the passage of compressed air or water under high pressure to facilitate their penetration and to jet away the soft, unstable upper strata of the ocean floor.

In order that each footing may be seated firmly against the ocean floor despite irregularities thereof, we preferably secure the footings to the spuds 4 with two-way pivotal means, such as a gimbal 11 (Figs. 13 and 14). The gimbal comprises a rigid, annular member 11*b* pivotally secured to the spud by means of a shaft 12. Secured to and extending radially from the annular member 11*b* at opposite sides thereof with their common axis perpendicular to the shaft 12 is a pair of co-axial posts 13 on which are pivotally mounted the footing 8. Thus, each footing 8 may be pivoted simultaneously in two directions, i.e. about shaft 12 and about co-axial posts 13, to enable it to adapt itself to any angle for firmly seating itself on an irregular ocean floor.

In our preferred embodiment, we provide in each column between the inner and outer cylinders 5 and 6 a plurality of vertical conduits 14 through which a pressure fluid may be forced to jet away sand and mud and enable the lower extremity of the spud 4 to penetrate into the ocean floor, the penetration being limited by a dividing wall 15. Mud-evacuation conduits 16 are provided to permit the escape of sand, water and mud which would otherwise be entrapped.

Referring now to Figs. 3 to 6, our device for raising and lowering each vertical spud or column 4 comprises an axially reciprocable, annular friction gripper or clutch 17 which positively grips the spud 4 in clamping engagement, moves it longitudinally an amount equal to the length of its axial stroke, and then releases the spud and returns for a subsequent stroke. Between active strokes of the reciprocating gripper 17, the spud 4 is held against longitudinal movement by one or more stationary annular grippers or brakes 18.

Forming a part of each elevated extension 3 of our drilling barge 1 is a pair of vertically spaced, interconnected, rigid structural frame members 19 in which are secured rigid circular girders 20 which encase the stationary grippers 18 and provide a vertical well or passage for a column 4. Extending upwardly from the lower frame member 19 and secured thereto is a plurality of hydraulic cylinders or jacks 21 slidably encasing double-acting pistons (not shown). The upper extremity of each piston rod 22 is rigidly secured, as by a nut 23, to the horizontal flange 24 of a third circular girder 25 which embraces, for reciprocable movement therewith, the movable gripper 17. The hydraulic jack 21 may be operated to move the circular girder the desired amount limited, of course, by the length of its stroke. The jack may be retained in fixed position at any point in its stroke to hold the girder in any desired position between the limits of the vertical travel of piston rod 22. To increase the strength of the assembly the horizontal flanges are preferably braced by gusset stiffeners 26.

Referring now to Figs. 3 to 7, we have shown the means for producing radial compressive forces in the stationary and movable grippers to provide the desired positive clamping engagement with the columns 4. Since the movable and the stationary grippers are nearly identical, like elements of both devices will be assigned the same reference numerals with the exception that reference numerals assigned to elements of the stationary grippers 18 will include the suffix *"a."*

Surrounding each column and concentric therewith throughout the height of the gripping members 17 or 18 is a plurality of rigid, arcuate straps or bands 27, 27*a*. Each strap has at one extremity thereof a hinge element 28, 28*a* so that adjacent arcuate straps may be pivotally interconnected at 29, 29*a*. Preferably the column 4 is substantially encircled by four arcuate straps so that two hinges 29 or 29*a* are located at diametrically opposite sides thereof with the free ends of the arcuate straps spaced 90° therefrom. The free end of each arcuate strap 27 or 27*a* terminates in a radial flange 30, 30*a* to which is pivotally connected a horizontal piston rod 31, 31*a* of a double-acting piston 32, 32*a* (Fig. 8). As best seen in Fig. 8 adjacent pistons 32, 32*a* are enclosed in a common cylinder 33, 33*a*. It is to be understood that each stationary or movable gripper preferably has a plurality of parallel, vertically spaced, arcuate band assemblies each of which is controlled by a hydraulic cylinder 33 or 33*a*.

Preferably a common hydraulic system under a constant pressure is in continuous communication with each cylinder, either through ports 133, 133*a* (Fig. 8) opening into the center of the cylinder between the pistons 32, 32*a* or through ports 233, 233*a* opening into the cylinder near the ends thereof to influence the opposite faces of the pistons 32, 32*a*. It is understood that the flow of hydraulic fluid through ports 133 or 233 may be under the control of manually operated valves or directed by a master electronic or mechanical system which opens and closes valves in a predetermined timed sequence. In any event, the valve means for controlling the flow of the band cylinder hydraulic medium is not a part of our present invention and, hence, will not be described in the present application.

Extending radially inward from each circular girder 20 and 25 and secured thereto at regular circumferential intervals, is a plurality of vertical supporting ribs 34, 34*a*. As best shown in Fig. 12, each supporting rib is notched or recessed at 35, 35*a* to slidably accommodate the arcuate straps 27, 27*a* so as to permit limited radial movement thereof but to preclude any axial movement with respect to the circular girders 20 or 25. Thus, it is obvious that the stationary girders 20 will retain the grippers 18 against axial movement relative to the frame members 19 while, when the reciprocable circular girder 25 is moved axially by the piston rods 22, the supporting ribs 34 secured thereto, by engagement of the arcuate bands 27 with the recesses 35 therein will carry the movable gripper 17 therewith. Thus, the movable gripper may be moved any desired amount relative to the stationary grippers 18 governed only by the length of the stroke of the piston rod 22 and may be held at any desired point along its path of travel.

Referring now to Fig. 7, at regular circumferential intervals along the arcuate length of each strap 27, 27*a* there are pivotally mounted, by means of vertical bolts or stud shafts 36, 36*a*, U-shaped members 37, 37*a*. To the web of each U-shaped member 37, 37*a* there is rigidly secured so as to be carried thereby, a vertically disposed channel member 38, 38*a*. Thus, each channel member 38, 38*a* is supported by a plurality of parallel, horizontally disposed arcuate strap members 27, 27*a* so as to be movable radially therewith. Each channel member 38, 38*a* is lined, by means of bolts 39, 39*a*, with rubber, composition material or a similar material having a high coefficient of friction to form a friction shoe, 40, 40*a* adapted to engage directly the outer cylinder 5 of the associated column or spud 4.

In operation, when hydraulic fluid under pressure from a source (not shown) is introduced between the adjacent coacting pistons 32 or 32*a* of the common strap cylinders 33 or 33*a*, the radial flanges 30 or 30*a* of adjacent arcuate straps are caused to separate to pivot the arcuate straps 27 or 27*a* about the hinges 29 or 29*a*, to move the channel members 38 or 38*a* and friction shoes 40 or 40*a* away from the surface of the column 4 to permit free, longitudinal movement of the column relative to those straps. Conversely, when the pressure fluid is introduced outside the pistons 32 or 32*a* the straps 27 or 27*a* are moved radially inward to cause the shoes 40 or 40*a* to tightly embrace column 4 under heavy frictional

forces and prevent movement between the column 4 and the shoes 40 or 40*a*.

Should, for any reason, the hydraulic pressure in the band cylinders 33 or 33*a* fail, we provide positive mechanical means (Figs. 9, 10 and 11) for locking the columns 4 against longitudinal movement relative to the elevated sections 3 of the barge 1. Along the length of each column 4, we provide a pair of bi-directional ratchet columns 41 spaced 180° apart so as to be diametrically opposite each other. Each bi-directional ratchet column 41 has a central row of upwardly inclined ratchet teeth 42 and, on both sides thereof, a row of ratchet teeth having downwardly directed teeth 43. Intermediate the pair of bi-directional ratchet columns 41, and spaced 90° therefrom, is a pair of diametrically opposite, single ratchet columns 44 having upwardly directed teeth.

Each single ratchet column 44 is opposed by at least one ratchet lock 45 having downwardly directed teeth. Each ratchet lock 45 is slidably mounted in a guideway 46 secured to the stationary circular girders 20 for movement in a radial direction relative to the spud or column 4 into and out of engagement with the ratchet column 44. Preferably there are two diametrically opposite ratchet locks, one for each ratchet column, slidably mounted in each stationary circular girder 20.

In association with each ratchet lock 45 is a hydraulic cylinder 47 rigidly secured to the web of the circular girder 20. Within each cylinder 47 is a single-acting piston 48 having a piston rod 49 threadedly engaged or otherwise rigidly secured to the ratchet lock 45. Surrounding a cylindrical projection 50 secured to the inactive face of the piston 48, and coaxial therewith, is a compression spring 51, the spring 51 being normally compressed between the piston 48 and an internal flange 52 at the rearward extremity of the cylinder 47.

From the hydraulic system that controls the operation of the arcuate band cylinders 33 and 33*a*, there is introduced through port 53 the hydraulic medium under the same constant pressure. The normal pressure of the hydraulic fluid from the hydraulic system of the band cylinders 33 and 33*a* is sufficient to overcome the force of the spring 51 and to retain it in compression to hold the ratchet lock 45 out of contact with the ratchet column 44. If, however, the pressure in the band cylinder system should fall below a safe predetermined minimum, the force of the spring 51 will overcome the opposing hydraulic pressure against the piston 48 and will immediately snap the ratchet lock 45 into engagement with the ratchet column 44. Since the ratchet locks 45 are mounted in the circular girders 20 against longitudinal movement relative to the elevated extensions 3, they will, when the opposing ratchet teeth 44 and 45 intermesh, lock the spud 4 against upward movement relative to the girders 20 and, of course, the barge 1. When the pressure in the hydraulic system again builds up to a safe level, the force thereof acting against piston 48 in opposition to the compression spring 51 will slide the ratchet lock 45 radially out of engagement with the ratchet column to permit normal operation of the grippers 17 and 18.

Opposing the bi-directional ratchet column 41 (Fig. 11), in a slideway 54 secured to stationary circular girder 20, is a composite ratchet lock assembly having three, separately slidable ratchet locks. As in the case of the single ratchet lock 45, the slideway 54 permits radial sliding movement of the composite lock assembly while precluding axial movement thereof. The composite assembly comprises two outer locks 55 having upwardly directed teeth and one central lock 56 having downwardly directed teeth. As in the case of the single ratchet column, when there is a failure in the band cylinder hydraulic system, the pressure in the cylinders 57 controlling the outer locks 55, and in the cylinder 58 controlling the central lock 56, will also diminish. When a pre-determined minimum pressure is reached, the force of the compression spring will overcome hydraulic pressure acting in opposition thereto against each piston and, hence, will throw the oppositely directed ratchet locks 55 and 56 into engagement with the corresponding racks of the bi-directional column 41.

Of course, the stress on the ratchet teeth at any given moment during engagement of the ratchet locks with the columns will be in one direction only depending on whether the barge 1 is supporting the columns 4, as in Fig. 1, or the columns are supporting the barge, as in Fig. 2. Consequently, only the ratchet locks opposing the force in that direction will be active and the compression springs 51 will permit a yielding movement of the inactive locks to enable the teeth thereof to slide over the cooperating teeth of the ratchet column.

It is contemplated that a relief valve may be provided in communication with ratchet lock cylinders 47, 57 and 58 so that fluid pressure opposing the compression springs 51 may, if desired, be diminished by an amount sufficient to permit the springs to bias the ratchet locks into engagement with their associated ratchet columns and lock the columns 4 against longitudinal movement from any position, for example, that shown in Fig. 2, in which it is desired to be maintained.

In operation, our barge 1 may be fabricated ashore and towed or otherwise propelled to a selected drilling site. While the barge 1 is being floated, the columns 4 are fully elevated, as shown in Fig. 1 with the footings 8 and their depending tines 10 fully contained within the recesses 9 afforded by the elevated extensions 3. Thus, navigability of the barge 1 would be limited only by the dimensions and draft of the buoyant hull section 2, provided there are no overhead obstructions such as stationary bridges. During navigation, the columns 4 are held in their fully elevated position by the stationary grippers or brakes 18 and, if desired, by the reciprocable gripper or clutch 17 with its associated circular girder 25 maintained stationary by the hydraulic jacks 21.

When a drilling site is reached, each movable circular girder 25 is moved to its uppermost position by piston rods 22 under force exerted by the hydraulic jacks 21. The movable grippers 17 are then tightly clamped around the columns 4 by the introduction of a hydraulic medium into the band cylinders 33 on the outside of pistons 32 while the hydraulic pressure between those pistons 32 is relieved. The resultant forced movement of the pistons 32 toward the center of the cylinder 33, moves the radial flanges 30 on the arcuate straps toward each other to pivot the straps about their hinges 29 radially inward until the shoes 40 tightly and positively engage the columns 4. Pressure fluid is then directed between the pistons 32*a* of the band cylinders 33*a* on the stationary grippers or brakes 18 and evacuated from the outside of those pistons to force separation of the radial flanges 30*a* of the arcuate straps 27*a* to release the frictional engagement of stationary brake shoes 40*a* from the columns 4. The pistons 22 of the hydraulic jacks 21 are then forced downwardly to carry the circular girder 20 with it. The positive engagement of the circular girder 20 and the arcuate bands 27 also moves axially the movable grippers 17 and, of course, the columns 4. When the piston rods 22 of the jacks 21 reach the end of their downward stroke, the pressure fluid is re-directed outside the pistons 32*a* of the stationary band grippers 18, to first bring them into clamping engagement with the columns 4, and then is re-directed between the cooperating pistons 32 of the movable band grippers to release engagement thereof with the columns 4. The hydraulic jacks 21 are again operated to return the piston rods 22 to the upper end of its stroke carrying grippers 17 over the column 4 to their initial position relative to the stationary rigid frame 19.

This cycle is repeated until the columns 4 are lowered into engagement with the mud of the ocean floor at which time the lower extremities of the columns 4 and the tines

10 penetrate into the soft sand or mud of the ocean floor. As previously explained, this penetration may be facilitated by means of water pressure forced through vertical conduits 14 and, possibly, through tines 10. When the footings 8 are firmly seated on the solid ocean floor, adapting themselves by means of gimbals 11 to irregularities thereof, the column lowering mechanism continues its alternating clutch, pull and reach operation until the barge 1 climbs up the columns 4 to a position in suspension above the surface of the water, as shown in Fig. 2.

It is obvious that under our novel clutch, pull and reach method of operation, a positive control of each column 4 is consistently maintained. Several advantages of our apparatus are apparent over the conventional slidably engaged columns which are lowered by cables, ballast or similar means. For example, each column is always under positive control of the raising and lowering mechanism to permit quick adjustment or reversal of operation. Further, since the hydraulic jacks 21 may be stopped and held at any point along their path of travel our apparatus readily lends itself to fine adjustment of the height and level of the drilling platform. Moreover, since each column is always engaged by and under the radial compressive forces exerted by either or both of the stationary and movable grippers, with no radial clearance afforded, the path of movement of the column must necessarily be perpendicular to the barge 1. This is in clear contradistinction to slidably mounted columns wherein the clearance required for sliding movement usually affords a certain amount of radial play. Even minute radial movement, when multiplied by the extreme length of the column, may result in a substantial variance in the column from the vertical and may even cause buckling of the column, particularly under action of wind and waves, and/or a severe binding of the column in the well wherein it is slidably contained.

As previously described, should for any reason the pressure in the hydraulic system controlling the band cylinders 33, 33*a* fail, the pressure in the cylinders 47, 57 and 58 (Figs. 9 and 10) will also diminish. When the pressure falls below a predetermined safe minimum, the compression springs acting against the pistons in cylinders 47, 57 and 58 will throw ratchet locks 45, 55, and 56 into engagement with co-acting ratchet columns 44, 41 and 42, which are disposed the length of columns 4, to lock the columns against longitudinal movement relative to the stationary, rigid frame 19 in elevated extensions 3. When the pressure in the band cylinder hydraulic systems again rises to a safe limit and the movable and stationary grippers 17 and 18 again tightly clamp the column 4, the pistons in cylinders 47, 57, and 58 will again overcome the force of the compression springs to throw the ratchet locks 45, 55, and 56 out of engagement with the ratchet columns to permit continued longitudinal movement of the columns 4 under operation of the movable gripper 17. It is contemplated that a relief valve may be introduced in communication with ratchet lock cylinders 47, 57, and 58 so that when it is desired to retain the columns 4 in any desired position the ratchet locks 45, 55, and 56 may be employed to assist the grippers 17 and 18 in holding the columns 4.

While a specific embodiment of our apparatus for converting a floating barge into a stationary platform according to our method has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

Having described our invention we claim:

1. In a drilling barge for conducting subaqueous operations on a body of water comprising a bouyant hull and a plurality of vertical, cylindrical columns movable longitudinally relative to said hull to support said hull above said body of water, the combination therewith of means for producing the longitudinal movement of said vertical columns comprising a plurality of rigid frame members joined to said hull, each of said frame members being adjacent to one of said columns, an annular friction brake mounted on each of said frame members to surround one of said columns, said brake being normally conditioned to lock said vertical column against said longitudinal movement, a plurality of sub-frames movably carried on said hull, each of said sub-frames being situated adjacent one of said columns, means for moving each of said sub-frames selectively in opposite vertical directions, a friction band comprising at least one pair of arcuate friction members carried by said sub-frames for travel therewith, and a hinge pivotally interconnecting said pair of arcuate friction members, pressure fluid responsive means operative when said sub-frame is at rest at one end of its path of travel to pivot said friction members about said hinge into claimping engagement with said column and operable when said sub-frame is at rest at the other end of the path of travel to pivot said friction members about said hinge to release clamping engagement thereof with said column, and pressure fluid responsive means to disengage said brake and permit longitudinal movement of said column after said column is engaged by said friction members and to re-engage said brake after said sub-frame reaches said other end of its path of travel but before said column is released by said friction members.

2. The combination defined in claim 1, including positive mechanical means operable in response to a predetermined drop in hydraulic fluid pressure to lock said column against longitudinal movement thereof.

3. The combination defined in claim 2 wherein said positive mechanical means comprises a vertical ratchet column secured to said cylindrical column along the length thereof and a cooperating ratchet lock slidably mounted on said frame member for radial movement into engagement with said ratchet column, a resilient member biasing said ratchet lock toward engagement with said ratchet column, and pressure fluid responsive means normally overcoming said resilient member to maintain said lock out of engagement with said ratchet column.

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