March 3, 1970 G. D. KNORR 3,498,392

DRILLING RIG FLOOR STRUCTURE

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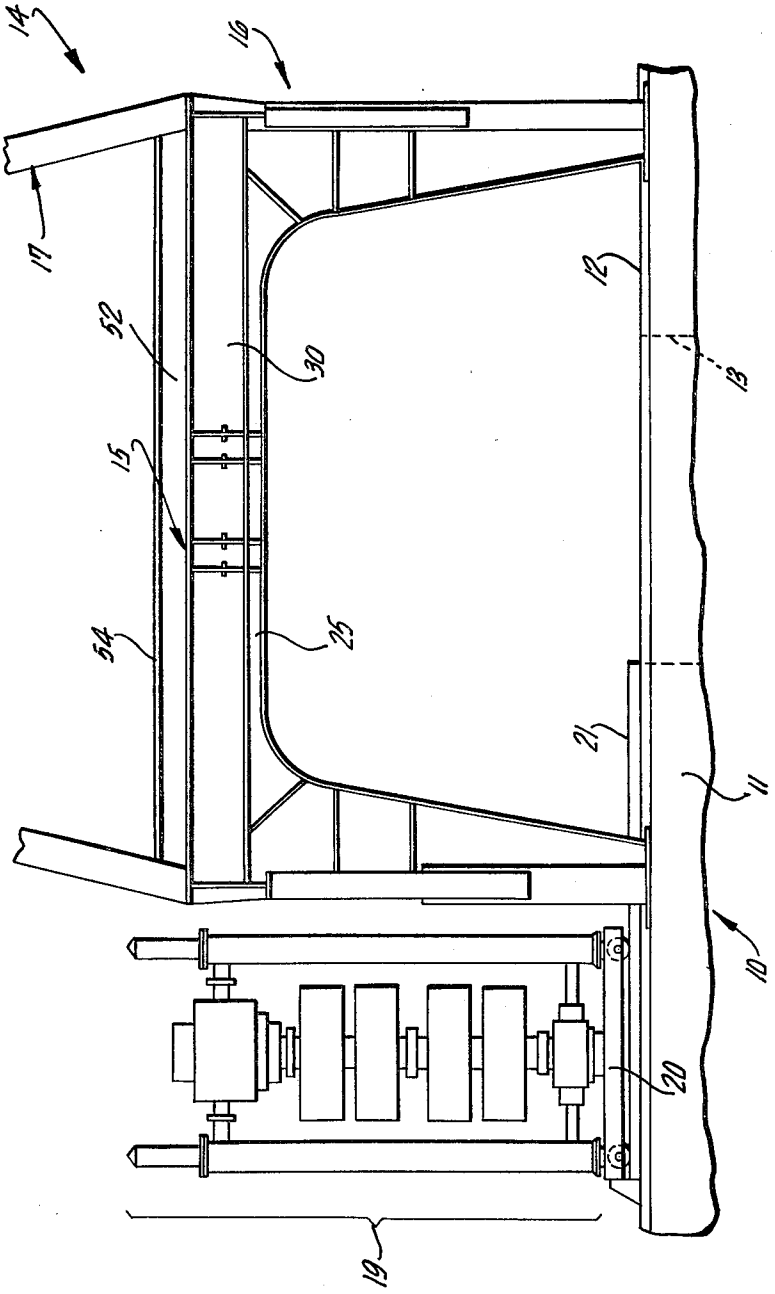

FIG 1

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DRILLING RIG FLOOR STRUCTURE

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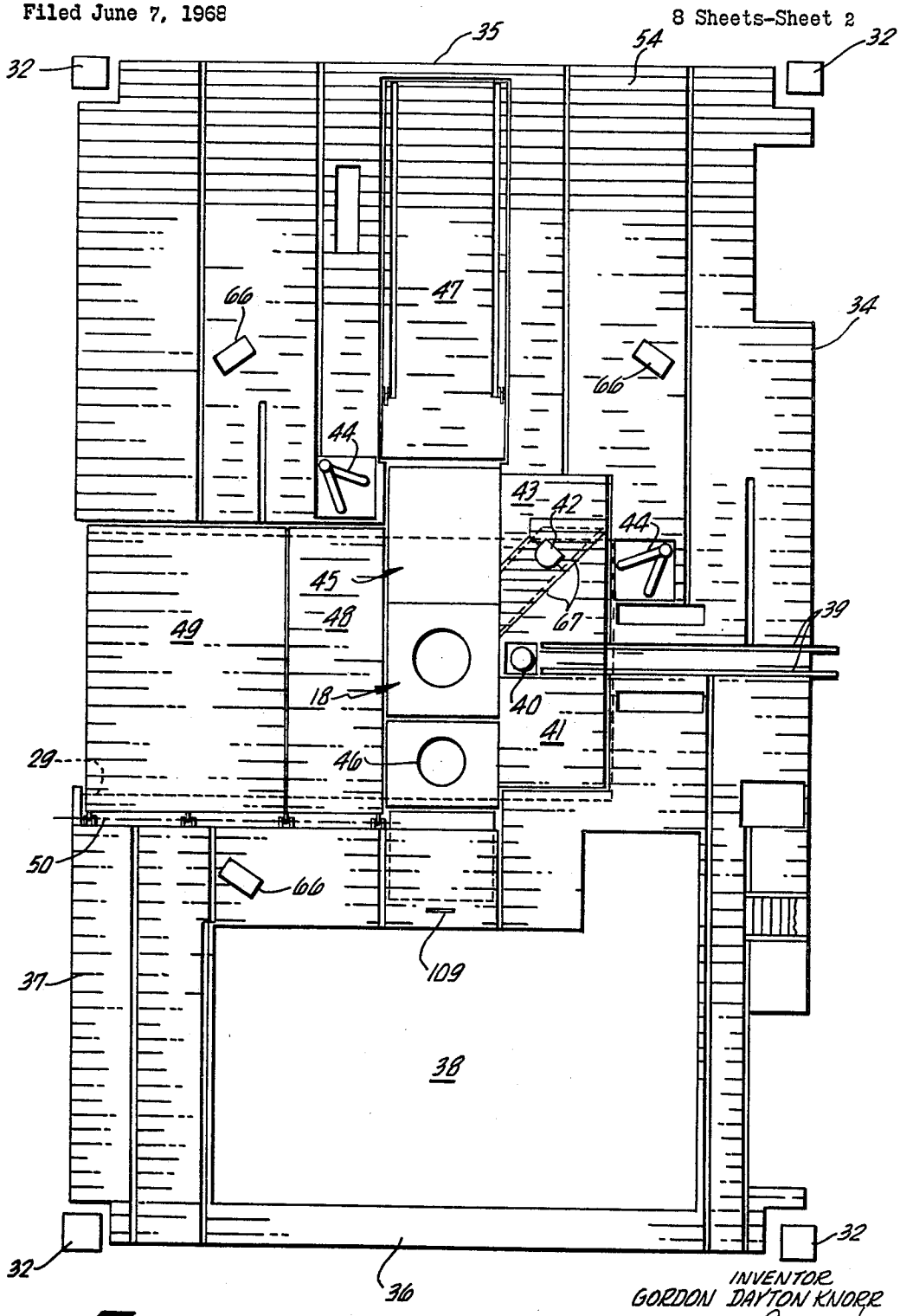

FIG 2

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DRILLING RIG FLOOR STRUCTURE

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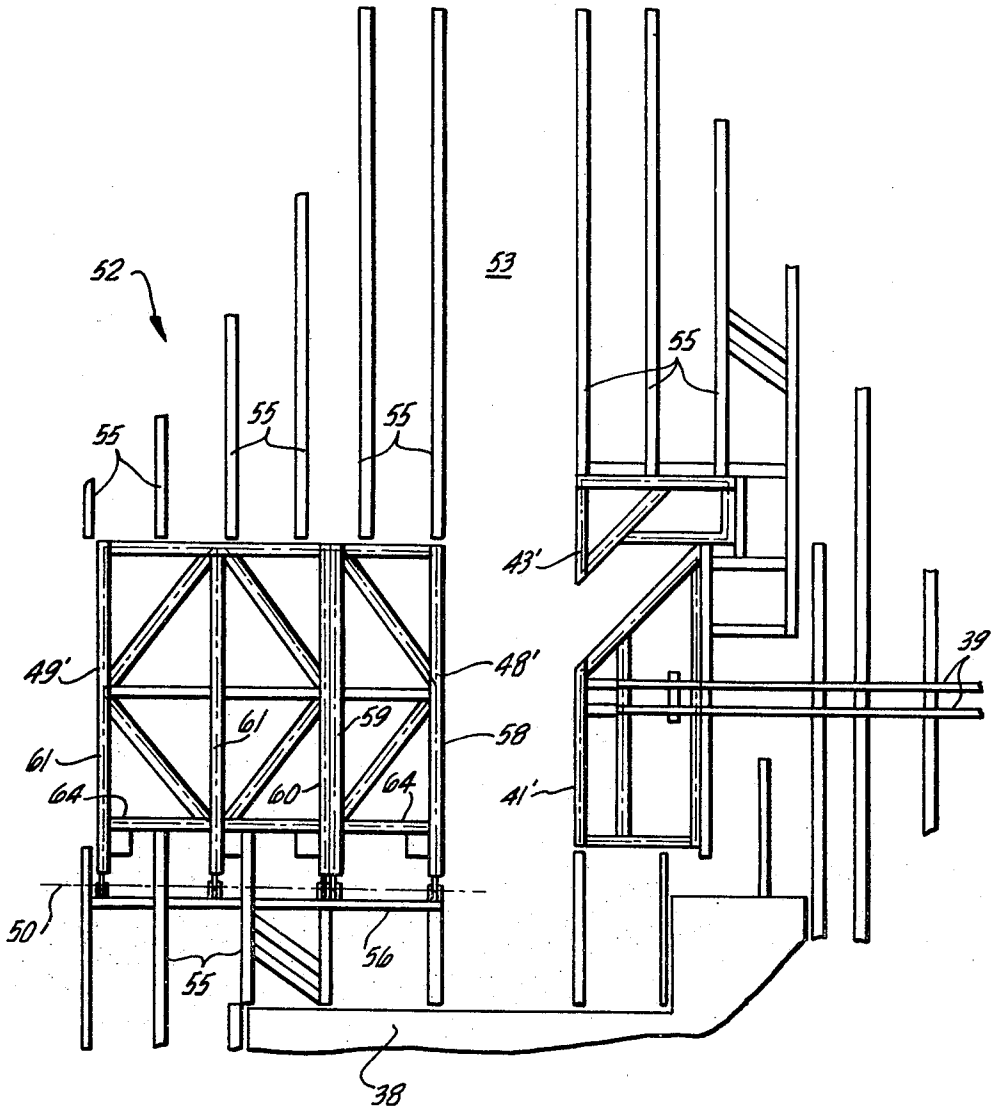

FIG 3

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DRILLING RIG FLOOR STRUCTURE

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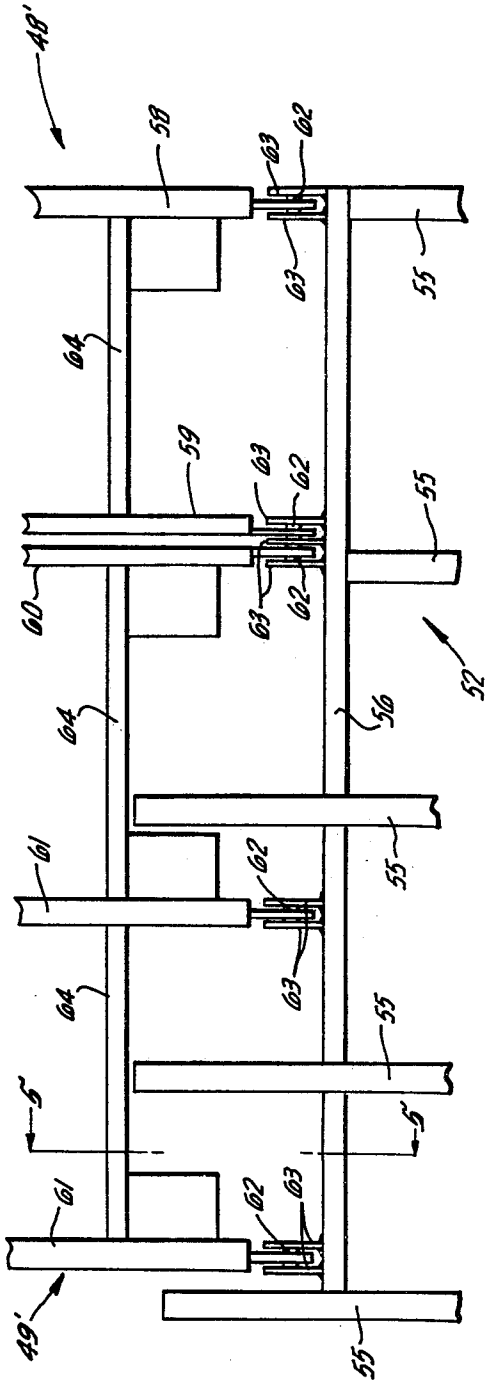

FIG. 4

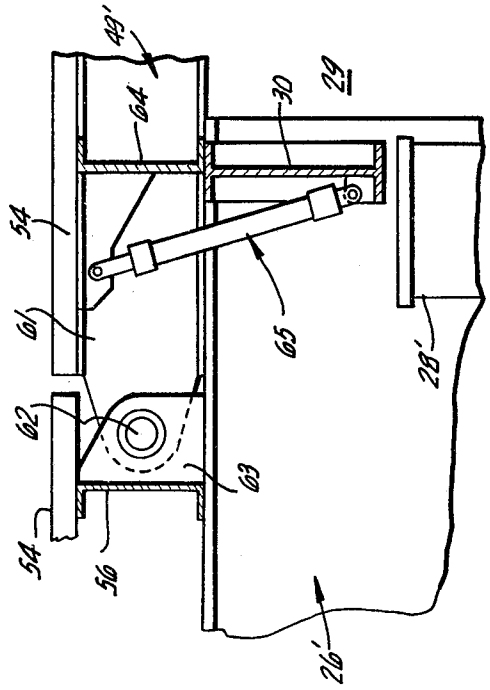

FIG. 5

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DRILLING RIG FLOOR STRUCTURE

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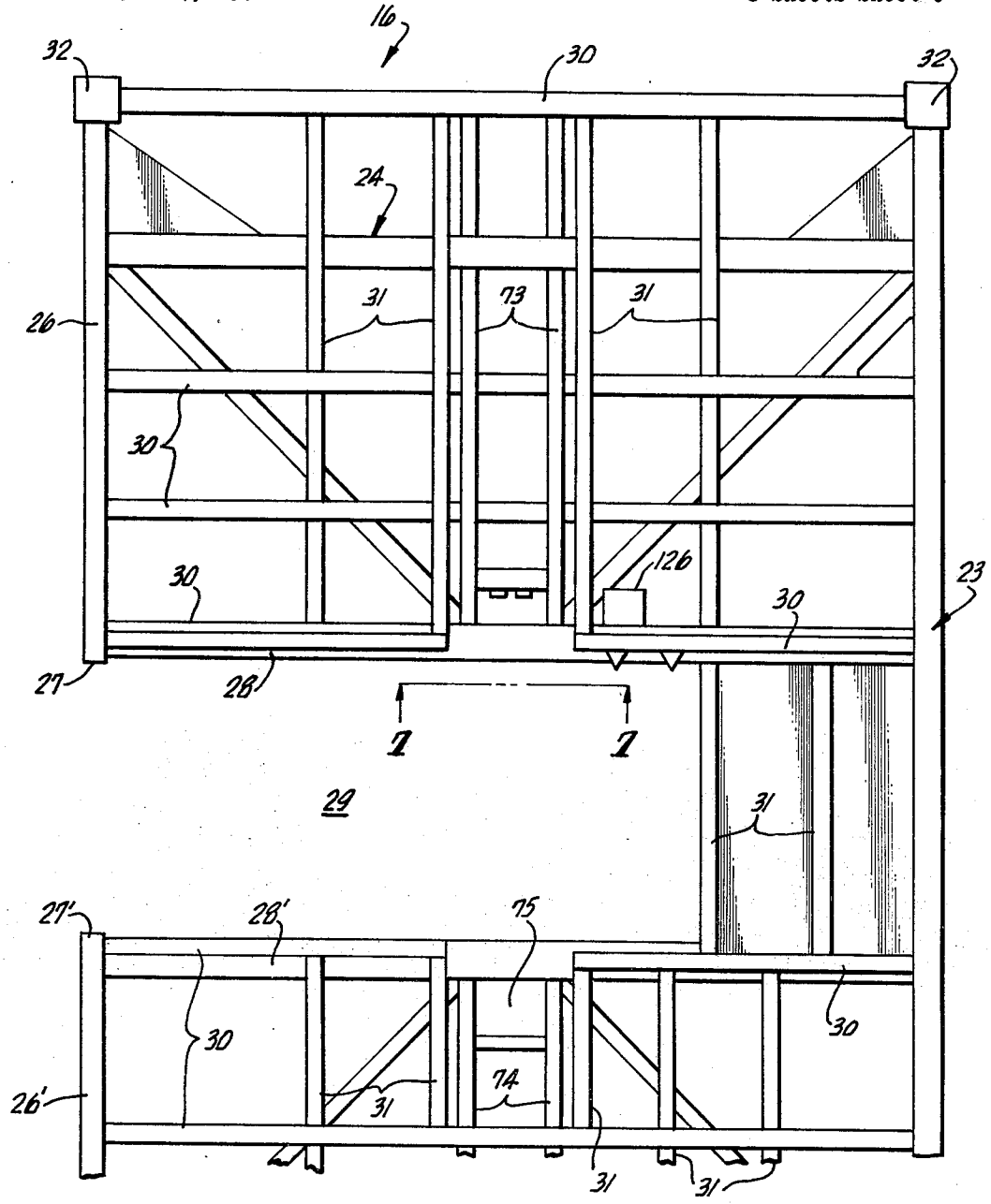

FIG 6

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DRILLING RIG FLOOR STRUCTURE

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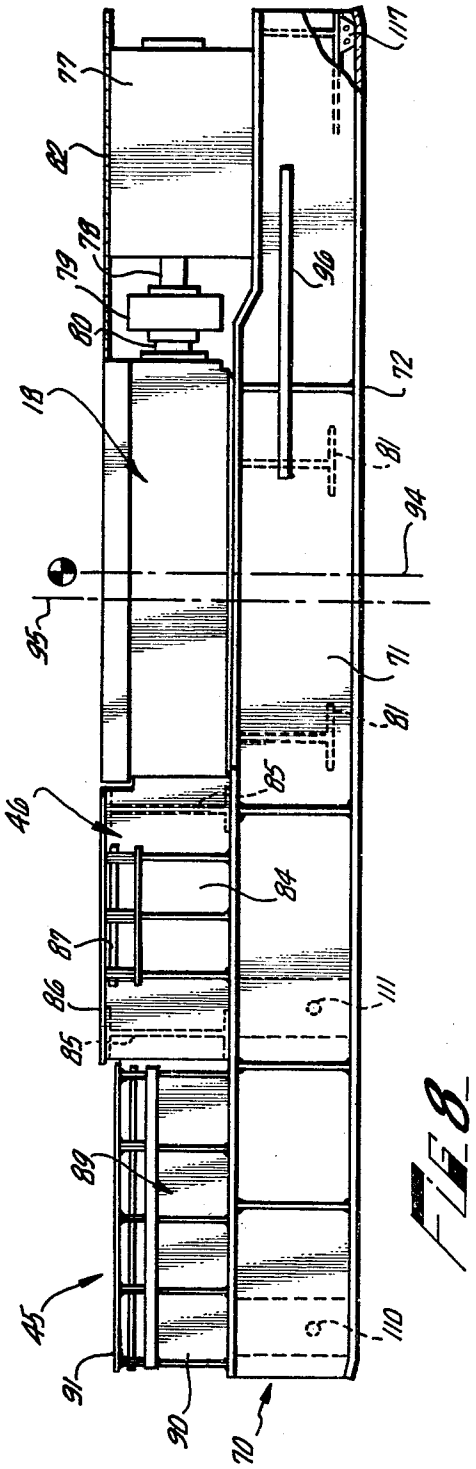

FIG 8

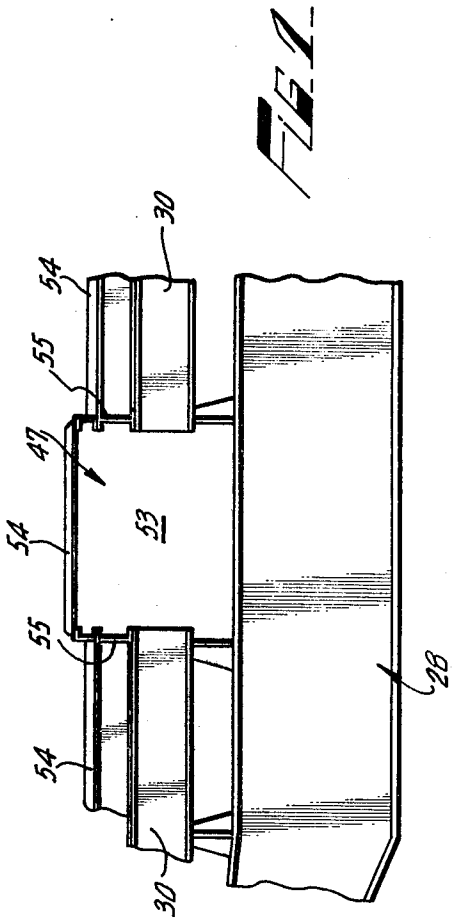

FIG 9

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DRILLING RIG FLOOR STRUCTURE

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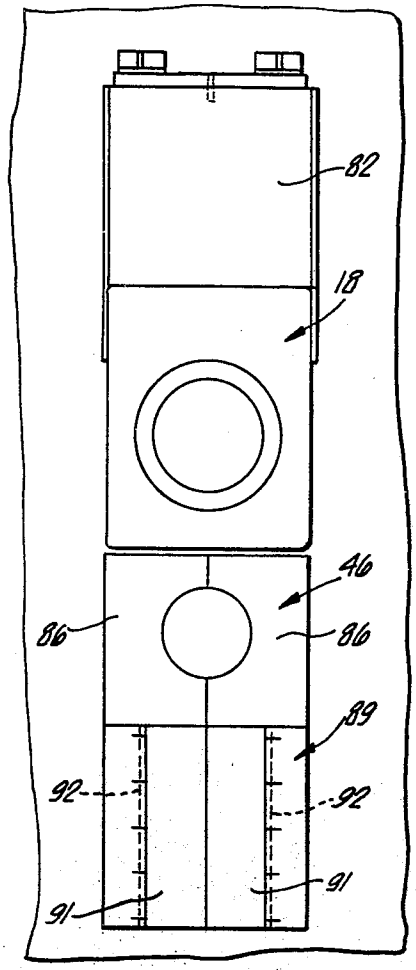

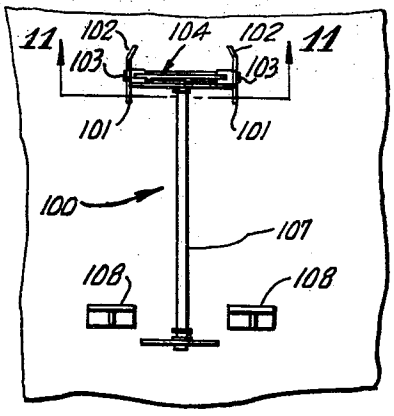

FIG 9

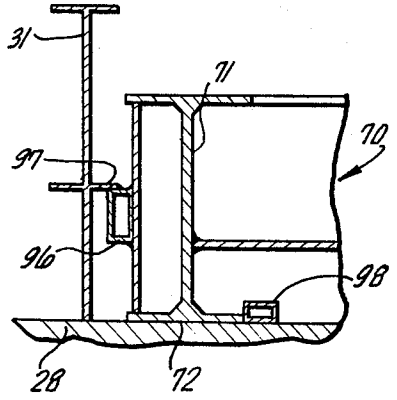

FIG 13

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DRILLING RIG FLOOR STRUCTURE

Filed June 7, 1968 8 Sheets-Sheet 8

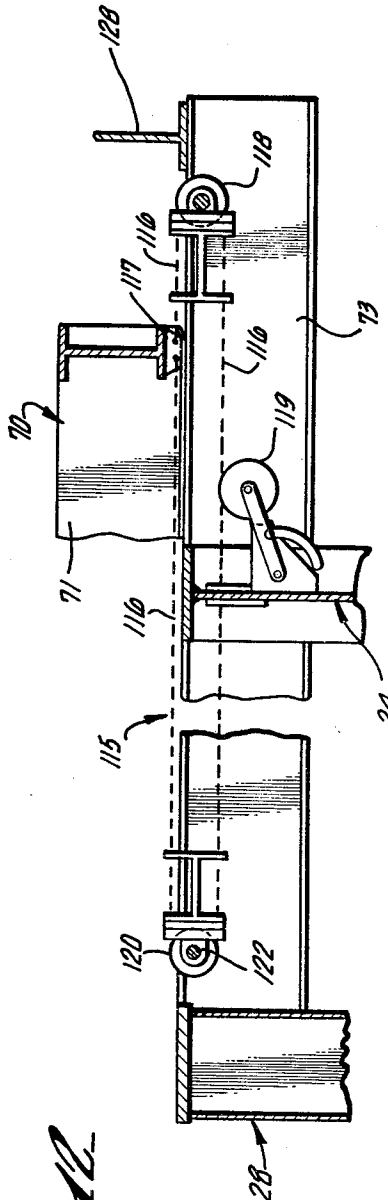

FIG 12

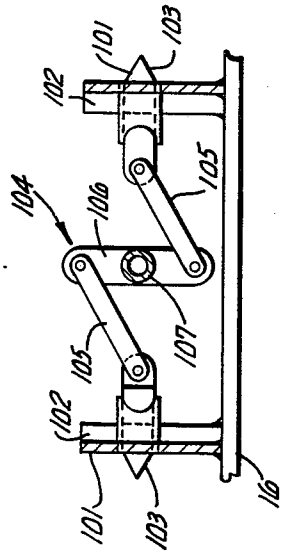

FIG 11

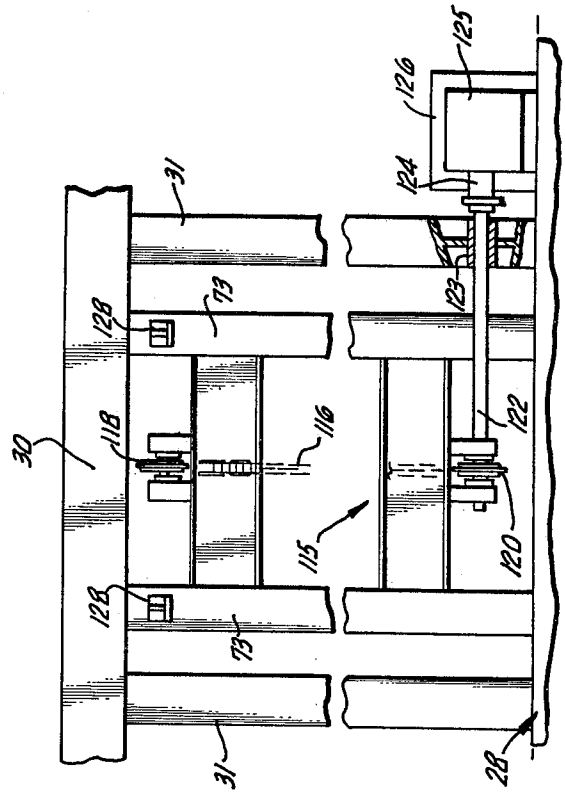

FIG 10

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United States Patent Office

3,498,392

Patented Mar. 3, 1970

3,498,392

DRILLING RIG FLOOR STRUCTURE

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Int. Cl. E21b 7/12, 15/02; E21c 19/00

U.S. Cl. 175—5 22 Claims

ABSTRACT OF THE DISCLOSURE

A drilling rig floor structure, especially useful in offshore drilling installations, in which a power operated hinged door extends from an edge of the floor to a rotary table which is retractably mounted in the center of the floor. Hinging of the door and retraction of the rotary table relative to the stationary portion of the floor provides an access passage from the side to the center of the floor through which may be moved a blowout preventer stack or the like.

BACKGROUND OF THE INVENTION

Field of the invention

This invention pertains to a power operated, openable floor structure for drilling rigs, particularly drilling rigs supported on floating vessels.

Review of the prior art

The utility of this invention is believed to be greatest in, but is not limited to, the context of floating drilling vessels. For this reason, this invention is described herein in the environment of a floating drilling vessel, and the prior art considered pertinent to the invention is reviewed with respect to such an environment. Basically, floating drilling vessels comprise a drilling rig mounted to the main deck of a ship of conventional hull form. The ship-mounted drilling rig is as similar as possible to land-based drilling rigs.

The basic purpose of such a floating drilling vessel is to carry out oil exploration and production operations with equipment which often is designed for use primarily in corresponding land-based procedures. The considerations pertaining to the basic purpose of the vessel are important technical and economic aspects of drilling ship design and often are sharply at odds with optimum naval architectural and marine engineering design parameters which include vessel stability.

The stability of a floating vessel of conventional hull form is directly related to the proximity of the vessel center of gravity to the keel. While the center of gravity may be, and usually is located higher from the keel than the vessel center of buoyancy, the amount by which the center of gravity may be higher than the center of buoyancy is limited. Of course, the center of gravity of the entire vessel may be lowered from the center of gravity of the basic vessel structure by the use of ballast carried low in the vessel, but the extensive use of ballast is not favored since such practices reduce the useful equipment and supply carrying capacity of the vessel.

The drilling rig carried by a floating drilling vessel includes a rig floor structure supported above the vessel main deck over a well vertically through the center of the ship, and a derrick erected over the rig floor. This structure is relatively massive and its presence has a significant effect upon the vertical position of the vessel center of gravity.

It has been found that it is impractical and inefficient to locate the rig floor directly upon the vessel main deck because of the necessity, at various times during offshore

drilling operations, to move various pieces of equipment, notably blowout preventer stacks, into position below a rotary table carried in the rig floor over the vessel center well. Thus, elevating the drilling rig above the vessel main deck further raises the vessel center of gravity and reduces vessel stability. For these reasons, the amount of rig floor elevation above the vessel main deck must be kept as small as possible, consistent with the basic purposes for which the vessel is designed. The practice in the past has been to elevate the rig floor sufficiently to enable the passage, under the rig floor along the vessel main deck to over the center well, of most previously used blowout preventer stacks; this practice places the rig floor at such a height that the vessel center of gravity is located so as to provide almost the minimum safe margin of stability for the vessel. This design compromise, necessitated by the marriage of a drilling rig to a ship, presents operational problems in the drilling of large diameter submarine oil wells and in the drilling of wells in water depths not previously encountered.

As the size of the drilled well increases, or as wells are drilled in increasingly large depths of water, the size of the equipment needed in the drilling process increases. The piece of equipment involved in the problem to which this invention is addressed is the blowout preventer stack used to controllably close the drill hole in the event that gas or oil at high pressures is unexpectedly encountered as the well is drilled. Blowout preventer stacks for large diameter wells and for deep water wells are too high to pass below the rig floors of drilling rigs mounted to vessel hulls of economical and practical dimension and form; this is the problem, and its significance is being felt more and more as larger and larger wells are being drilled in greater and greater water depths.

For the reasons given above, the problem cannot be solved merely by further elevating the drilling rig floor above the vessel main deck. While the dimensions or form, or both, of the vessel could be altered to produce a beneficial effect upon the relation between the vessel center of buoyancy and the vessel center of gravity, such a solution is obviously not practical with respect to existing vessels and usually is not economically realistic with respect to vessels yet to be constructed specially for offshore drilling operations.

SUMMARY OF THE INVENTION

Briefly, this invention provides a drilling rig which includes an elevated floor and a rotary table mounted in the floor at a normal operational position disposed centrally of the side edges of the floor. The floor has a major stationary portion, and includes door means hinged to the stationary portion. The floor door means extend from the operational position of the rotary table to a side edge of the floor. Power means are connected to the door means for hingably moving the door means relative to the floor stationary portion to provide an access passage from the floor side edge to the operational position of the rotary table. The structure of the invention also includes means for moving the rotary table from its operational position to provide an extension of the access passage to centrally of the floor.

As noted above, the present invention is believed to have its greatest utility when incorporated into the structure of a floating drilling vessel. It will be understood, however, that the invention can be used to advantage in other drilling structures, as in non-floating offshore drilling installations and facilities, for example.

DESCRIPTION OF THE DRAWINGS

The above-mentioned and other features of the invention are more fully set forth in the following detailed description of a presently preferred embodiment of the

structure and operation thereof, which description is presented with reference to the accompanying drawings, wherein:

FIG. 1 is a fragmentary side elevation view of the base of a drilling rig on a floating drilling vessel showing a large blowout preventer stack stored adjacent the rig;

FIG. 2 is a top plan view of the floor of the drilling rig shown in FIG. 1;

FIG. 3 is a fragmentary plan view of the substructure of the rig floor shown in FIG. 2;

FIG. 4 is an enlarged plan view of a portion of the structure shown in FIG. 3;

FIG. 5 is an enlarged elevation view taken along line **5—5** in FIG. 4;

FIG. 6 is a top plan view of the supporting base for the drilling rig and to which the structure shown in FIG. 3 is mounted;

FIG. 7 is an elevation view taken along line **7—7** in FIG. 6.

FIG. 8 is a side elevation view of the rotary table and its supporting sled;

FIG. 9 is a top plan view of the structure shown in FIG. 8 and of a sled hold-down device mounted to the structure shown in FIG. 6;

FIG. 10 is a fragmentary plan view of the rotary table sled drive means;

FIG. 11 is an enlarged elevation view taken along line **11—11** in FIG. 9;

FIG. 12 is an elevation view of a portion of the sled drive means; and

FIG. 13 is a cross-sectional elevation view of the sled guide structure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A floating drilling vessel **10** (see FIG. 1) has a hull **11** having a main deck **12**. A center well **13** is formed vertically through the hull at about 'midships of the vessel. A drilling rig **14** is erected on the hull over the center well and includes a rig floor structure **15**, a truss-work foundation **16** supporting the floor structure above the main deck over the center well, and a derrick **17** supported on the foundation. Most drilling operations are carried out on the floor of the drilling rig, although some operations, especially operations peculiar to offshore drilling, are carried out on the main deck and in the center well.

In drilling an oil well from a floating drilling vessel, a conductor pipe is run down from the vessel through the center well to the ocean bottom and is either jetted or drilled into the ocean bottom to establish a connection between the vessel and the geology of the ocean bottom. A landing base is then lowered on cables along the conductor pipe into contact with the ocean bottom, the cables thereafter serving as guides for the movement of additional pieces of equipment between the vessel and the hole. A string of drill pipe and a drilling tool are then run from the rig through a rotary table **18** (see FIG. 2) mounted in the rig floor, through the conductor pipe and into the ocean floor, and the hole is drilled out for a short distance. Suitable casing is next inserted into the hole and is cemented to the geology to permanently establish the upper end of the well, the landing base forming a part of the permanent structure on the ocean floor.

Upon completion of the foregoing procedures, and before drilling is actually commenced in earnest, a blowout preventer (BOP) stack **19** (see FIG. 1) is installed on the landing base. To install the BOP stack, all drill pipe and conductor pipe is run up from the well. The BOP stack is moved along the vessel main deck into position over the center well, and is then lowered along the guide cables by a string of drill pipe into proper registry with the landing base. After the BOP stack has been properly seated on the wellhead at the landing base, a drilling mud riser pipe is connected between the vessel and the stack. Drilling then may be commenced in earnest.

As shown in FIG. 1, BOP stack **19** normally is stored on the vessel main deck on a wheeled dolly **20** engaged with rails **21** which extend from the position in which the stack is stored to the adjacent edge of the center well. Previously, where small sizes of drill pipe and oil conductor pipe were used in conjunction with relatively small diameter holes, the BOP was sufficiently small that it could be stored under the rig floor on the vessel main deck. Today, however, wells are being drilled in greater and greater depths of water, and the economics of such activities encourages the drilling of wells of larger and larger diameter. Ideally, larger and larger BOP stacks should be used for safety and adequate control over the wells during the drilling procedure. Wellhead diameters of 16¾" and more are becoming increasingly common.

FIG. 1 illustrates the problem presented by a BOP stack for use with a 16¾" wellhead; stack **19** is constructed for use with such a wellhead and, with its supporting dolly, extends approximately 26 feet above main deck **12**. The top of foundation **16** is located about 23 feet above the main deck. Obviously, stack **19** could not merely be run along the rails to the center well were floor structure **15** and foundation **16** of conventional design.

As shown in FIGS. 1 and 6, drilling rig foundation **16** includes a forward 'thwartships arch **23**, and port and starboard arches **24** and **25**, each of which extends continuously along a corresponding side of the foundation as shown in FIG. 1 relative to starboard arch **25**. The rear side of the foundation, however, is defined by a pair of column-like half-arches **26** and **26'** having inboard extremities **27** and **27'** which are spaced from each other a distance at least as great as the 'thwartships width of BOP stack **19** which has its storage position aft of the drilling rig as shown in FIG. 1. Parallel box beams **28** and **28'** connect the inboard extremities of the half-arches with the forward arch (see FIG. 6) and define the sides of an opening **29** in the foundation, the opening extending more than half the distance from the rear side of the foundation to the front side thereof. Fore-and-aft girders **30** and transverse girders **31** laid over the box beams and arches further comprise the horizontal part of the foundation upon which floor structure **15** is constructed. A support pad **32** for a leg of the derrick is located at each upper corner of the foundation.

The arrangement of rig floor **15**, and of certain pieces of equipment mounted thereon, is shown in FIG. 2. Rotary table **18**, when in use, is located centrally of the forward **34**, port **35**, starboard **36** and aft **37** edges of the floor. A derrick drawworks **38** is located along the starboard edge of the floor. Skate rails **39** of a drill pipe handling and racking assembly extend from the forward edge of the floor to a mouse hole **40** (in which a joint of drill pipe may be stored temporarily) located in a removable floor section **41** just forward of the rotary table. The skate rails are severable over the forward edge of floor section **41**. A rathole **42**, in which a kelly joint may be stored, is located between floor section **41** and a second generally triangular removable floor section **43**. Two pipe tong latch and back-up posts **44** are mounted on the stationary portion of the floor adjaceint the rotary table. The rotary table is located on a sled **45** which also carries a spider base **46**. The sled is retractable transversely of the vessel into a tunnel **47** which extends inwardly of the rig from the port edge of the floor.

The portion of the floor aft of the in-use position of sled **45** (the position shown in FIG. 2) is defined by two doors **48** and **49** which are hinged to the stationary portions of the floor along collinear, fore-and-aft hinged axes **50**. When closed, the doors span opening **29** in the rig foundation.

The surface of floor structure **15** is defined by planking (see FIG. 2) which is laid over floor substructure **52** (see

FIG. 3) as well as over removable sections **41** and **43** and over doors **48** and **49**. The floor substructure includes frameworks **41'** and **43'** for floor removable sections **41** and **43**, and frameworks **48'** and **49'** for doors **48** and **49**. Those elements of FIG. 3 in which dash-dot-dash lines are used are movable relative to the remaining elements of the floor substructure; a comparison of FIGS. 2 and 3 will show the correspondence between the movable portions of the rig floor and foundation opening **29**.

FIG. 3 also illustrates that the floor substructure defines a 'thwartships passage **53** for sled **45**, such passage being covered by raised planking **54** to define tunnel **47** as shown in FIG. 7. The floor substructure is defined predominantly by 'thwartship channels and I-beams **55**; it also includes a fore-and-aft channel **56** extending adjacent the starboard side of door frameworks **48'** and **49'** (see FIGS. 3 and 4).

As best shown in FIGS. 3, 4, and 5, framework **48'** for door **48** includes a 'thwartship I-beam **58** adjacent the rotary table and a 'thwartships channel **59**, the flanges of which face forward, located along the aft edge of the framework. Framework **49'** for door **49** includes, all as 'thwartships elements, a forward channel **60** which has its flanges facing aft, and two I-beams **61**. The flanges of each of elements **58–61** are cut away at the starboard ends of the elements, and the webs of these elements at their starboard ends each journal a corresponding hinge pin **62** (elements **59** and **60** cooperate with a common hinge pin as shown in FIG. 4) which are mounted coaxially of each other in vertical support lugs **63** extending toward the vessel centerline from channel **56** of floor substructure **52**. In this manner the doors are mounted to the stationary portion of the drilling rig floor for hingable movement relative to the stationary portion of the floor about a fore-and-aft axis lying essentially in the plane of the rig floor.

Hinge pins **62** are disposed outboard, and to starboard of foundation girder **30** which lies along the starboard side of space **29**; each door framework includes a fore-and-aft structural member **64** which engages the top of this girder when the door is closed (see FIG. 5). Three extensible, double-acting hydraulic rams **65** are pivotally coupled between girder **30** and framework **49'** outboard of member **64**; two extensible double-acting rams are similarly coupled to framework **48'**. The rams are connected to a suitable source (not shown) of hydraulic power. The rams coupled to door **48** are operable independently of the rams coupled to door **49**.

The unhinged ends of doors **48** and **49** rest upon girder **30** along the port edge of space **29** when the doors are closed. Thus, when the doors are closed, hinge pins **62** are essentially unloaded even though the doors may be supporting large loads.

The incorporation of doors **48** and **49** in the floor of drilling rig **14** enables the convenient provision of an access passage through the floor from the storage position of BOP stack **19** to the in-use position of the rotary table. As noted above, however, the BOP stack must be lowered through the center of well **13**. Therefore, it is necessary that the access passage for the BOP stack be extended forward in the drilling rig, beyond the forward extent of door **48**, at the time it is desired to lower the BOP stack to the submerged wellhead, so that the BOP stack may be centered over the vessel center well. Such extension of the BOP stack access passage is accomplished by fully retracting rotary table sled **45** into tunnel **47** and by removing floor sections **41** and **43**. Since floor sections **41** and **43** are relatively small and light in weight, the removal of these sections from the stationary portion of the rig floor can be accomplished rapidly and easily through the use of cables extended from air tuggers **66** (see FIG. 2) located at various positions on the rig floor around the boundaries of the access passage. Metal floor plates **67** associated with rathhole **42** are also removed readily by the use of the air tuggers.

Sled **45** (see FIGS. 8 and 9) includes an elongated bed **70** having a width sized to fit within the width of passage **53** and of tunnel **47** (see FIG. 7). The bed is defined by a pair of parallel beams **71** which have flat bottom surfaces **72**. Surfaces **72** are arranged for sliding along the greased upper surfaces of the flanges of a pair of 'thwartships beams **73** which form a portion of foundation **16** (see FIG. 6) between port arch **24** and port box beam **28**; similar beams **74** are included in the foundation in conjunction with box beams **28'**. The upper surfaces of box beams **28**, **28'**, and arch **24**, and of beams **73** and **74** are coplanar and define slide ways for sled **45** along the bottom of tunnel **47** and passage **53**, as well as along a recess **75** in the foundation along the starboard side of passage **29** in alignment with passage **53**.

An electric motor **77** is mounted to the port end of the sled bed (see FIG. 8) and has an output shaft **78** which is coupled via a clutch **79** to the drive shaft **80** of rotary table **18** which is also mounted to the sled bed to span the space between beams **71**. The rotary table is also supported by a pair of beams **81** which are permanently connected between beams **71**. A cover plate **82** is provided over the motor flush with the top of the rotary table. Power is supplied to the motor, at any position of the sled in the rig floor, via a self-reeling power cable (not shown) extending from the port end of the sled.

Spider base **46** is mounted to the sled bed adjacent the rotary table on the side of the table opposite from motor **77**. The structure of the spider base includes side walls **84** parallel to beams **71**, spaced transverse beams **85** which are removably connected between beams **71**, and a pair of top cover doors **86** which are hinged to side walls **84** by way of hinge pins **87**. The cover doors are cooperatively recessed to define a circular opening through the sled when the doors are closed as shown in FIG. 9.

The starboard ends of sled beams **71** support an auxiliary work platform **89** which is comprised only of side walls **90** and a pair of cover doors **91** each of which is hinged to a respective side wall **90** for rotation about a hinge axis **92** parallel to the length of the sled. Doors **91** are not recessed as are doors **86**. When doors **91** are open, the starboard end of the sled defines a U-shaped recess which opens away from the rotary table. This recess can be extended to the rotary table by opening spider base doors **86** and by removing beams **85** of the spider base; this construction makes it very easy to quickly outfit the drilling rig for passage of a running tool, for example, through the floor and downwardly of the vessel.

The vertical extent of the auxiliary work platform above beams **71** of the sled bed is less than the vertical extent above these beams of the spider base and the rotary table. Accordingly, when the sled is disposed to place the sled in its most starboardward position (see FIG. 2), the auxiliary work platform is positioned under the floor planking which covers recess **75**.

When the sled is in its most extended position (shown in FIG. 2), the sled is supported on box beams **28** and **28'**. The sled, however, may be fully retracted into tunnel **47** from between these box beams. Since it is contemplated that vessel **10** may be pitching or rolling when the sled is moved, the center of gravity (represented in FIG. 8 by line **94**) of the sled assembly is located to port of the axis **95** of rotation of the rotary table. Thus, as the sled is extended from its retracted position, the starboard ends of beams **71** engage box beam **28'** before the sled center of gravity passes beyond box beam **28**. The sled, therefore, cannot tip into the space provided between box beams **28** and **28'**.

Undesired tipping of the sled about box beam **28** is further prevented by registry of ribs **96**, extending outwardly of beams **71** adjacent the port end of the sled (see FIG. 8), under cooperating flanges **97** (FIG. 13) extended inwardly of passage **53** from those of foundation girders **31** which define the sides of passage **53**. The sled is guided linearly during its movement in the drill-

ing rig by guide members **98** (FIG. 13) which cooperate with the inner sides of sled beams **71**.

FIGS. 9 and 11 illustrate a locking mechanism **100** for securing sled **45** to the portion of foundation **16** which lies to starboard of space **29**. A pair of spaced, vertical guide plates **101** are mounted to the upper surface of box beam **28'** centrally of recess **75** to extend athwartships of the vessel. These guide plates cooperate with the opposing surfaces of sled bed beams **71** and are toed inwardly, as at **102**, toward each other adjacent passage **29** to assure proper alignment of the sled with recess **75** should the sled be slightly skew to the recess as it approaches the recess from the tunnel. A latching pin **103** is journalled in each guide plate (see FIG. 11) for reciprocation fore-and-aft of the vessel upon operation of a toggle linkage **104**. The toggle linkage includes a pair of links **105** each of which is pivoted between a corresponding latching pin and a bellcrank lever **106**. The bellcrank lever is secured to a shaft **107** which is rotatably mounted to the foundation and which extends parallel to the foundation along the length of recess **75**. The shaft extends between a pair of stops **108** which are fixed to the foundation to define the starboard limit of travel of the sled. The locking mechanism is operated by inserting a suitable handle (not shown) through a slot **109** (see FIG. 2) in the rig floor planking into engagement with the starboard end of shaft **107**, and by moving the handle in such direction as to cause the latching pins either to extend from or to retract into guide plates **101**.

The latching pins of locking mechanism **100** cooperate with apertures **110** and **111** formed in the inner (i.e., the opposing) faces of beams **71** of the sled bed (see FIG. 8). Apertures **110** are used in cooperation with the latching pins to secure the sled in such a position that spider base **46** is positioned over the center of well **13**; in this position of the sled, the sled is partially retracted from its most extended position. Apertures **111** and the latching pins cooperate to secure the sled in its most extended position, as shown in FIG. 2, so that rotary table **18** is centered over the vessel center well.

The locking mechanism is particularly advantageous as a safety feature in the structure of rig floor **15**. As noted above, the rig floor is located high above the main deck of the vessel. If the vessel should be rolling to any appreciable extent, the sled will be subjected to 'thwartship accelerations and may tend to shift transversely of the rig floor while personnel are working on the rig floor and the sled. The locking mechanism secures the sled in those positions in which it is most frequently disposed so the sled cannot unexpectedly move from such position. Also, the latching mechanism holds the sled down against the foundation and prevents the sled from being lifted by drill pipe caught either in a spider or the rotary table.

FIGS. 10 and 12 illustrate a drive mechanism **115** for powered movement of sled **45** transversely of the rig floor. A sled drive chain **116** (represented by a dashed line in FIG. 12) is secured at one end of its length to a lug **117** which depends from the center lower portion of the sled at the port end of the sled (see FIG. 12). The chain extends around an idler sprocket **118** which is rotatably mounted to the foundation between sled rail beams **73** just inboard of port arch **24**. From the idler sprocket the chain extends to starboard centrally between the sled rail beams over an adjustable tensioning sprocket **119** to around a drive sprocket **120**; the drive sprocket is rotatably mounted to the rig floor foundation outboard of box beam **28** centrally between the sled rail beams. Chain **116** extends to port from the drive sprocket back to lug **117** of the sled bed.

The chain drive sprocket is secured to a shaft **122** which is journalled to the foundation, as at **123**, and which extends parallel to box beam **28**. The shaft is connected to the output shaft **124** of a reversible sled drive motor **125** mounted on a support platform **126** secured to the box beam. Motor **125** may be a pneumatic motor or an electric motor, but a hydraulic motor is preferred in combination with a reduction gear system (not shown). Operation of the motor causes the sled to be driven linearly transversely of the rig floor between the position of the sled shown in FIG. 2 and a position in which the sled is fully retracted into tunnel **47** and engages port sled stops **128** (see FIG. 12) secured to rail beams **73** adjacent port foundation arch **24**.

From the foregoing description, it is apparent that this invention provides a rig floor structure which enables the construction of economic drilling vessels capable of drilling submarine oil wells of essentially unlimited diameter. The invention makes it possible to locate the drilling rig floor sufficiently close to the vessel main deck that a safe margin of stability is assured for the vessel, yet the vessel is still given the capacity to drill wells of large diameter. Moreover, the above-described features of the invention make is possible to drill a well with greater efficiency than has heretofore been possible since valuable time is not lost in manually dismantling the rig floor structure to move the rotary table or to move a BOP stack into position over the vessel center well.

What is claimed is:

1. A drilling rig including a floor and a rotary table mounted in the floor at a normal operative position centrally of the side edges of the floor, and characterized in that the floor includes a major stationary portion and door means hinged to the stationary portion, the door means extending from the rotary table normal position to a side edge of the floor, power means connected to the door means for hingably moving the door means relative to the floor stationary portion to provide an access passage from the floor side edge to the normal position of the rotary table, and means for moving the rotary table from the normal position thereof to provide an extension of the access pasage to centrally of the floor.

2. A drilling rig according to claim **1** including a truss-like foundation supporting the rig floor at an elevated location above a supporting base, the foundation defining a space in the upper portion thereof below the floor access passage and the extension thereof, the space under the floor having dimensions in directions parallel to the floor at least as great as those of the extended passage in corresponding directions, the space extending to and through the side edge of the foundation corresponding to said side edge of the floor.

3. A drilling rig according to claim **2** wherein the means for moving the rotary table includes drive means coupled between the foundation and the rotary table operable for moving the table in the plane of the floor into and out of the normal operative position thereof.

4. A drilling rig according to claim **3** including guide means for guiding the rotary table for movement thereof transversely of the elongate extent of the access passage relative to the rig floor.

5. A drilling rig according to claim **4** wherein the guide means comprises a tunnel in the rig floor into which the rotary table is movable in response to operation of the drive means.

6. A drilling rig according to claim **5** including an elongate sled to which the rotary table is mounted and to which the drive means is connected, the sled having a length adequate to span the space defined by the foundation.

7. A drilling rig according to claim **5** including a spider base mounted to the sled, the sled having a length adequate to span said foundation space when either the rotary table or the spider base is disposed centrally of the side edges of the floor.

8. A drilling rig according to claim **7** wherein the spider base and the sled are constructed for defining an opening through the sled from the end of the sled disposed most outwardly of the tunnel in the normal operative position of the rotary table to the rotary table.

9. A drilling rig according to claim 6 including a drive motor for the rotary table mounted to the sled.

10. A drilling rig according to claim 6 including latch means operable for securing the sled in at least one selected position relative to the rig floor.

11. A drilling rig according to claim 1 including selectively operable means for securing the rotary table in said normal operative position.

12. A drilling rig according to claim 2 including hinge means connecting the door means to the floor stationary portion, and wherein the door means and the foundation are cooperatively configured and arranged so that the hinge means are essentially unloaded when the door means is closed relative to the floor.

13. A drilling rig according to claim 1 wherein the door means comprises a plurality of door units in the rig floor.

14. A drilling rig according to claim 13 wherein the power means comprises means for moving each door unit hingably relative to the floor stationary portion independently of the other door units.

15. A drilling rig according to claim 1 wherein the drilling rig is disposed on a floating drilling vessel at an elevated location over a center well formed through the vessel, and the normal operative position of the rotary table is centrally over the vessel center well.

16. In an installation for drilling submarine wells and the like including a drilling rig floor elevated above a floating supporting structure, a rotary table disposed in the rig floor and having a normal operating position centrally of the floor, and means mounting the rotary table in the floor for movement into and out of the normal operating position thereof, the improvement comprising selectively operable drive means continuously and positively coupled to the rotary table and operable for moving the table into and out of said position.

17. Apparatus according to claim 16 including a support to which the rotary table is mounted, a tunnel defined in the rig floor, and guide means cooperating with the support for guiding the support into and out of the tunnel during operation of the drive means.

18. Apparatus according to claim 17 including a drive motor for the rotary table mounted to the support.

19. Apparatus according to claim 17 including a spider base mounted to the support.

20. In a floating drilling vessel having a drilling rig floor fixedly elevated above and disposed substantially parallel to a main deck of the vessel over a center well through the vessel, a rotary table mounted in the rig floor and having a normal operating position over the well, and in which the rig floor has a stationary portion and includes a second portion thereof extending at least from the normal position of the rotary table to a side edge of the floor which is effectively removable from the floor stationary portion, and a foundation supporting the rig floor above the vessel main deck, the improvement comprising a permanent opening defined by the foundation in the portion of the foundation supporting said side edge of the rig floor, said opening being aligned with the second portion of the floor.

21. Apparatus according to claim 20 wherein said opening extends within the foundation vertically through the foundation and horizontally of the foundation longitudinally and transversely of the vessel amounts substantially equal to the corresponding extents of the floor second portion.

22. Apparatus according to claim 20 including means for storing a blowout preventer stack on the vessel main deck laterally of the rig floor adjacent the foundation opening.

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