United States Patent

[11] 3,593,529

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[33] **Netherlands**
[31] **67-13804**

[54] METHOD AND APPARATUS FOR INSTALLING DRILLING PLATFORMS

1 Claim, 6 Drawing Figs.

[52] **U.S. Cl.** **61/46.5,** 114/43.5
[51] **Int. Cl.** **E02b17/02,** B63b 35/44
[50] **Field of Search** 61/46.5, 46; 114/.5, 43.5

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ABSTRACT: A buoyant mobile drilling platform has a gap in its side in which is detachably disposed a permanent drilling platform. The two platforms are floated to the drilling site and temporarily emplaced. If a test drill shows the presence of gas or oil, then the permanent platform is permanently emplaced and the mobile platform is floated away.

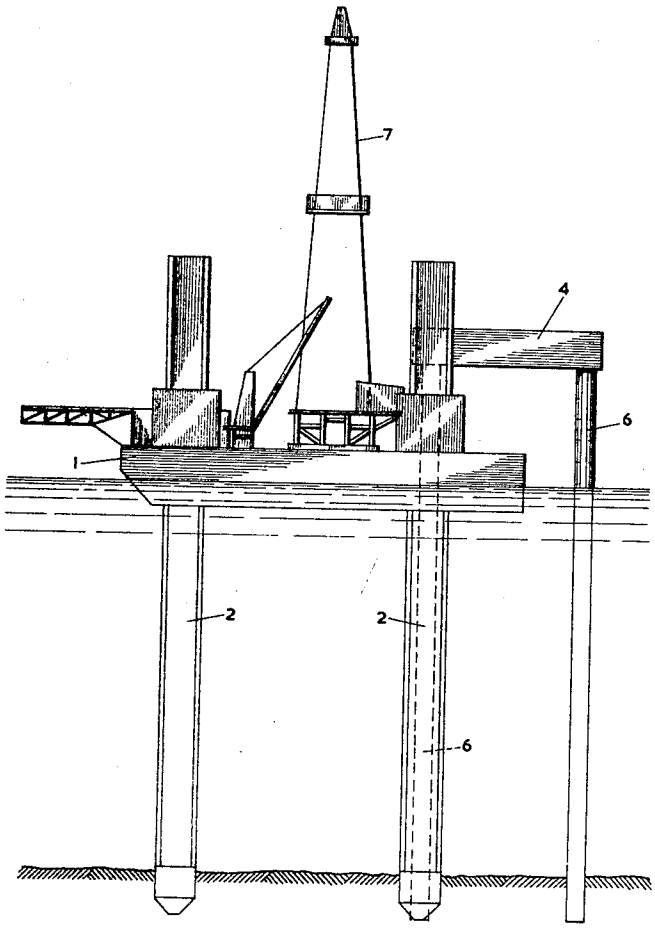
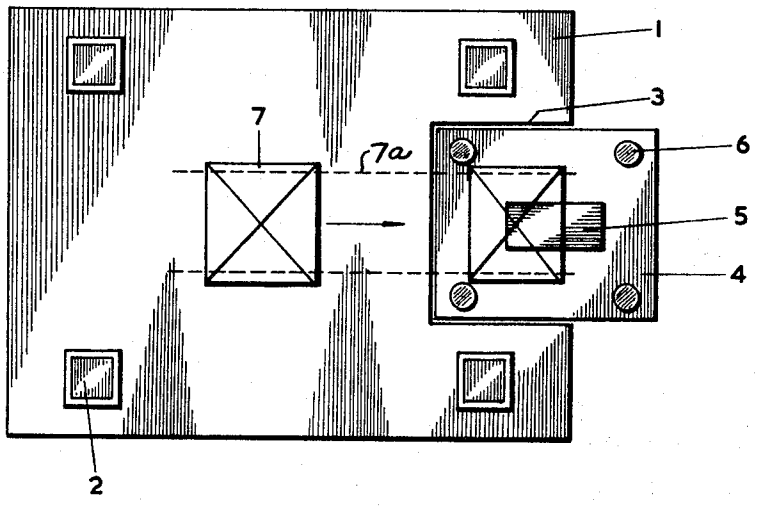
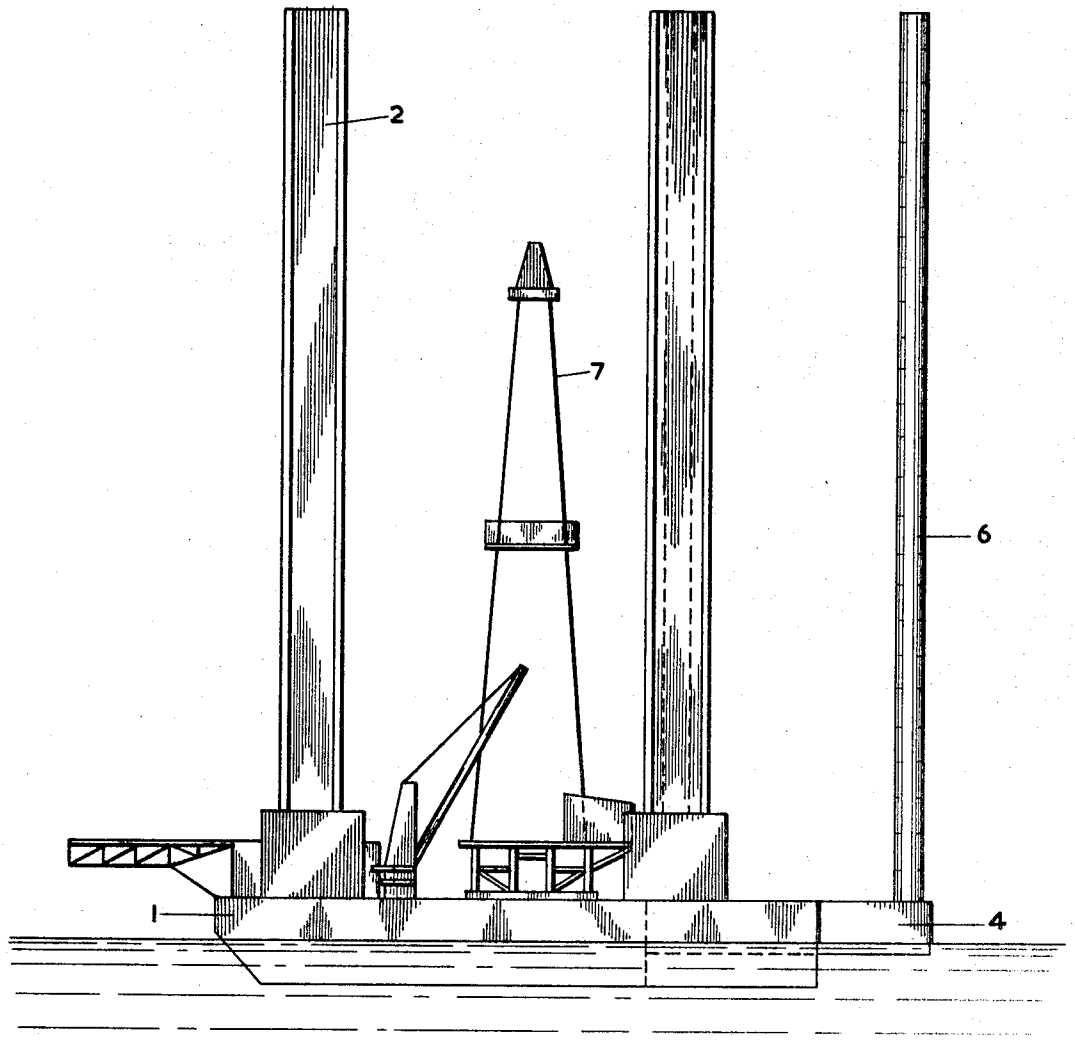


FIG. 1



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FIG. 2



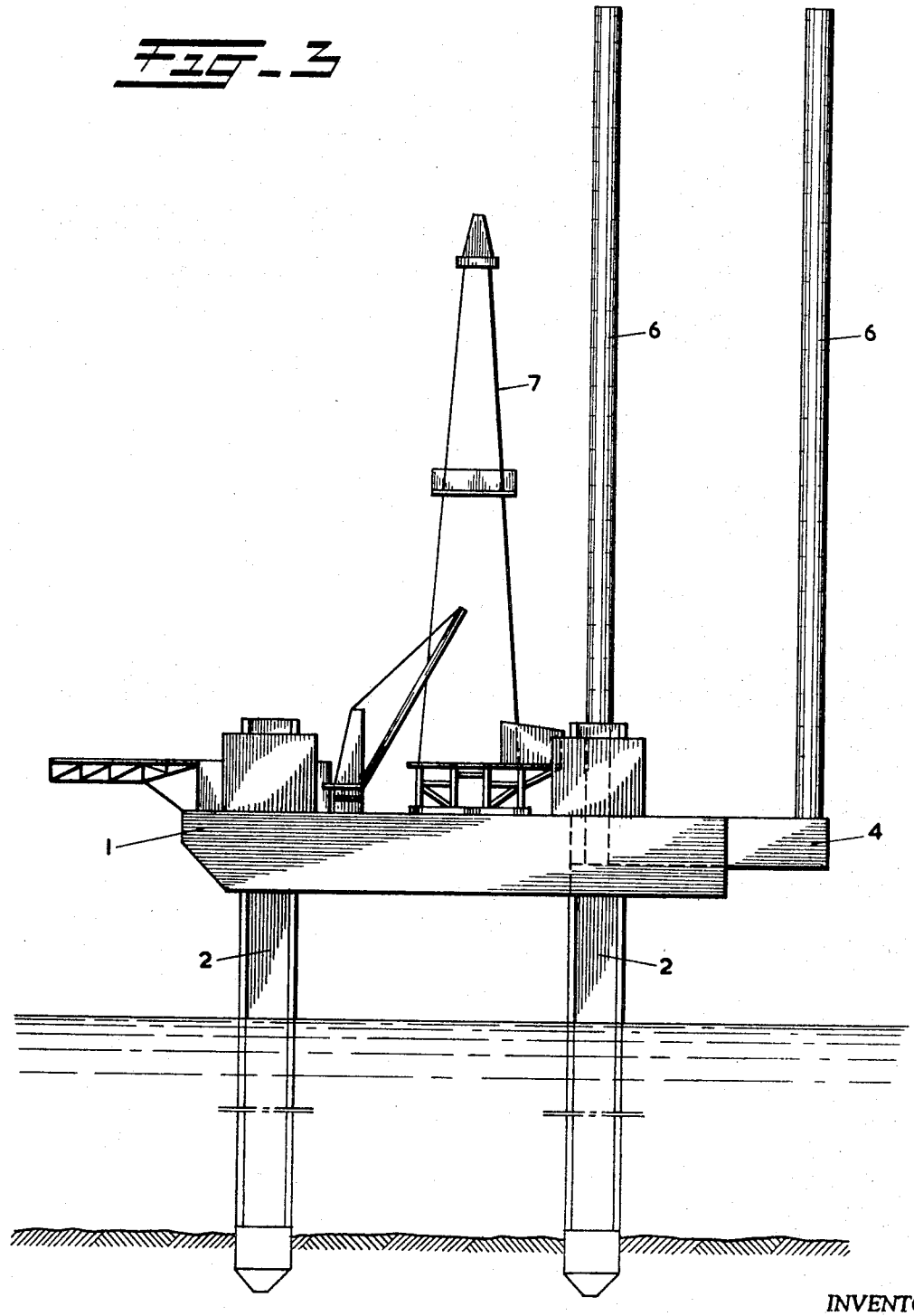
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Fig. 3



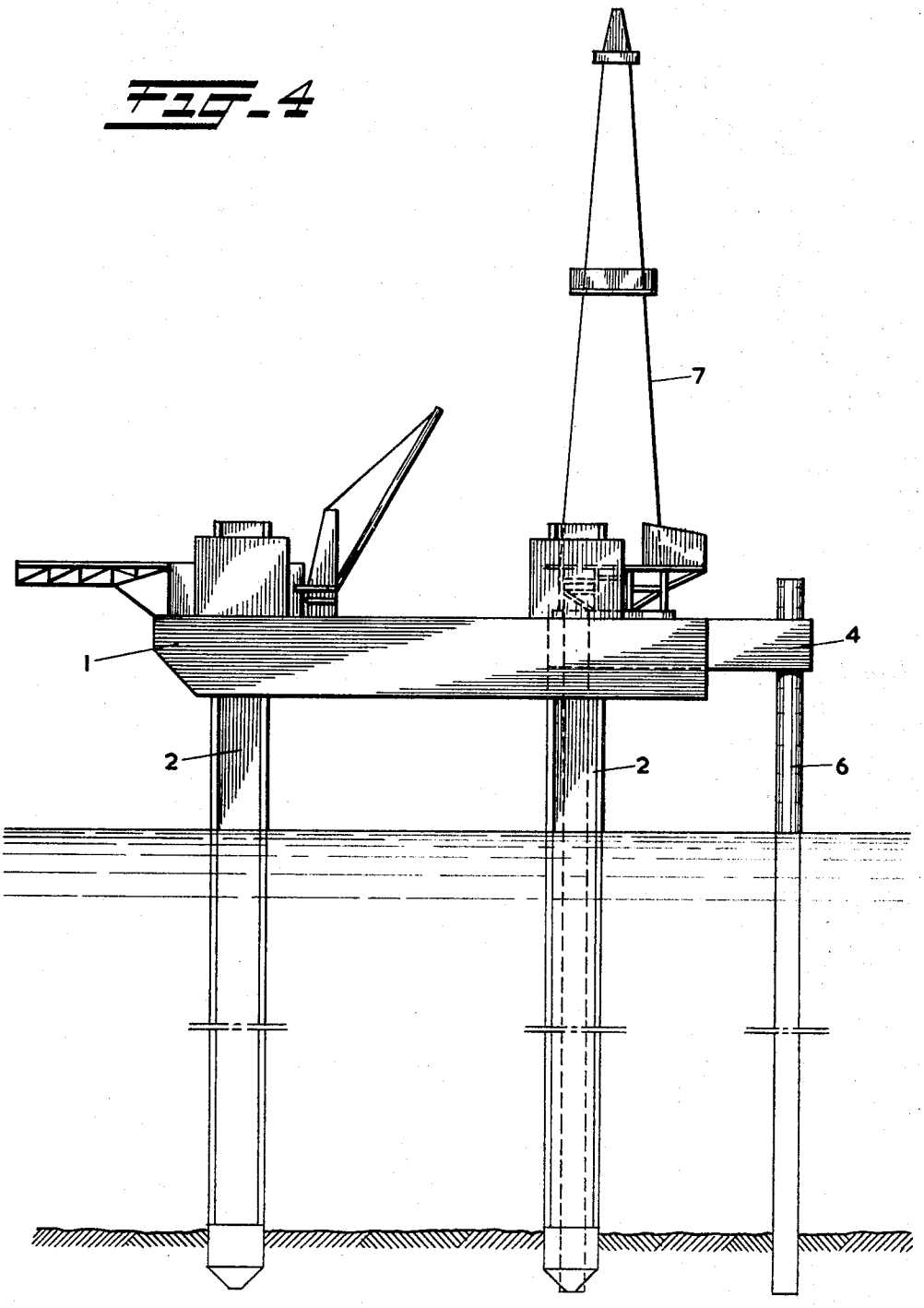
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Fig. 4



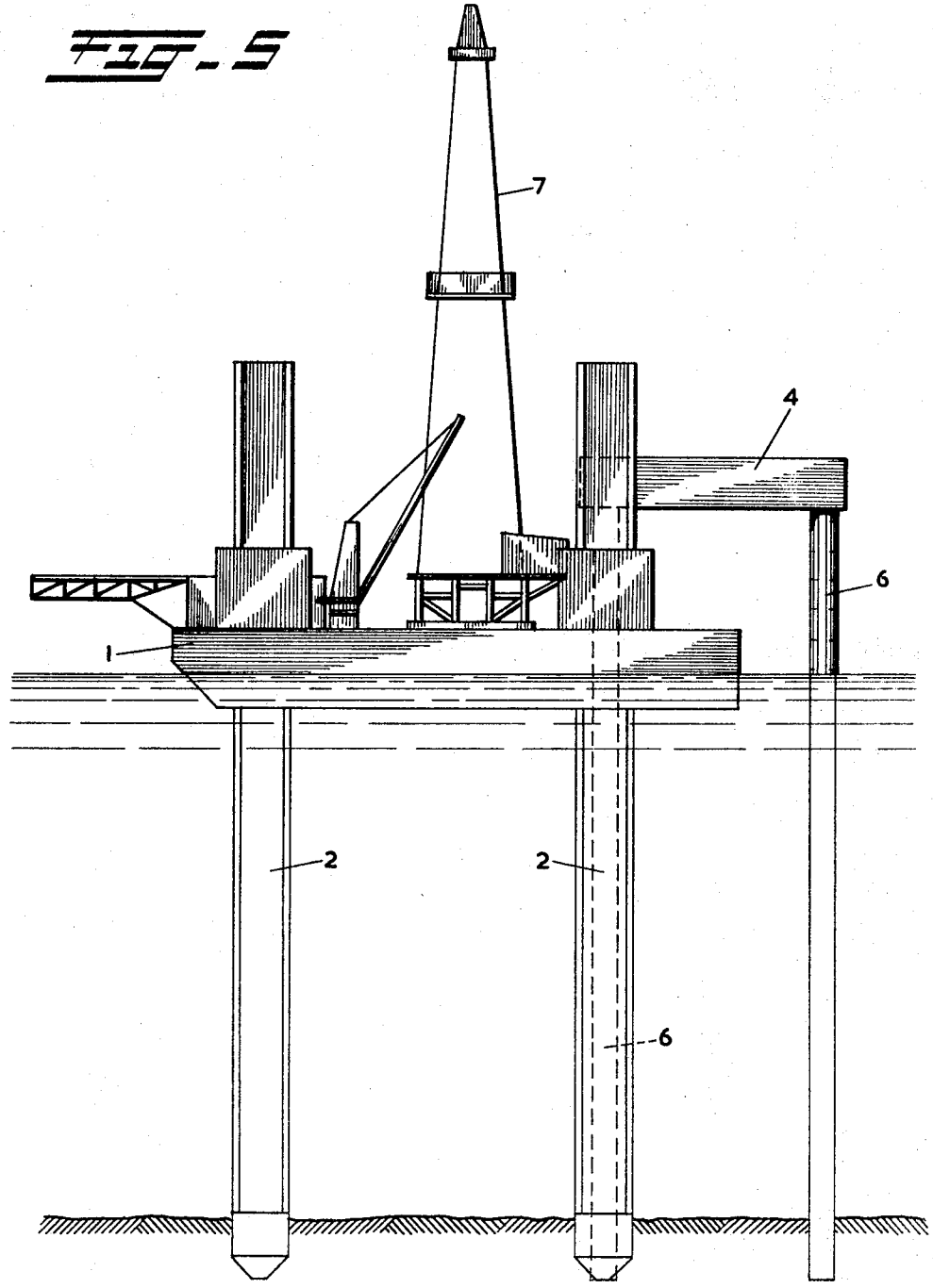
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FIG. 5



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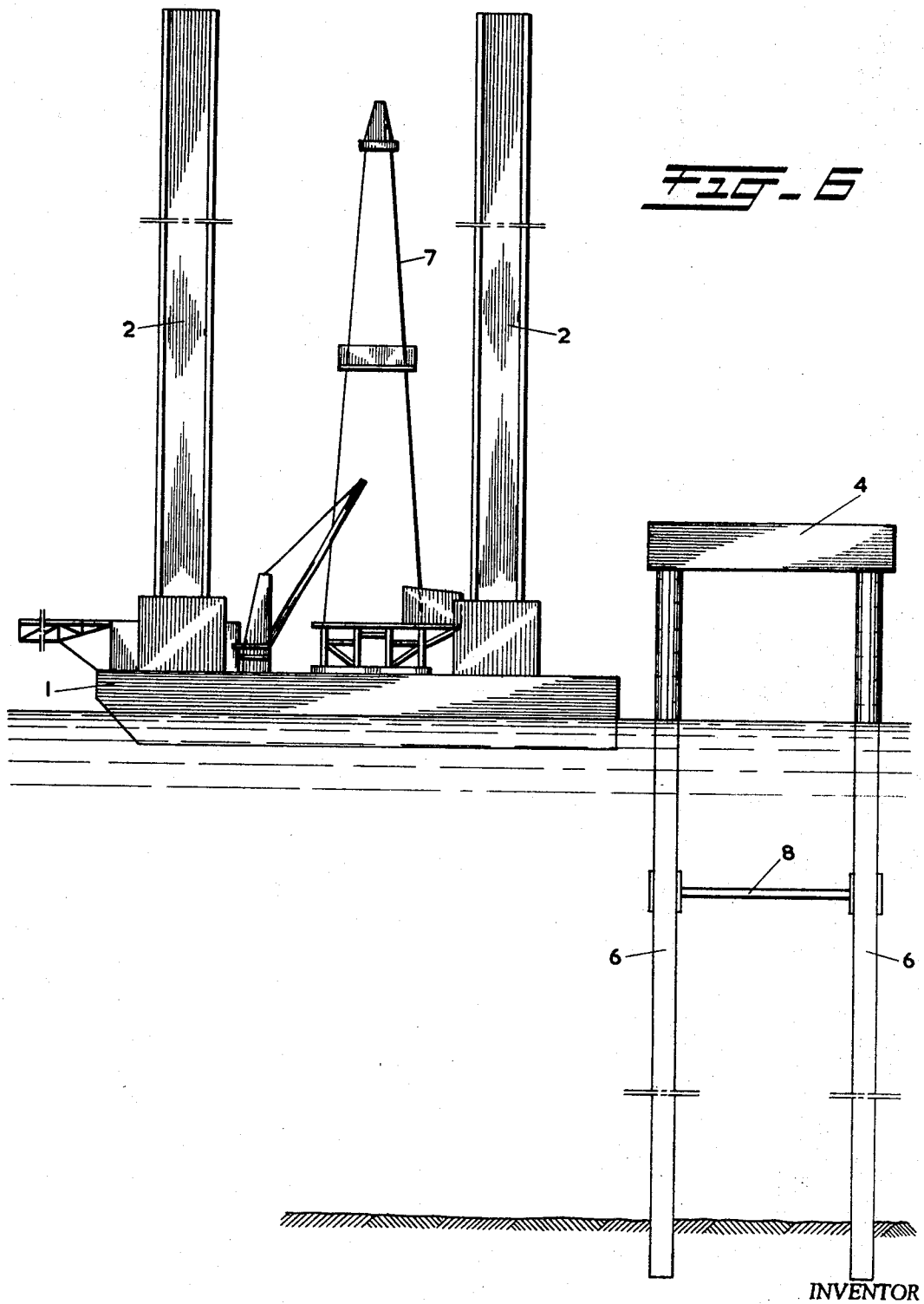


Fig. 6

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METHOD AND APPARATUS FOR INSTALLING DRILLING PLATFORMS

The present invention relates to combinations of mobile drilling platforms and permanent drilling platforms; and hence it is useful to distinguish between the two. Mobile platforms for example comprise a buoyant platform having a plurality of pillars that can be moved vertically relative to the platform. The platform is floated to its destination and the pillars are lowered into contact with the sea floor whereupon the platform is then hoisted or jacked above the surface of the water on and relative to the pillars. Another type of mobile platform comprises vertically disposed floats which together support a platform, the buoyancy of the floats being regulable.

On the other hand, permanent drilling platforms may for example comprise an under structure which is conveyed to its destination by means of floats or its own buoyancy and either made to sink, or else overturned and lowered to the bottom of the sea and anchored there. Then the rest of the permanent drilling platform is erected on top of the under structure. However, separate lifting mechanisms and transport means are required. Also, the services of specialized contractors are required and expensive seagoing lifting machinery has to be used. The procedure is thus expensive and time consuming and is often delayed by weather conditions.

A mobile drilling platform is preferably used when prospecting for gas or oil at the bottom of the sea. If the hole is dry, the drilling platform is shifted. But if the well produces, then a permanent rig is installed and is provided with the necessary pumps and vents and valves.

The object of the present invention is to provide a method and apparatus by which the installation of permanent drilling platforms, for instance after gas or oil has been struck, can be considerably simplified and speeded up without the need for the services and equipment of expensive and specialized contractors.

Other objects and advantages of the present invention will become apparent from a consideration of the following description, taken in connection with the accompanying drawings, in which:

FIG. 1 is a top plan view of a combined mobile drilling platform and permanent drilling platform, as associated with each other according to the present invention;

FIG. 2 is a side elevational view of the apparatus of FIG. 1, shown in the position in which it moves to the drilling site;

FIG. 3 is a view similar to FIG. 2 but showing, at a subsequent stage of operation, the mobile platform supported on the sea floor and raised above the surface of the water and in turn supporting the permanent drilling platform;

FIG. 4 is a view similar to FIGS. 2 and 3, but showing a subsequent stage of operation in which the permanent drilling platform is supported on the sea floor and the derrick is moved from the modile to the permanent platform;

FIG. 5 is a view similar to FIGS. 2—4 but showing a subsequent stage in which the derrick is moved back onto the mobile platform and the mobile platform lowered to float preparatory to removing the mobile platform; and

FIG. 6 is a view similar to FIGS. 2—5 but showing a subsequent condition of the apparatus in which the mobile platform is floating and can be removed, and the pillars of the permanent platform are cross braced.

Referring now to the drawings in greater detail, there is shown a mobile drilling platform comprising a platform proper or float 1 which is buoyant and which supports a plurality of pillars 2 for vertical movement relative to float 1 by conventional mechanism (not shown). One side of float 1 is provided with a gap or opening 3 therein, best seen in FIG. 1, in which the platform proper or body 4 of a permanent drilling platform is disposed. Body 4 is supported on and detachably interconnected with float 1 by connecting means (not shown). Body 4 may itself have buoyancy and may provide storage space for equipment. Body 4 has a central opening vertically therethrough which is closed by a cover 5. Pillars 6 are vertically movable through body 4.

A derrick 7 moves on tracks 7*a*. A portion of tracks 7*a* is disposed on float 1 and registers with a portion of tracks 7*a* disposed on body 4, so that derrick 7 is movable back and forth between float 1 and body 4 Alternatively, the guage of tracks 7*a* can be sufficiently great that they span gap 3 so that derrick 7 is never supported by body 4.

In operation, the two platforms are at the drilling site in the condition shown in FIG. 2, detachably interconnected and with the pillars 2 and 6 raised. The pillars 2 of the mobile platform are then sunk to the FIG. 3 position and the float 1 supporting the permanent platform is raised above the surface of the water. Next the pillars 6 of the permanent drilling platform are lowered into supporting contact with the sea floor and the derrick 7 is moved on tracks 7*a* onto body 4. This is the FIG. 4 position. In this connection, it should be noted that the pillars 6 can thus be initially emplaced by winches. The pillars 6 can be rotated relative to body 4 so as to drive them more deeply into the sea floor, because it is not necessary to make them polygonal or otherwise to provide mechanisms cooperable with pillars such as the pillars 2 on which the float 1 is to be jacked up. The pillars 6 can also be further pressed into the sea floor by transferring at least a portion of the weight of the float 1 onto the pillars 6.

With the cover 5 removed, the actual drilling is conducted through the central opening of the body 4. If the drilling is unproductive, then the parts are returned to their FIG. 2 position and the apparatus moves on to another drill site. But if the well is productive, the derrick 7 is moved back to the FIG. 5 position and the permanent platform is permanently emplaced by pile driving or the like and concretework. Any necessary completion of the body 4 can be effected and the pillars 6 can be cross braced.

On the mobile platform, the float 1 is lowered on pillars 2 until it is again immersed. The pillars 2 are then jacked up from the sea floor to the FIG. 6 position and the two platforms are disconnected and the mobile platform is floated away, leaving the permanent platform relatively permanently emplaced. The mobile platform can then be joined to another permanent platform in a harbor, or in deeper water if the permanent platform is also buoyant.

The pillars 6 of the permanent platform can be braced by lowering a framework 8 along pillars 6 and securing framework 8 to pillars 6 at a suitable level. Framework 8 can be manipulated from body 4 by means of cables or chains.

From a consideration of the foregoing disclosure, therefore, it will be evident that all of the initially recited objects of the present invention have been achieved.

Although the present invention has been described and illustrated in connection with preferred embodiments, it is to be understood that modifications and variations may be resorted to without departing from the spirit of the invention, as those skilled in this art will readily understand. Such modifications and variations are considered to be within the purview and scope of the present invention as defined by the appended claims.

I claim:

1. A method for the installation of a drilling platform, comprising floating to a drilling site an interconnected float and drilling platform each having a plurality of relatively vertically movable pillars with said interconnected float and platform having upper surfaces in the same plane, floating said float and platform to the drilling site with their pillars raised, lowering the pillars of said float relative to said float until the lowered pillars contact the sea floor and support said float and platform in raised position above the surface of the water, lowering the pillars of said platform until the last-named pillars support said platform above the surface of the water and at the level of said float moving a portable derrick across the upper surface of said float and into supported relationship on the upper surface of said platform with said upper surfaces of said float and platform disposed in a common horizontal plane, performing a drilling operation with said derrick supported on said platform, moving said derrick back onto the upper surface of said float, lowering said float and derrick to floating support in the water and raising the pillars of said float and floating said float and derrick away from said platform.