July 1, 1952 W. A. CLARK 2,601,762

DRILLING BARGE

Filed Dec. 23, 1949

Fig. 3.

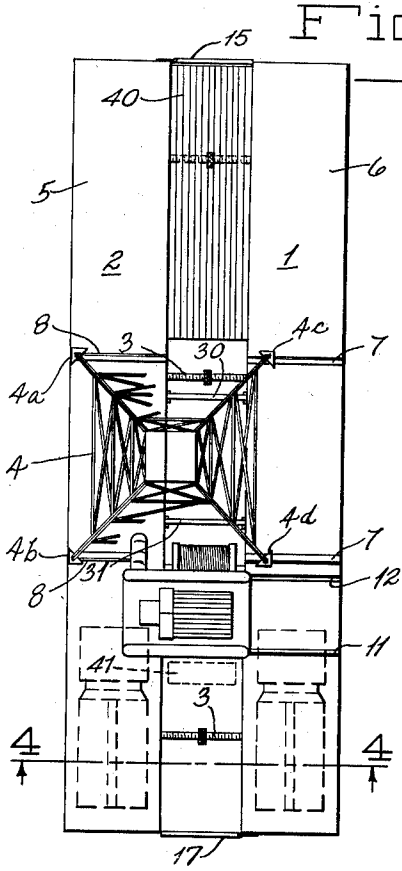


Fig. 1.

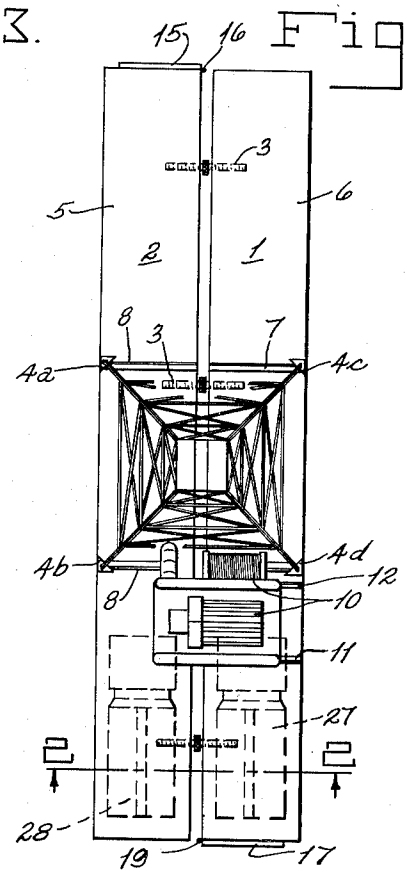


Fig. 4.

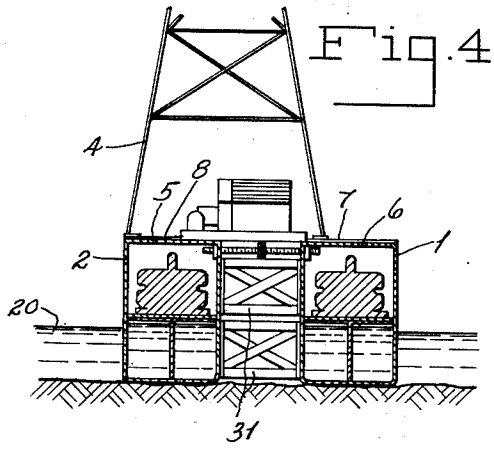
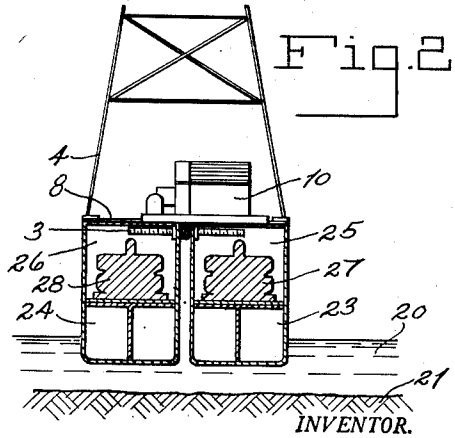


Fig. 2.



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Patented July 1, 1952

2,601,762

UNITED STATES PATENT OFFICE

2,601,762

DRILLING BARGE

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Application December 23, 1949, Serial No. 134,791

4 Claims. (Cl. 61—46)

1

This invention relates to a drilling barge adapted for movement through narrow waterways or channels and for drilling oil wells in lake bottoms and other submerged lands.

The invention broadly contemplates a submersible submarine drilling barge having mounted thereon a superstructure of well drilling equipment including a derrick, adapted for movement by floating through narrow waterways and also adapted for seating on a submerged area. The drilling barge comprises separate elongated submersible hulls displaced in substantially parallel relationship to each other and having a working platform supported in elevated relation on the barge so as to stand above water when the barge is resting on a submerged area. Means are provided for effecting lateral displacement of one floating hull relative to the other independent of the superstructure. Means are also provided for maintaining the hulls in rigid displaced relationship.

One of the present inherent characteristics of drilling barges, which is disadvantageous, is the width of beam. This is necessary to accommodate drilling equipment permanently set in place. This great width necessitates construction of wide water channels in order to move the barge from one location to another. The construction of such channels or widening of natural waterways for passage of the conventional barge often entails considerable extra expense, particularly in those areas where the land is covered with forests or woods.

Accordingly, the present invention involves a modification of the conventional barge design rendering it possible to retract the width of the barge so that it can be floated through relatively narrow channels or waterways. Thus the invention contemplates employing a barge comprising two relatively long hulls joined together by rigid turnbuckles or horizontal jacks set between the hulls. For setting over a well location the hulls are separated by the jacks to form the familiar "slot" through which to drill. Suitable rigidity as well as support for the rotary table is accomplished by means of heavy gates placed across the slot between the two hulls.

After completion of the well, the barge is refloated and withdrawn from over the well head, the gates being removed or swung back and the width of the barge contracted by means of the turnbuckles or jacks. The equipment and derrick are provided with runners, rollers or wheels to facilitate sliding along rails or tracks fastened to and extending across the platform of

2

one or both hulls as the hulls are drawn together or moved apart, as the case may be. By this means the width of the barge may be contracted as much as ten feet or, for example, from forty-two feet when the twin hulls are displaced to thirty-two feet when they are brought together.

In order to describe the invention more fully, reference will now be made to the figures of the accompanying drawing.

Figure 1 is a plan view of a drilling barge with the two hulls drawn together.

Figure 2 is a sectional elevation of the barge in the position of Figure 1.

Figure 3 is a plan view of the barge with the two hulls displaced and submerged.

Figure 4 is a sectional elevation of the barge in the position of Figure 3.

In Figure 1, the numerals 1 and 2 designate the two hulls locked together by turnbuckles 3.

The numerals 4*a*, 4*b*, 4*c* and 4*d* designate the four feet of a conventional derrick 4, the base of which is indicated in Figure 2. The feet 4*a* and 4*b* are rigidly attached to the platform 5 comprising the top of the hull 2.

The legs 4*c* and 4*d* of the derrick are slideably supported by tracks 7 extending across the platform 6 of the hull 1. Tracks 8 extend across the platform 5 of hull 2 providing slideable support for legs 4*a* and 4*b* of the derrick.

The numeral 10 designates a conventional draw works such as is customarily employed in conventional well drilling practice. This draw works is likewise slideably supported on tracks 11 and 12 extending across the platform 6 of the hull 1.

The numeral 15 designates a gate member hingeably attached to one vertical corner 16 of the hull 2 while the numeral 17 designates a similar gate member hingeably mounted at the vertical corner 19 of the adjacent hull.

As illustrated in Figure 2, the hulls 1 and 2 are floating on a body of water 20 and the lower portion of each hull contains ballast tanks or compartments 23 and 24 into which sea water may be introduced through sea cocks not specifically indicated. Thus provision is made for flowing water into the compartments or ballast tanks to sink the hulls, thereby causing them to "bottom" upon the submerged area 21 after the manner disclosed in the Giliasso Patent No. 1,681,533.

Compartments 25 and 26 above the aforesaid ballast tanks may be used advantageously for housing pumps 27 and 28 or other heavy equipment and apparatus.

The portion of the hulls 1 and 2 comprising the compartments 25 and 26, may be entirely closed, as indicated. On the other hand, an open-type of structure supporting the platform sections 5 and 6 may be employed particularly where the barge is being used in relatively shallow waters.

As indicated in Figure 2, when the hulls are drawn close together for transport through the narrow water channels the feet of the derrick rest at the outer longitudinal edges of the platform sections. The draw works 10 is drawn over so that it rests mainly on the platform of the hull 1.

It, of course, will be understood that provision may be made for adjusting the buoyancy of all sections of the hulls and for disposing movable drilling equipment about the platform sections so that the barge will at all times be maintained in a vertical and upright position.

Figure 3 shows the barge when the two hulls 1 and 2 are laterally displaced for submerging upon the submerged surface of the earth. As is indicated, the gates 15 and 17 are swung about into closed position so that they lock into contact with the adjacent corner of the adjacent hull.

Also, as indicated in Figure 3, additional gate members 30 and 31 may be inserted between the central portions of the displaced hulls so as to further increase the rigidity of the displaced hulls and platform sections.

Any number of these gate members may be used as desired. Also, it is contemplated that the gate members may be of either solid or open construction. Solid construction can be used where it is desired to close off the space between the displaced hulls and thus prevent movement of water therethrough.

Movable platform sections or walkways 40 can be placed across the space between the displaced hulls so that when the hulls are in displaced position a substantially continuous platform surface is provided.

As indicated in Figure 4, the displaced hulls are resting on the submerged surface of the earth as a result of the introduction of water into the ballast tanks. The draw works 10 occupies a position corresponding to about the middle of the barge. The feet 4c and 4d of the derrick 4 occupy a position near the inner longitudinal edge of the hull platform 6. However, it is contemplated that if it is desired the derrick may be centered laterally of the submerged barge, using tracks 8 provided on the platform 5 for the derrick feet 4a and 4b. Likewise provision can be made for centering the draw works and hoisting machinery.

While not indicated in the drawing, it will be understood that these tracks and rollers or other sliding mechanisms may be designed so as to hold the derrick feet down upon the tracks and thus prevent tipping over of the derrick.

As indicated in Figure 3, a movable drilling mud tank 41 can be suspended or supported within the space between the displaced hulls.

Obviously, many modifications and variations of the invention, as hereinbefore set forth, may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

I claim:

1. A submersible submarine drilling barge having mounted thereon a superstructure comprising well drilling equipment including a derrick and draw-works adapted for movement by floating through narrow waterways and also adapted for seating on a submerged area comprising a pair of separate elongated submersible hulls disposed in substantially parallel relationship to each other, a section of working platform mounted in elevated relation on and rigidly attached to each hull to stand above the water when the hull is submerged and adapted to support said superstructure, the two feet on one side of said derrick being attached to the platform section of one hull, tracks extending laterally across the platform section of the other hull to provide slideable supporting means for the two feet on the opposite side of said derrick, separate tracks extending laterally across one of said platform sections to provide slideable support for said draw-works, means for effecting lateral displacement of one hull relative to the other independently of said superstructure and means for maintaining said hulls in rigid displaced relationship.

2. A submersible submarine drilling barge having mounted thereon a superstructure comprising well drilling equipment including a derrick and draw-works adapted for movement by floating through narrow waterways and also adapted for seating on a submerged area comprising a pair of separate elongated submersible hulls disposed in substantially parallel relationship to each other, a section of working platform mounted in elevated relation on and rigidly attached to each hull to stand above the water when the hull is submerged and adapted to support said superstructure, the two feet on one side of said derrick being slideably attached to the platform section of one hull, tracks extending laterally across the platform section of the other hull to provide slideable supporting means for the two feet on the opposite side of said derrick, separate tracks extending laterally across one of said platform sections to provide slideable support for said draw-works, means for effecting lateral displacement of one hull relative to the other independently of said superstructure and means for maintaining said hulls in rigid displaced relationship.

3. A submersible drilling barge having mounted thereon a superstructure comprising well drilling equipment including a derrick and draw-works adapted for movement by floating through narrow waterways and also adapted for seating on a submerged area comprising a pair of separate elongated submersible hulls disposed in substantially parallel relationship to each other, a section of working platform mounted in elevated relation on and rigidly attached to each hull so as to stand above the water when the hull is submerged and adapted to support said superstructure, the two feet on one side of said derrick being attached to a platform section of one hull, tracks extending laterally across the platform section of the other hull to provide slideable supporting means for the two feet on the opposite side of said derrick, means for effecting lateral displacement of one hull relative to the other independently of said structure and means for maintaining said hulls in rigid displaced relationship, said last mentioned means comprising at least one vertical gate between adjacent sides of said hulls and hingeably attached to one of said hulls.

4. A submersible drilling barge having mounted thereon a superstructure comprising well drilling equipment including a derrick and draw-

works adapted for movement by floating through narrow waterways and also adapted for seating on a submerged area comprising a pair of separate elongated submersible hulls disposed in substantially parallel relationship to each other, a section of working platform mounted in elevated relation on and rigidly attached to each hull so as to stand above the water when the hull is submerged and adapted to support said superstructure, the two feet on one side of said derrick being attached to a platform section of one hull, tracks extending laterally across the platform section of the other hull to provide slideable supporting means for the two feet on the opposite side of said derrick, separate tracks extending laterally across one of said platform sections to provide slideable supports for said draw-works, means for effecting lateral displacement of one hull relative to the other independently of said structure and means for maintaining said hulls

in rigid displaced relationship, said last mentioned means comprising at least one vertical gate between adjacent sides of said hulls and hingeably attached to one of said hulls.

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