

Jan. 19, 1943.

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2,308,743

BARGE

Filed Sept. 16, 1939

4 Sheets-Sheet 1

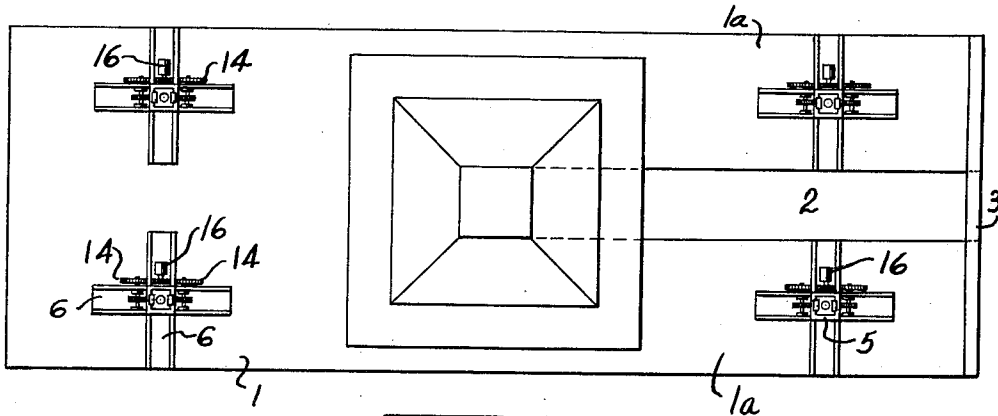


Fig. 2.

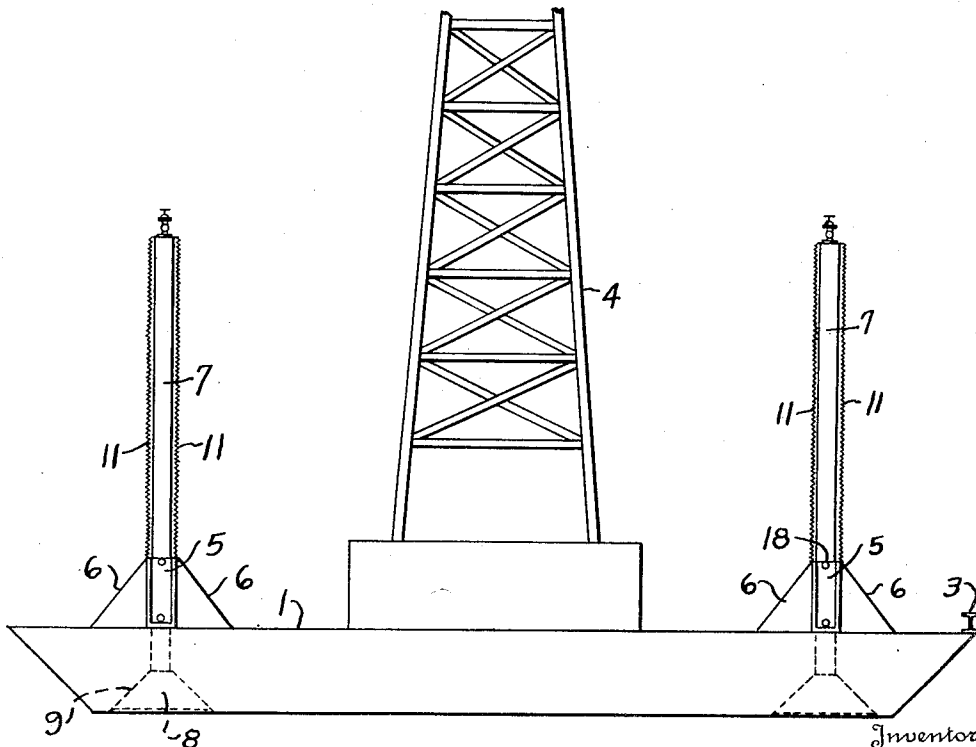


Fig. 1.

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4 Sheets-Sheet 2

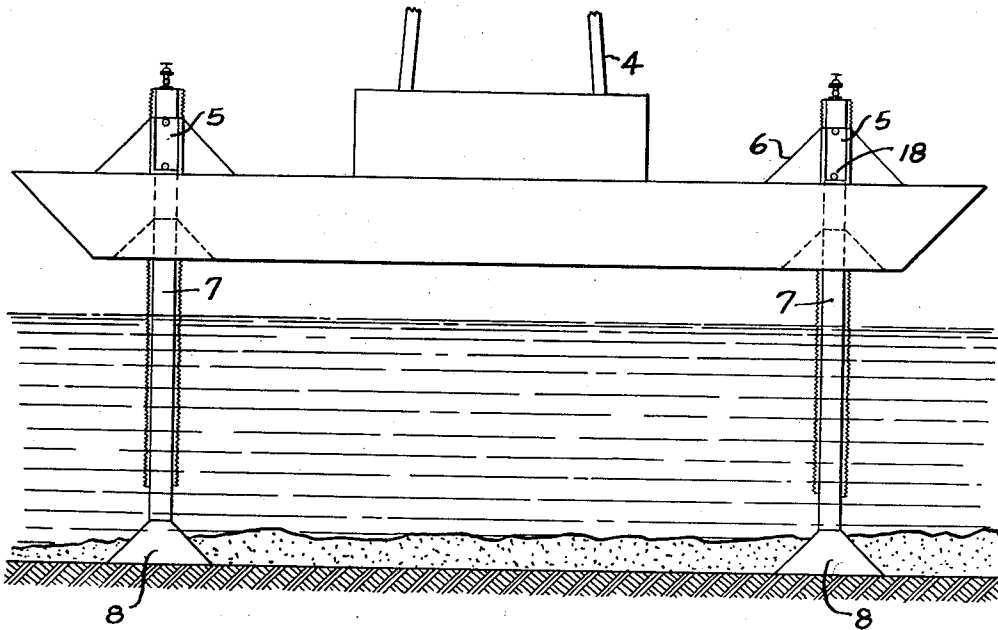


Fig. 3.

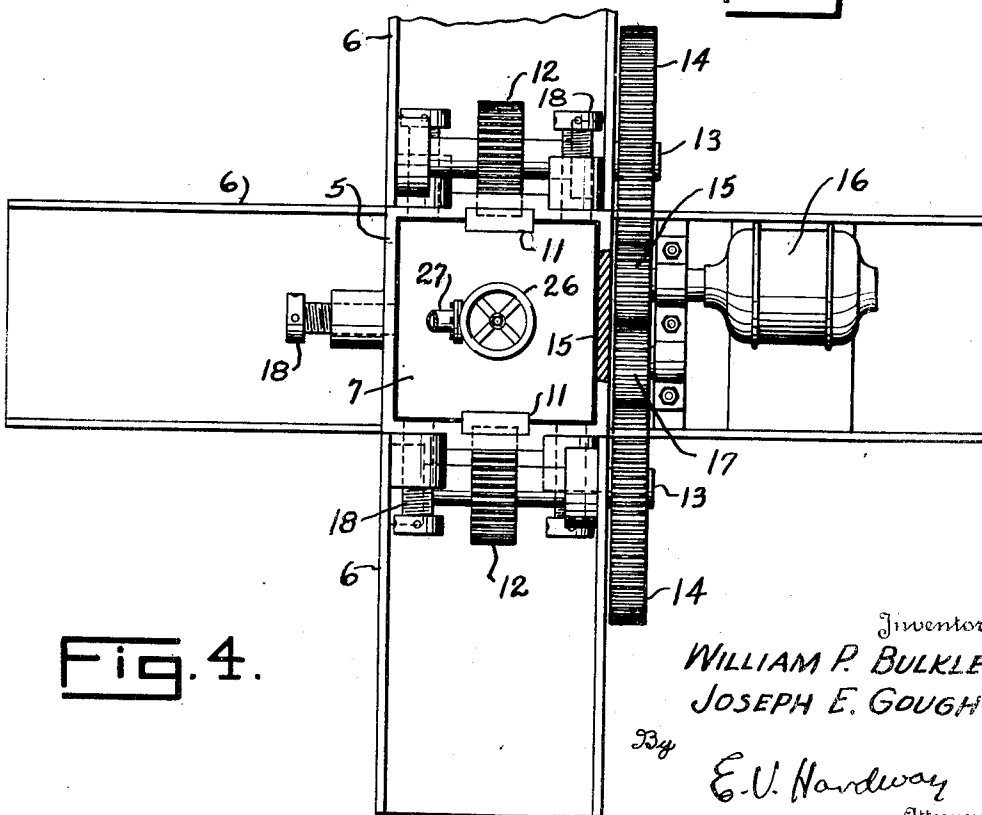


Fig. 4.

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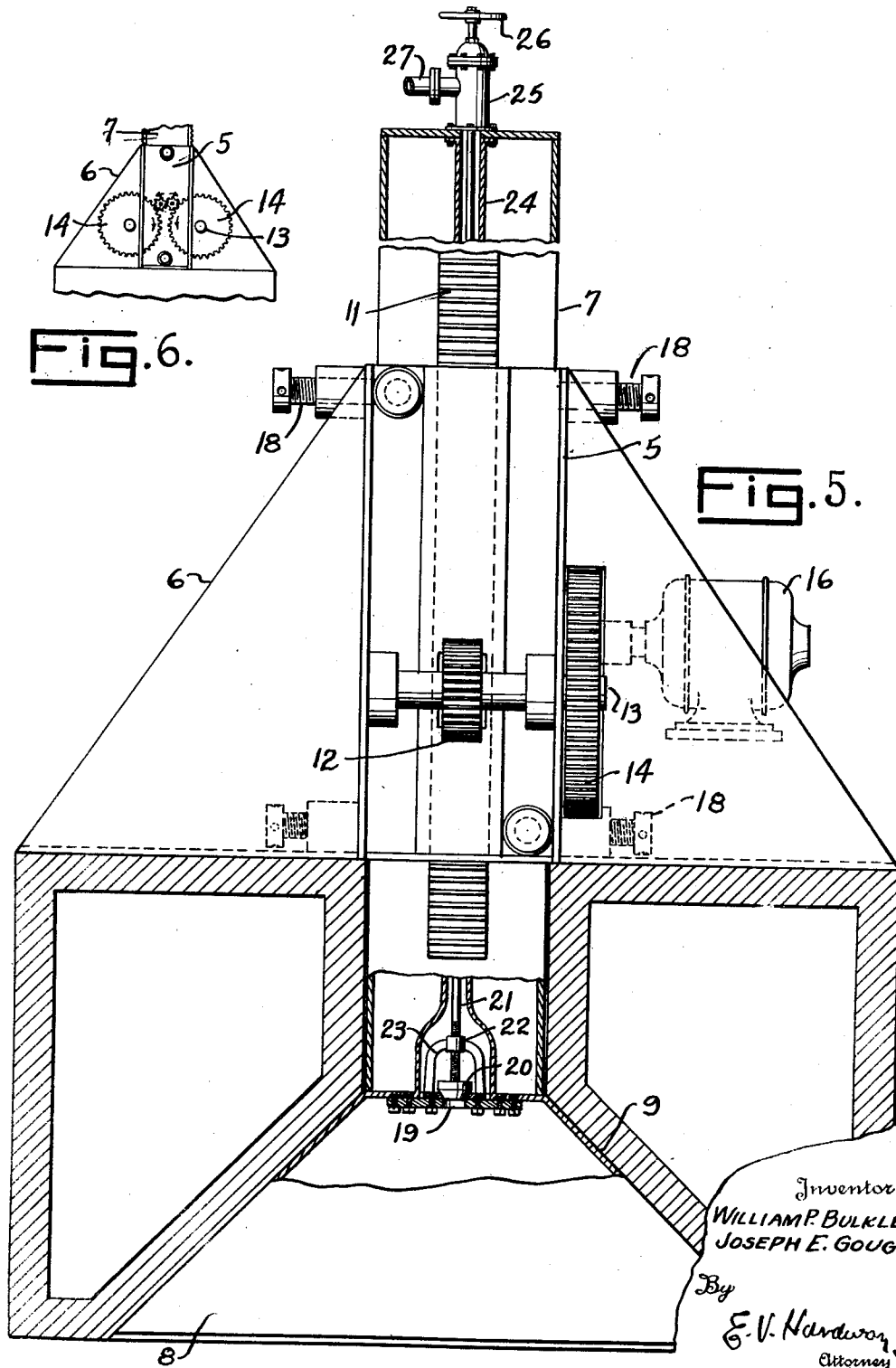
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4 Sheets-Sheet 3



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BARGE

Filed Sept. 16, 1939

4 Sheets-Sheet 4

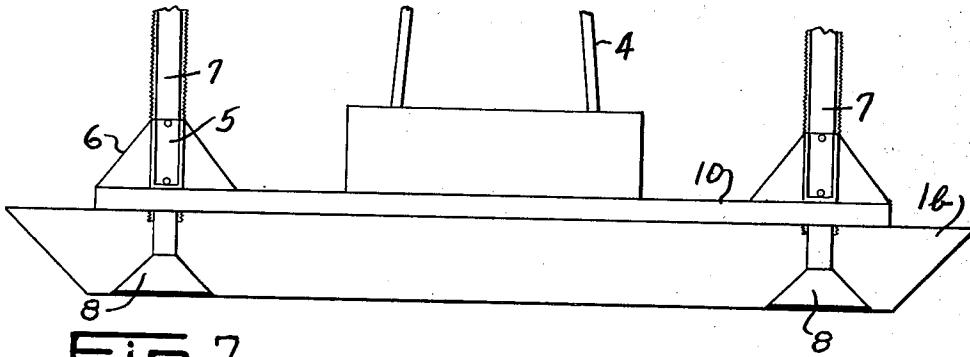


Fig. 7.

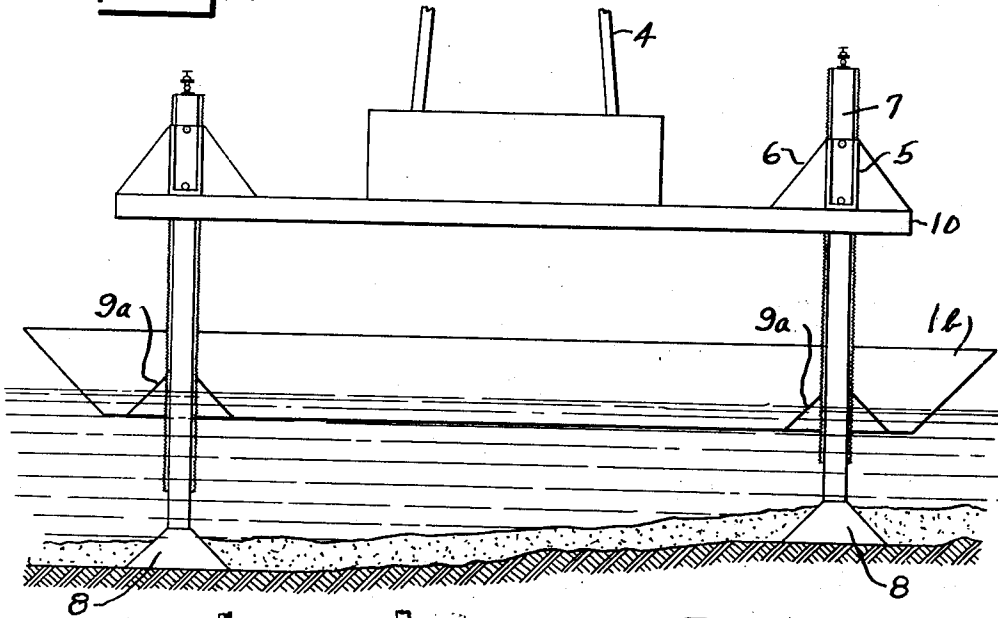


Fig. 8.

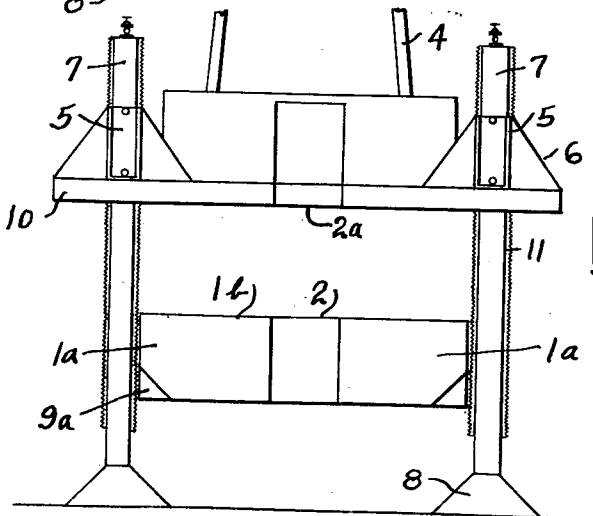


Fig. 9.

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UNITED STATES PATENT OFFICE

2,308,743

BARGE

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Application September 16, 1939, Serial No. 295,327

2 Claims. (Cl. 61—46)

This invention relates to a barge and has particular relation to means whereby the barge may be supported, at a selected position, and at the desired elevation relative to the surface of the water.

The type of barge herein disclosed is particularly useful for transporting well drilling equipment and for firmly supporting said equipment at the well location.

As is well known oil producing land is often submerged and in developing such land for oil or minerals the drilling equipment must be located out a distance from shore. It is one of the principal objects of this invention to provide means for transporting the well drilling equipment out to the location and for securely supporting the rig at said location while carrying on the drilling operations.

It is a further object of the invention to provide a special type of barge for this purpose which is so shaped that it may be readily moved from the location after the well has been completed and the producing equipment installed.

It is a further object of the invention to provide a barge equipped with novel means for elevating the same to the desired level when the barge has been moved to the location at which the well is to be drilled.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, examples of which are given in this specification and illustrated in the accompanying drawings, wherein:

Figure 1 shows a side elevation of the barge showing a derrick mounted thereon.

Figure 2 shows a plan view.

Figure 3 shows a side elevation, showing the barge located at the selected location and supported in elevated position from the bottom.

Figure 4 shows a fragmentary, horizontal, sectional view of the elevating mechanism.

Figure 5 shows a fragmentary, vertical, sectional view thereof.

Figure 6 shows a fragmentary, side elevation thereof.

Figure 7 shows a fragmentary, side view of another embodiment of the invention.

Figure 8 shows a side view thereof showing the supporting platform elevated, and

Figure 9 shows an end view.

Referring now more particularly to the drawings wherein like numerals of reference designate similar parts in each of the figures, the numeral 1 designates a barge which, at one end, is divided forming the spaced wings 1a, 1a with a tunnel or recess 2 between them. The free ends of the wings 1a, 1a may be connected, or anchored together, by means of a suitable cross-beam as 3. The derrick 4 may be located on the

barge over the inner end of the tunnel 2 as illustrated in Figures 1 and 2.

Suitable well drilling equipment may be installed on the barge at the base of the derrick in the usual manner for carrying on said drilling operations. The necessary equipment for carrying on the drilling operations, including the derrick, may be installed on the barge while it is at shore and then transported out to the desired location. When the desired location is reached the barge then should be anchored firmly in place.

It is, of course, obvious that the derrick 4 may be built after the barge has been located in position at the well location. The barge is equipped with a suitable number of upstanding bearings as 5 preferably rectangular in horizontal cross-section as shown more accurately in Figure 4. These bearings are firmly secured to the deck of the barge and are reinforced and supported by the braces 6. Elevating legs 7 extend through said bearings and on downwardly through aligned bearings through the barge. They extend the required distance above the deck of the barge and their lower ends are equipped with the downwardly flared supporting footings 8. The construction of the legs and of the footings is more clearly illustrated in Figure 5. The underside of the barge is formed with cavities 9 into which the footings are withdrawn while the barge is being transported. As also illustrated in Figure 5 and as further illustrated in Figure 1 when so withdrawn the footings will not interfere with the movement of the barge through the water. As illustrated in Figures 7 to 9 inclusive, the barge is indicated by the numeral 1b. It is substantially similar in general design to the barge 1 shown in Figure 2. Mounted on it is a platform 10 to support the derrick and drilling equipment. As clearly illustrated in Figure 9, the platform 10 is wider than the barge and the bearings 5, and the legs 7 are mounted on the side margins of the platform so that said legs will be out beyond the sides of the barge as clearly shown in Figure 9. While the barge of this type is being transported, the legs will be in their upper position as shown in Figure 7 and the footings 8 will be in their upper position seated in the side cavities 9a of the barge 1b. When the location for drilling has been reached the platform 10 may be elevated into the position shown in Figure 8 in the manner hereinafter described and the barge 1b then removed passing between the legs 7 until the well has been completed and it is desired to remove the drilling equipment whereupon the barge may be floated into position between said legs 7 underneath the platform and the platform lowered onto the barge and the drilling rig thus removed from the location.

Each leg 7 has the vertical rack members 11, 11 fixed on opposite sides thereof and in mesh with

corresponding spur gears 12, 12 which are fixed on the shafts 13, 13. The outer ends of each shaft 13 has a spur gear 14 fixed thereon. The shafts 13, 13 are mounted in suitable bearings in corresponding braces 6. One of the gears 14 is in mesh with and driven by a spur gear 15 which is fixed on the shaft of a driving motor 16. Between the gear 15 and the other spur gear 14, and in mesh with both of them, there is an idler gear 17. Accordingly, when the motor is turned in one direction, the corresponding leg will be elevated and when turned in the other direction, the corresponding leg will be lowered. It is to be noted that each leg is equipped with this lifting and lowering mechanism as shown in Figure 2. When the barge has reached the location for drilling, the motors 16 may be started and turned in a direction to move the legs downwardly until the footings 8 land on bottom. A continuation of the rotation of the motors in the same direction will thereafter cause the barge, of the form shown in Figure 1, to be elevated to the position shown in Figure 3. If the form shown in Figure 7 is being used, a continuation of the rotation of the motors will cause the platform 10 and the equipment thereon to be elevated as shown in Figures 8 and 9. When the work is completed and it is desired to move the barge and equipment, the direction of rotation of the motor may be reversed and after the barge has landed on the water, or after the platform 10 has landed on the barge, a continuation of the rotation of the motors will elevate the legs until the footings are seated in the cavities provided for them in the bottom of the barge.

It may be here noted that the legs 7 are independently operated so that the footings 8 may be located at variable distances from the barge to accommodate them to the uneven surface of the bottom as illustrated in Figure 8 when the barge or platform is raised.

The bearings 5 are provided with horizontal tapped bearings to receive the required number of clamp bolts 18 which are threaded through said bearings. When the barge, or platform, has been elevated the required distance these clamp bolts 18 may be screwed inwardly against the corresponding legs so as to maintain the platform, or barge elevated. A sufficient number of clamp screws will be provided to sustain the load carried by the legs.

As hereinabove indicated the footings are downwardly flared, as indicated in Figure 5, to provide a wide base therefor. These footings are preferably formed of heavy sheet metal and will penetrate a considerable distance into the soft earth beneath the water as indicated in Figure 8. Accordingly, when the platform 10 has been lowered onto the barge beneath, or when the barge, as shown in Figure 3, has landed on the water surface the legs will be moved further upwardly so as to seat the footings in the barge recesses above. In order to provide means for breaking the vacuum that would otherwise be formed in a footing so that it may be more readily released from the bottom, means have been provided for forcing air into said footings.

The upper end of each footing, accordingly, is provided with an air inlet opening 19 which is normally closed by a valve 20 fastened to the

stem 21 which is threaded through a bearing 22 of the spider 23.

The outer end of each leg 7 is closed. A tube 24 surrounds and is spaced from the stem 21 with its outer end secured to the outer end of the leg and its inner end secured to the inner end of the leg and being enlarged to surround the spider 23. On the outer end of each leg there is a connection 25 through which the valve stem extends and the outer end of said stem has a hand wheel 26 thereon through which said stem is turned and the valve 20 opened or closed. The valve 20 will be normally closed. When it is desired to force air into a footing the valve 20 may be opened and air, under pressure, introduced through the line 27, the tube 24 and the opening 19 to relieve the vacuum in the footing and to assist in disengaging the footing from the formation in which it is submerged.

The legs 7 with their footings, and the means for actuating the same constitute, in effect, lifting jacks for the purposes specified. It is to be understood, of course, that what is now considered a preferred means for lifting said jacks is shown but other suitable means may be employed.

When a well has been completed the producing equipment attached to the upper end of the well pipe extends up within the tunnel 2, or possibly above it. Therefore, in order to permit the movement of the barge away from the well the tunnel 2 is necessary. When it is desired to move the barge, the beam 3 may be removed and may thereafter be replaced.

The platform 10, of the form shown in Figures 7 and 8, may be also provided with a tunnel 2a which aligns with the tunnel 2 beneath and is provided for the same purpose.

The supporting area of the footings may be increased in accordance with the load to be supported and the condition of the formation at the well location.

The drawings and description are illustrative merely, while the broad principle of the invention will be defined by the appended claims.

What we claim is:

1. In combination, a barge for supporting well drilling equipment and the like having an independent load supporting platform thereon, jacks vertically movable relative to the platform and arranged beyond the extremities and on opposite sides of the barge, said barge and platform having aligned tunnels extending inwardly from the margins thereof, operative connections between the jacks and platform for elevating the platform above the barge to allow the barge to be removed from beneath the platform.

2. In combination, a barge for supporting well drilling equipment and the like and having an independent load supporting platform thereon, jacks arranged on opposite sides of the barge and operatively connected with the platform for elevating the platform above the barge to allow the barge to be removed from beneath the platform and being operative to lower the platform onto the barge when the barge is beneath the platform, said barge and platform having registering tunnels extending inwardly from corresponding margins thereof.

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