

Aug. 10, 1943.

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2,326,353

MARINE FOUNDATION

Filed Dec. 5, 1939

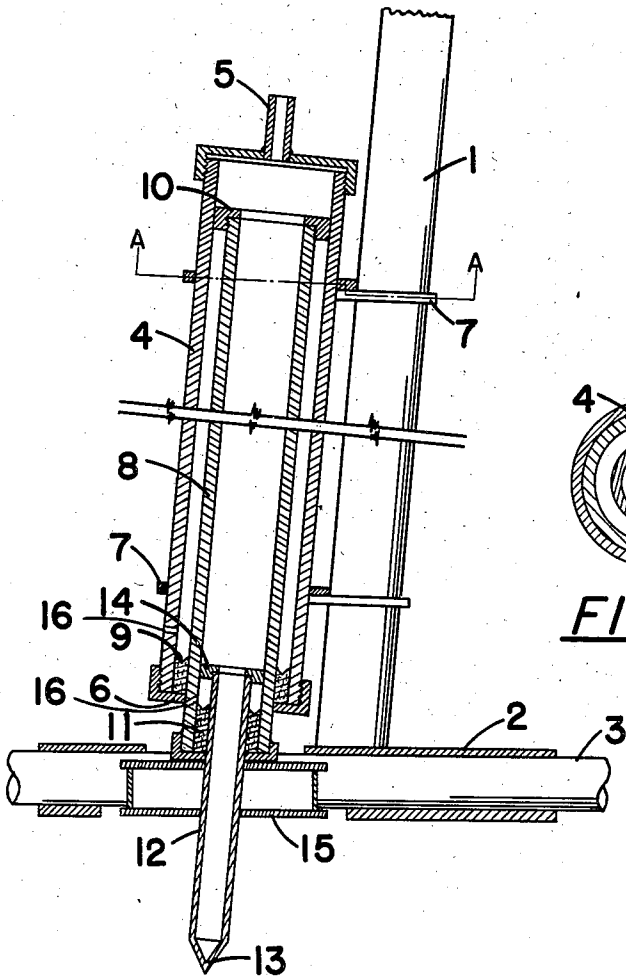


FIG. 1.

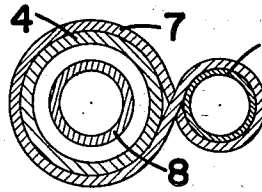


FIG. 2.

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2,326,353

MARINE FOUNDATION

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Application December 5, 1939, Serial No. 307,569

2 Claims. (Cl. 61—50)

The present invention is directed to marine foundations and constitutes an improvement on the marine foundation described and claimed in my copending application Ser. No. 182,829, filed December 31, 1937.

The principal object of the present invention is to provide in a structure of the character described, an anchoring device adapted to penetrate through soft mud and silt to a firm foundation.

An additional object of the present invention is the provision in a structure of the character described of means operable from the surface for levelling the structure on an uneven bottom.

A further object of the present invention is the provision in a structure of the character described of means for temporarily levelling the structure until permanent levelling and anchoring have been accomplished.

Further objects and advantages of the present invention will appear from the following detailed description of the accompanying drawing in which

Fig. 1 is a front elevation of a device according to the present invention, partly in section, shown attached to a leg of a marine foundation; and

Fig. 2 is a cross section of the device along the line A—A of Fig. 1.

Referring to the drawing in detail, numeral 1 represents a leg of a marine derrick shown attached to a bottom plate 2 which forms a part of a skid-like base made up of tubing 3. Numeral 4 designates a cylinder having an upper inlet 5, and having a lower open end 6. This cylinder is secured to leg 1 by iron bands 7 which are preferably welded to the leg and to the exterior of the cylinder. Slidably mounted in cylinder 4, so as to fit the lower open end 6, is a second cylinder 8. The annular space between cylinders 4 and 8, near the lower open end of the former, is filled with a packing material 9, the upper end of which is notched to form a Bridgeman seal. The upper end of cylinder 8 is open and carries a collar 10, the exterior diameter of which is such as to form a sliding fit with the interior of cylinder 4. The lower end of cylinder 8 is also open and, like cylinder 4, is provided with a Bridgeman seal 11 in which is frictionally mounted a piston-like member 12 which has a lower pointed end 13 and has an open upper end provided with a collar 14, which makes a sliding fit with the interior of cylinder 8.

At this point, it may be mentioned that there may be as many cylinders as desired between

cylinder 4 and piston 12, all telescopically mounted and provided with the necessary seals to render the assembly pressure-tight.

The assembly thus far described may be used for penetrating soft formations until solid substructure is reached. This is accomplished by introducing a fluid under pressure through the opening 5, whereby the piston 12 is caused to move downwardly and will continue to move downwardly so long as pressure is applied in sufficient amounts to permit it to penetrate the formation. As previously indicated, the distance which piston 12 can penetrate is regulated by the number of cylinders 8 which are employed. When it is desired to use the structure as a permanent structure, the interior may be filled with cement after it is sufficiently distended to rest on a solid bottom. With one of these assemblies attached to each leg of the structure, the structure may be levelled on uneven rocky bottom, the levelling being done at the surface by adjusting the pressure on the various assemblies.

It will be noted that each of the outer cylinders is provided near its lower end with an opening 16 for the escape of air entrapped between the cylinders during the movement of each cylinder in the next outer cylinder.

In order to adapt this structure for use as a temporary levelling means in soft formations, there is provided around piston 12 a float member 15 of sufficient diameter to constitute a footing in soft materials. The base 2 is suitably cut away to permit the nesting therein of the float member 15. As shown, the float member is fixed to the bottom of cylinder 8 and member 12 is slidable through the float member so that it can be retracted into cylinder 8. The float member could as readily be arranged on member 12 by having a rib on member 12 and a corresponding groove in member 15 in the conventional manner.

It will be apparent that various changes in the design, proportions of parts, and the like, may be made in the device described above without departing from the essential invention embodied therein. Such changes are contemplated within the scope of the present invention which is defined by the appended claims.

The nature and objects of the present invention having been thus described and illustrated, what is claimed as new and useful and is desired to be secured by Letters Patent is:

1. In a marine foundation having supporting legs, a levelling device comprising a cylinder fixed to one of said legs, adjacent the lower end there-

of, a plurality of concentric cylinders mounted inside said cylinder in a telescoping manner, for extension downwardly therefrom, the upper ends of said inner cylinders communicating with the interior of said fixed cylinder, an intermediate one of said inner cylinders being provided at its lower end with a laterally extending member having a large surface area relative to the cross sectional area of said intermediate cylinder, a

spudding point on the lower end of the innermost cylinder, and an inlet for pressure fluid on the upper end of the fixed cylinder.

2. A construction according to claim 1 in which the upper end of each cylinder is formed to provide a pressure-tight joint with the lower end of the next larger cylinder.

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