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F. R. HARRIS

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PILES FOR MARINE STRUCTURES

Original Filed April 22, 1949

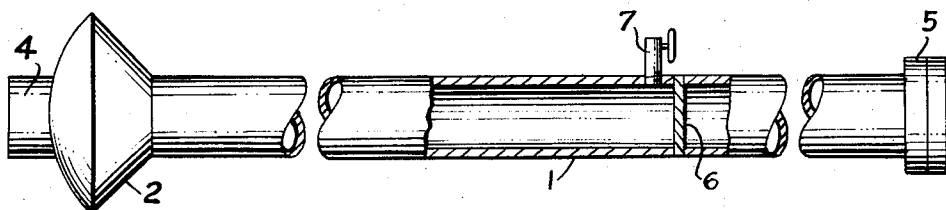


FIG. 1

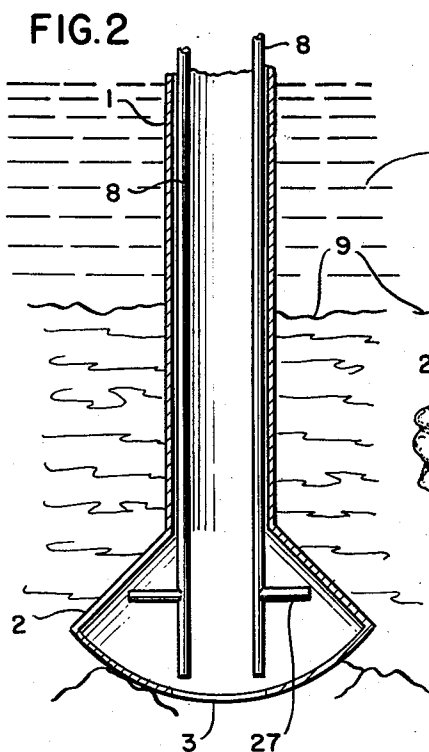


FIG. 2

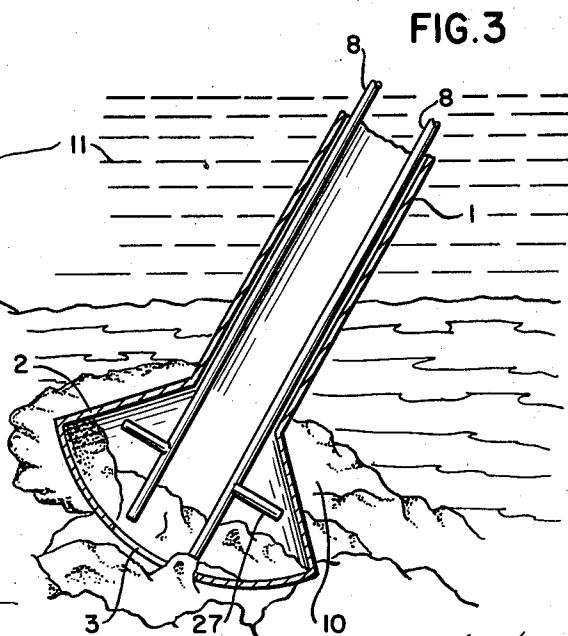


FIG. 3

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PILES FOR MARINE STRUCTURES

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Original application April 22, 1949, Serial No. 89,002.
Divided and this application February 8, 1951, Serial
No. 210,074

1 Claim. (Cl. 61—53)

This invention is an improved pile for erecting and supporting structures in water; especially platforms, towers and equipment to drill for oil in the earth under the water; and other uses.

An important object of this invention is to provide a pile capable of supporting heavy and uneven loads above the surface of the water, and resisting wind and wave action; easy to set up and anchor securely in place.

In its preferred embodiment the pile has the form of a hollow metal column, constructed so that the upper portion is buoyant; hence the pile can be submerged while virtually upright. The pile also has means for enabling it to be secured at its lower end in the bottom under the water, and therefore it does not have to be driven into the bottom to embed the lower end into the wet earth. Thus much time and labor are saved in the operation of getting the piles into position.

These and other objects and the nature and advantages of the invention are set forth in the ensuing description; and one or more embodiments are illustrated in the drawings. But the disclosure is by way of example only and any alterations in the details of structure can be adopted without deviation from the essential characteristics of the design as broadly defined in the appended claim.

On the drawings:

Figure 1 is a side view partly in section of the body of a pile according to this invention.

Figure 2 is a longitudinal section of the lower part of said pile when first lowered to the bottom.

Figure 3 is a similar view showing said pile in final anchored position, in final position on the bottom.

This application is a division of application Serial No. 89,002, for Method and Apparatus for Erecting Structures in Water, filed April 22, 1949, now Patent No. 2,775,095.

The body 1 of the pile is tubular. It can be floated to the spot where it is to be installed, and then flooded to sink it.

The lower end of the pile, which has the form of a long hollow pipe, is expanded to make an enlarged conical head 2, and in its outer end this head has a large opening 3 which is closed by a plug 4. The top of the body 1 bears a cover 5, which is of course removable. Within

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the pile is a transverse partition 6, below which is an air vent cock 7. The pile, being hollow, will float in a horizontal position, when lowered into the water with the plug 4 and cover 5 tight. When it is desired to sink it, the plug 4 is removed so that water can enter into the lower end of the body and fill the interior space up to the partition 6. The lower part of the pile will thus be overweighted, while the upper end remains buoyant, so that it can be submerged in vertical position. The valve 7 is opened when the plug 4 is removed to let out the air.

The pile also has one or more pipe lines 8 therein which extend from the head 2 through the partition 6 and the top cover 5. The upper ends of these lines can be capped when the pile is submerged, and later uncapped and coupled to water pumps; so that when the lower end of the pile reaches bottom 9, water can be forced through the pipes 8 to excavate the bottom and allow the head 2 to sink to some depth. When the head 2 rests firmly on the bottom, liquid concrete in the form of grout or in such state as to be suitable for "tremie" pouring, is supplied under pressure to the pipes 8 to accumulate in a mass 10 in and around the head 2; and when this concrete sets, the pile has its own foundation and is anchored securely. They can be maintained upright or tilted, as indicated on Figures 2 and 3. The water above the bottom is indicated at 11. The part of the body 1 between the partition 6 and cover 5 constitutes a buoyancy member by means of which the one end of the pile is kept uppermost when the other end with the head 2 is submerged.

Having described the invention, what is believed to be new is:

A hollow elongated pile to be set up in water, said pile having its one end to be uppermost closed, and a transverse partition forming with the pile adjacent said end a closed buoyant air chamber, the other end of the pile having a large head with an opening and a removable plug in the opening to exclude water, and one or more pipes extending through the first-named end and said chamber and partition to said opening, the pile having a vent outside said chamber in one side of said pile adjacent said partition on the side thereof towards said head.

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