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P. H. GATIEN

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LOAD BEARING PILE

Filed Aug. 19, 1968

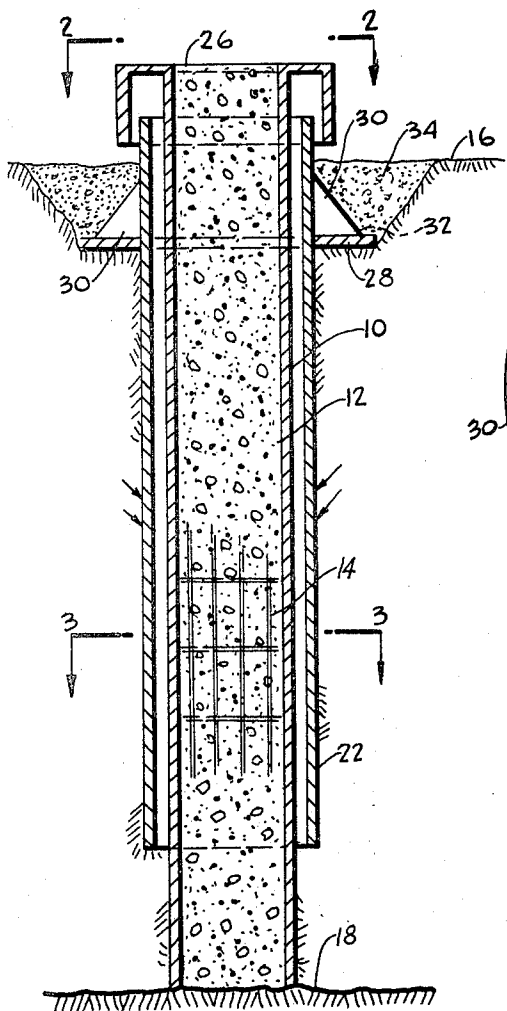


FIG. 1.

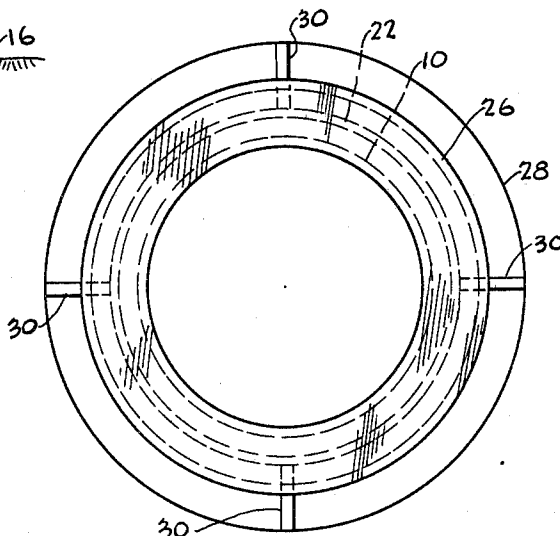


FIG. 2.

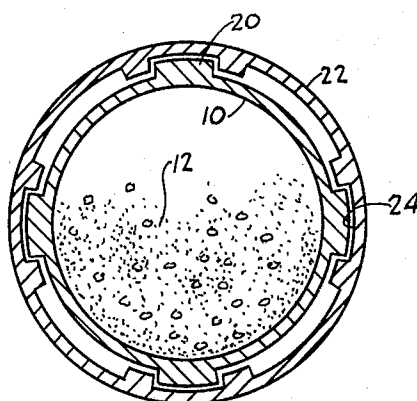


FIG. 3.

INVENTOR.
PAUL HENRI GATIEN

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3,487,646

LOAD BEARING PILE

Paul Henri Gatién, 5810 Park St., Pierrefonds, Quebec, Canada

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5 Claims

ABSTRACT OF THE DISCLOSURE

A load bearing pile adapted to be inserted in the earth, as for example in soft clay, to a considerable depth utilizing a first hollow cylinder of relatively small diameter filled with concrete and a second concentric cylinder of larger diameter which is slidable along the first cylinder and isolates the first cylinder from negative pressure.

SUMMARY OF THE INVENTION

When building roads, bridges or buildings, the engineers often encounter bad carrying grounds, say like soft clay to depths 100' to 300' or more. It is not economical to use standard bearing piles, even if the piles are made of an outside steel pipe filled with reinforced concrete. Because the engineer has to take into consideration (1) the initial load, (2) the impact, (3) the bending moment of the long pile, and (4) the negative soil pressure due to bridge abutment, etc., and his answer would be a very large diameter pipe filled with reinforced concrete. The bigger the pipe, the bigger the load of the soil negative pressure, and a greater load to be carried by the rock at the bottom of the pile.

With my invention the designer needs only to take care of the load required plus the impacts, thus reducing the size of the steel pipe to be filled with reinforced concrete. He does not have to take care of the bending moment of the pile, because the pile would be touching at some points along the outside pipe and the friction would be nearly nil. We can say that the inside pier is free. The outside pipe is floating in "the earth" and releases the main pile from surrounding soil negative pressure. As a result, a pile in accordance with my invention can be used at greater depths and yet employ a smaller diameter pipe.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a cut away side view of my pile;

FIG. 2 is a view through 2—2 in FIG 1; and

FIG. 3 is a view through 3—3 in FIG 1.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Referring now to FIGS. 1-3, an elongated hollow steel pipe 10, filled with concrete 12 reinforced with rods 14, extends downward from above the ground level 16 to a considerable depth with the bottom end resting on rock 18. Typically the earth is formed of soft clay. The outer surface of pipe 10 carries four vertical equidistantly spaced lands 20.

A second hollow pipe 22 of larger diameter is dis-

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posed concentrically about pipe 10 and has vertical valleys 24 in which lands 20 are slidably disposed. The bottom end of pipe 22 is disposed above that of pipe 10 to avoid bearing on the rock. The top end of the pipe 22 extends above ground level but below the top end of pipe 10.

The top end of pipe 10 is covered by cap 26 which extends radially past pipe 22.

A horizontal ring 28 has a central opening through which pipe 22 extends. This ring is secured to pipe 22 and in addition is connected thereto by four equidistantly spaced vertical stiffeners 30. The ring is disposed in the ground below the frost line 32 to prevent pipe 22 from sinking. After the hole is dug to accommodate the ring and stiffeners, the space above the ring can be filled with gravel 34. Ground negative pressure is then transmitted to pipe 22 as indicated by the inclined arrows in FIG. 1 which is retransmitted to pipe 10.

While I have described my invention with particular reference to the drawings, such is not to be considered as limiting its actual scope.

Having thus described this invention, what is asserted as new is:

1. A load bearing pile adapted to be inserted into the ground comprising:

a first vertical hollow cylinder having its lower open end extending into the ground, and its upper open end extending above the ground;

a second vertical hollow cylinder of larger diameter concentrically disposed about the first cylinder, the lower end of the second cylinder being disposed above the lower end of the first cylinder in the ground, the upper end of the second cylinder extending above the ground and disposed below the upper end of the first cylinder;

guide means secured to the inner surface of the second cylinder and to the outer surface of the first cylinder to permit the second cylinder to slide in the axial direction along the first cylinder; and

a horizontal ring having a central opening through which said second cylinder extends, said disc being peripherally secured to the second cylinder, said ring being disposed in the ground below the frost line.

2. A pile as set forth in claim 1 further including stiffeners secured between said ring and the outer surface of the second cylinder.

3. A pile as set forth in claim 2 wherein said first cylinder is filled with concrete.

4. A pile as set forth in claim 3 wherein said first cylinder is filled with reinforced concrete.

5. A pile as set forth in claim 4 further including a cap secured to the upper end of the first cylinder and extending radially beyond the second cylinder.

References Cited

UNITED STATES PATENTS

2,322,855 6/1943 Lenahan 61—51
3,347,053 10/1967 Manning 61—53 X

JACOB SHAPIRO, Primary Examiner

61—51, 52, 53, 52, 56