J. STEWART.

METHOD OF PLACING AND DRIVING CONCRETE PILES.

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Witnesses—

John Stewart.

by his Attorneys—

1,157,444.
To all whom it may concern:

Be it known that I, JOHN STEWART, a citizen of the United States, residing in Norwood, county of Hamilton, State of Ohio, have invented certain Improvements in the Methods of Placing and Driving Concrete Piles, of which the following is a specification.

The object of my invention is to improve the method of driving pre-molded concrete piles so as to prevent the disintegration of the pile during the driving process and to economize in the time necessary to drive the pile.

In the accompanying drawings: Figure 1 is a view illustrating a pile form driven in the ground to make a hole for the reception of the molded concrete pile; Fig. 2 is a sectional view showing the character of a hole after the form has been removed; said hole containing grout in the bottom; Fig. 3 is a sectional view showing the pre-molded concrete pile inserted in the hole; and Fig. 4 is a sectional view showing the pre-molded concrete pile driven to its final position; the grout filling the voids between the walls of the hole and the pile.

A pre-molded concrete pile, i.e., a pile which has been cast first and allowed to cure from thirty to sixty days, is difficult to drive into some soils under certain conditions. Under ordinary conditions the pre-molded pile is placed in the hole, and is sunk by driving with a drop or steam hammer in the same manner as wooden piles are driven. When long piles of this character are required to reach a considerable depth, the friction of the earth is so great thereon as to make the driving difficult and it frequently happens that the value of the pile is destroyed during the process of driving. By my improved method, the pile can be driven to its full depth without danger of being fractured or disintegrated and the voids in the ground surrounding the pile are filled by the material used in aiding the pile to penetrate the earth.

Referring to the drawings, 1 is the ground into which the pile is to be driven.

2 is the removable preparatory pile having a casing 3 and a point 4. In the present instance, this point 4 is of a greater diameter than the casing 3 forming the body of the pile; consequently, the body portion is freed from frictional contact with the walls of the opening; thus facilitating the driving of the preparatory form and the withdrawal of the same when it has reached the proper depth.

In the present instance, the body portion consists of a metal tube, although it may be made of wood or solid metal, if desired, with a driving head 5 at the top. The point 4 extends into the casing and is tapered, as shown, so as to displace the earth laterally as it enters the ground. This preparatory pile is driven into the ground by any suitable means to a depth less than the full depth required for the finished pre-molded pile, leaving, in the present instance, about five or six feet of ground to be displaced in driving the pre-molded pile. After the preparatory pile has been driven to the desired depth, it is withdrawn, leaving a hole in the ground. The hole, in some instances, may be irregular, as shown in the drawings, due to the movement of the earth. I pour into the hole a quantity of very wet cement grout, which acts as a lubricant to assist in driving the pre-molded concrete pile.

The pre-molded concrete pile 6 is then lowered into the hole, as illustrated in Fig. 3, and is driven by means of a drop or steam hammer to its final penetration, as illustrated in Fig. 4. The grout, as stated above, assists in the lubrication of the pile and, as the pile is driven, this grout works itself into the space between the rough walls of the hole and the pile; filling any voids which may have formed. When this cement grout sets and hardens, the voids are filled with solid material, making an exceedingly substantial and satisfactory pile.

In driving the pre-molded concrete pile the short distance necessary, it is not injured to the same extent as where it is driven the full distance by the drop or steam hammer. In some instances, instead of grout, I may use water, where the voids in the earth are comparatively small, but I prefer to use grout in most cases.

I preferably make the hole for the pre-molded pile of a greater diameter than the pile, although it may be of the same diameter or even of a smaller size than the pile, in which case it will be understood that it is necessary to drive the pre-molded pile into the hole.
In some character of ground, the hole will be substantially the same diameter as the preparatory pile, but in other character of ground the walls may form an irregular opening, as shown in Fig. 2, or, if the ground is very soft, the hole made by the preparatory pile may be entirely closed, but even should the hole be closed, it will be much easier to drive the preparatory concrete pile into the ground than if the pile made the initial penetration.

In extremely hard ground the hole made by the preparatory pile may be the full length of the pre-molded concrete pile and the grout is placed in the hole to lubricate the concrete pile and to fill any voids around the pile.

In some instances it may be possible to place the pre-molded concrete pile in the hole and to allow it to sink by its own weight, in place of sinking it by driving, if the hole is made rather large and the ground in which the hole is made is sufficiently hard and firm to keep the large diameter hole intact.

It will be understood that the pre-molded concrete pile can be made solid, hollow, or may be reinforced to any extent desired. The reinforcing will depend considerably upon the length and the diameter of the pile, and while I have shown a round pile, it may be hexagonal or in any other shape desired to efficiently perform the function for which it is intended.

My invention relates solely to the method of placing the pile into the ground.

I claim:

1. The method herein described of driving a pre-molded concrete pile into the ground, said method consisting in first making a hole by driving a preparatory pile to a depth less than the full depth to which the concrete pile is to be driven; removing the preparatory pile; inserting a quantity of cement grout into the hole; and driving a pre-molded concrete pile in the hole to a depth greater than the preparatory pile was driven.

2. The method herein described, of driving pre-molded concrete piles in the ground; said method consisting in first making a hole by driving a preparatory pile to a depth less than the full depth of the concrete pile to be driven; inserting in the hole a quantity of grout in a liquid state; then placing a pre-molded concrete pile in the hole and driving it to the depth required; the grout forming a lubricant for the pre-molded concrete pile as it is driven and filling the voids formed between the walls of the hole and the concrete pile; the concrete, when it sets, forming a solid mass which enters the voids.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN STEWART.

Witnesses:

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