R. J. BEALL, JR.

PROCESS OF MAKING CONCRETE PILES.

APPLICATION FILED APR. 16, 1904. RENEWED JUNE 20, 1908.

1,127,393. Patented Feb. 9, 1915.

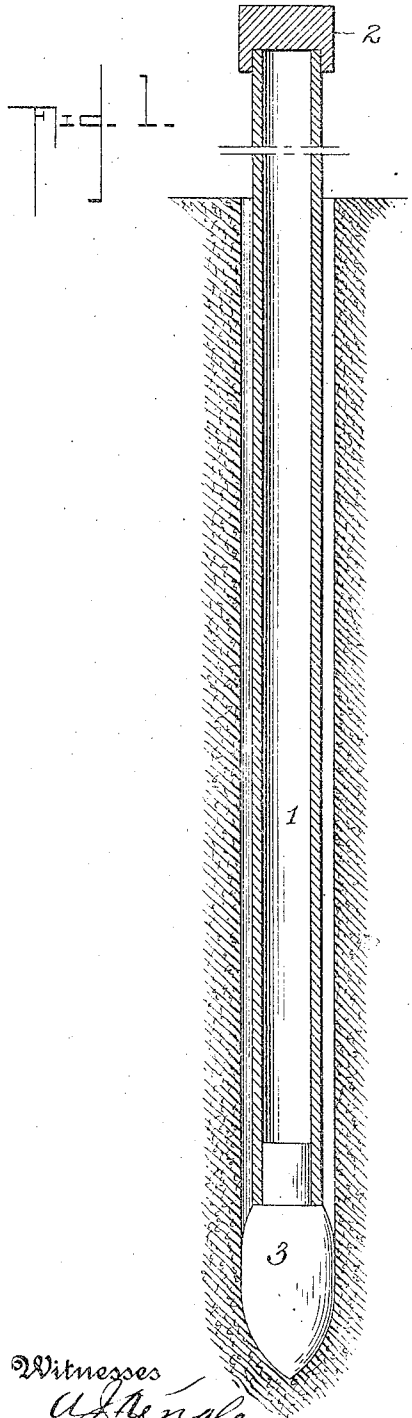


Fig. 1.

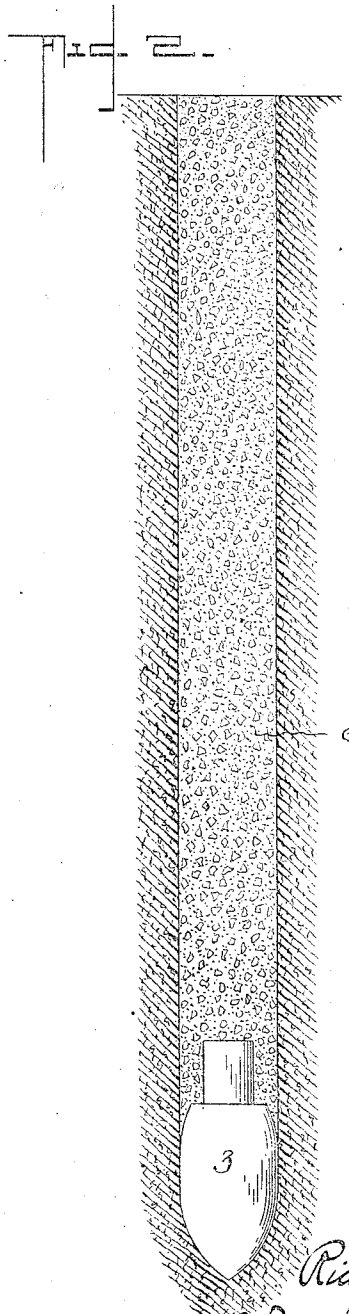


Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

RICHARD J. BEALL, JR., OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO THE SIMPLEX CONCRETE PILING COMPANY, OF WASHINGTON, DISTRICT OF COLUMBIA, A CORPORATION OF THE DISTRICT OF COLUMBIA.

PROCESS OF MAKING CONCRETE PILES.

1,127,393. Specification of Letters Patent. Patented Feb. 9, 1915.

Application filed April 16, 1904, Serial No. 203,491. Renewed June 20, 1908. Serial No. 439,593.

To all whom it may concern:

Be it known that I, RICHARD J. BEALL, Jr., a citizen of the United States, residing in the city of Washington, District of Columbia, have invented certain Improvements in Processes of Making Concrete Piles, of which the following is a specification.

My invention relates to that method of forming piles of concrete or cement which consists in first driving a preparatory pile into the ground, then withdrawing said preparatory pile, and then filling the opening formed thereby with concrete or cement in fluid or plastic form, which when it becomes set forms the permanent pile.

One object of my invention is to provide an efficient foundation for the concrete pile; and a further object is to provide for driving or withdrawing the preparatory pile with the exercise of much less power than is required when piles of this class as heretofore constructed are used.

In the accompanying drawing: Figure 1 is a sectional view illustrating the method of forming the opening in the ground by means of a preparatory pile in accordance with my invention. Fig. 2 is a similar view showing the preparatory pile removed and the opening filled with concrete resting upon a base or foundation introduced into the opening in accordance with my invention.

For the purpose of forming in the ground openings for the reception of concrete or cement to constitute a permanent pile the use of an ordinary wooden or metal preparatory pile of cylindrical form or tapering inwardly from top to bottom is objectionable, for the reason that the frictional hold of the earth upon the sides of the same is such that the pile cannot be driven beyond a limited distance without the exercise of destructive force and cannot be withdrawn after being driven without the exercise of still greater force, frictional hold of the earth upon the pile being now assisted by atmospheric pressure, owing to the fact that the withdrawal of the pile tends to create a partial vacuum in the opening left thereby. For this reason various forms of collapsible piles have been proposed; but such piles owing to their sectional character are necessarily limited in strength and, moreover, do not overcome the objection of resistance to the frictional hold of the earth thereupon while they are being driven. When the pile tapers inwardly from top to bottom, there is the same resistance to the driving of the pile, and the resistance to the withdrawal of the pile is also excessive, because owing to the atmospheric pressure the earth is caused to cling firmly to the pile, so as to increase the difficulty of starting the pile and retard its movement for some time after it is started. In carrying out my invention, therefore, I displace the earth at and near the point of the preparatory pile to a greater extent than the diameter of said pile, thereby freeing the pile, except as to a limited area at and near the point, from any material frictional contact with the walls of the opening formed thereby, thus facilitating the driving of the pile. The enlarged point of the preparatory pile is detachable therefrom, and when said preparatory pile is withdrawn said point remains at the bottom of the hole formed by the pile and serves as a base or foundation for the permanent pile, which is produced by pouring the cement or concrete into said hole and permitting it to become set.

On reference to Fig. 1 it will be observed that the preparatory pile 1 is in the form of a metal tube, although it may be a solid pile of wood or metal, if desired, this pile being provided at the top with a suitable driving-head 2 and at the bottom with a point 3, which is of so much greater diameter than the pile 1 that there is no likelihood of the latter coming in contact to any material extent with the walls of the opening formed by the driving of the pile. The point is reduced in diameter at the top, so as to provide a shoulder for engagement with the lower end of the pile, and said point is detachable from the pile. Hence while it will be driven into the earth in advance of the pile it will when the pile is withdrawn remain at the bottom of the hole, as shown in Fig. 2. The point 3 has a tapered lower end and also by preference tapers from its portion of greatest diameter inwardly to the shoulder upon which rests the lower end of the pile 1, so that no abrupt shoulders are presented to the earth in driving the pile. After the preparatory pile has been withdrawn, leaving the point 3 at the bottom of the hole, the latter is filled with concrete or cement, which is permitted to remain with-

out disturbance until it becomes set, so as to form the permanent pile 6, as shown in Fig. 2. The point 3 can be made of any desired shape and of wood, cast or wrought iron, steel, glass, asphaltum, or combinations of the same, or, in fact, of any material which will withstand the shock of driving, preference being given to a point composed of concrete, which may if desired be sheathed with sheet metal except at the top or internally reinforced to strengthen it, as the plastic concrete of which the pile is composed will take a better hold upon such concrete point than upon a metal or other point not affording as good a holding surface.

Having thus described my invention, what I claim and desire to secure by Letters-Patent, is:

1. The method of making concrete piles, which consists in providing a pile stem with a detachable pointed hole forming end or head of greater diameter than any part of the pile stem, driving said head to displace the earth and thereby forming a hole larger than the pile stem, detaching and withdrawing the pile stem leaving the head, and then filling the hole above said head with concrete or other plastic material and permitting the same to set.

2. The method of making concrete piles, which consists in providing a pile stem with a detachable concrete pointed head of greater diameter than any part of the pile stem, driving said pile to displace the earth and thereby forming a hole larger than the pile stem, detaching and withdrawing the pile stem without the head, and then filling the hole above said head with concrete or other plastic material adapted to unite with said concrete head, and permitting the same to set.

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

RICHARD J. BEALL, JR.

Witnesses:

EMORY H. BOGLEY,

H. S. BEALL.