No. 817,595. PATENTED APR. 10, 1906.

F. SHUMAN.

SETTING CONCRETE PILES.

APPLICATION FILED JULY 26, 1905.

Fig. 1

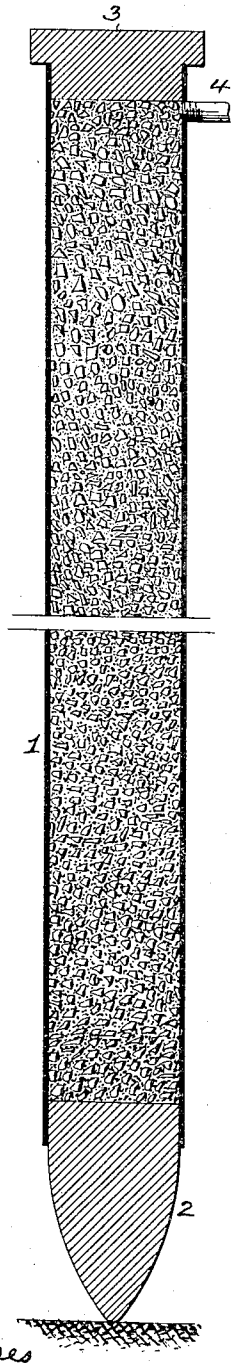


Fig. 2

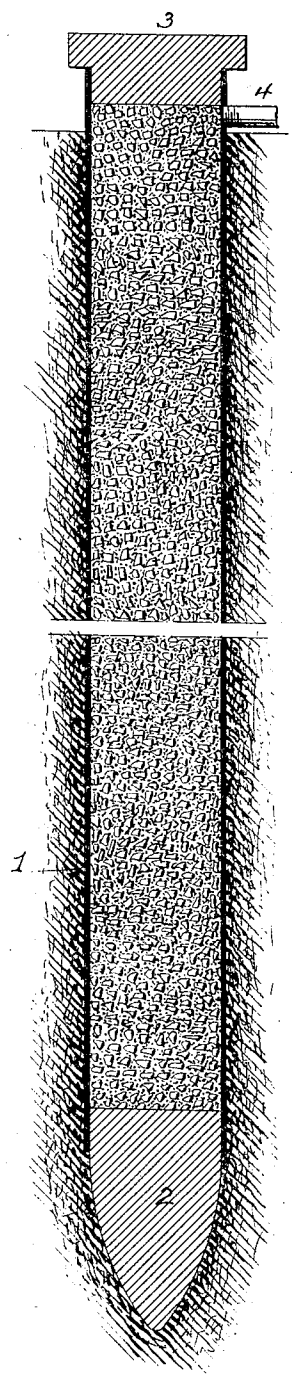
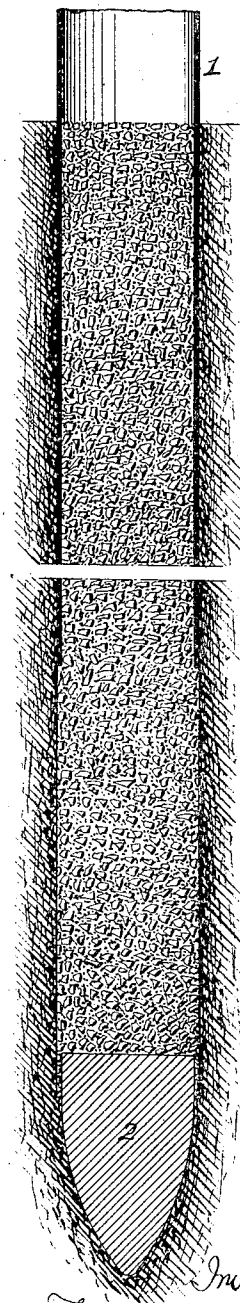


Fig. 3



Witnesses
Walter F. Pellinger
Augustus B. Coppes

Inventor
Frank Shuman
by his Attorneys
Fraser & Howson

UNITED STATES PATENT OFFICE.

FRANK SHUMAN, OF PHILADELPHIA, PENNSYLVANIA.

SETTING CONCRETE PILES.

No. 817,595. Specification of Letters Patent. Patented April 10, 1906.

Application filed July 26, 1905. Serial No. 271,325.

To all whom it may concern:

Be it known that I, FRANK SHUMAN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Setting Concrete Piles, of which the following is a specification.

My invention relates to that method of forming concrete piles in which a preparatory pile, usually in the form of a hollow metal tube, is first driven into the ground to form an opening for the reception of the concrete of which the permanent pile is to be composed the hollow preparatory pile being ordinarily withdrawn either before, during, or after the filling in of the concrete. Such preparatory piles have heretofore been provided with points which have been either detachable, so that they could be left at the bottom of the hole as the tubular pile was withdrawn, have been removable through the pile before filling in the concrete, or have been in the form of pivoted jaws or valve members which would swing apart as the pile was withdrawn, so as to permit of the passage of the concrete between them.

I find that in the formation of concrete piles in many different kinds of soil—for instance, in those which are marshy or of a clayey nature—the use of a point of any kind can be dispensed with if the hollow preparatory pile is filled with the concrete before being driven, and said concrete is prevented from escaping at the top, the pile in this case having the same effect as a solid pile, but the metallic tube being susceptible of being withdrawn from the concrete after it has been driven, so as to leave said concrete in the opening which has been formed. If it is desired to use a point, the latter can be a simple plug at the bottom of the pile, and therefore of a much simpler and cheaper character than the points heretofore used.

In the accompanying drawings, Figure 1 is a view illustrating the first step in the formation of a concrete pile in accordance with my invention. Fig. 2 is a view illustrating the second step in the formation of the same, and Fig. 3 is a view illustrating the final step.

The preparatory pile which I use in carrying out my present invention may consist of a metal tube or pipe 1, open at both ends or provided at the lower end with a plug 2, from which the pipe 1 can be readily withdrawn after the driving of the pile. The pipe is set up in the desired position between the leads of the pile-driver and either before or after being thus set up is filled with concrete, which is of a relatively wet or plastic character, so that it can slide easily in the pipe. The top of the pipe is then, by preference, closed by means of a cap-plate 3, on which rests the driving-head, if a detachable driving-head is used, or the detachable driving-head may be used as the closure for the top of the pipe. This concrete-filled hollow pipe is then driven in the same manner as an ordinary solid pile and acts in the same way as would such a solid pile, being driven just as true and as safely.

I have shown at the lower end of the pipe a plug 2, which is tapered at the lower end; but a simple disk may be employed, or a plug of relatively dry and stiff concrete a foot or two in depth may be used, or a plug of any kind may be dispensed with, since the blunt lower end of the pile does not interfere to any material extent with the driving of the same in that class of soils for which piles of this character are intended. In marshy soil a point does not materially facilitate the driving of the pile, and in clayey soil a mass of clay has a tendency to form in advance of and travel ahead of the pile, so as to constitute, in effect, a substitute for a point.

After the pile has been driven to the desired extent, as shown in Fig. 2, the pipe 1 is withdrawn from the concrete filling, the latter being sufficiently plastic to enter and fill the space formerly occupied by the pipe, as shown in Fig. 3, suitable pressure being, if desired, imparted to the top of the plastic mass of concrete in order to insure the ejection of the same from the pipe.

If desired, air or other fluid under pressure may be introduced through the tube 4 between the closed top of the pipe and the top of the mass of concrete therein, so as to simultaneously force the pipe upward and the concrete downward.

It will be evident that a plug 2, such as I have shown, is much cheaper and simpler than a detachable point such as heretofore proposed for use in connection with a hollow preparatory pile, since such point must be molded with a shoulder to constitute a bearing for the lower end of the pipe and must be strengthened in order to enable it to resist the blows of the pipe, which are exerted upon the limited area represented by said shoulder.

My improvement in forming concrete piles is available for use generally, except in cases where the ground is very hard or filled with boulders.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The mode herein described of setting a concrete pile, said mode consisting in first surrounding the mass of concrete with a pipe, driving the two as a unit, and then withdrawing the pipe.

2. The mode herein described of setting a concrete pile, said mode consisting in first filling a pipe with plastic concrete, preventing escape of the latter at the top of the pipe, driving the pipe thus filled, and then withdrawing the pipe and leaving the mass of concrete in the opening.

3. The mode herein described of setting a concrete pile, said mode consisting in first filling a pipe with plastic concrete, preventing escape of the latter at the top of the pipe, driving the filled pipe and then removing the pipe and forcing the plastic mass therefrom, as said pipe is being withdrawn.

4. The mode herein described of setting a concrete pile, said mode consisting in providing a removable plug at the bottom of the pipe, filling said pipe with concrete, preventing escape of the latter at the top of the pipe, driving said filled pipe, and then withdrawing the pipe and leaving the plug and the mass of concrete in the opening.

5. The mode herein described of setting a concrete pile, said mode consisting in filling with plastic concrete a pipe which is open or has a removable closure at its lower end, preventing escape of said concrete at the top of the pipe, driving said filled pipe, and then withdrawing the pipe and forcing the concrete therefrom by introducing fluid under pressure between the top of the mass of concrete and the closed top of the pipe.

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

FRANK SHUMAN.

Witnesses:

WM. E. SHUPE,

JOS. H. KLEIN.