Aug. 13, 1935. F. S. SNOW ET AL 2,011,459

REENFORCED CONCRETE PILE

Filed Jan. 4, 1933

Fig. 1.

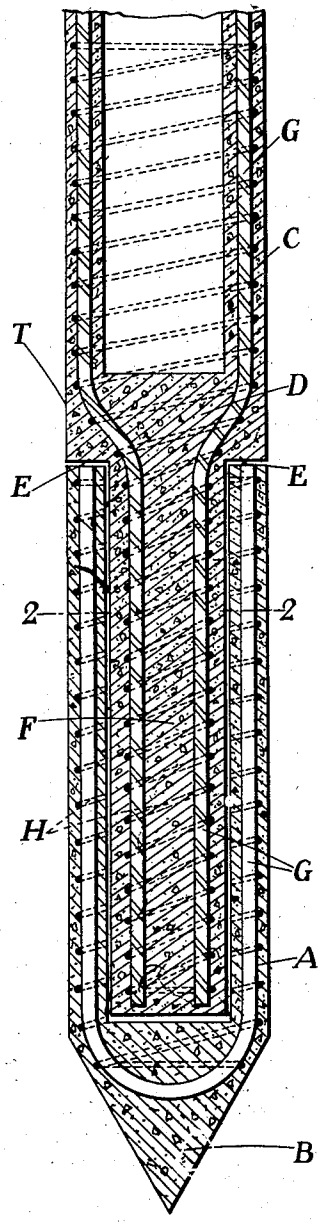
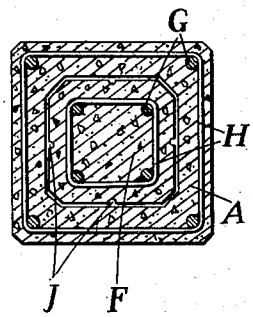


Fig. 2.



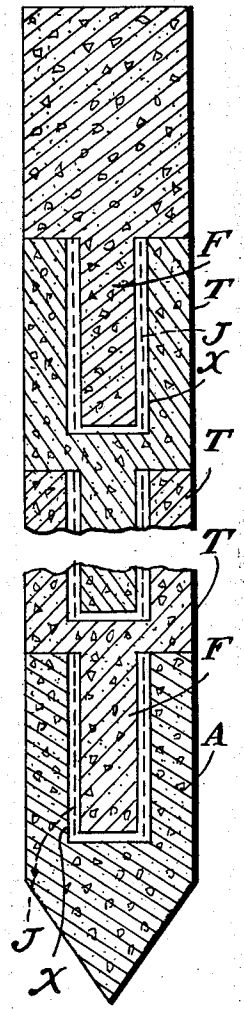


Fig. 3.

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REENFORCED CONCRETE PILE

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10 Claims. (Cl. 61—56)

This invention relates to concrete and like piles and has for its object to provide an improved construction of pile, which is particularly applicable where head-room for driving is limited.

Concrete piles are of two main classes, namely precast piles which are hardened before driving and in situ piles which are formed by driving a hollow shell into the ground and filling the shell with concrete as the former is withdrawn.

With both types of pile as ordinarily constructed, the driving frame has to have sufficient head-room to commence driving when the whole length of the pile is above the ground.

One type of pile has been proposed in which successive short lengths of hollow concrete tubes are driven into the ground to the requisite depth, one tube abutting its neighbour, and the hollow space is afterwards filled with concrete. This type of construction enables driving to be carried out with smaller head-room than with the ordinary precast pile, but presents difficulty in ensuring absolute straightness of the pile and a tight joint between successive lengths.

One object of the invention is to provide a precast reenforced concrete impact driven pile comprising in combination a plurality of precast units each of comparatively short length provided with inter-engaging extensions and recesses to form a substantially solid pile.

Another object of the invention is to provide a precast reenforced concrete pile comprising a bottom pointed member provided with a deep recess in the top thereof and an upper member provided with a spigot engaging said recess the junction of the spigot and main portion of the upper member forming a ledge fitting over the lower member and transmitting the driving impact thereto.

With these and other objects in view the invention consists in the improved constructions of pile hereinafter described in detail and set out in the claims which follow.

In one preferred form of pile each unit, with the exception of the top and bottom lengths, is formed at one end with a recess, at the other end with an extension, and a shoulder at the top of the extension which bears upon the top of the unit below with or without a protective gasket; while the spigot or extension fits into the socket of this lower unit.

The bottom unit has an appropriately shaped shoe portion and a central hollow portion into which fits the bottom solid portion of the unit next above it; the top unit resembles the intermediate units but has preferably no upper recess.

It will be seen that with the construction above referred to driving can continue almost immediately after each lengthening piece has been placed in position because the shoulder of the lengthening piece bearing against the top edge of the lower length gives the necessary bearing to transmit the impact.

In order that the nature of the invention may be more fully understood forms of pile in accordance with it will now be described by way of example with reference to the following drawing in which:—

Fig. 1 represents a longitudinal section through the bottom and next higher units of one form of pile constructed in accordance with the invention,

Fig. 2 is a cross-section on the line 2—2 of Fig. 1,

Fig. 3 represents diagrammatically a longitudinal sectional view of a composite pile made up of a plurality of interengaged units.

Referring to Fig. 1, a base unit A is formed as a rectangular beam hollow for most of its length and having a lower shoe portion B. The next higher unit T consists of an upper rectangular hollow portion C of the same external cross-section dimensions as those of the base unit A; a solid portion D, the shoulders E of which bear on the top of the base A, and a solid extension F which fits into the hollow portion of the base A, which hollow portion is of very slightly larger dimensions than the extension F. Suitable reenforcements are provided in both units, which consist of continuous longitudinal bars G, bent in the solid portion D of the upper unit, and spiral transverse lacing H.

The internal dimensions of the hollow portion C of the upper unit are the same as those of the hollow portion of the base A in order to receive the extended portion of a further unit of the same shape as the unit T.

The solid extension F of the upper unit T is provided with grooves J (Fig. 2) which act as channels for cement grout X which may be poured into the hollow portion of the shell A after driving it, and before or simultaneously with the insertion of the extension, to fill the voids between the units and form a substantially solid pile.

Fig. 3 shows diagrammatically the construction of a completed pile in which a plurality of units T, as shown in Fig. 1, are inter-engaged one above the other and above the lowermost unit A. Obviously, the number of units required depends on the length of pile to be constructed. The topmost unit Y is of the same construction

as the units T except that its upper part is solid instead of being formed with a recess, and furthermore the length of its upper part need not necessarily be the same length as the upper parts of the units T. Thus, the length of the upper part of the unit Y may be shorter or longer or equal to the lengths of the upper parts of the units T, depending upon the ultimate length of pile desired.

We claim:—

1. A precast reenforced concrete impact-driven pile comprising in combination a bottom pointed member provided with a deep central recess and an upper member provided with a long spigot fitting within said recess, the junction with said spigot and the body of said upper member forming a shoulder engaging with the upper surface of said lower member.

2. A precast reenforced concrete impact-driven pile comprising in combination a bottom pointed member provided with a deep central recess and an upper member provided with a long spigot fitting within said recess and an upper deep central recess, the junction with said spigot and the body of said upper member forming a shoulder engaging with the upper surface of said lower member.

3. A precast reenforced concrete unit for an impact-driven pile having a deep recess at the upper end and a deep spigot at the lower end thereof, the recess and spigot being of substantially the same dimensions and their depth being not less than three times their lateral dimensions.

4. A precast reenforced concrete impact-driven pile comprising in combination a plurality of precast units each of comparatively short length provided with inter-engaging recesses and solid spigots to form, by their interengagement, a substantially solid pile.

5. A precast reenforced concrete impact-driven pile comprising in combination a bottom pointed member provided with a deep central recess and a plurality of interfitting upper members each provided with a lower long spigot and an upper deep central recess, each spigot having at least one groove therein forming a cement grout channel, and the spigot of the lowermost of said upper members fitting within the recess of the bottom member and the body thereof engaging with the upper surface thereof.

6. A precast reenforced concrete impact-driven pile comprising in combination a lower member having a deep recess in the top thereof and an upper member provided with a deep spigot of slightly smaller cross sectional dimensions than those of the recess in the lower member, the spigot fitting in the recess, and cement grout positioned in the clearance space between said spigot and said recess.

7. A precast reenforced concrete unit for an impact-driven pile having a deep recess at the upper end and a deep spigot at the lower end thereof, and reenforcing means running substantially throughout the length of said unit including said spigot and comprising a plurality of longitudinal bars bound by transverse lacing.

8. A precast reenforced concrete unit for an impact-driven pile having a deep recess at the upper end thereof and a deep spigot at the lower end thereof and a shoulder at the top of said spigot.

9. A precast reenforced concrete impact-driven pile comprising in combination a bottom pointed member provided with a deep central recess, and with reenforcement throughout substantially the whole length of said member, and an upper member provided with a long spigot fitting within said recess and an upper deep central recess, said upper member being provided with reenforcement throughout substantially its whole length, and the junction with said spigot and the body of said upper member forming a shoulder engaging with the upper surface of said lower member.

10. A precast reenforced concrete unit for an impact-driven pile having a deep recess at the upper end and a deep spigot at the lower end thereof, and a shoulder at the top of the spigot, the depth of said recess being slightly greater than the length of said spigot.

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