

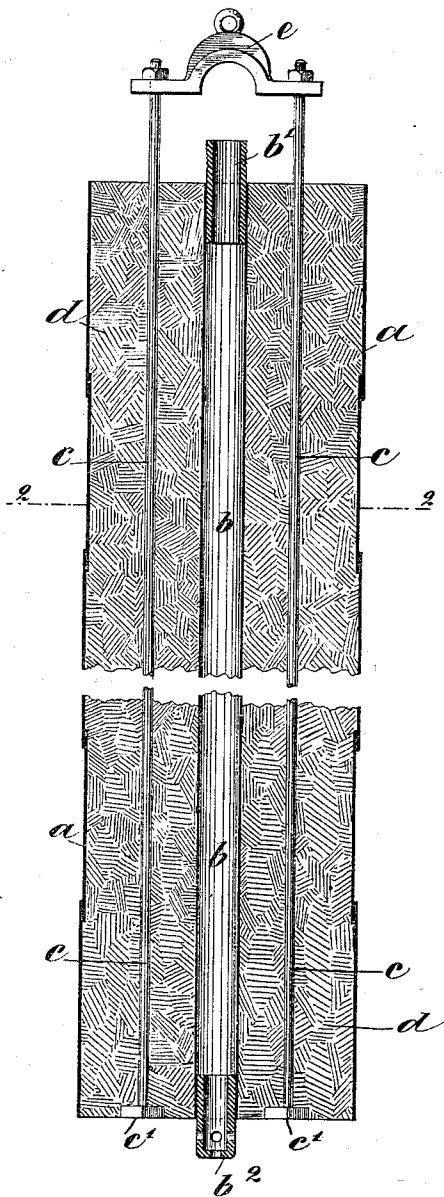
(No Model.)

W. KENNISH.  
PILE.

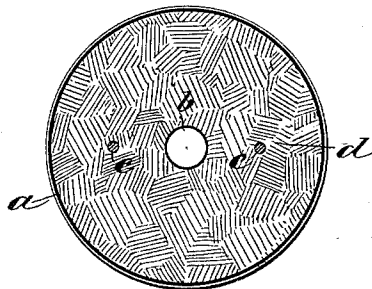
No. 509,474.

Patented Nov. 28, 1893.

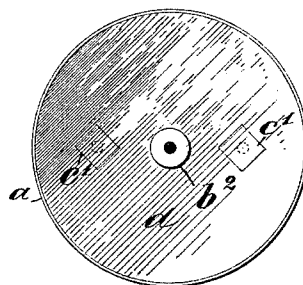
*Fig: 1.*



*Fig: 2.*



*Fig: 3.*



WITNESSES:  
*Herbert Bloforn*  
*Charles A. Barker*

INVENTOR:  
*William Kennish*  
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# UNITED STATES PATENT OFFICE.

WILLIAM KENNISH, OF WILMINGTON, NORTH CAROLINA.

## PILE.

SPECIFICATION forming part of Letters Patent No. 509,474, dated November 28, 1893.

Application filed September 10, 1891. Serial No. 405,324. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM KENNISH, a citizen of the United States, residing at Wilmington, in the county of New Hanover and State of North Carolina, have invented certain Improvements in Piles, of which the following is a specification.

My invention relates to the construction of piles adapted to be set in sand, or in water-ways having sandy or soft bottoms, and particularly, though not necessarily, for piling in marine waters where the piles are subject to attacks from the *Teredo navalis*.

The object of my invention is to produce a pile composed of concrete which may be sunk or driven in a sandy or soft bottom.

In carrying out my invention in its preferred form, I first construct a tube of thin sheet metal, as sheet iron, this tube having the transverse sectional contour, the diameter, and the length of the pile desired. It may, for example, be fifty feet in length, four feet in diameter, and cylindrical. This larger tube is placed on end and a smaller tube, which may also be of sheet iron, is erected in it, preferably at or near the axis of the larger tube. Two or more iron rods are also erected within the larger tube, in the annular space between the larger and smaller tubes. The annular space between these tubes is now filled with concrete which embeds the inner tube and the rods. After the concrete has set and become hard, the pile is hoisted into place, the rods fixed in its mass serving as a point of attachment for the hoisting tackle. After the pile has been set in place it may be sunk or driven by driving the sand from under its foot with a stream of water forced down through the inner, smaller tube which extends longitudinally through the pile.

In order that my invention may be the better understood reference may be had to the accompanying drawings, wherein—

Figure 1 is a longitudinal mid-section of a pile constructed according to my invention. Fig. 2 is a transverse section of the same taken on the plane indicated by line 2, 2, in Fig. 1, and Fig. 3 is a plan view of the foot or lower end of the pile.

*a* represents the larger metal tube, forming the outer jacket or casing of the pile.

*b* is the inner metal tube, *c, c*, two iron rods,

and *d*, the mass of concrete forming the body of the pile. The rods *c* have heads *c'*, at their lower ends, to anchor them the better in the concrete mass. At the upper end of the pile the rods project, and a yoke, *e*, may be fitted on to them to provide an attachment for the hoisting tackle required in handling the pile.

The outer casing or tube *a*, may be made up of a number of cylindrical sections, overlapping each other at the several points when they are united together. The tube *a* may be open at both ends, or it may have a bottom.

The inner tube *b*, may be of thin sheet iron, and be provided at its upper end with a metal nipple, *b'*, to which the hose or pipe from a force-pump may be attached; and at the foot of the pile, the tube *b*, may also be provided with a jet-nozzle, *b<sup>2</sup>*, having lateral outlets as well as a direct outlet at the bottom.

As the purpose of the tube *b* is to provide a passage for the stream of water employed for driving away the sand or earth from under the foot of the pile when setting it, any arrangement of a tube or pipe extending lengthwise of the pile and adapted to lead the water to the proper point at its foot, will serve the purpose.

After the pile has been sunk, the tube *b*, may be filled with concrete, or with a mixture of hydraulic cement and sand. The exterior iron shell or casing *a*, may corrode away, in course of time, but this is of little importance as the casing serves mainly as a mold in forming the pile, the concrete forming the body of the pile.

As my pile is formed of a mass of concrete, and will ordinarily be constructed on shore and then lifted into place and sunk in the bottom, the casing or jacket serves as a convenience in handling the pile after the concrete is set. I do not contemplate setting the concrete pile on the bottom and supporting it in position by wooden piles driven in the ground, nor using concrete as a covering for wooden piles, to protect the latter.

I prefer to employ sheet iron for the casing *a*, but it will be obvious that other materials, as wood or copper, may be substituted for the iron.

The rods *c*, are not absolutely essential to my invention, as the pile may be handled by other means; but these rods serve not only as

an attachment for the hoisting tackle, but also to strengthen the pile, and their projecting upper extremities may be utilized also as a means for securing to the piles the timbers of the superstructure supported thereby.

I do not herein claim the method of sinking or driving the pile as this is embodied in another application, Serial No. 405,325; but What I do claim is—

1. A concrete pile having an incasing jacket *a*, and a tube *b*, extending through it longitudinally substantially as set forth.

2. A pile composed of a single mass of concrete having an incasing jacket *a*, and a tube *b*, extending through it longitudinally, substantially as set forth.

3. A pile composed of a single mass of concrete having an incasing jacket *a*, a tube *b*, extending through it longitudinally, and iron rods *c*, embedded in its mass and projecting from its upper end, substantially as set forth.

4. A pile composed of a single mass of concrete having a jacket or casing *a*, and provided with a passage for water which extends through it longitudinally, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WM. KENNISH.

Witnesses:

A. D. CAZAUX,

GEO. W. FREDERICKS.