(No Model.)

H. CASE.

PILE.

No. 262,569. Patented Aug. 15, 1882.

FIG. 3.

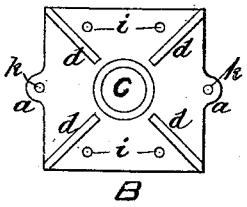


FIG. 2.

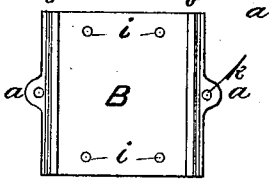


FIG. 1.

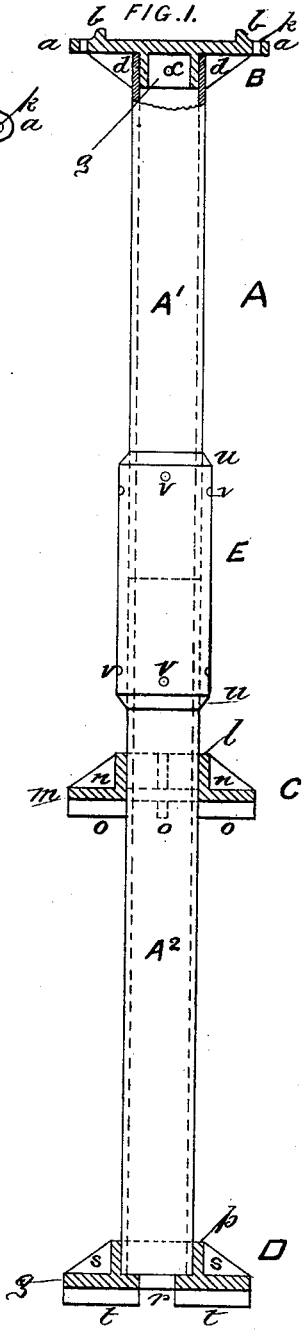


FIG. 4.

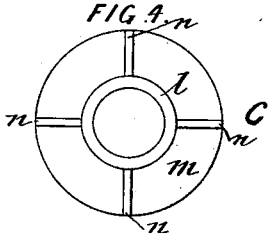
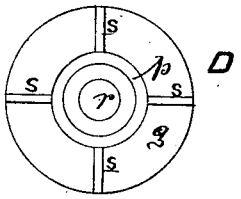


FIG. 5.



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HENRY CASE, OF BROOKLYN, NEW YORK.

PILE.

SPECIFICATION forming part of Letters Patent No. 262,569, dated August 15, 1882.

Application filed February 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY CASE, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Piles, of which the following is a specification.

This invention relates to piles that are adapted to be sunk or placed in position by means of hydraulic appliances and processes; and its object is to provide a pile that shall be stronger, more durable, and better adapted than any other to hold fast when in place.

The invention consists of a tubular pile of iron or other suitable material, provided with a flanged and tenoned cap, with a fixed flanged bottom shoe having a central aperture and bottom ribs, and with an encircling sliding brace-shoe that is designed, when the pile is in position, to be sunk a short distance beneath the surface of the ground in order to brace the pile and prevent its lateral motion; and it further consists of an improved splicing device, designed for stiffening the pile and giving it superior durability.

Figure 1 is an elevation of the pile with the cap and shoes in section. Fig. 2 is a plan of the cap. Fig. 3 is a plan of the reverse of the cap. Fig. 4 is a plan of the sliding brace-shoe. Fig. 5 is a plan of the bottom shoe.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents a tubular iron pile, formed of two sections of pipe, $A' A^2$; but the pile may be composed of more sections, if desired.

B represents the improved cap, presenting in plan a rectangular outline broken by flanges or ears *a* on the opposite sides thereof. On the upper surface of the cap B, near the edges from which project the flanges or ears *a*, are formed parallel ribs *b b*, extending across the face of the cap. Centrally from the under side of the cap B a tubular tenon, *c*, projects downward, and four triangular strengthening webs or braces, *d*, fixed on the under side of the cap B and forming part of it, with their straight edges parallel with and a short distance from the tenon *c*, radiate to the four corners of said cap. It is designed to apply this cap B to the pile A, as shown in Fig. 1, with the tenon *c* entered into the upper end thereof, while the straight edges of the braces *d* fit closely against the outside of the pile top; and the said cap B is then secured in place by pins or bolts *g*, passed horizontally from side to side through the pile and cap-tenon.

In constructing a pier it is designed to secure the abutting ends of the timbers on the face of the cap B between the ribs *b b* by means of bolts passed through the timbers and the holes *i* in said cap, and to secure the ends of other or cross timbers on the flanges or ears *a* by bolts passed through said timbers and holes *k*. Braces or rods of suitable character may then be applied to tie the timbers of the pier more firmly together.

The cap B, it will be seen, is constructed especially with reference to strength and rigidity. The flanges *a* are not necessarily of the shape or proportions shown in the drawings, as it is manifest that they may be extended or enlarged without departing from my invention.

C represents the sliding brace-shoe, designed to encircle the pile A and move loosely thereon, consisting of a short tube or collar, *l*, whose bore is straight and concentric with the pile on which it is placed, having an annular flange, *m*, extending at right angles from its bottom, with four triangular webs or braces, *n*, set in the angle formed by the collar *l* and flange *m*, and radiating in opposite directions, and with four ribs, *o*, on the under side of the flange *m* for strengthening the shoe and for holding it in place, preventing its canting when the pile is in position.

D represents the bottom shoe, designed to be rigidly secured on the lower end of the pile for the purpose of holding it fast in place, as well as to co-operate with the hydraulic process in the sinking of the pile. The shoe D consists of a short tube or collar, *p*, of suitable diameter to fit about the lower end of the pile A, having a circular plate or flange extending at right angles from its bottom, through which plate or flange *q* is a central opening, *r*, preferably of less diameter than the bore of the tube *p*. Triangular strengthening-braces *s* are set in the angle formed by the collar or tube *p* and flange *q*, and radiate in opposite directions, while ribs or scrapers *t*, projecting downward from the under face of the

plate *q*, radiate from the edge of the opening *r*. These scrapers or ribs *t* are designed to strengthen the shoe D, and to loosen the soil beneath the pile as the latter is rotated or turned by the operator when it is being sunk or placed in position.

E represents the improved splice, consisting of a sleeve of iron or other metal, having a smooth interior surface, and having its ends beveled on their outer edges, as shown at *u*, and being shrunk on over and about the abutted ends of the pile-sections A' A^2, as shown in Fig. 1. This splice E, being sufficiently heated, is applied when so heated and shrinks tightly about the abutted ends or joint of the pile, so as to exclude water and air therefrom, and it is further secured in place by bolts or pins *v*, that are passed through both splice and pile sections, as shown. It is found in practice that this method of splicing an iron pile is far superior to and cheaper than the method in common use, which method consists in cutting screw-threads about the abutting ends of the pile-sections and screwing them into an internally-threaded sleeve. These screw-splices are found not to make joints impervious to water. Hence when immersed in salt-water piles so spliced quickly rust and become weak at the spliced joints. The cost of cutting screw-threads on the ordinary spliced pile and sleeve is also very considerable.

The pile A being placed in an upright position, devoid of the cap B and with the shoe D on the ground or bottom of the river or harbor, water is forced through the pile and out through the opening or perforation *r* in the shoe D, whereby the soil beneath and about the shoe D is fast washed away, so that the pile may sink, and at the same time a rotary motion back and forth is given to the pile, so that the ribs or scrapers *t* shall co-operate with the jet of water in loosening and removing the earth from beneath the pile.

If it be desired, the opening *r* in the shoe D may be closed after the pile is sunk in position, and then the pile may be filled with concrete or other material to increase its power of resistance to shocks from floating ice or other bodies.

I do not hereby claim a sliding brace-shoe in combination with a pile, being aware that a brace-shoe with tapering recess and moving on balls is not new.

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

1. An improved pile, constructed substantially as herein shown and described, consisting of two or more sections of pipe butted together and spliced with one or more bevel-ended sleeves of smooth interior, flanged and tenoned cap, flanged and ribbed perforated fixed bottom shoe, and sliding flanged brace-shoe, all arranged as set forth.

2. The combination, with a pile, of a flanged brace-shoe capable of sliding up and down upon the pile, and having a bore concentric with the same, substantially as herein shown and described.

3. The combination, with a pile, of a flanged brace-shoe capable of sliding up and down upon the pile, and of straight bore, and a fixed bottom shoe, substantially as herein shown and described.

4. The combination, with a sectional iron pile adapted to be sunk or placed in position by means of hydraulic appliances, of a bevel-ended splicing-sleeve of smooth interior, when said sleeve is applied in a heated state to and shrinks about the abutted ends of the pile-sections, substantially as herein set forth.

HENRY CASE.

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