

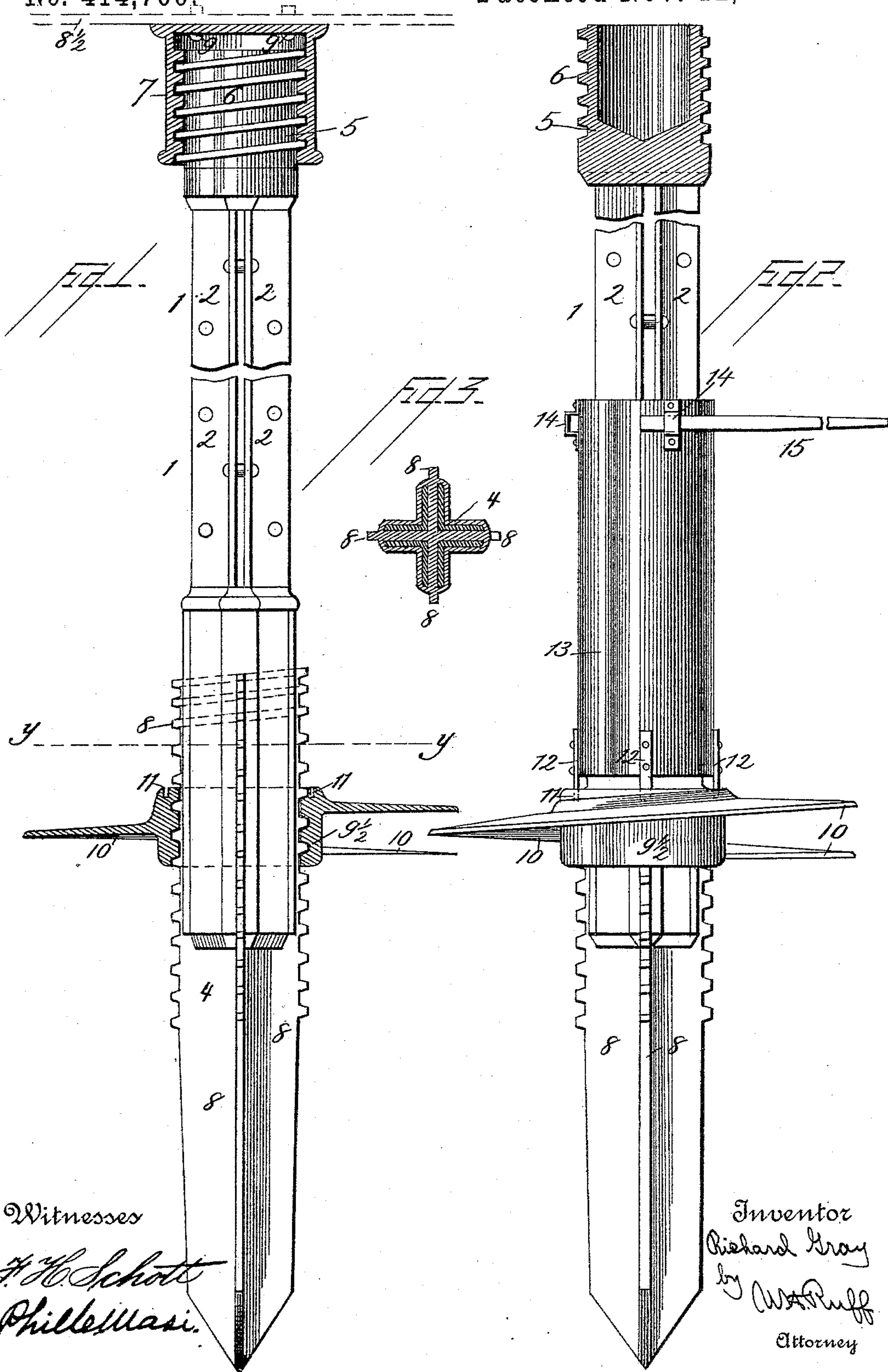
(No Model.)

2 Sheets—Sheet 1.

R. GRAY.
PILE.

No. 414,700.

Patented Nov. 12, 1889.



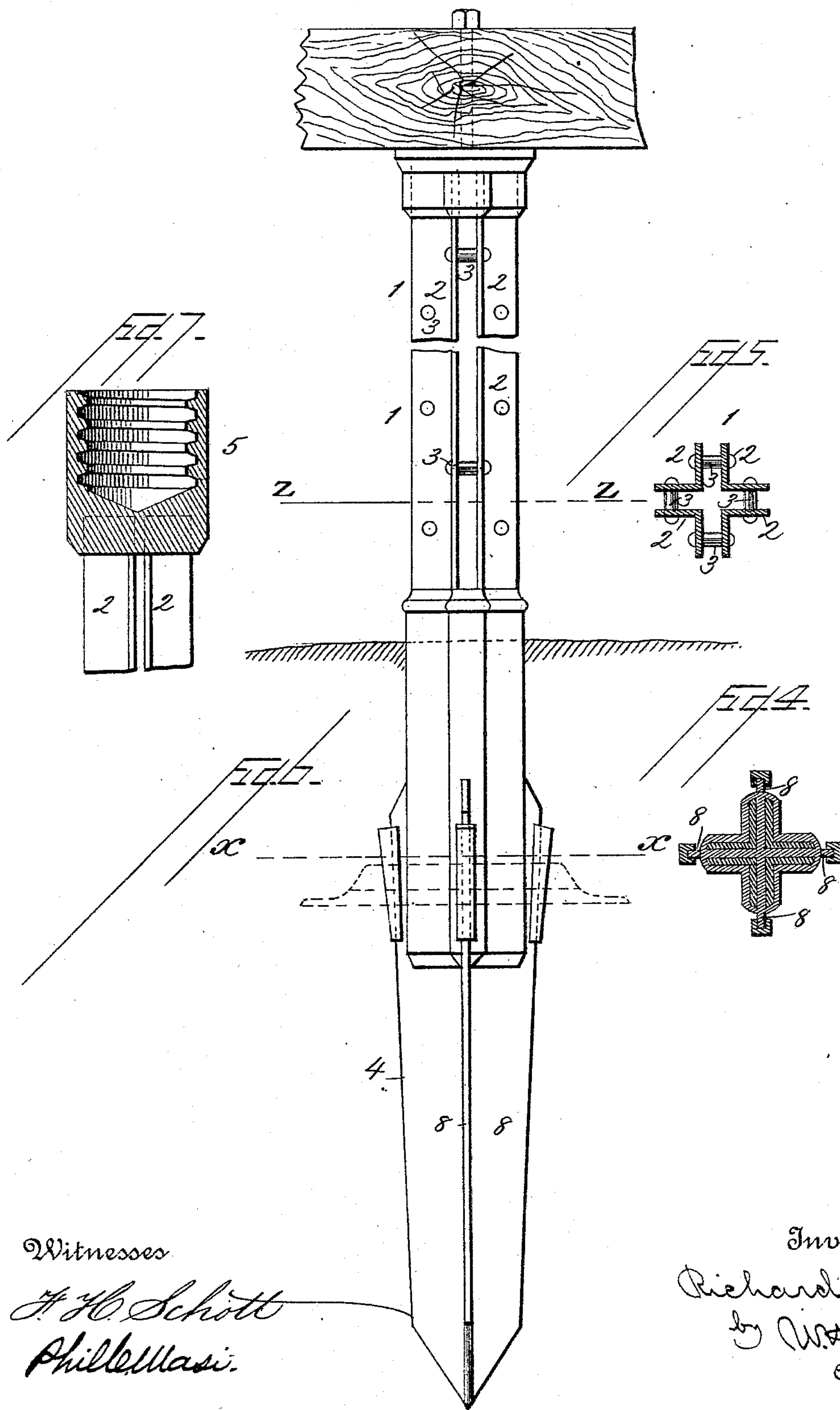
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Witnesses

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UNITED STATES PATENT OFFICE.

RICHARD GRAY, OF BLOOMINGTON, ILLINOIS.

PILE.

SPECIFICATION forming part of Letters Patent No. 414,700, dated November 12, 1889.

Application filed July 31, 1888. Serial No. 281,540. (No model.)

To all whom it may concern:

Be it known that I, RICHARD GRAY, of Bloomington, in the county of McLean, and in the State of Illinois, have invented certain new and useful Improvements in Piles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to an improvement in metallic piles.

Heretofore screw-piles have been employed where the earth was soft and liable to yield, thereby rendering an uncertain support to a driven pile. A similar pile has also been used in structures where a strong upward or lifting force is encountered—as upon the coasts where exposed to the waves. Piles of this character have been found objectionable, owing to the fact that they are liable to be thrown out of position during the process of erection, by reason of encountering obstacles or non-uniformity of resistance to the screw. Furthermore, it is well known that cast-iron when compared with wrought-iron possesses greater crushing strength and durability against rust, but it is deficient in toughness; also, cast piles having wrought columns superposed and coupled thereto are common; but this construction is faulty, because if the coupling be below the surface-line the wrought column is speedily destroyed by rust. If above, there is a want of reliability at or near the surface-line, where the greatest strain occurs, especially when rigidly held by frozen earth or ice.

The object of my invention is to provide a pile in which the advantages of the screw and driven pile are retained and the deficiencies overcome.

A further object is to provide a pile composed partly of fibrous or wrought metal and partly of crystalline or cast metal, disposed and arranged so as to combine advantages of both kinds of metal.

A further object is to provide a pile of such construction that the vertical adjustment thereof can be accurately and conveniently made.

A further object is to provide a pile with a

reliable supplementary support which can be easily and cheaply placed in position.

With these ends in view my invention consists of the certain features of construction and combinations of parts, as will be hereinafter fully described, and pointed out in the claims.

In the drawings, Figures 1 and 2 are views partly in section and partly in elevation. Fig. 3 is a cross-section on the line *yy* of Fig. 1. Fig. 4 is a cross-section on the line *xx* of Fig. 6. Fig. 5 is a cross-section on the line *zz* of Fig. 6. Fig. 6 is a modified form of the pile, shown in elevation. Fig. 7 is a modification of the pile-head.

1 represents a column composed of four angle-bars 2, all of fibrous or wrought iron, joined together by the bolts or rivets 3 in the usual manner. The lower ends of the angle-bars are inclosed within the upper part of the post, which is preferably cast upon them. The lower end 4 of the post is entirely of cast metal, and is preferably formed, as shown, with a solid center and four flanges 8 radiating therefrom, and the lower ends thereof converging to a point.

The pile-head 5 is preferably cast upon the upper end of the column, although it may be formed separately and attached thereto, and to tighten the same it may be cast hollow, as shown in Fig. 2. The head is cylindrical in form, and is provided with a screw-thread 6 to receive the hollow cap 7, which is provided with an internal screw-thread, adapting it to engage the thread 6, whereby it is secured to the head and rendered susceptible of accurate adjustment. The cap is secured to a superstructure or plate 8½ by the bolts 9, placed eccentrically to the cap, which prevents its turning after adjustment. The flanges 8 are provided with screw-threads on their edges adapted to engage a screw-thread in the hub 9½, the said hub carrying the screw-blade 10, provided with a cutting-edge to facilitate entrance into the earth. The hub is provided with holes 11 in its upper end adapted to receive the downward-projecting lugs 12 on the sleeve 13, the upper end of which is provided with the brackets 14 at suitable intervals. The office of the brackets is to receive the lever 15, by means of which

the sleeve may be turned and the motion transmitted to the screw-blade 10, causing the latter to penetrate the earth. When this is accomplished, the sleeve is removed from the pile, and may be again employed. The lower incased part of the column 2 preferably extends below the supporting-plate 10.

The pile is erected in the following manner: The cap and spiral plate are detached and the pile is driven in the usual manner until its top is a little below the line of the top of the cap when in position. The bearing-plate is then passed down upon the section 4, so that its screw-thread will engage that of the flanges 8. The sleeve 13 is then telescoped upon the pile, so that the lugs 12 will register in the holes 11 in the hub. Then by means of lever 15 the plate is screwed down into firm earth, after which the sleeve is removed and the cap applied to the pile-head. If preferred, the head may be provided with an internal screw-thread, as shown in Fig. 7, and the thread on the cap changed to correspond.

It is apparent that a pile of this construction has many advantages.

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

1. As a part of a substructure, a metallic bearing-pile having a wrought or fibrous upper portion joined to a cast lower portion by an elongated coupling wherein the said sections interlap upon each other, whereby both the wrought and the cast portions are extended both above and below the surface-line, substantially as described, and for the purpose specified.

2. In a metal pile, the combination, with a wrought upper portion provided at its upper end with a head adapted to receive and withstand the blows of a pile-driver and to support a superstructure, of a middle portion composed of wrought or fibrous metal inclosed within cast metal, whereby the wrought column is re-enforced and protected from rust.

3. In a metal pile, the combination, with a wrought or fibrous upper portion provided at

its upper end with a head adapted to receive and withstand the blows of a pile-driver and to support a superstructure, of a cast lower portion having a penetrating-point.

4. As an article of manufacture, a composite metallic pile composed partly of wrought or fibrous metal and partly cast metal, having a cast penetrating-point, and a middle portion cast integrally with the point and upon or adapted to inclose the lower end of the upper portion, substantially as described, and for the purpose specified.

5. As a support for a pile, a bearing-plate adapted to movably encompass the pile and to be screwed into yielding earth surrounding the pile.

6. The combination, with a pile having a screw-thread or sections of a screw-thread upon its body, of a bearing-plate having a screw-thread adapted to engage the screw-thread or sections of screw-thread upon the body of the pile.

7. The combination, with a pile having a screw-thread or sections of a screw-thread upon its body, of a bearing-plate having a central hub provided with a screw-thread within adapted to engage the screw-thread or sections of a screw-thread upon the body of the pile, and a spiral flange or cutting-blade adapted to the purpose described.

8. The combination, with a pile and a supporting-plate adapted to be screwed into yielding earth surrounding the pile, of a lever for turning the supporting-plate around the pile, whereby it is caused to penetrate the earth.

9. The hollow cylindrical tube 13, provided with lugs at its lower end adapted to engage the holes 11 in the hub $9\frac{1}{2}$, in combination with the lever 15 and brackets 14, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of July, 1888.

RICHARD GRAY.

Witnesses:

THOS. SLADE,
WALTER B. SLADE.