

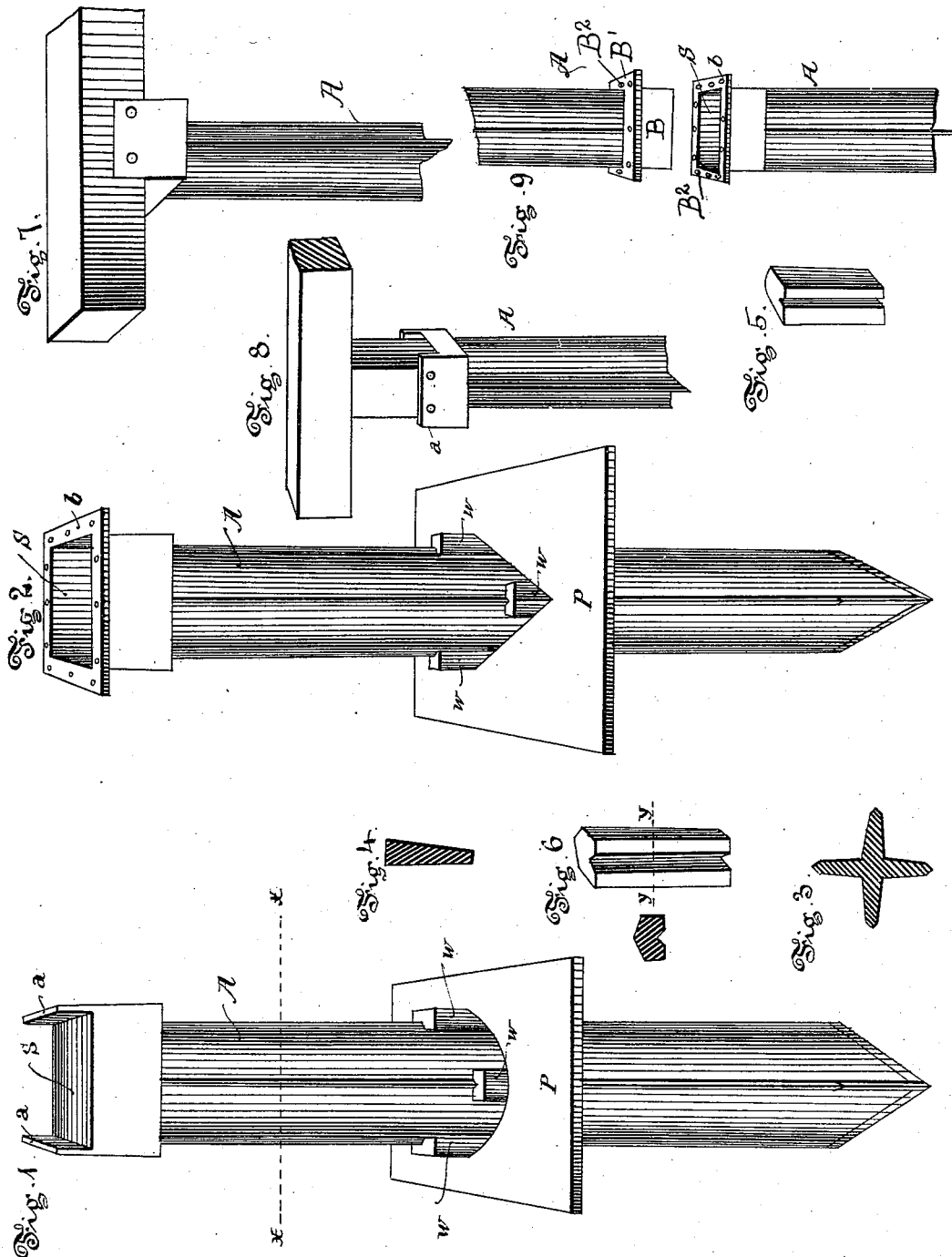
(No Model.)

R. GRAY & B. R. ABBOTT.

METALLIC PILE.

No. 307,541.

Patented Nov. 4, 1884.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

RICHARD GRAY AND BENJAMIN R. ABBOTT, OF BLOOMINGTON, ILLINOIS.

## METALLIC PILE.

SPECIFICATION forming part of Letters Patent No. 307,541, dated November 4, 1884.

Application filed March 6, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, RICHARD GRAY and BENJAMIN R. ABBOTT, of Bloomington, in the county of McLean and in the State of Illinois, have jointly invented certain new and useful Improvements in Metallic Piles; and we 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.

Our invention relates to the construction of metallic piles and driving or placing them in the ground for foundations or substructures. Heretofore such piles have been made hollow or having a central cavity extending nearly or throughout their entire length. This form is objectionable for the reason that the cavity is liable to become filled with water, the expansion of which when frozen is liable to burst this column. To provide against this danger heretofore it has been found necessary to fill or seal such cavities. Another objection to hollow metallic piles is the increased cost and difficulty in manufacturing, particularly when cast in molds. This arises from the fact that the production of a cavity necessitates the employment of a core, which requires skill and labor in adjustment.

Our invention has for its object the production of a metallic pile without a central cavity, possessing great strength and stiffness, cheaply manufactured, and easily erected; and to this end the invention consists in novel features of construction and combination and arrangement of parts, all as will be hereinafter fully described, and set forth in the claims hereto annexed.

Referring to the accompanying drawings, Figure 1 is a perspective view of our improved pile, having solid center, straight radial flanges, a socket at its upper end, and provided with a broad bearing-plate keyed to the body of the pile. Fig. 2 is a perspective view of our improved pile, having solid center, tapered radial flanges, a socket at its upper end, and provided with a broad bearing-plate keyed to the body of the pile. Fig. 3 is a horizontal cross section cut on the line *x x*. Fig. 4 is a vertical cross-section of the wedged-shaped key *w*. Figs. 5 and 6 are perspective

views of the wedged-shaped key *w* with groove in its inner face.

In Fig. 1 the column *A* has parallel sides, and is pointed at its lower end. *P* is the broad bearing-plate with large circular opening, and is secured to the pile by the keys *w w*. *S* is a socket provided with upward projections *a a*.

In Fig. 2, *A* is the body of the pile, having a solid center and radial flanges, which are slightly tapered, and is sharpened at its lower end. *P* is a broad bearing-plate having a square or angular opening, and secured to the pile by keys *w w w*. *S* is a socket provided with a horizontal flange, *b*, preferably extended around the socket *S*, as shown. *B* is a plug provided with lateral flange *B'*, the flanges *B'* and *b* having openings *B<sup>2</sup>* for the reception of bolts, whereby one pile may be secured to another. The plug *B* fits in the socket *S*, and the flanges *B' b* are brought together and bolted or otherwise united. The object of the horizontal flange or upward projections is to provide a means of coupling two or more columns together, and also for attaching to the superstructure, as shown in Figs. 7, 8, and 9. The socket *S* is preferably made rectangular, and is for the purpose of receiving and holding a solid piece of wood or plug of rectangular shape, to receive the shock of the hammer of the pile-driver, thus protecting the pile from breaking or injury. A still further object of the socket is to receive and hold the foot of a surrounding column or the downward projections of the superstructure, as shown in Figs. 8 and 9. The object of the broad plate *P* is to re-enforce the pile, so that it will not sink under the superincumbent weight, and also to this end the pile is preferably made tapering, as shown in Fig. 2, so that it will not slip through the plate *P* after being keyed. The wedged-shaped key is preferably made large and of cast metal to insure durability. This key is shaped to conform to the aperture which it fills, and has a longitudinal groove in its inner face. This groove fits against the outer edge of the flange of the pile and keeps the key in an upright position.

We are aware that bearing-plates of peculiar construction, having openings made to conform to the shape of the pile, have been

used; but experience has shown that such plates are objectionable, for the reason that they often require fitting, because of imperfection in casting either the pile or the plate itself. We have, therefore, adopted a plain and large opening to avoid this difficulty.

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

10 1. A pile provided on its upper end with a socket and lateral flange, in combination with a superposed portion provided with plug or end B adapted to fit in said socket, and a lateral flange whereby one pile may be placed  
15 upon another and secured, substantially as set forth.

2. A pile provided on its upper end with a socket and lateral flange having openings, in combination with a superposed portion adapted to fit in said socket, and a lateral flange having openings, and means whereby said flanges may be secured, substantially as specified.

25 3. A pile consisting of a solid body having radial longitudinal flanges tapering from top

to bottom, in combination with a plate having a central opening and a tapering grooved key adapted to fit the outer edges of the flanges and lie between said plate and flanges, whereby the parts may be rigidly secured in the manner and for the purpose specified.

4. The combination, with a metallic pile having a solid center, longitudinal flanges, and a socket at its upper end, of the plate P having large central opening and adapted to be keyed to the pile, substantially as shown and described.

5. The wedged shaped key *w*, having a longitudinal groove in its inner face, in combination with plate P, having a large central opening, and the pile A having longitudinal flanges, substantially as shown and described.

In testimony that we claim the foregoing we have hereunto set our hands this 27th day of February, 1883.

RICHARD GRAY.  
BEN. R. ABBOTT.

Witnesses:

THOS. SLADE,  
S. R. GRIFFITH.