

(No Model.)

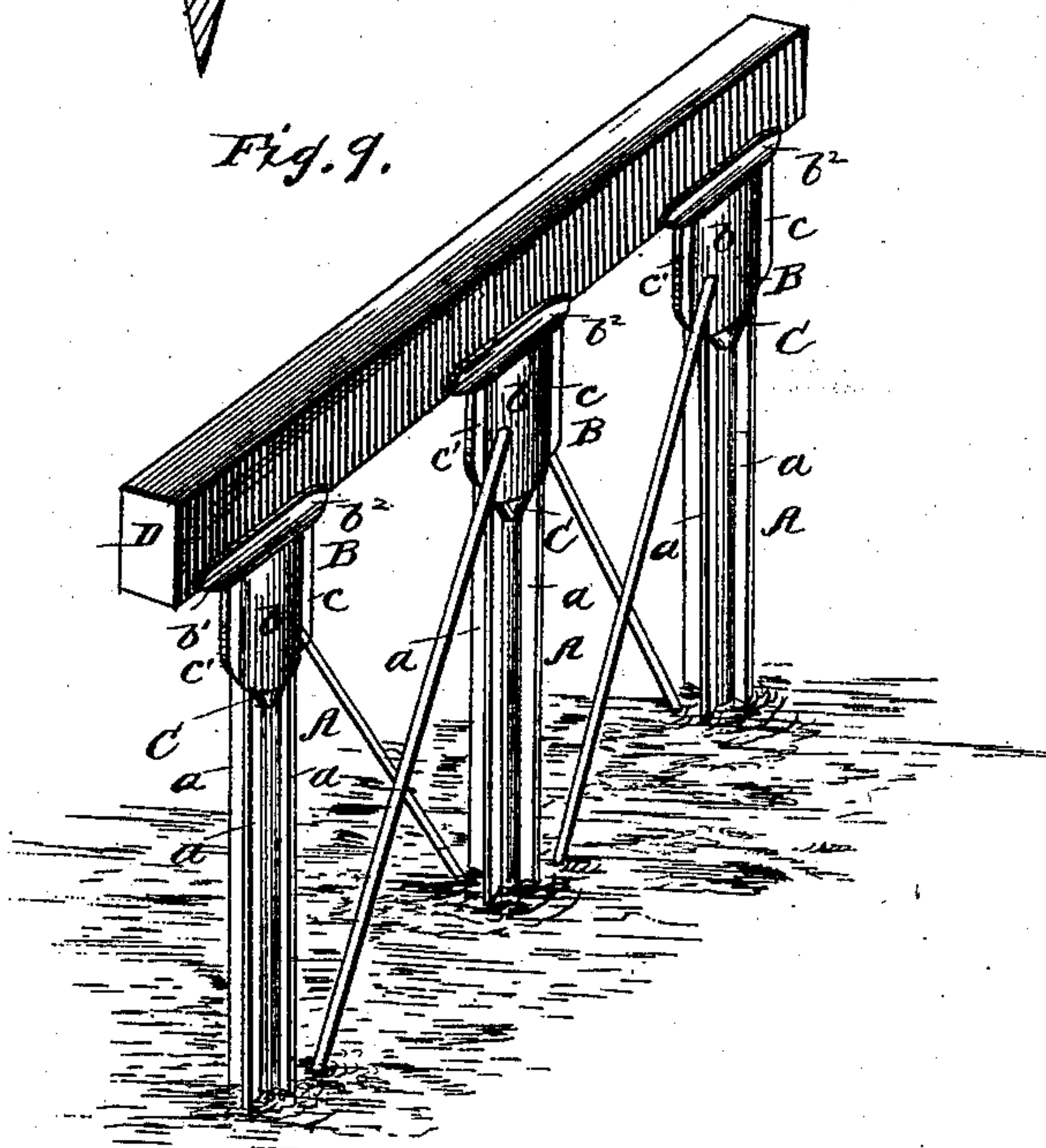
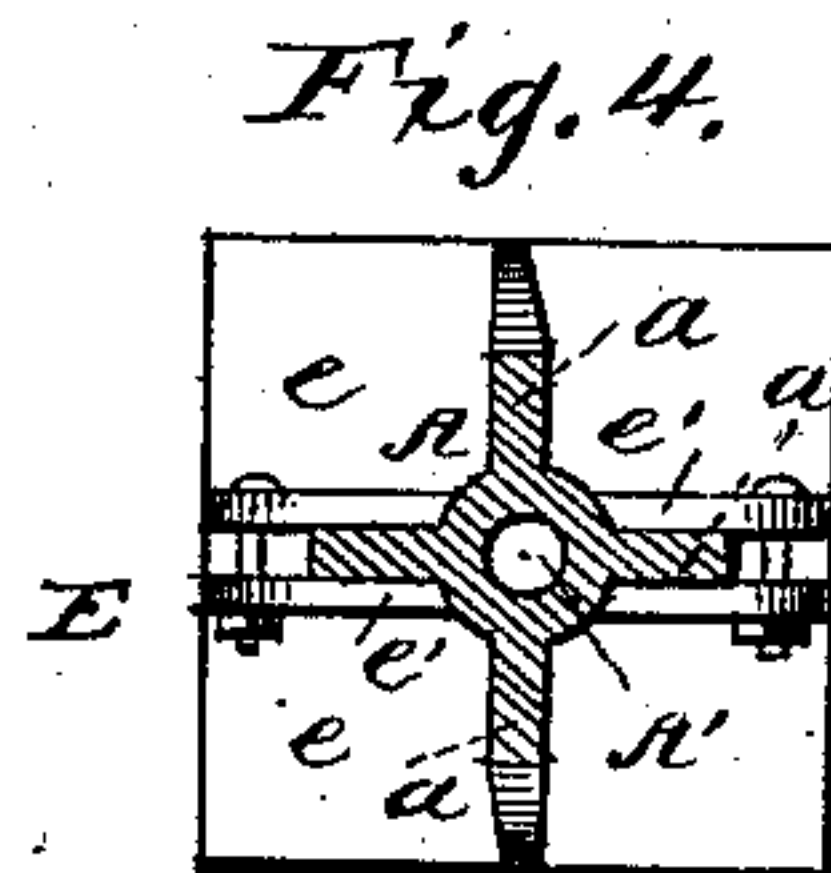
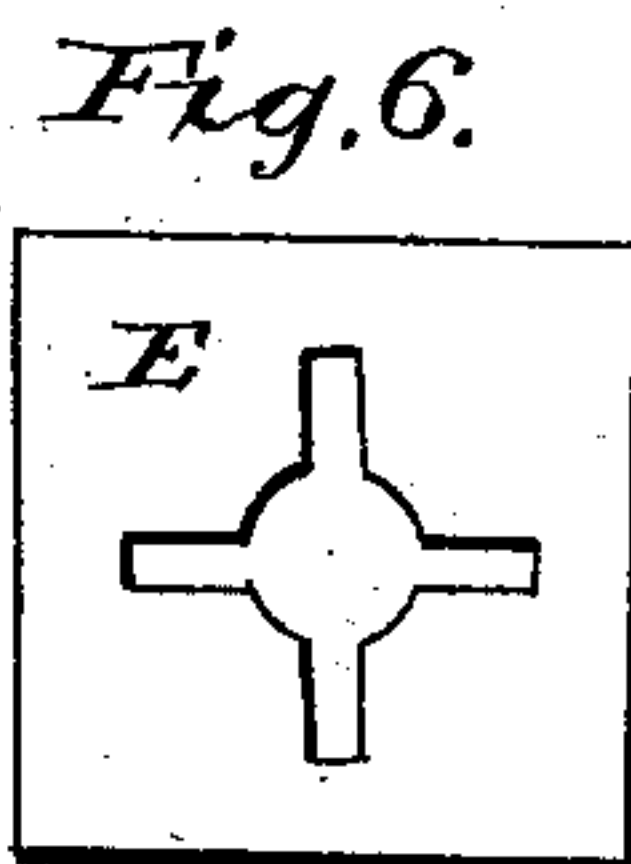
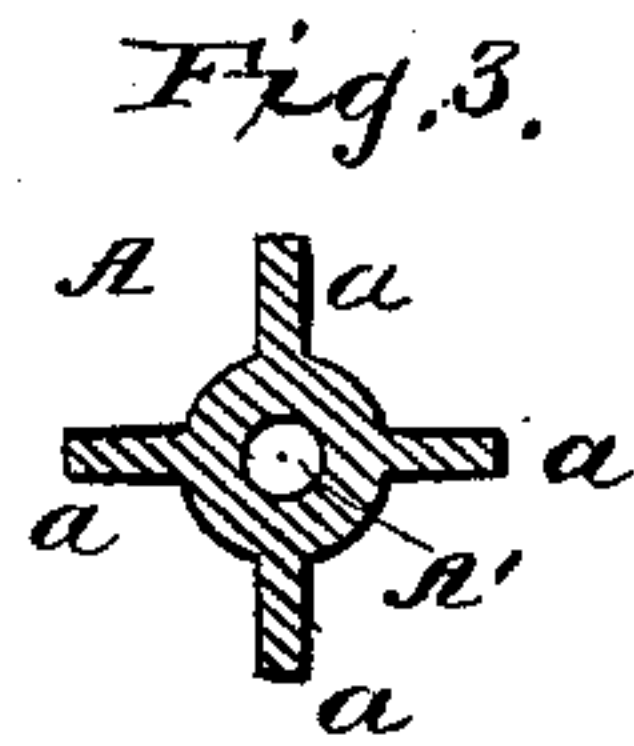
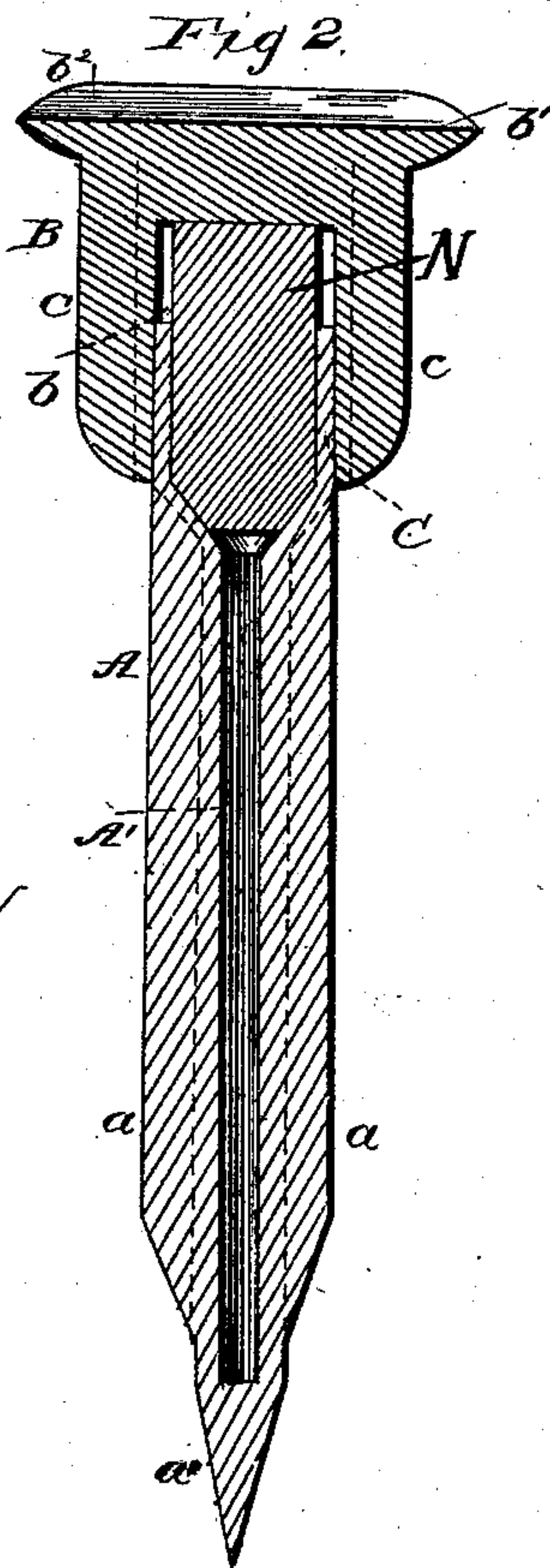
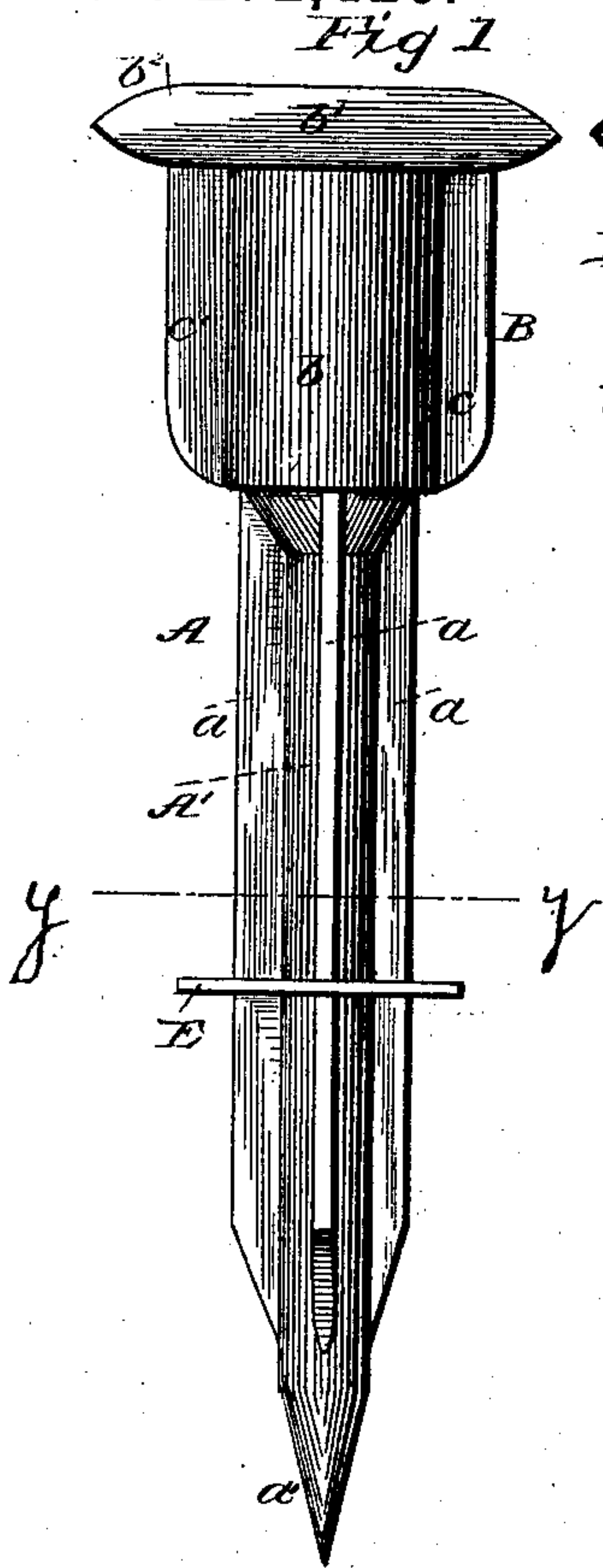
R. GRAY & B. R. ABBOTT.

2 Sheets—Sheet 1.

IRON PILE.

No. 272,426.

Patented Feb. 20, 1883.



WITNESSES:

Fred. L. Dieterich
Jno. W. Stockett

INVENTORS.

Richard Gray
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By De Witt C. Allen

ATTORNEY

(No Model.)

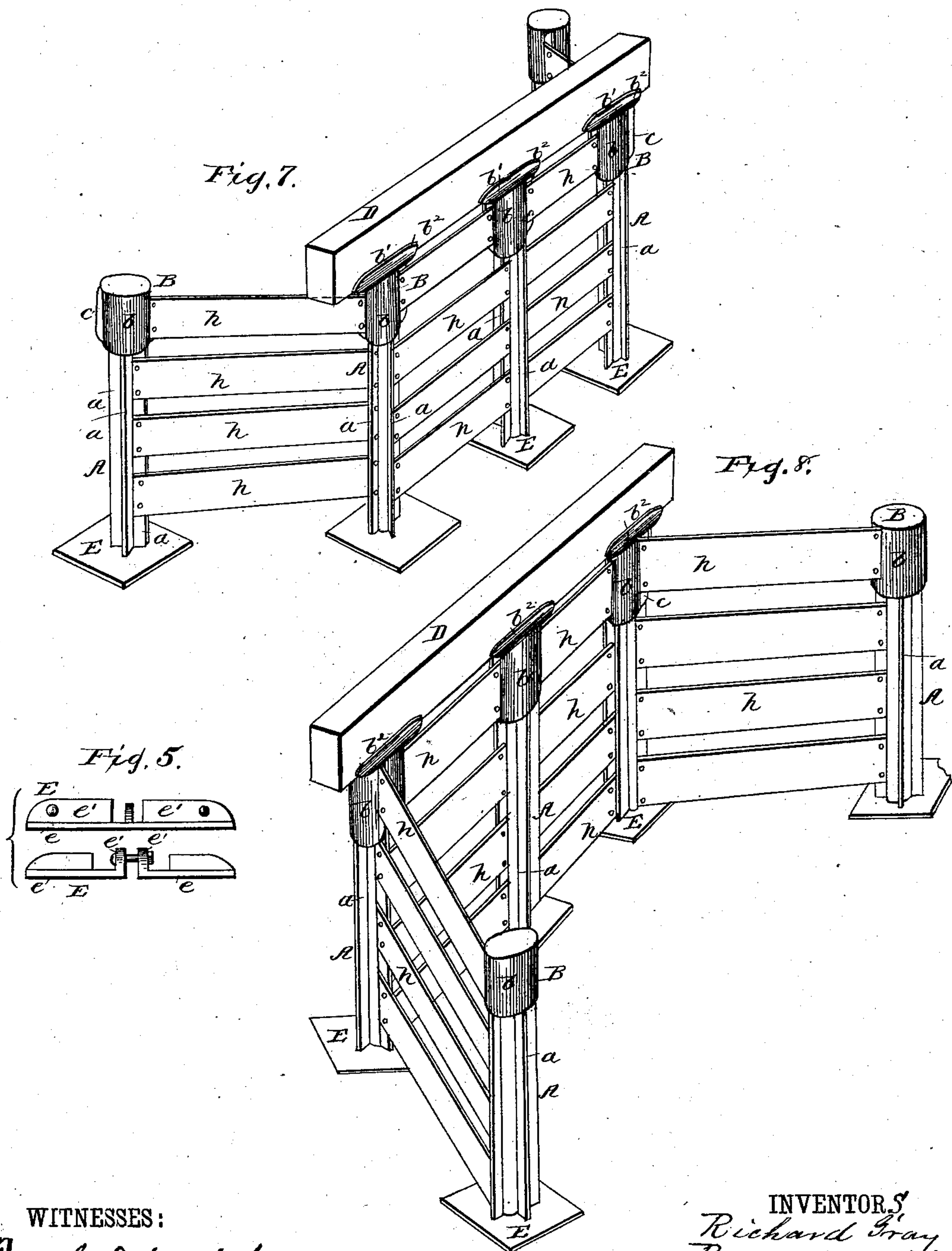
2 Sheets—Sheet 2.

R. GRAY & B. R. ABBOTT.

IRON PILE.

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WITNESSES:

Thos. L. Dietrich
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UNITED STATES PATENT OFFICE.

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

IRON PILE.

SPECIFICATION forming part of Letters Patent No. 272,426, dated February 20, 1883.

Application filed July 21, 1882. (No model.)

To all whom it may concern:

Be it known that we, RICHARD GRAY and BENJAMIN R. ABBOTT, citizens of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Iron Piles; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to the construction of iron piles and driving or placing them in the earth for foundations or substructures.

Heretofore wooden piles have been generally used; but these have been objectionable on account of their liability to destruction and decay. The difficulties heretofore encountered in the use of iron piles are their liability of breakage in driving them, impracticability of driving them "plumb," and when connected together it has been exceedingly difficult to drive them so that their tops would be sufficiently in line or level to receive the superstructure. As heretofore constructed, if the pile was made large it was impracticable to drive it without breaking on account of its "inertia," while on the other hand, if the pile was made small, so as to be easily driven with light blows of the hammer, then in many cases it would sink deeper into the ground under the weight of the superstructure, and particularly where it was subjected to any vibration or jar—as, for an example, under a bridge.

Our invention has for its object the production of an iron pile which can be easily driven with light blows, and will not break in driving or injure the hammer; to secure the pile so that it will bear its burden without sinking; to make the pile adjustable as to length, so that when several of them are used together they may be brought to a uniform height and leveled at their tops to receive the superstructure; also, to give increased strength and stiffness to the pile, while at the same time rendering it susceptible of easy attachment for braces and other fixtures; 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 represents a side elevation of our improved pile; Fig. 2, a vertical central section through the same; Fig. 3, a cross-section through the line *y y* of Fig. 1; Figs. 4, 5, and 6, detached views. Figs. 7, 8, and 9 represent our improved pile and its adaptation in the construction of bridges and their approaches.

Like letters of reference refer to like parts in the several figures.

In the drawings, A represents our improved pile, which is composed of a central hollow cylinder, A', with its lower end, *a'*, solid and pointed. The cylinder A' is provided with four flanges, *a*, beveled or sharpened at their lower ends, and which preferably only extend down to the solid point *a'*. The upper portion of the hollow cylinder has an enlarged socket, C, over which loosely fits the hollow cylinder *b* of the part B of our improved pile. The upper portion of the part B is composed of an elongated flat plate, *b'*, provided with side flanges *b² b²* for the reception of the superstructure or beam D; and *c c'*, wide ribs or flanges.

E represents a broad plate, preferably formed in two parts, *e e*, with flanges *e'*, having bolt-holes, by which it may be secured or clamped to the pile.

The objects of the flanges *a c* of the piles are twofold: first, to strengthen them, and, secondly and more particularly, to provide convenient means for the braces or other desired fixtures.

The manner of erecting the pile is as follows: A solid cylindrical piece of wood, N, is fitted into the socket C of the pile similarly to the handle of an ordinary chisel. This piece of wood or handle receives the blows of the hammer and protects the pile from injury precisely as the handle protects a chisel. After the pile is driven the piece of wood or handle can be taken out and used to drive other piles. Now, as before stated, a pile can be only so driven as to approximate the desired height. In order to obviate this difficulty, we place a cylindrical block, N, sawed the proper length and of a diameter to nearly fill the cylinder *b* of part B. The lower end of the cylindrical block of wood, N, is made somewhat smaller, in order to rest within the socket C in the pile. This block also forms a rest for the part or cap B, and its length regulates the distance the

part or cap B can pass down or telescope over the pile, and consequently regulates its height. The upper end of the cavity within the pile A is plugged, so as to prevent the ingress of water; or the cavity may be filled with concrete.

In order to prevent the pile from settling into the earth under the weight of the superstructure D, we preferably excavate the earth from around the pile after it has been driven for a greater or less distance, and then clamp or key the broad plate E firmly to the pile, said plate resting upon the earth, and thereby forming a support for the pile.

The adaptation of our invention in the construction of bridges will be readily understood by reference to Fig. 6, the flanges affording an easy means of attaching braces and stays or other fixtures. We employ cast-iron slabs *h* for earth-supports in the construction of approaches to bridges. These slabs are bolted to the flanges of the piles and take the place of stone abutments, they being designed for use in localities where stone cannot be easily obtained, as shown in Figs. 7 and 8.

Instead of having a socket, C, in pile, as before described, it may be made solid, in which case the hammer of the pile-driver should be provided with a wooden face or plug to prevent the breaking or battering of the pile or hammer.

When the plate E is made in one piece, as shown in Fig. 6, it is slipped over the pointed end of the pile, and secured in position substantially in the manner hereinbefore described.

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

1. The combination of an iron pile having longitudinal radial flanges *a*, and the plate E, having a central opening and slots radiating therefrom, substantially as and for the purpose herein shown and described.

2. The combination of the cylindrical hollow portion A' of an iron pile, having a solid point, flanges *a*, and enlarged socket C, and wooden support N at its upper end, substantially as and for the purpose specified.

3. The combination of the cylindrical hollow portion A' of an iron pile, having an enlarged socket, C, or solid head at its upper end, and the part B, having the hollow cylindrical portion *b*, adapted to fit over the socket C or solid head, substantially as and for the purpose specified.

4. The combination, with a pile, of the sectional plate E, constructed substantially as shown, and adapted to be secured to the pile, substantially as and for the purpose specified.

5. The combination, with the cylindrical hollow portion A' of an iron pile, having a wooden support, N, of the part B, having the hollow cylindrical portion *b*, and the upper elongated plate, *b'*, provided with flanges *b*² *b*², substantially as and for the purpose herein shown and described.

6. The part B, having hollow cylindrical portion, side flanges *c* *c'*, and upper elongated flat plate, *b'*, having side flanges, *b*² *b*², in combination with portion A', having flanges *a*, substantially as and for the purpose specified.

7. The combination, with the cylindrical hollow portion A' of the pile, and the cylindrical hollow cap B, of the adjustable wooden support N, substantially as and for the purpose herein shown and described.

In testimony whereof we affix our signatures, in the presence of two witnesses, this 7th day of July, 1882.

RICHARD GRAY.
BENJAMIN R. ABBOTT.

Witnesses:

THOS. SLADE,
E. M. HAMILTON.