

(No Model.)

A. BORNEMAN.

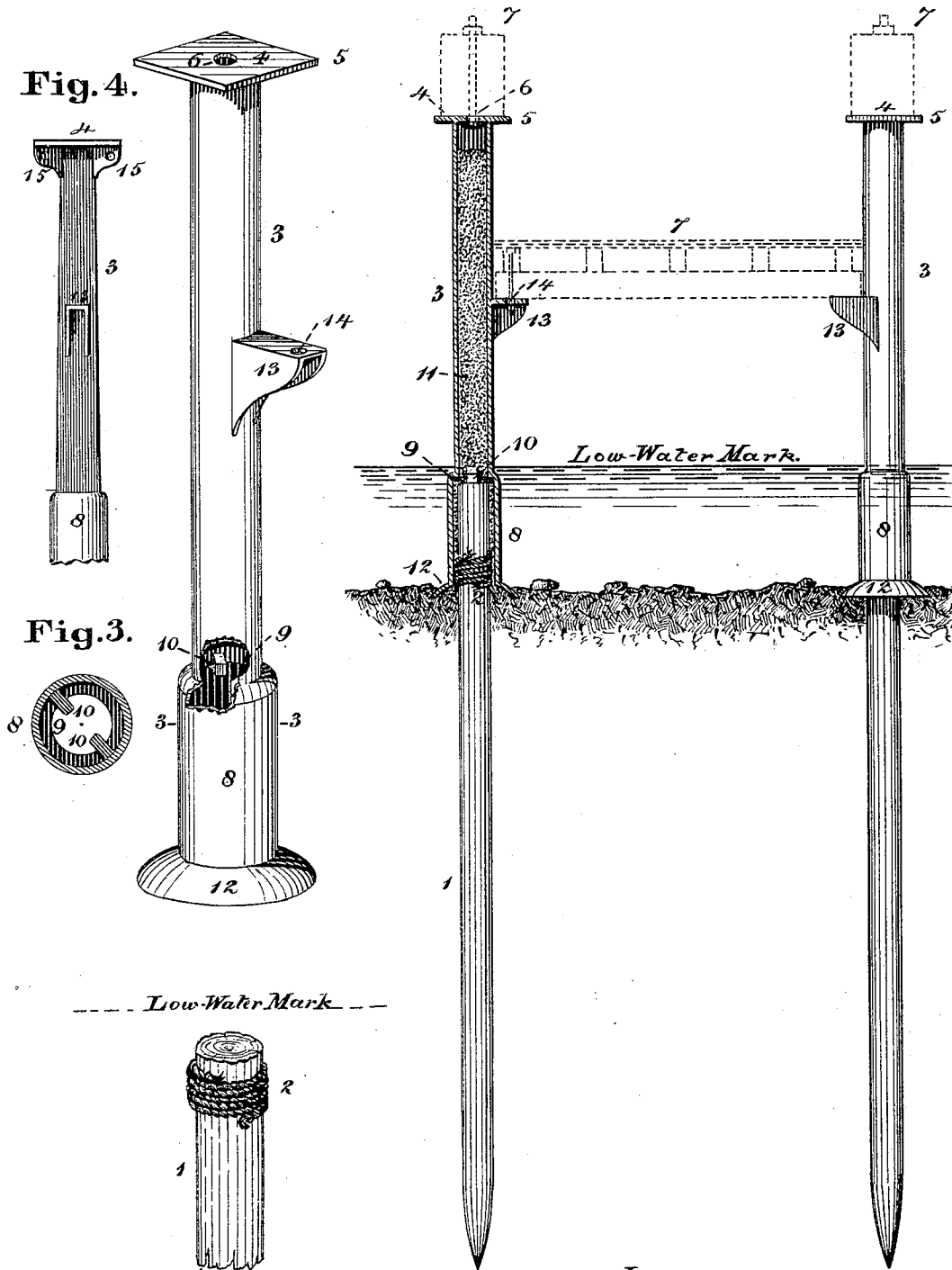
COMPOSITE PIER FOR BRIDGES.

No. 360,273.

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Fig. 1.

Fig. 2.



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UNITED STATES PATENT OFFICE.

AUGUST BORNEMAN, OF LANCASTER, OHIO.

COMPOSITE PIER FOR BRIDGES.

SPECIFICATION forming part of Letters Patent No. 360,273, dated March 29, 1887.

Application filed January 13, 1887. Serial No. 224,249. (No model.)

To all whom it may concern:

Be it known that I, AUGUST BORNEMAN, of Lancaster, Ohio, have invented a new and useful Improvement in Piers for Bridges, &c., of which the following is a specification.

My invention is especially designed for bridge-piers and like structures on wet or yielding ground requiring the use of piling.

In the accompanying drawings, Figure 1 shows, by perspective view, one of the hollow metallic columns and the upper portion of a pile such as, when joined together in the manner hereinafter explained, constitute a composite pier, shaft, or pillar embodying my invention. In said figure portions of the column-wall are broken away. Fig. 2 shows, partly in elevation and partly in vertical section, a group of such composite piers adapted for support of a superstructure such as that of a bridge or a viaduct, of which parts are indicated in the figure by dotted lines. Fig. 3 is a horizontal section on the line 3 3 in Fig. 1, looking upward. Fig. 4 represents a modification of my metallic shaft or column.

1 represents a wooden pile whose upper end is bound with a grommet, 2, of tarred rope. (See Fig. 1.) The pile having been driven until its point reaches solid foundation, its head is sawed off a little below low-water mark, as shown in the figures.

3 is the shaft or principal portion of a hollow column of cast-iron, preferably of circular transverse section, and which consists of the following integrally-cast parts: The said column is partially closed at the top by a fillet, 4, which may project on one or more sides beyond the general periphery, as represented at 5, and which has a central orifice, 6, that serves the twofold purpose of an aperture through which to introduce the cement filling, to be presently described, and afterward that of a socket for the anchor-bolt of a bridge-chord or other portion of a superstructure—such, for example, as that indicated by dotted lines 7 in Fig. 2. The said column, at its lower end, is somewhat enlarged in diameter, so as to form a chamber, 8, whose interior diameter is such as to enable it to fit loosely over the head of the pile. The junction of the portions 3 and 8 of the said metallic column forms a shoulder or offset, 9. Lugs 10, whose lower surface is somewhat be-

low said shoulder, and which approach each other within a distance less than the diameter of the pile, discharge the several functions of limiting the penetration of the pile within the column, of supporting the latter upon the head of the pile, and of securing between said head and shoulder 9 passages for descent and occupancy of a filling, (preferably hydraulic cement,) 11, whose complete envelopment of all that portion of the pile which is above the grommet 2 hermetically seals the same against atmospheric influences and converts the said pile and superincumbent column into a single rigid and enduring structure. The said column preferably terminates below in a splay-foot, 12, having the form of an inverted saucer, whose distance below the shoulder 9 is such as to cause it to rest upon the surface of the ground, as shown in Fig. 2.

The column may be adapted for the support and attachment of any special superstructure—such, for example, as that indicated by dotted lines in Fig. 2—by having one or more integrally-cast projections or brackets such as the bracket 13, which in the illustration is shown supporting one of the bolsters or transverse beams of a truss-bridge, a trestle, or like structures. The brackets 13 may be perforate, as at 14, to receive the fastening-bolts of such superstructure. Such composite piers or columns may be grouped in any desired numbers or arrangements to conform to the exigencies of any given superstructure. The above-described form of metallic column is manifestly susceptible of various modifications. For example, the shaft 3 (instead of being strictly of the cylindrical form represented in Figs. 1 and 2) may, as shown in Fig. 4, taper upward, and, as shown in said figure, may have one or more integrally-cast perforate lugs or projections, 15, to receive tie or bearing rods or other structural fastenings, and such column, instead of the represented circular, may have a rectangular or other transverse section.

The act of forcing the column down over the pile pushes the grommet to the position shown in Fig. 2, so as to displace the water from the interstice and permit the entrance of the cement filling 11. (Seen in said figure.) Having reached its permanent position, the grommet 2 prevents escape downward of any por-

tion of the cement filling—such as would otherwise take place before solidification of the cement.

I claim as new and of my invention—

- 5 1. The composite pier, shaft, or pillar consisting of the combination, with the wooden pile 1, bound with grommet 2, of the hollow metallic column 3, having the lugs 10, that project inwardly and downwardly from the
10 shoulder 9 of the enlarged chamber 8, whose interstice surrounding the pile-head is filled with hydraulic cement 11, as and for the purposes set forth.
2. The combination, in the hollow metallic
15 column 3, of enlarged chamber 8, whose shoulder 9 has the inwardly and downwardly projecting lugs 10, as and for the purposes set forth.
3. In a hollow metallic column, 3, the combination of the following elements, to wit: the
20 enlarged chamber 8, whose shoulder 9 has the inwardly and downwardly projecting lugs 10, said chamber terminating in the splay or saucer-shaped foot 12, as and for the purpose set forth.
- 25 4. The hollow shaft or column having in the described combination the integrally-cast enlargement 8, interior lugs, 10, crowning-fillet 4, and exterior lugs or brackets, 13 15.

5. The combination, with a wooden pile, of the hollow metallic column 3, which has at its
30 lower end the enlarged chamber 8, provided with the lugs 10 and terminating in the splay-foot 12, in the form of an inverted saucer, said column being crowned with the fillet 4 5 6, and having one or more integrally-cast lateral pro-
35 jections or brackets, 13 15.

6. The composite pier, pile, or column composed of the combination, with a grommeted wooden pile, 1 2, of the superimposed hollow
40 metallic shaft or column consisting of the integrally-cast parts, as follows, to wit: the main portion or shaft proper, 3, the enlarged portion 8, the foot 12, the perforate crown or fillet 4 5 6, and one or more perforate lateral projec-
45 tions or lugs, 13 15, the interstice between the head of the pile and the enlarged portion 8 being charged with hydraulic cement, in the manner set forth.

In testimony of which invention I hereunto set my hand.

AUGUST BORNEMAN.

Attest:

GEO. H. KNIGHT,
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