

No. 635,068.

Patented Oct. 17, 1899.

V. WINDETT.
DOCK CONSTRUCTION.

(Application filed May 13, 1899.)

(No Model.)

2 Sheets—Sheet 1.

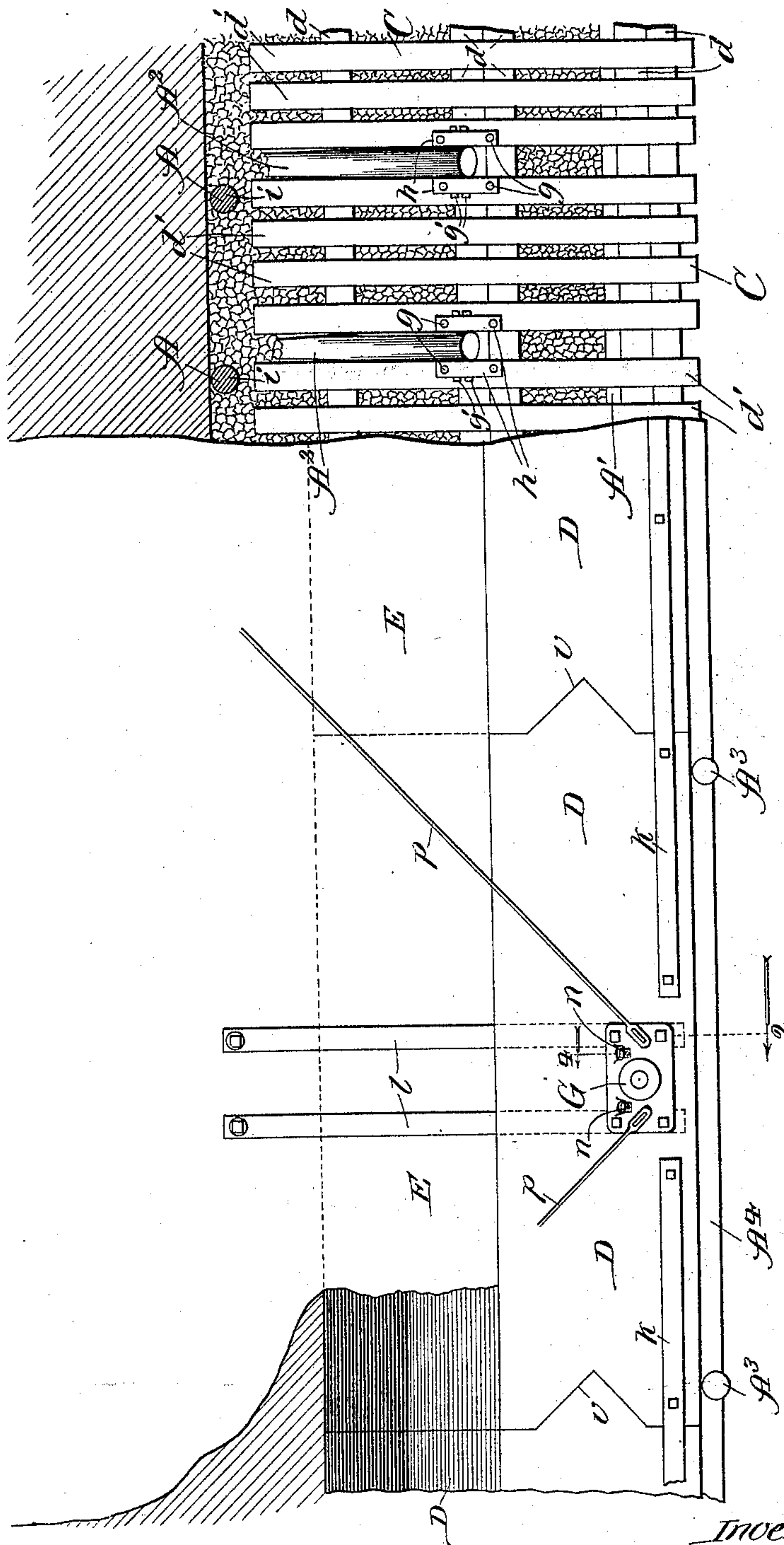


Fig. 1.

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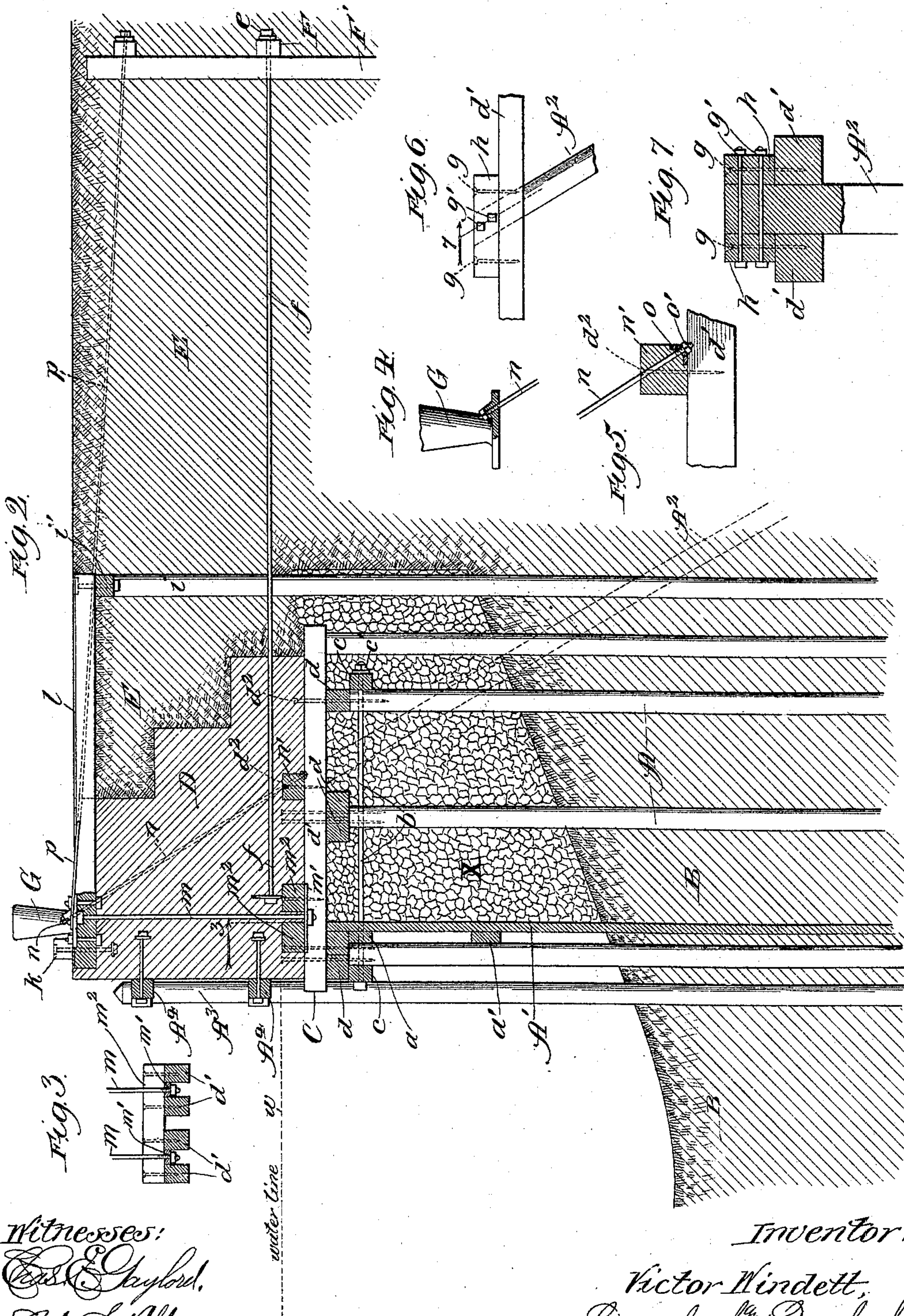
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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DOCK CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 635,068, dated October 17, 1899.

Application filed May 13, 1899. Serial No. 716,781. (No model.)

To all whom it may concern:

Be it known that I, VICTOR WINDETT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Dock Construction, of which the following is a specification.

My invention relates more especially, though not exclusively, to an improvement in the construction of wharf-like docks or those which extend along the side of a body of water; and the primary object of my improvement is to provide a shallow concrete dock which shall be less expensive to construct and maintain and more durable than a timber dock.

My improved construction is shown in detail in the accompanying drawings, in which—

Figure 1 is a broken plan view; Fig. 2, a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow; Fig. 3, a section taken at the line 3 on Fig. 2 and viewed in the direction of the arrow; Fig. 4, a section taken at the line 4 on Fig. 1 viewed in the direction of the arrow and enlarged; Fig. 5, a broken sectional view showing a detail of the mooring-post anchorage; Fig. 6, a broken view showing in side elevation the preferred manner of fastening a batter-pile to the grillage, and Fig. 7 a section taken at the line 7 on Fig. 6 viewed in the direction of the arrow and enlarged.

A A are piles driven in desired number and relation into the bed B to form longitudinal and transverse rows relative to a body of water, the level of which is indicated at *w* in Fig. 2. As shown, the piles are vertical, though they, and more especially those in the outer longitudinal rows, may be slanting or "battered," and, if desired, the spaces between the piles may be filled with broken stone or other reinforcing material, as indicated at X in Fig. 2.

A' denotes sheet-piling provided for the usual purpose just behind the line of piles A adjacent to the water and braced against said piles through the medium of interposed wales *a a'*. It is preferred also to strengthen the foundation structure, as indicated in Fig. 2, through the medium of tie-rods *b*, passed through the transverse rows of piles A near their upper ends and through wales *c c* extending along the outer longitudinal rows of

the piles, the tie-rods being fastened at their projecting ends by nuts *c'*.

C is the grillage surmounting the piles A, composed of timbers *d d*, laid along the tops of the longitudinal rows of the piles, and timbers *d' d'*, laid at intervals crosswise of the timbers *d* and fastened in place by drift-bolts *d²*, driven through the crossing timbers at their intersections into the piles in a manner to leave the upper expanded ends of the bolts protruding for a purpose hereinafter described.

D is the concrete stepped top surmounting the grillage C, to which it is firmly fastened by embedment in the concrete of the projecting ends of the drift-bolts *d²* and also, if the concrete be spread in a plastic condition, by its binding into the interstices of the grillage. It is within my invention, however, to form the top D separate from the dock structure and place it and fasten it down upon the grillage. Either way, however, it is desirable to form the top in sections, as represented in Fig. 1, each, say, about twenty-five feet in length, and connect the sections together at their abutting ends by tongue-and-groove joints, as indicated at *v*, since it is found that a continuous concrete top will crack under the action of frost at about the intervals mentioned, and by thus forming it in sections cracking is prevented.

For strengthening the structure the top should be anchored at intervals through the medium of rods *f*, embedded toward one end in the concrete and extending transversely through the top, through the earth E back of the structure, and through an anchor-wale F or "deadman," fastened by nuts *e* against anchor-piles F', driven into the ground at a suitable distance from the dock. For further strengthening the foundation batter-piles, one of which is indicated at A² in Fig. 2, may be provided, and I fasten each at its upper end by bolts *g'* between pairs of short timbers *h h*, fastened by bolts *g g* down upon the grillage-timbers *d'* and embedded in the concrete of the top. The face of the dock should be protected by fender-piles, one of which is shown at A³, fastened to the top D, and wales A⁴, and a guard-timber *k* is fastened on the upper side of the top D to extend lengthwise thereof near its edge.

G is one of any desired number of mooring-posts provided at suitable intervals on the top D. To avoid, under use of a mooring-post, tension strain on the concrete, which being brittle would tend to break it, I anchor each mooring-post to the grillage and preferably, also, to the anchor-piles F'. As shown, the support for each mooring-post is a pair of timbers ll , extending across and embedded in the concrete of the top D and across a cap i' on piles i . The mooring-post is bolted through its base to the timbers l and is anchored by rods m passing vertically through the concrete top and each held at its lower end by a plate m' , confined below a pair of blocks m^2 , extending across and fastened to the grillage-timbers d' and embedded in the concrete, and further anchorage to the grillage is afforded to the mooring-post by rods n , each extending from the base of the post diagonally through the concrete top and similarly through a short timber or block n' , laid across and fastened to the grillage-timbers d' and embedded in the concrete, the diagonal rods being fastened at their lower ends by nuts o' bearing against metal shoes o , with which the respective corners of the timbers n' are bound. For additionally anchoring each mooring-post rods p may be provided, connecting it with the anchor-piles F', as indicated.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a dock structure, the combination with a pile foundation, of grillage surmounting and fastened thereto, and a concrete top surmounting and fastened on said grillage, said top being formed in longitudinal sections connected by tongue-and-grooved joints at their ends, substantially as described.

2. In a dock structure, the combination with a pile foundation, of grillage comprising longitudinal timbers and transverse timbers on the upper ends of the piles and fastened together and to the piles by bolts passing through said timbers at their intersections into the piles and protruding at their upper expanded ends beyond the upper surface of the grillage, and a concrete top on said grillage and embedding the said protruding bolt ends, substantially as described.

3. In a dock structure, the combination with the pile foundation, of grillage compris-

ing longitudinal timbers and transverse timbers on the upper ends of the piles and fastened together and to the piles by bolts passing through said timbers at their intersections into the piles and protruding at their upper expanded ends beyond the upper surface of the grillage, a concrete top on said grillage and embedding the said protruding bolt ends, anchor-piling, and anchor-rods embedded in said top and extending and fastened to said anchor-piling, substantially as described.

4. In combination with a dock structure comprising a pile foundation surmounted by grillage carrying a concrete top, a mooring-post on said top and anchored to the grillage, substantially as and for the purpose set forth.

5. In combination with a dock structure comprising a pile foundation surmounted by grillage carrying a concrete top, a mooring-post fastened to timbers secured on said top, and vertical and diagonal anchor-rods connecting said post with the grillage and passing through said top, substantially as described.

6. In combination with a dock structure comprising a pile foundation surmounted by grillage carrying a concrete top anchored to anchor-piling, a mooring-post fastened to timbers secured on said top, vertical and diagonal anchor-rods connecting said post with the grillage and passing through said top, and anchor-rods connecting said post with the anchor-piling, substantially as and for the purpose set forth.

7. In combination with a dock structure comprising a pile foundation surmounted by grillage carrying a concrete top, a mooring-post fastened to timbers secured on said top, blocks m^2 and n' embedded in the concrete on said grillage, a rod m extending from the mooring-post through said top and terminating in a plate m' confined against the under sides of said blocks m^2 , and a rod n extending from said post diagonally through said top and block n' and fastened at its inner end by a nut o' bearing against a metal shoe o with which the corner of the block is bound, substantially as described.

VICTOR WINDETT.

In presence of—

R. T. SPENCER,
D. W. LEE.