No. 751,492. PATENTED FEB. 9, 1904.

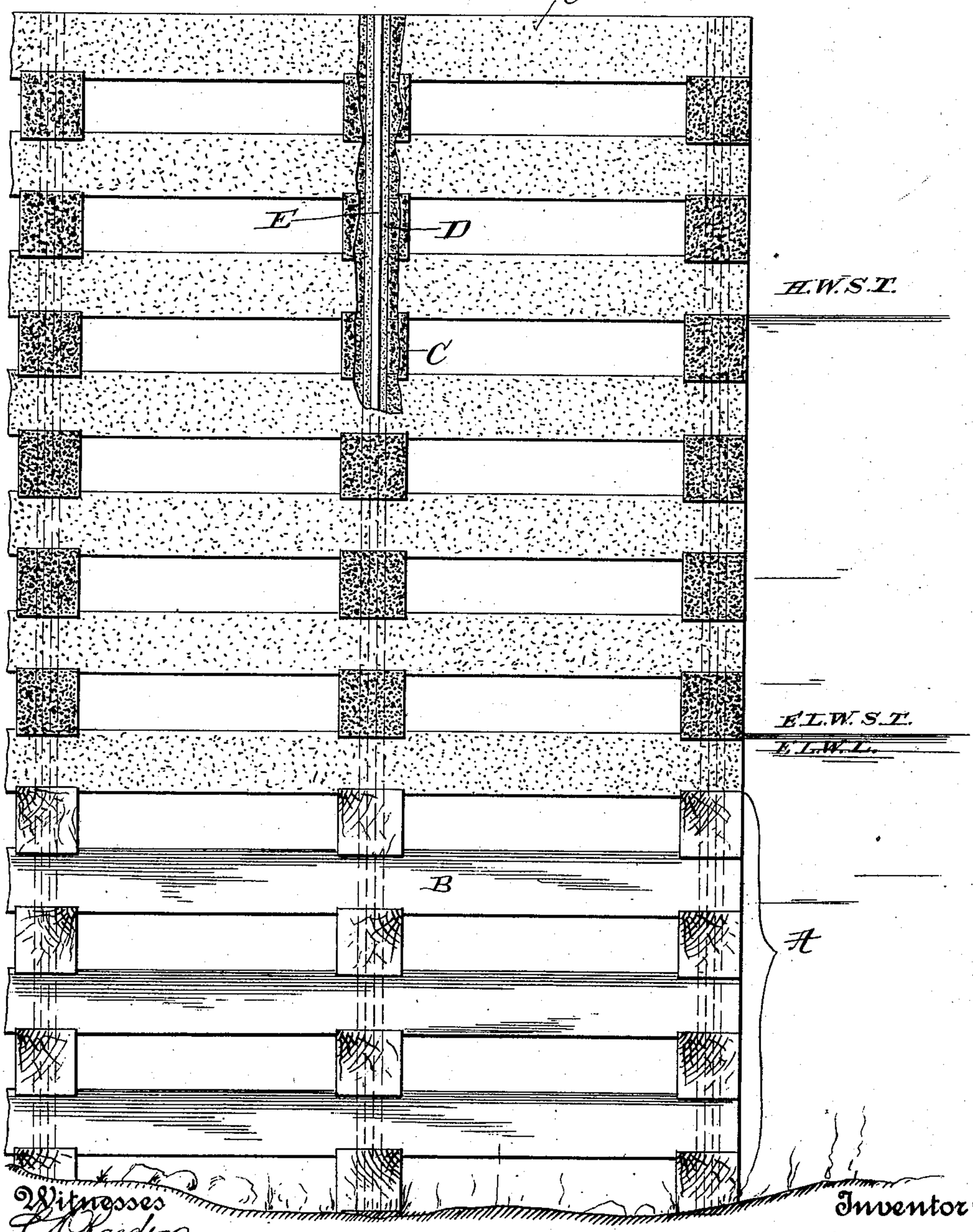
J. W. FRASER.

CRIBWORK OR THE LIKE.

APPLICATION FILED OCT. 16, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

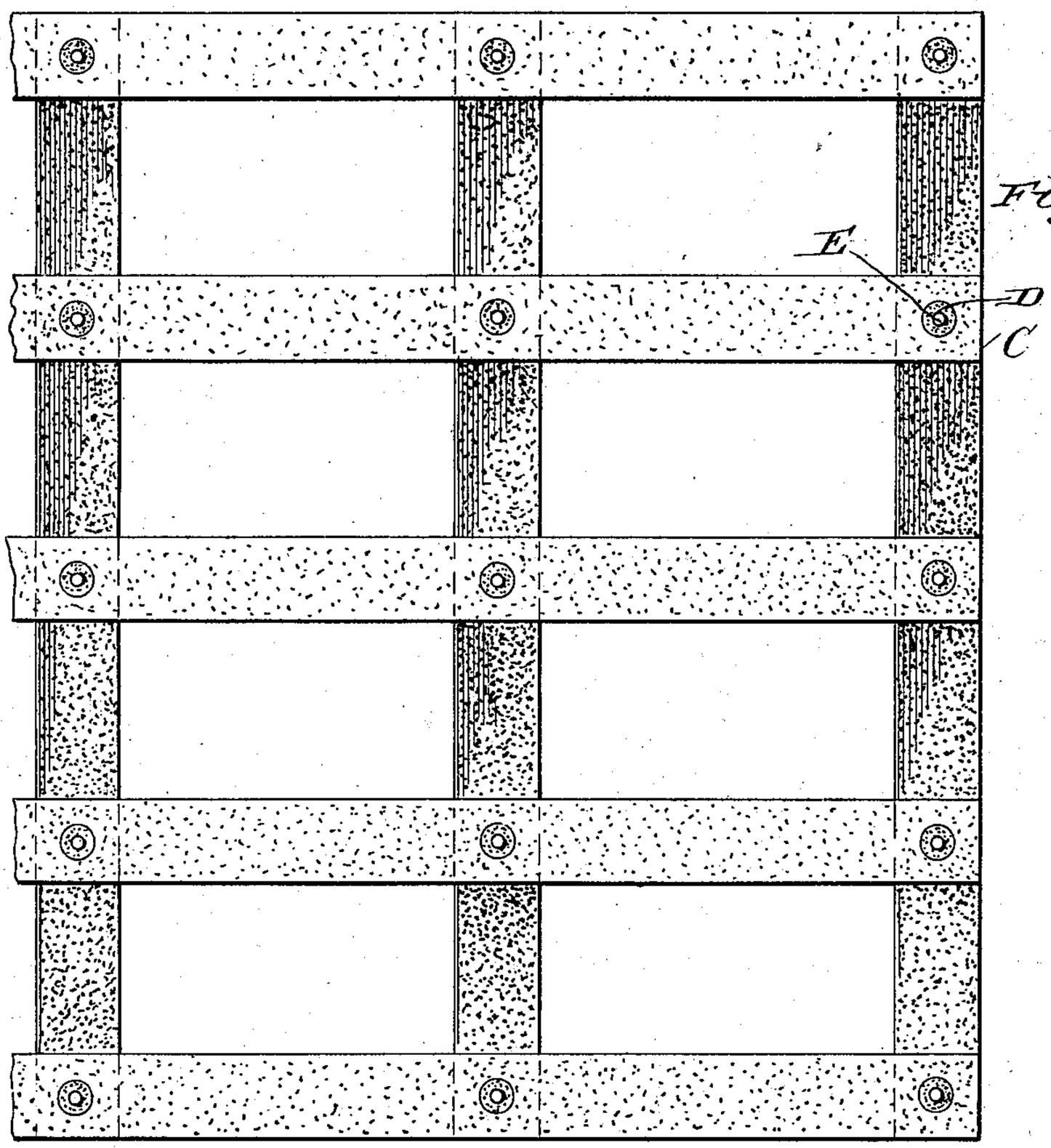


Fig. 2.

Fig. 3.

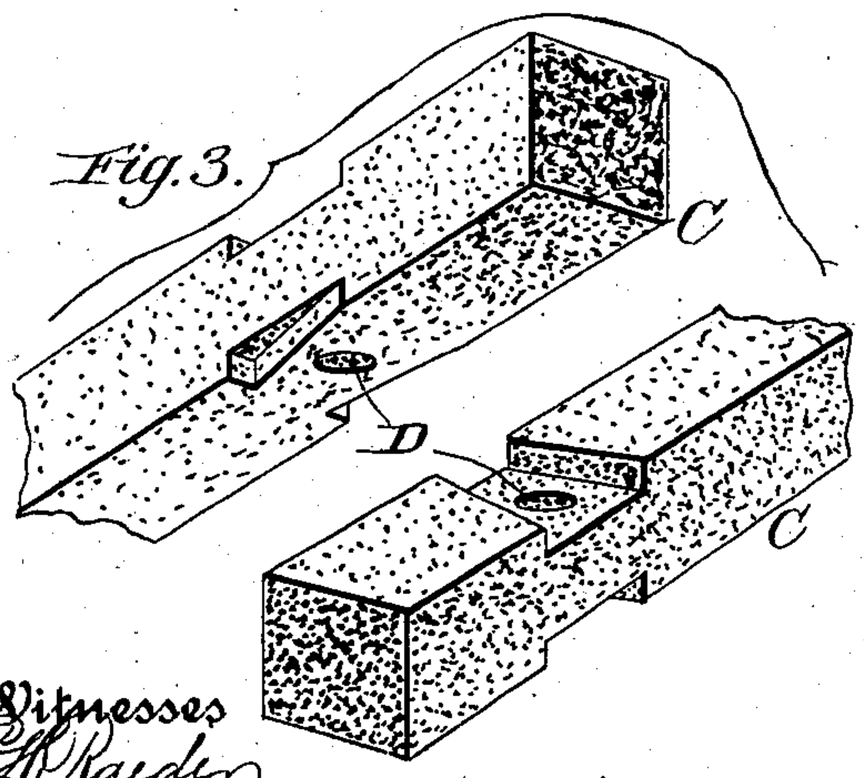
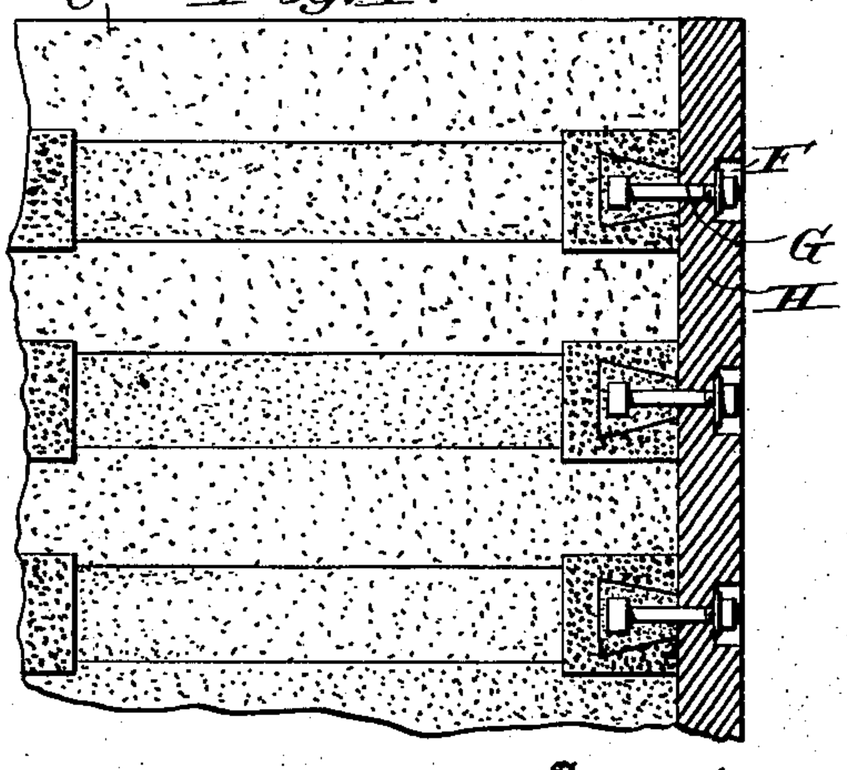


Fig. 4.



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No. 751,492. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

JOSEPH W. FRASER, OF OTTAWA, CANADA.

CRIBWORK OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 751,492, dated February 9, 1904.

Application filed October 16, 1903. Serial No. 177,294. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. FRASER, a subject of the King of Great Britain, residing at Ottawa, in the county of Carleton, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Cribwork or the Like, of which the following is a specification.

My present invention relates to cribwork and the like, the construction and advantages of which will be hereinafter fully set forth.

Under the present invention or system the use of two distinct or different materials is contemplated, the lower portion of the cribwork, which is constantly submerged, being composed of timbers, while the upper portion or superstructure is formed of artificial stone or cement work, the cement members preferably having the general shape of timbers. These latter members or "timbers," as they may be termed, are molded before being placed in position. The lower or timber portion proper will be so treated as to render it proof against the attack of the teredo (when submerged in salt water) or other marine life. As will be readily seen, the superstructure, by reason of the material of which it is composed, is proof against the attack of limnoria, and the entire cribwork is thus permanently protected. Furthermore, the wooden substructure being constantly submerged is never exposed to the air, which condition also tends to prolong its life. The advantages derived from the employment of a structure of this character are many, both from the constructor's point of view and also as regards stability and duration. It is well known by those who have had experience in the construction of cribwork, first, that timber of different kinds is the only material which, up to the present time, has been successfully utilized in the construction of cribwork; second, that cribwork composed of timbers is perishable, having only short duration when exposed to the weather and requiring the reconstruction of its superstructure about every eight years; third, that sometimes the timbers composing the exterior surface of the body of the cribwork do not offer sufficient resistance to the elements, and the structure is often damaged by moving floes of ice and from other causes, and, fourth, that cribwork built in salt water is exposed in some localities to destructive worms, which attack the foundation of the structure and very often cause its partial or total collapse without warning.

By the use of the system which I have devised the above objections to cribwork as at present constructed are practically overcome. The substitution of concrete in the superstructure for the ordinary timber heretofore employed insures a permanent cribwork, as repairs will not be required unless the structure should become accidentally damaged. In case of injury by accident the superstructure may be as easily repaired as timber cribwork. The employment of concrete to form the different pieces of the superstructure renders the cribwork sufficiently strong to withstand the destructive action of the elements and the pressure and eroding effect of ice-floes.

Under my present invention the substructure may be started and built afloat for half of its height, more or less, with timbers which have been creosoted or treated in any other desired manner. The concrete pieces are then put in place until the timber portion or substructure has almost lost its buoyancy, at which time the cribwork may be set in position (if found high enough to reach the surface of the water after it is sunk to the bottom) by adding more concrete pieces. This method of sinking obviates the necessity of piling stones on top of a crib to set it in position.

If it be found that the timber utilized does not provide sufficient buoyancy to allow the construction of the concrete work to the required height without sinking, the cribwork may be held up by the use of scows or the like until the desired height has been reached, when the whole structure, together with the scows, can be sunk. The scows will, of course, afterward be floated. This method renders the work of starting the permanent construction under low water very easy, which is not usually the case, especially in connection with

retaining-walls, as it is difficult and expensive to prepare a foundation under water.

Where the substructure is not subjected to the attack of worms, that portion of the cribwork may be composed of timber in its natural state, for, as is well known, wood which is constantly submerged is not perishable. Again, the interior of the superstructure may be built partly of untreated timber, especially if the chambers of the cribwork are to be filled with earth, which will have the effect of burying the timbers and insuring their preservation. The use of this earth filling is practical as regards both permanence and economy, but it cannot be employed with cribwork composed entirely of timber.

The necessity for the use of coffer-dams and the like is obviated with my invention. In the case of retaining-walls this system of concrete cribwork can be adopted with great advantage and at a considerable reduction in cost. Retaining-walls of a permanent nature are generally built of heavy masonry or of monolithic concrete, requiring an artificial foundation if formed on soft material. The same may be said of heavy lock-walls forming the chamber of a lock and applies equally as well to dry-dock walls, abutments of bridges, breakwaters, jetties, and the like. In tidal water it is difficult to build concrete in place, as the constant rising of the tide washes away a portion of the cement before the concrete is set. Besides this, the large molds required are in constant danger of being damaged by the waves, ships, &c., while under my system no such molds are required in exposed places, as all parts are formed upon the land or upon barges or vessels especially designed for this purpose.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of a cribwork constructed in accordance with my invention; Fig. 2, a top plan view thereof; Fig. 3, a perspective view showing portions of two of the concrete members, and Fig. 4 a sectional view showing a modification of the invention.

Referring first to Figs. 1 to 3, inclusive, A denotes the substructure, composed of a series of timbers B, by preference, suitably notched in order to lock the parts or members together. This portion of the cribwork lies below the extreme low-water line of rivers or lakes or below the extreme low water of spring tides when the structure is built where tides occur.

The superstructure is composed of a series of concrete members C, which, as above noted, are formed in molds at a point remote from the cribwork.

The particular composition of the concrete employed is immaterial so long as the resulting member is sufficiently stable for the purpose in view. Again, the particular form or contour of the members is immaterial, it being only necessary that they are capable of being readily handled and assembled. It is of course essential that the members be so formed that they may be securely fastened together, as well as to the substructure, and with this end in view they are notched or recessed, as shown in Fig. 3 or in any other suitable manner, this being merely a matter of detail of construction. By preference each member and also the timbers of the substructure will be provided with an opening D at the points where the various members and timbers intersect, and iron rods E are passed down into these openings after the cribwork is completed, the openings being subsequently filled with grout. Any other suitable arrangement may of course be adopted for tying the whole structure together.

If desired, the superstructure may be sheathed, as shown in Fig. 4, recesses F being formed in the outer faces of the concrete members in the process of molding for the reception of bolts G, which are secured therein by cement or the like. The sheathing H is in turn secured in place by the bolts.

Under certain conditions it may be found desirable to fill in the cribwork, and in such event the sheathing will be found desirable, though not absolutely essential. The structure illustrated in Fig. 4 is shown as filled.

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

1. In a cribwork or the like, the combination of a substructure composed of timber; and a superstructure composed of concrete members formed previously to their being put in place.

2. In a cribwork or the like, the combination of a substructure composed of timber; a superstructure composed of concrete members; and means for securing the various parts together.

3. In a cribwork or the like, the combination of a substructure composed of treated timbers; and a superstructure composed of concrete members, said members being formed previously to their being put in place.

4. In a cribwork or the like, the combination of a substructure composed of treated timbers; a superstructure composed of concrete members, said members being formed previously to their being put in place; and means for securing the various members together.

5. A cribwork having its superstructure composed of concrete members, said members being formed previously to their being put in place.

6. A cribwork having its superstructure composed of a series of interlocked concrete members.

7. A cribwork having its superstructure composed of a series of concrete members,

said members being formed previously to their being put in position; and means for securing said members together.

8. A cribwork having its superstructure composed of a series of concrete members, said members being formed previously to their being put in position; and a series of rods passing down through said members at their points of intersection, substantially as described.

9. A cribwork having its superstructure composed of a series of interlocking concrete members, said members being formed previously to their being put in place; and a series of rods passing down through openings formed at the points of intersection of said members, substantially as described.

10. A cribwork having its superstructure composed of a series of interlocking concrete members, said members being formed previously to their being placed in position, each of said members being provided with an opening at those points where it crosses other members; iron rods passing down through the alined openings in the various members; and a filling placed in the openings, substantially as described.

11. In a cribwork or the like, the combination of a superstructure composed of a series of concrete members, said members being formed previously to their being put in position; a substructure of timbers; and a series of rods extending down through alining openings formed in the concrete members and the timbers, substantially as described.

12. A cribwork having its superstructure composed of a series of concrete members formed previously to their being put in place, combined with a sheathing secured to the outer face of the cribwork.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH W. FRASER.

Witnesses:
ARTHUR ST. LAURENT,
R. J. ROBILLARD.