(No Model.)

R. HUNT.

CONSTRUCTION OF SUBAQUEOUS STRUCTURES.

No. 457,438. Patented Aug. 11, 1891.

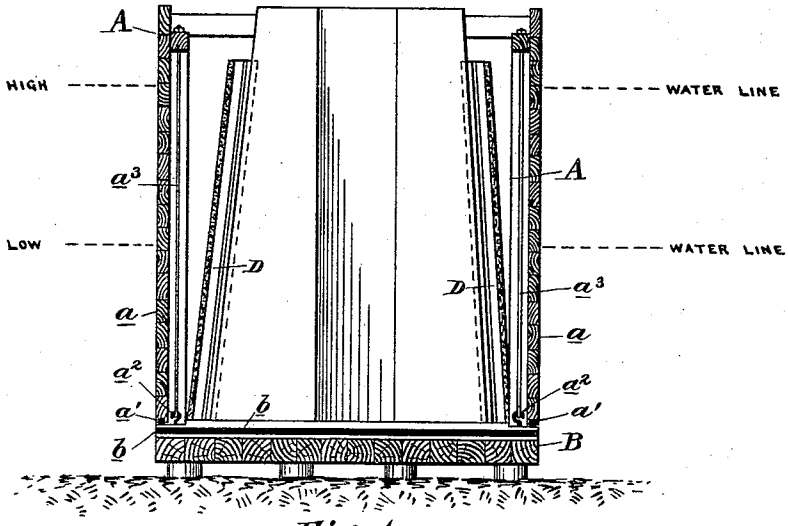


Fig. 1.

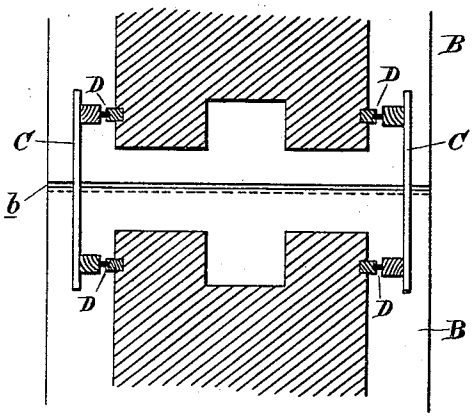


Fig. 2.

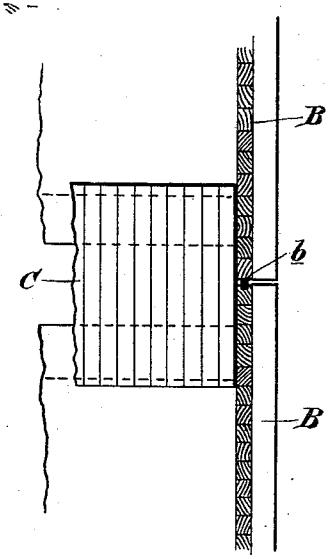
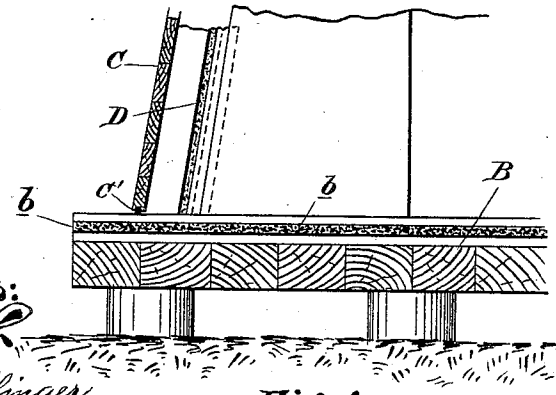


Fig. 3.



Witnesses:
W. X. Smyth
Geo. W. Uffinger.

Inventor.
Randee Hunt

Fig. 4.

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UNITED STATES PATENT OFFICE.

RANDELL HUNT, OF SAN FRANCISCO, CALIFORNIA.

CONSTRUCTION OF SUBAQUEOUS STRUCTURES.

SPECIFICATION forming part of Letters Patent No. 457,438, dated August 11, 1891.

Application filed February 17, 1891. Serial No. 381,754. (No model.)

To all whom it may concern:

Be it known that I, RANDELL HUNT, of the city of San Francisco, in the county of San Francisco and State of California, have invented a new and useful Means of Constructing Continuous Subaqueous Structures; and I hereby declare that the following is a full and exact description thereof, reference being made to the accompanying drawings.

The object of my invention is to provide a means for constructing subaqueous structures, and particularly for building continuous sea-walls, so that the masonry of which they are built may be laid freely in the open air, while at the same time the structures will be continuous ones without breaks or joints other than the ordinary joints of stone or brick masonry, or if built of concrete deposited in place that they shall be complete monolithic structures from end to end.

Referring to the accompanying drawings, Figure 1 is a cross-section of a caisson containing a length of wall sunk into position. Fig. 2 is a plan view of the end of two lengths of wall in position ready to be connected into a continuous wall. Fig. 3 is a portion of an end elevation of Fig. 2, showing joint-strip between supporting platforms or grillages. Fig. 4 is a cross-section of an enlarged view of a portion of the coffer-dam.

The following is a description of the application of my invention:

A section of the wall is first built within a floating caisson A, the bottom of which is composed of the timbers forming the grillage or supporting-platform B, upon which the wall is to rest when placed upon its foundation of piles or other material. The sides a and ends of this caisson may be built of timber and secured to the bottom B by eyebolts a^3, which are looped over hooks a^2, as shown by Fig. 1. The lower edge of the caisson sides is provided with a joint-strip of rubber or other suitable material a'. As the masonry composing the wall is built in place within the above-described caisson, it gradually sinks until it reaches its prepared foundation of piles or other materials. The supporting-platform or grillage B for another section of wall is now constructed and floated into the place required. The sides and ends of the caisson in which the first section of wall was sunk are unhooked and detached from its bottom and secured above the floating platform of the second section. When the tide rises, the buoyancy of the bottom presses it with great force against the joint-strip a', which, being of flexible material, is forced into all the inequalities of the surface of the bottom B, and a perfectly-tight joint is thereby formed. During the time that the rising tide is exerting a pressure against the bottom B the hooks a^2 and eyebolts a^3 are engaged, thereby securely fastening the bottom to the caisson sides and ends. A complete floating caisson is thus made similar to that in which the first section of wall was constructed. Another section of the wall is now built in a similar manner to the first and settled upon its foundation, which is a continuation and immediately adjoining that of the first section of wall previously constructed. This second section is so guided in its descent that the supporting platform or grillage B, forming the bottom of the caisson in which it is built, presses close against the platform or grillage B of the first section. Upon the edge of the timbers forming the supporting platform or grillage B of either the first or second sections is placed a joint-strip of rubber or other suitable material b, so that when the platforms of the two sections press against each other a water-tight joint is made between them. This joint-strip is easiest and best placed upon the edge of the supporting platforms or grillages before they are sunk under the water.

During the construction of a section of wall within a floating caisson, as just described, I place near the ends of the wall, on both its face and back, joint-strips D, which may be embedded in the masonry, if necessary, and which extend from the platforms B up to and above high-water mark after the wall is sunk in place.

The floating caisson being free from water on the inside makes a convenient means for placing these joint-strips D D, while upon their edge may be fastened a strip of rubber or other suitable material.

The means for connecting separate sections of wall together is as follows: After two sections of the wall are in place and the sides

and ends of the caissons have been removed I construct sides, partitions, or coffer-dams C C upon the top of the supporting platforms B B, which have been joined together, as above described, and rest these sides or coffer-dams against the joint-strips D D in the ends of the wall. The bottom edge of the coffer-dams or sides makes a water-tight joint with the supporting platforms or grillages B B by means of a joint-strip c', of rubber or other suitable material. The sides or coffer-dams C C also make tight joints where they rest against the joint-strips D D, because of the aforesaid strip of rubber or other suitable material at those places, and against which they press with considerable force as soon as an excess head of water on the outside of the sides or coffer-dams is obtained by pumping out that on the inside. The space between the two sections of wall as thus connected and coffer-dammed can then be pumped dry and masonry built up within and joined and bonded to the two sections previously constructed, making the connection complete from the supporting-platforms or grillages up to the top of the wall and making the wall a continuous structure. In this manner a third section of the wall can be constructed, the space between it and the second section can similarly be coffer-dammed, and the masonry of the second and third sections bonded and joined together, and so on the construction of any length of wall required can be attained which shall be a complete continuous structure, all of which has been constructed freely in open air, thus avoiding the disadvantages of constructing masonry under water.

I am aware that caissons of various forms have been employed in constructing portions of structures which have been afterward connected by other means. I do not, therefore, claim as new the method of constructing subaqueous structures by means of caissons; but

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

1. As a means for constructing a continuous wall which is founded below water, the combination of open floating caissons and connecting coffer-dams, substantially as shown and described.

2. As a means for connecting two detached sections of wall founded below water, the combination of a coffer-dam with said detached sections of wall, substantially as shown and described.

3. As a means for making a water-tight joint between the ends of supporting-platforms of structures founded below water, the combination of a joint-strip of rubber or other suitable material with the supporting-platforms, substantially as shown and described.

4. As a means for constructing continuous structures founded below water, the combination, with a caisson having a platform or grillage, of a joint-strip to form a water-tight joint between itself and another platform or grillage, substantially as shown and described.

5. As a means for constructing continuous structures founded below water, the combination of platforms or grillages provided with a joint strip or strips between them and supporting each a section of structure to be joined and connected into a continuous construction, and a partition or coffer-dam temporarily connecting the sections on each side of the dividing space between the sections and resting upon and forming a joint with the supporting platforms or grillages, substantially as shown and described.

6. As a means for constructing continuous structures founded below water, the combination of platforms or grillages, each supporting a section of a structure to be connected into a continuous construction, each of said sections being provided with a suitable joint-strip D, and a partition or coffer-dam temporarily connecting the sections on each side of the dividing-space and forming joints with the joint-strips D on the sections, and also at the lower edge of said partitions by joint-strips c' with the platforms or grillages, substantially as described and shown.

RANDELL HUNT.

Witnesses:
JAMES L. KING,
W. W. SANDERSON.