J. J. MILLER.

REINFORCED CONCRETE PLANK AND SEA WALL CASING.

APPLICATION FILED MAY 6, 1912.

1,048,567. Patented Dec. 31, 1912.

Fig. 1.

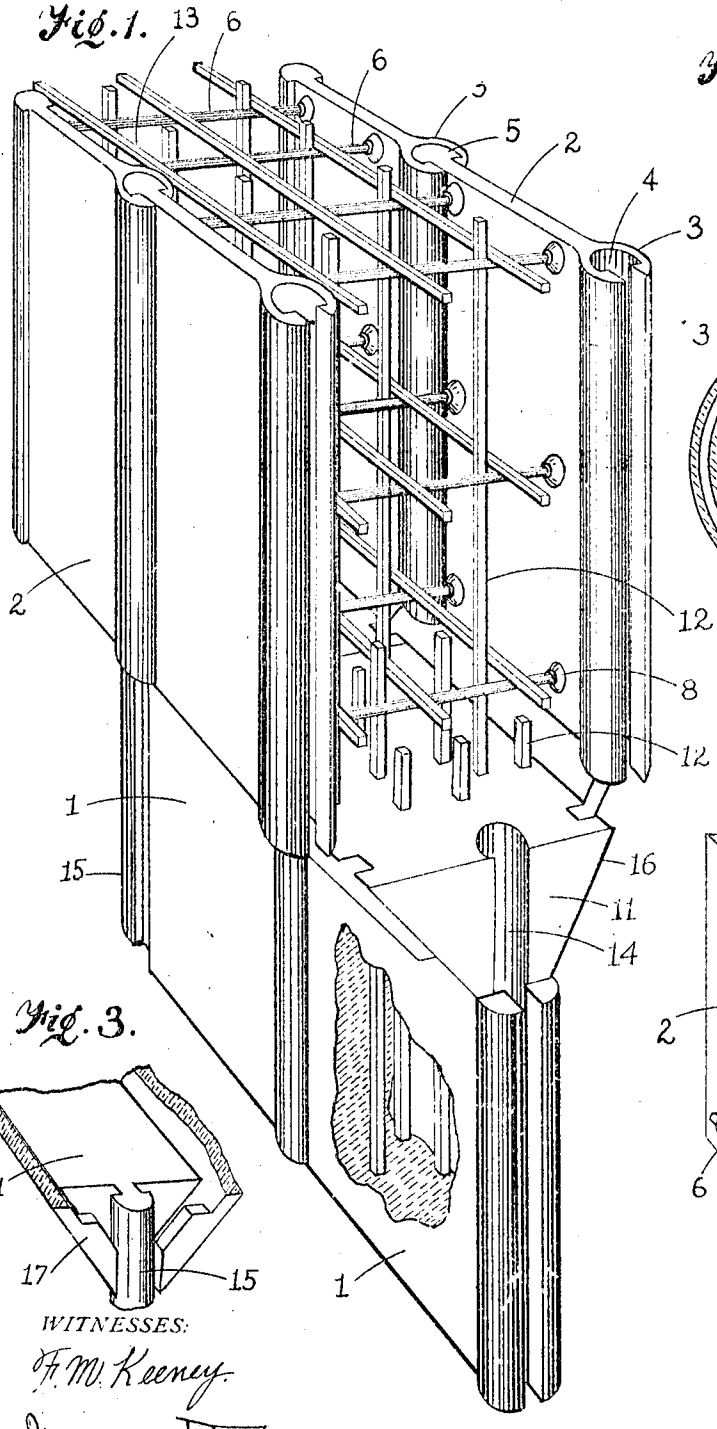


Fig. 2.

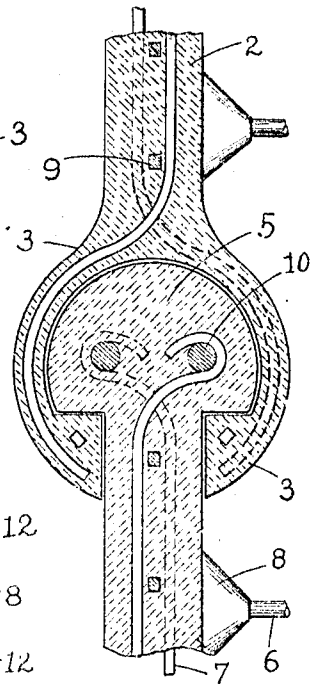
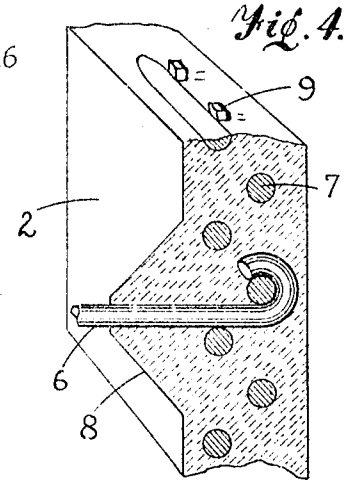


Fig. 3.

Fig. 4.



WITNESSES:

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REINFORCED-CONCRETE PLANK AND SEA-WALL CASING.

1,048,567. Specification of Letters Patent. Patented Dec. 31, 1912.

Application filed May 6, 1912. Serial No. 695,401.

To all whom it may concern:

Be it known that I, JOHN JOSHUA MILLER, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented a new and Improved Reinforced-Concrete Plank and Sea-Wall Casing, of which the following is a full, clear, and exact description.

My invention has reference to improvements on sea walls, and it consists in the novel arrangement, construction, and combination of parts as herein described and claimed, the objects of the invention being to construct sectional casings having means for interlocking the adjoining sections preparatory to pouring, ramming, and otherwise filling the casing to make the completed sea wall, it being a design of the invention to so relate the elements thereof, that the sections shall be simple to manufacture, that they may be easily assembled preparatory to placing the concrete thereon, that they may be maintained in alinement until the wall is completed, that they may be anchored securely to the earth, and that they may be erected without the assistance of skilled labor, it being also a design of the invention to construct the sections with the metal reinforcements so arranged as to interlock and produce a rigid and substantial casing that may be placed in the water and withstand the pressure thereof preparatory to the completion of the wall structure. The principles herein related may be embodied into any suitable form, and therefore, for the purpose of explanation, a preferred arrangement with the proper correlative parts, is shown in the accompanying drawings which form a part of this specification.

While simple and efficient means are herein provided for accomplishing the objects of the invention and the elements shown and described are well adapted to serve the purposes for which they are intended, it is to be understood that no limitation is made to the precise structural details exhibited, but that variations, alterations, and modifications, within the scope of the appended claims, may be adopted if desired, the essence of my invention comprising a sea wall casing with separate interlocking form sections, and means for securing and maintaining alinement of adjoining sections and opposed walls of each section, to form a casing to receive the plastic material and thereby form a concrete sea wall, the invention being fully illustrated in the accompanying drawings, whereon—

Figure 1 is a perspective view of two interlocking sections of my reinforced concrete plank and sea wall casing, incorporating the principles of this invention, disclosing the position of the plank, the opposed side walls, the bonds which connect them, and the position of the metal reinforcements therein. Fig. 2 is a sectional detail view of an interlocking joint of the upper wall casing disclosing the arrangements of the metal reinforcements therein. Fig. 3 is a perspective and detail view of the interlocking joint at the upper end of the anchoring plank or panel. Fig. 4 is a sectional detail view of a portion of a wall section, disclosing the arrangement of the tying, bonding, and bracing means between the opposed walls of the casing, and the alternation of the longitudinal metal reinforcements therein.

In the several illustrations similar characters of reference apply to corresponding parts.

Assuming the invention to be embodied in the form illustrated, each section of the casing has a central wall or plank 1, forming the lower part, and opposed side walls 2, the central and side walls being in parallel planes, and the side walls forming the upper part of a casing section. Side walls 2 have flange members 3, forming a longitudinal channel 4, therebetween, which engages with tongue member 5 on the adjoining edge of the next successive section. Side walls 2 are supported in opposed relation each to the other, and are connected by transverse tie bars 6, which are anchored to horizontal reinforcing rods 7, in the side walls. A cement reinforcement 8 is provided for the tie rods at their entrance to the side walls.

The side walls are provided with vertical reinforcing rods 9, arranged in the center thereof, and horizontal rods 7, are arranged alternately on opposite sides of rods 9. At each edge of the side walls, rods 7 pass to the opposite side of the wall to form flanges 3 and tongue member 5. This crossed relation of the reinforcing rods, strengthens the parts correspondingly. In the tongue member the crossed ends of rods 7 are tied to vertical rods 10.

Connecting member 11, unites the upper edge of the lower plank with side walls 2, and is formed of concrete. A plurality of vertical reinforcing rods 12, are embedded in

member 11, some of which extend from the bottom of plank 1, to the level of the top of side walls 2, and others extend upward a short distance from member 11. In Fig. 1 of the drawing, a part of rods 12 are shown, but it is to be understood that the number may be as desired to sufficiently reinforce the concrete material to be placed between the walls of the casing. Reinforcing rods 13 are horizontally disposed between the walls of the casing.

The plank member is formed with a longitudinal channel 14, and a corresponding tongue member 15, on opposite edges thereof, for connecting adjoining sections and securing them in alinement. Member 11 has flanges 16, which engage with flanges 17 on the next successive section. These flanges overlap when the sections are assembled, and may be coated with tar or other waterproof preparation to form a watertight joint. In assembling the sections preparatory to pouring the concrete therein, all interlocking joints may be thus prepared with a waterproof coating.

A retaining wall for the sea, for rivers, and for all waterways may be formed by assembling a sufficient number of sections of casing as herein described, the sections of the casing being prepared and reinforced as described, and then placed in position with the plank member extending into the earth, the section being embedded to the bottom of the side walls, and the joints prepared as aforesaid. The sections are assembled by engaging the tongue members of one section with the adjoining section and then placing the section in position, and so on until a wall casing is completed, and then pouring the plastic material between the side walls until level with the top thereof.

It will be noted that this invention embodies the use of a plurality of form sections which are prepared prior to erecting in the water to form the wall, means being provided for uniting the sections to form a continuous wall or casing for the entire structure to be erected, the said casing having transverse, vertical, and horizontally disposed reinforcing rods which are to be embedded in the concrete material placed between the walls of the casing, thus firmly uniting the casing and the material placed therein, into an integral and homogeneous structure.

I claim as my invention:

1. In a reinforced concrete retaining wall, a plank of cement or concrete adapted to be embedded to its full depth into the earth, a connecting member at the top thereof, side walls extending upward from said connecting member, transverse tie rods extending between said side walls, a plurality of metal reinforcing rods disposed within the space formed by the side walls, and a cement body between said side walls embedding said tie rods and reinforcing rods, substantially as set forth.

2. In a retaining wall, the combination of opposed side walls to form a casing, a plank to extend into the earth, a connecting member between said side walls and plank, and a concrete body within said casing, substantially as set forth.

3. In a casing for a retaining wall, the combination of side plates of concrete, tie rods connecting said side walls, a connecting member at the bottom of said side walls which supports them in an upright position, reinforcing rods extending from the connecting member upward between said side walls, a plank extending downward from said connecting member, said reinforcing rods extending therein, and reinforcing rods in said side walls to which said tie rods are secured, substantially as set forth.

4. In a casing for a retaining wall, a series of sections composed of reinforced concrete, flanges on each section forming a channel therebetween, tongue members on the opposite end of the section to engage with the channels in the next successive section, to form a continuous casing, and panels on the bottom of each section to anchor the same to the earth, substantially as set forth.

5. In a casing for a retaining wall, a plurality of separate sections, opposed side walls to each section, a connecting member at the bottom of the side walls, a panel depending from said connecting member, means for securing the opposed side walls in a rigid position, and means for securing the adjoining sections each to the other, substantially as set forth.

6. In a casing for a retaining wall, a plurality of sections, each of said sections comprising a central and two side plates, each of said sections having a projection on one end of each of said plates, and a corresponding seat at the other end whereby the sections may be locked together, substantially as set forth.

7. In a casing for a retaining wall, a plurality of sections adapted to be assembled into a continuous structure, and a plurality of flanges on each section so interlocking with each other and overlapping to form watertight joints and form a continuous structure to receive a concrete body, substantially as set forth.

8. In a casing for a retaining wall, a plurality of sections adapted to be assembled together, a plurality of flanges on each section interlocking with each other to aline said sections and resist the pressure of the water, and metal reinforcing rods disposed longitudinally in said sections, with the ends of alternate rods in crossed relation to each other and entering said flanges, substantially as set forth.

9. In a casing for a retaining wall, a plurality of sections having reinforced side plates, a reinforced central plate which is adapted to set into the earth, and flanges on each plate section whereby the section plates may be set up to form a continuous wall and are locked against lateral displacement, substantially as set forth.

In testimony whereof I have hereunto affixed my signature to this specification, this 29th day of April, 1912.

JOHN JOSHUA MILLER.

In the presence of—
J. W. MASTER,
F. M. KEENEY.