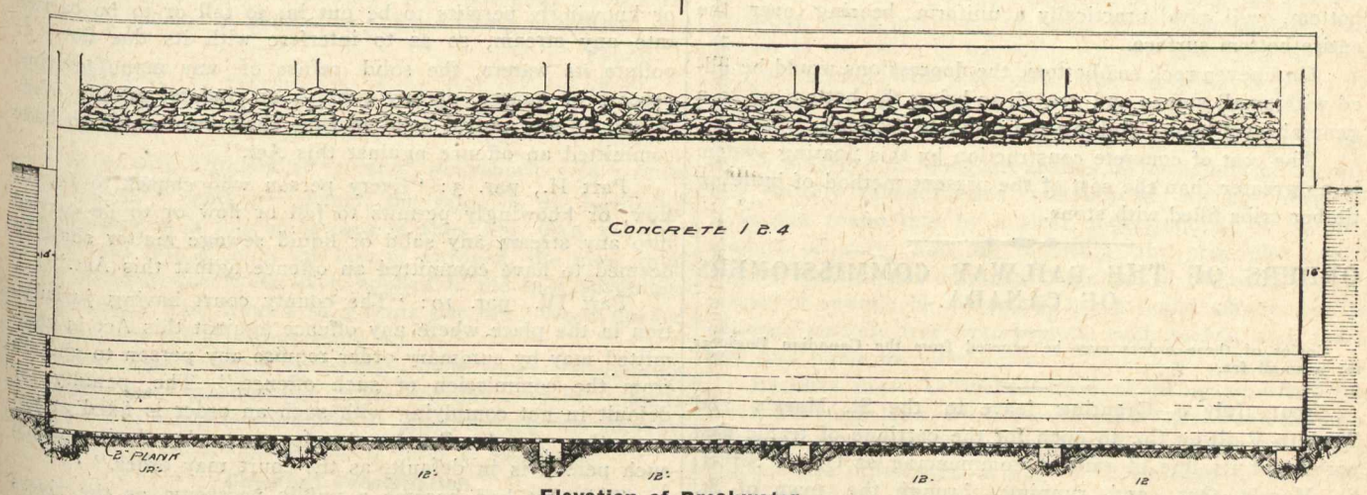
patents in Canada and the United States, and upon which, patents have been applied for in most of the principal European countries, is intended to remove the danger and difficulty of building concrete under water in open sea.

The system is applicable in the building of docks, piers, breakwaters, sea walls, coffer dams, lighthouse foundations, and for many other purposes. In fact, its application in subaqueous construction is almost unlimited.

The open sea hazard is entirely eliminated, for the work of construction is carried on within a harbor, or in well sheltered water, and when the concrete sections are completed, they are then towed out during calm sea, and sunk upon the intended site. The weight of the concrete sections being sufficient to withstand any reasonable sea, which might break over the sunken structure until ballasting of its compartments is completed.



Elevation of Breakwater.

Reference to the accompanying cuts, and the following description, should give our readers a clear idea of the design; and also of the principles of construction employed. The simplicity and practical utility of which, should strongly appeal to all experienced engineers.

All of the concrete work is done floating, but above, and protected from the water.

Water-tight pontoon bottoms, or basins, are built on shore, one pontoon for each section. The sections should be preferably about 100 feet long, but may be longer or shorter as conditions demand.

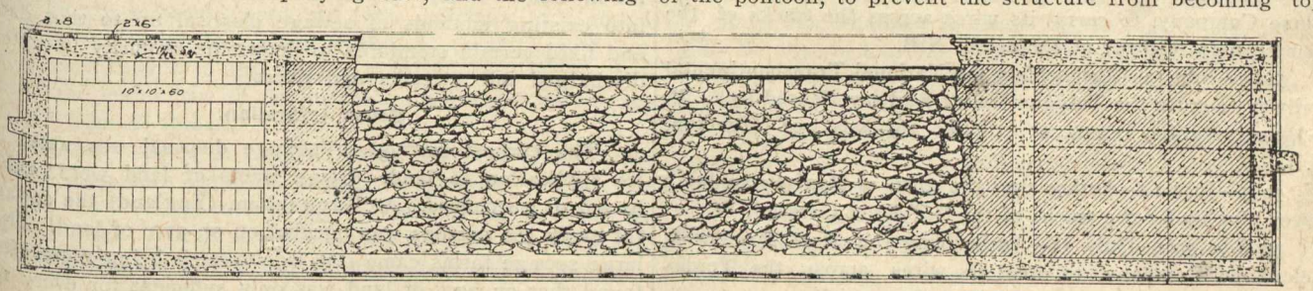
Launch and float the pontoons into a sheltered location, convenient for building operations, but with sufficient depth of water for sinking while under construction.

The concrete walls, which are built to form square compartments, begin directly upon the floor of the pontoon basin, and are built up in layers of about two feet deep. The steel reinforcement, being built in as the walls progress.

As the walls rise, their weight, of course, sinks the pontoon, but as the displacement of the pontoon, per foot deep, is about double the tonnage of the walls per foot high, it follows that for every two foot course of concrete built, the pontoon will sink one foot lower, and the top of walls will rise one foot higher above the surface of the water.

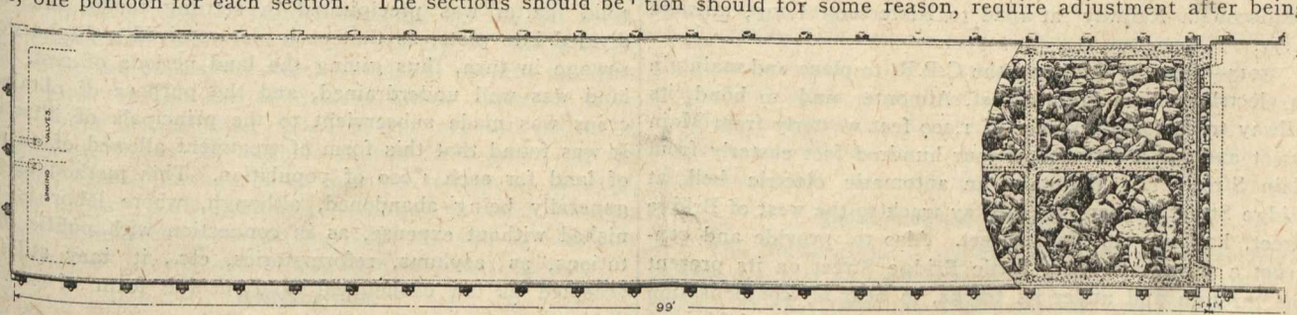
Therefore, when the walls have reached a weight sufficient to entirely submerge the top of the pontoon basin, the top of the walls will also have reached a height above the surface of the water equal to the height of the pontoon sides, so that when the top of the basin passes below the water line, the hardened concrete walls will themselves form a continuation of the pontoon.

Some stationary ballast would be required on the bottom of the pontoon, to prevent the structure from becoming top heavy and rolling over, as the walls are raised. In this manner, the walls are built up to a height somewhat greater than the depth of water in which the sections would be sunk, so that when the structure rested on the sea bottom, the top of the concrete walls would still project above the water.



PLAN VIEW.

Suitable sea valves are provided to admit water into the compartments for sinking the sections, and in case, a section should for some reason, require adjustment after being sunk, it may be refloated by closing the valves and pumping out a portion of the water.



Part Section Showing Interlocking Scheme.

The sections are made male and female for coupling together, and as the walls are perfectly water-tight, the washing action of the sea will have no effect upon the interior ballast, which may be of rock, gravel, sand or a concrete mixture of all.