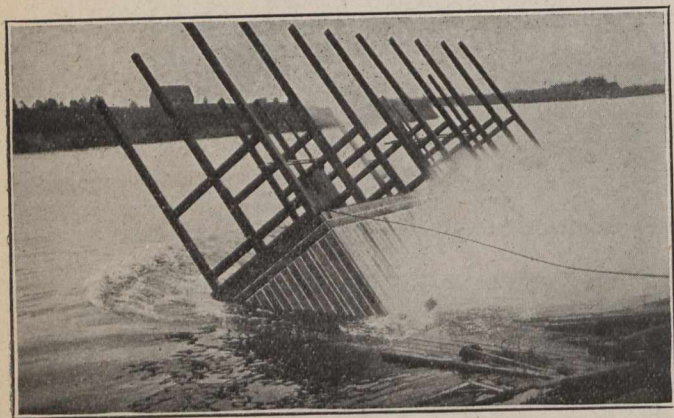


the caisson was ready to launch, the supporting timbers were, one at a time, lowered down to the skid timbers which had been well greased, and the caisson allowed to slide out in a horizontal position. Before launching, the first sections of the man-lock and two material locks were bolted into position, also all pipe connections through the deck and inside fittings placed. These consisted of two 5-inch pipes with flap valves for the air; one 3-inch pipe for water connections, with valves, hose, etc., for three jets; three 4-inch pipes, with valves, hose, etc., for blow-off pipes; one connection for high pressure air; two whistle pipes; and electric lighting connections.

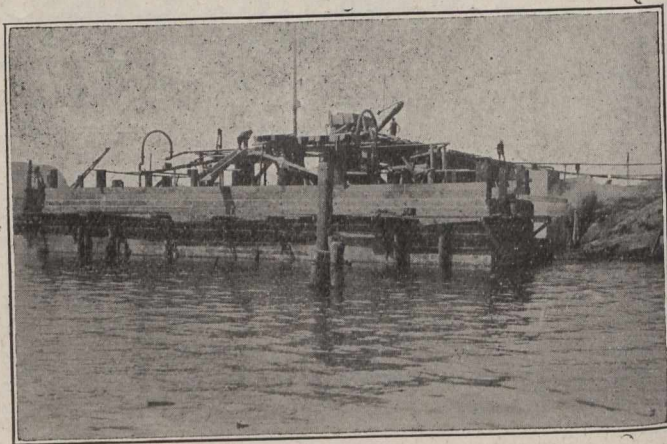


4. Launching Caisson.

After launching the caisson, it was towed into position and secured there by means of cables and piles. There is very little current in the river at this place, so little difficulty was met in keeping the caisson in position.

The caisson was then sunk by placing concrete on the deck, forms having first been built around the air lock shafts and piping so that they could be recovered; and the coffer dam kept well above the water level. When the shoe of the caisson was bedded in the river bottom, the air pipes were connected with the compressors and the caisson filled with compressed air. On starting operations in No. 1 caisson, the shoe was 20 feet below water level and nine pounds pres-

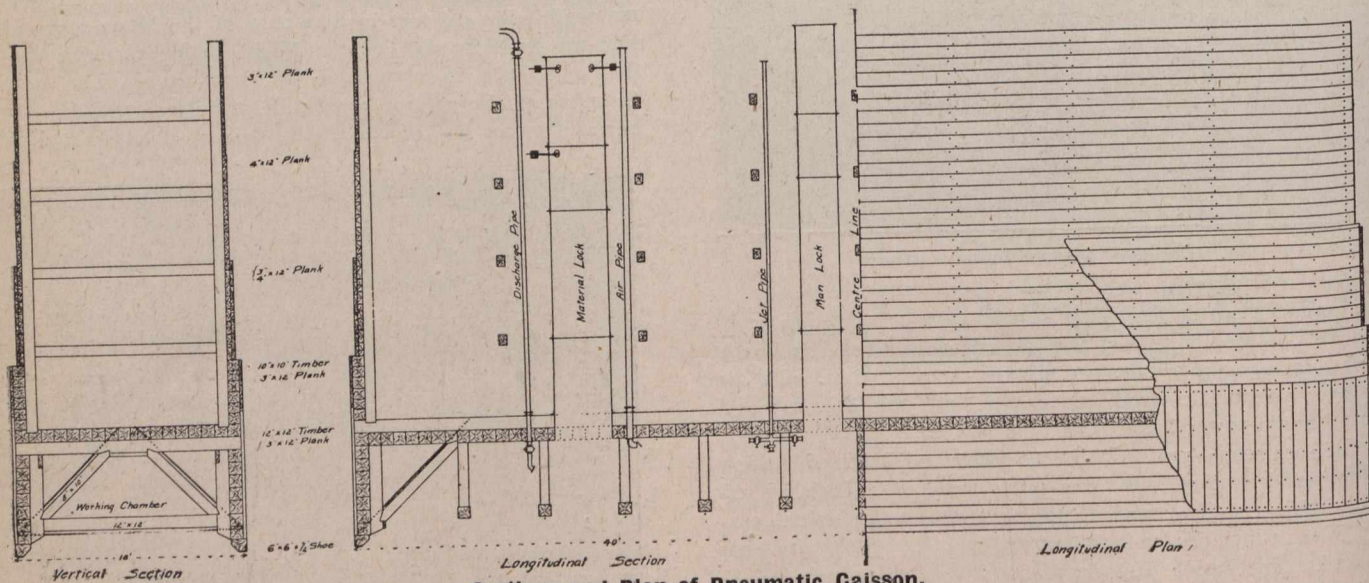
sure was used. The weight of concrete were increased as the caisson sank until, at bed rock, 38 feet down, an air pressure of 16 pounds was used. Boulders and rock were excavated in buckets through the material locks; but all clay, gravel and small stones were blown out through 4-inch pipes by the pressure within the chamber. The upper excavation was a boulder clay, the boulders ranging from small stones up to some the size of a barrel. The lower excavation was a gravelly hard-pan, also full of boulders. This had to be picked and spaded before the jets would have much effect on it, the blow-pipes were governed by 4-inch cast-iron plug-cocks which were opened



5. Sinking Caisson.

and closed as required. A  $\frac{3}{4}$ -inch plug-cock tapped into the pipe above this valve and left open while blowing out material, helped considerably. A 4-inch hose, 15 feet long with a  $3\frac{1}{2}$ -inch nipple on the end, was kept with its nozzle in a pool of water formed by the jet; and the material to be excavated shoved by hand to the nozzle by the "sand hog" operating the pipe. The pressure of the air forced it up and out without the loss of very much air from the chamber.

In the hard-pan excavation, the material was taken out for from three to four feet below the shoe of the caisson but leaving a bank of material, clear around, supporting the caisson. Excavation was then suspended, and this bank



Sections and Plan of Pneumatic Caisson.

sure was used. The water inside the caisson being driven out under the shoe, the air men, or "sand hogs" as they are called, entered the caisson through the man-lock; and excavation began. Three eight-hour shifts of about twenty men each were worked continuously. The air pressure and upper

was picked down to a level bench, leaving the caisson suspended by the friction on its sides. When everything was clear below the shoe, the blow-pipes were opened and the air pressure lowered three or four pounds. The weight of concrete on top was so regulated that the caisson would then