

mark ; at the pier site it was of irregular form, and though found to fall off rapidly a few feet farther north, it here presented a surface that was almost level, though inconveniently rough. This rock was almost bare, being seldom covered with more than a foot or two of deposit. The current was but little less rapid than in the middle of the channel, and was far too strong to allow of any extensive operations being carried on within it. It was therefore thought necessary first of all to obtain slack water about the pier site, after which the foundation works, more properly so called, could safely proceed.

A large timber caisson, designed to serve as a water deadener, or break-water, was built on the shore, about midway between the south end of the bridge line and the Company's machine shop. It was built of oak, with pointed ends ; the entire floor and the sides to a height of 15 feet were solid, and of square timber ; its outside measurements were 65 feet long from nose to nose, 18 feet wide, and 27 feet and three inches high ; it was stiffened internally by rows of vertical truss bracing, and bound together by long iron rods built into the solid timber of the bottom and sides ; the whole was thoroughly caulked, and valves were provided for admitting or excluding the water.\* After it had served its purpose as a water deadener, it was raised and finally sunk below Pier No. 2, where it forms the foundation of the lower draw rest. On the 19th of May, 1869, this caisson was launched ; it was kept anchored to the shore till the 7th of the following August, when the river was thought to be low enough to begin work ; it was then towed to a point about 100 feet above the pier site, secured by four wire cables reaching to the shore, and sunk by admitting water through the valves and throwing in a ballast of broken stone. Being placed transversely with the current, it formed a complete water deadener, and quiet slack water was secured at the pier site.

A bottomless caisson, which should serve as an enclosure to build the pier in, was also constructed. It was built on a floor placed between four boats well braced together ; it was a frame structure, entirely of oak and planked vertically ; the ground plan was substantially the same as that of all other caissons built upon the work, the ends being formed of two short sides making a right angle together ; its total length was 70 feet, and the width 19.5 feet. The first

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\* The plans of this caisson are given on Plate III.