

to correspond with the rods in the caisson. These screws were twenty-four feet long, ten of them three inches in diameter, and the other fourteen, which had been used in lowering the masonry of the Quincy Railroad bridge, two and a half inches. Ten additional screws of the same size as the latter were kept in reserve.

On the morning of the 21st of October the caisson was successfully launched and towed to the false-works. Two or three weeks previously a large flat-boat loaded with sand, in attempting to shoot the works, had struck against one of the upper piles and sunk; the wreck had caused a sand deposit at the pier site, so that, though there was plenty of water to float the caisson, which drew only three feet and a half, it could not be brought under the trusses without removing the suspension rods; they were, accordingly, unscrewed, taken out, and the caisson brought into position, when they were replaced and easily screwed into the nuts, which were held by the square recesses cut in the triangular timber below the sill. This was accomplished in a day, but the want of deep water proved a more serious obstacle in the way of removing the false bottom. It had first been proposed to sink the bottom by throwing in sand, water being already admitted above it, make fast to it with the steamboat, and pull it out below; the depth of water proving insufficient for this, it had to be broken in pieces, and taken out in small parts, an operation which involved nearly two weeks' delay, and which, it was feared, would cause trouble by leaving unremoved fragments; an apprehension which fortunately proved groundless. A week later a sand bar, which had already been observed forming in front of the launching ways, had so much increased that it would have been impossible to launch the caisson, so that a tedious portage by land was narrowly escaped.

On the 11th of November, the work was begun of filling the spaces between the double walls of the caisson with beton, while the false-works were completed, and the machinery mounted as fast as could well be done.* The false-works were built with three floors; the lower one, intended for the use of carpenters and masons, was placed at an elevation of 108.7, and made a

* Full plans of these works and machinery are given on Plates IV. and V.