third from the melted snows brought from the northward in July by the Missouri. It will, therefore, be easily believed that the engineer of the bridge had a most unmanageable river to deal with. The sand-buried foundations of No. 7 pier were left untouched till after the last of those freshets had passed away, when it was cleared, and the masonry was commenced on the 1st of October. Work was then begun simultaneously upon piers one, three, four, and six. In the position of pier No. 1, the rock was almost free of sand, being 18 ft. below low water, and a little above its site a heavy timber caisson, 70 ft. long, 20 ft. wide, and 28 ft. high, was moored to the shore, to reduce the current running at a speed of 7 ½ miles an hour, and to protect the temporary works from passing boats and débris brought down by floods. Timber piles clamped to the rock were placed in position, and a timber caisson was suspended from them by screws in the exact position to be occupied by the pier; this being lowered gradually on to the rock, the lower edge penetrated through the thin stratum of sand with which it was covered, and the joint was made water-tight by bags of sand and pumice on the outside. The caisson being cleared of water, the surface of the rock was cut to the proper level, and the masonry begun upon it. This pier was completed with great expedition, the caisson having been put into position in September, and the masonry finished on the 30th of November, 1867.

The foundations of pier No. 3 were commenced almost at the same time as those of Nos. 1, 4, and 6, that is, just after the early flood of 1867, which submerged, and buried with sand, the preliminary works of pier No. 7. When the freshet had subsided, and the river had resumed its natural condition, it was found that on the site of No. 3 pier, the rock which had been previously thinly covered with sand, and which had been swept bare during the flood, had been covered during the subsidence by a sand-bank 23 ft. deep, there being 13 ft. depth of water at the place. It was originally intended to construct the caisson, within which the pier was to be built upon the shore, and float it into position, but the rapid current made this a work of so much difficulty, that it was resolved to take advantage of the sand-bank, and drive piles down to the rock, upon which a staging could be erected, and the caisson built in place. On the 29th of August, after the third annual freshet, this work was begun, and slowly carried forward, for it was found that the loose sand was being perpetually agitated by the water, and the piles loosened and uprooted; four piles, however, could be driven for every one that was lost, and as they were rapidly secured by diagonal bracing, a reliable temporary structure was at length obtained. Upon the top of the piles a staging was laid, and the caisson was built in place, and lowered by means of adjusting screws sus-