

struction. A fortnight later the caisson struck upon one of the bearing piles, which was pulled up from the outside, the platform over it having first been sustained by trussing across between the two adjoining piles. At this depth the work was also occasionally impeded by sand slides, the first notice of which was given by a sudden rise of the water inside of the caisson, a considerable quantity of sand from the exterior slipping through under the cutting edge and forcing the water before it, which increased the amount of excavation required and engendered a corresponding delay.

On the 6th of January very cold weather had set in ; three days later the ice had jammed at the bridge line, and the river closed for the season. The ice soon became so strong that the stones used in the masonry at Pier No. 6 were taken across on wagons. To guard against the injury which might result from the breaking up of this ice, the cluster of anchor piles was made into an ice-breaker by surmounting it with a small triangular crib of square timber, to which was fastened the upper end of a single inclined stick, the lower end of which rested on the bottom of the river 15 yards above, being held down by another small crib filled with stone ; a row of spring piles was also driven, extending from this ice-breaker to the instrument stand. A narrow opening, about two feet wide, was cut in the ice on the channel side of these protections, extending some distance above them, by which the main field of ice was separated from that nearer the shore which was attached to the piles. It was hoped that the fields of ice would be broken into small cakes by the inclined timber, and that these cakes would jam against the spring piles, pack to the bottom of the river, and thus form a gorge above the pier site which should protect the caisson from the shocks of the remaining ice. The trusses above the platform were taken down, and everything not absolutely needed was removed to a place of safety. About the same time a fourth section was added to the caisson ; it was in all respects similar to the third section, the walls filled with rubble masonry, and it made the total height of caisson about forty feet.

On the 12th of February, the upper end of the cutting edge came to a bearing on a point in the rock. The day previous the weather had become warm, and the ice began to rot ; on the 17th, at about noon, it broke and moved down the river. The water was very low, 100.5, the current less than