

soon created a change for the better below. The water was easily expelled by the air, leaving it dry under foot.

By this time also the gas-lights were in complete operation in all the chambers, giving ample light in every part. Two coats of whitewash over the roof and walls aided in reflecting it and making the air chamber an agreeable spot compared with what it was at the beginning.

The performance of the

DREDGES

in the mud and coarse sand and gravel was very satisfactory. They constantly maintained a hole about six feet in depth under the water shafts, and removed from three hundred to four hundred yards per day.

Water for the shafts was supplied by two sets of four-inch pipes, one of fresh water from the city mains, the other connecting with a force pump on the dock, which threw in a constant supply of salt water under great pressure, and proved of considerable use subsequently in loosening boulders under the water shafts. Owing to the fact that the shafts were fifty feet from the nearest edge of the caisson, a supply of water from the river without could at no time be relied upon.

THROWING OUT SAND THROUGH PIPES.

About fifty pipes were located in the roof of the caisson, passing up through the timber, and discharging above beyond the coffer-dam. In size they varied from three and a half to four inches.

The precise mode in which they were to be utilized in throwing out sand had been, to a certain degree, left undetermined. Two modes were applicable, either to throw out the sand by direct force of air, or else have recourse to sand pumps.

Very satisfactory experiments had been made the year before in the Brooklyn caisson in throwing out sand through pipes by air pressure.

The same mode had been used ten years previously by General S. Smith and Mr. C. C. Martin in blowing sand out