candle, and by mixing alum with the tallow, and also steeping the wick in vinegar. The inhaling of so much floating carbon is very injurious to the lungs, as the lamp-black remains in them for weeks and months. Nevertheless candles had to be used more or less for all special work requiring illumination close by. Lamps are of little account since they smoke more than candles, and the oil is dangerous in case of fire.

Fortunately, the existence of an establishment in New York, for the production of oxygen gas in large quantities, and at moderate prices, made the introduction of calcium lights quite feasible.

For a time, cylinders filled with compressed oxygen gas, and compressed coal gas, were lowered into the caisson and there used. The danger, however, of breaking a freshly charged cylinder was too great on account of the risk of an explosion. A double system of pipes was therefore put up in the air-chamber, one for oxygen and the other for coal gas, which takes the place of pure hydrogen. In the end of each chamber was one burner, and a special one next to the water shafts, making fourteen calcium lights in all. In addition, there were sixty burners for common street gas, which was used whenever the supply of oxygen failed. The two gas mains passed to the outside of the caisson, where they connected with two tanks. In order to make the system effective it was necessary to have the gas pressure always one pound, or thereabouts, in excess of the air pressure in the caisson, and also, to maintain this as the caisson sank. For this purpose the two gas tanks were filled with water from an artificial reservoir, having a head always slightly in excess of the caisson pressure. Into these tanks the gases were discharged from smaller cylinders, under a pressure of two hundred and twenty-five pounds. The immediate effect was to force the water from them back into the reservoir, until the tank was full, when the supply was stopped. The pipes leading to the caisson remained open, and the gas passed through them under the pressure due to the artificial head of water. By means of glass gauges the contents of the tanks could be watched and replenished as often as necessary. As the cais-