The idea of placing the air-lock at the bottom of the air-shaft, below the water level \( \text{of above it, in masonry caissons, is not new, having been proposed in England as long ago as 1831 by Lord Cochran, and again by Wm. Bush in 1841, and still later in 1850 by G. Pfannmuller, of Mayence. It, nevertheless, remained for Captain Eads, in his St. Louis caissons, to make the first practical application of the same on a really large scale in this country.}

**Excavation of Material.**

The removal of the material from the caisson is effected as before, by means of open water shafts and the Cummings' dredges. The shafts, however, in place of being square, are round, having a diameter of seven feet nine inches. The round form is much better adapted to resist a bursting pressure in case it is necessary to blow the water out of them. Since the water shafts have to be cut off when the caisson arrives on the rock, they are provided with caps and air-locks of their own; the old Brooklyn locks being used for the purpose. This will give the opportunity of filling the shafts under pressure.

In addition, fifty-eight iron pipes, of three and a half and four inches diameter, have been distributed throughout the caisson for the purpose of sending out any sand that may be fine enough to admit of it.

The fact, however, of three bore-holes out of four encountering boulders, made it necessary to provide the means used before for their removal.

**The Supply Shafts**

are four in number, two of twenty-one inch diameter, and two of two feet diameter, disposed symmetrically throughout the caisson, and arranged in the same manner as those used before. They will prove more than sufficient to supply all the concrete that one hundred and twenty men can dispose of in filling the air chamber.

**The Lighting**

is done by gas principally, although a double set of pipes has been put in for sixteen calcium lights. Sixty double gas bur-