feet in mass, was a matter of difficulty and patience, enhanced moreover by a deposit of two feet of slimy dock mud.

During this period we had to contend with the rising of the caisson at every high tide, and its resting on the ground again at low water. This required the inside work to be done at low tide, when the air-chamber was comparatively free from water. Some time, therefore, elapsed before the cutting edge was sufficiently imbedded in the hard ground to shut off direct communication with the water outside. Moreover, since the shape of the shoe is rounding, it allows the air to blow out before the water inside has reached its lowest limit; this is caused by any trifling agitation of the level of the water inside, which gives the escaping air a chance to establish an outgoing current before the head of water inside becomes great enough to overcome it.

In proportion as weight was placed on top of the caisson, without any corresponding sinking of the structure, the center of gravity was raised and a condition of unstable equilibrium established. One end of the caisson would remain on the ground, while the other alone would rise with the tide, the level of the water inside being of course governed by the higher edge of the chamber.

This circumstance was attended by another phenomenon of imposing appearance. The rising of the end would not be gradual, but amount suddenly to six inches or more. The result is that for a few minutes the tension of the air inside exceeds the head of water inside, and a tremendous outward rush of air takes place under the shoe, carrying with it a huge column of water to a height of sixty feet at times. This continues until the return wave inside the caisson checks it. Such blow-offs are not felt to any extent by the men inside, beyond the warning noise and momentary draft created.

The magazine of force contained in one hundred and seventy thousand cubic feet of air, is so large that the loss of a few hundred tons of it is a trifle.