Boston, who also furnished the exploders. This machine was instantaneous in its effects, never out of order, and would set off any number of charges at the same time.

After a thorough blasting, the Osgood dredge could work to advantage for a time. Boulders, too heavy for the dredge, were slung under water by divers, and either raised or floated under water beyond the enclosure. The whole process was expensive but effective.

Nature of Bottom.

This driving of iron piles afforded a thorough knowledge of the entire ground. On the eastern side a few blows would force the pile through soft clay to a depth of forty feet, where it was brought up by a hard stratum. In the centre, however, there was a broad ridge of hard pan of varrying thickness and so hard that frequently one hundred blows of a one thousand five hundred pound hammer were required to drive the pile three feet into the material. Towards the south side, the clay again disappeared, giving place to large boulders, packed close together, a coarse sand filling up the spaces. On the water side, all sand or clay was washed away, leaving the bare stone.

As time passed along, all work was confined to the line of frames and edges alone, leaving the ridges between to be removed afterwards from under the caisson. Three-fourths of the boulders removed were of Trap, with a few of Gneiss and sandstone.

No dredge ever built is adapted for such work. Ordinary dredge buckets present too much surface for penetration, and for similar work should be replaced by a single tooth, so made as to plow up the material. This was tried with some success.

The cost of dredging the soft material on top was sixty cents per yard; but of the hard material below, including blasting, $3.62 per yard. One thousand one hundred and seventy-three blasts were fired, consuming thirteen thousand pounds of powder.

While the dredging progressed, the enclosure proceeded,