

continuous platform extending on all sides of the caisson ; it was generally left open on all sides, but a small house was built at the south-east corner, in which a twenty-five horse-power engine and a donkey pump were placed ; a room was also enclosed in the middle of the south side for the use of the divers, where the air-pump and submarine apparatus was kept. At the south-west corner a staircase led to the second floor, which was placed on a level with the lower chords of the trusses. This floor extended over the caisson, having four holes in it through which the dredges worked ; it was completely housed in, was provided with work benches, warmed by stoves, and contained the lamp-room and superintendent's office. At either end a staircase led to the third floor, a narrow platform, resting upon the upper chords of the trusses, where stood the four hand-crabs used in handling the dredges.

The excavating machinery consisted of four large dredges of the endless chain pattern. They were mounted with vertical telescopic frames of wood, the lower tumbler being attached to a single frame, inclosed by a double frame which carried the upper tumbler ; the boxes of the upper tumbler were set on adjustable blocks.* By this arrangement the dredges could be lengthened to suit the depth at which they were operating, the length being varied from 51 to 85 feet ; this was done by removing the bolts which united the two frames, putting in an additional length of dredge chain, with the proper number of buckets, and raising the outer frame till the length of the added chain was taken up ; the bolts were then replaced and such slack as might remain in the chain taken out with the adjusting screws. The entire frames were raised and lowered, independently of this change in their length, by chains which passed through sheaves on the sides of the double frame, and were worked by the crabs on the upper floor. Two of these dredges had originally been used on the Quincy bridge and were now rebuilt to adapt them to this work ; a third was similar, and had been made from the same patterns, though designed in the first instance for use at Kansas City, on the old No. 4 foundation. These three dredges had square tumblers of cast-iron ; the links of the chains measured 22 inches between centres, and the buckets were bolted on every fourth link

* For plans and details of dredges, see Plates V. and VI. The plan on Plate V. shows the frame of shorter length than that actually used.