The columns are reinforced with four ¾-in. round bars tied by 1 in. by 1/16 in. hoop iron links at 10-in. intervals. Where the bars join the base they are inserted into wrought iron tube sleeves one-quarter inch larger in diameter and grouted with neat liquid cement. After the bases had set these rods kept the forms from rising when they were filled with wet concrete.

The forms for the columns were made in three sections built of two-inch planks with 4 ins. by 4 ins. cross pieces at three feet centres and held together by ⅝ in. bolts. Each section was numbered so that three forms made a complete column. Sufficient forms for twenty

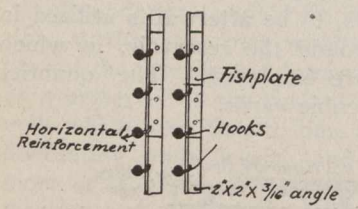

Fig. 3.—Standard and Hooks.

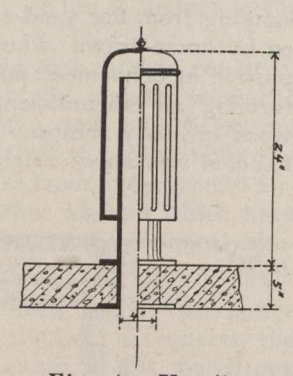

Fig. 4.—Ventilator.

columns were made and these were therefore used at least three times. These forms were assembled on the ground and hoisted up and lowered over the rods by means of a light gin pole on a monkey derrick built of skids. Lumber 2 ins. by 8 ins. was used to build up the derrick, and this was moved fom column to column by the men. The columns were braced by one-inch boards tied to the wall forms and were plumbed to assure the perpendicularity of the lower forms; the other forms were held in place by two bolts holding the second and third sections down to the one already filled in. One section about 9 feet high was filled each day.

Wall.—The wall is 57 inches thick at the floor level, while seven feet above the floor a steep batter on the outside reduces it to 18 inches, and from this point it tapers to 14 inches at the top water line. The wall then corbels out to allow a base for the roof beams and for a rain-water gutter. In the original design the wall was to be 9 ins. thick at the top and 14 ins. at a height of 5 feet above the floor, with three external reinforced concrete rings placed at points of equal pressure, to provide extra strength, as the work would be carried out under somewhat unusual conditions, but, owing to the delays already mentioned, it was deemed expedient to alter the design by eliminating the rings and thickening the walls by an equivalent volume of concrete and steel, so as to simplify the construction and thus expedite the work. The inside face of the wall is vertical.

The horizontal reinforcement in the wall was designed to take up the tensional stresses proportional to the varying depths of water. At the floor level there are two 1⅜-in. round bars at 3 ins. centres, curved to template to fit the curvature of the wall, and at the top 1 in. at 4½ ins. centres. These bars are held in place by 2-in. by 2-in. by ¼-in. angle steel standards in which holes were drilled at prescribed distances apart and ¼ in. steel hooks inserted to clip the rods. Such standards are 3 ft. 6½ ins. apart along the perimeter of the reservoir, and fixed so that there are 5 ins. of concrete between the horizontal steel reinforcement and the water face at the bottom, and 3 ins. at the top. This method of placing and fixing the horizontal bars resulted in a firm and satisfactory frame work which could not be disturbed when the men were placing the concrete.

The vertical reinforcement consists of half-inch bars at 8½ ins. centres, and are tied to the horizontals by black wire at every fifth intersection vertically and at each intersection on the fifth rows horizontally.

There are 45 buttresses spaced at 14 ft. 2 ins. around the outside of the wall. These buttresses are 2 ft. wide and project beyond the 14-in. wall at the top about 11 ins. and die out at the base. These are reinforced vertically by half-inch rods, spaced 4 ins. apart.

The walls, etc., were built in courses about 12 ins. high. Exery horizontal and vertical joint was thoroughly cleaned before the next layer of concrete was laid. Any concrete work which had been standing twenty-four hours or more had the laitance removed by picks, wire brushes, and plenty of water, so as to ensure a thoroughly sound bond. The concrete was well worked into the spaces between the steel rods, etc.

On the completion of the work, the wall, floor and columns were painted with hot liquid bituminous asphalte and afterwards limewashed.

The timber work necessary to form the internal surface of the wall consisted of bents erected about 14 ft. apart; the girts were spaced every five feet and on each row of girts were placed 6-in. by 6-in. beams. The one facing the studding had a segmental piece nailed on to its face to form the curve. On the top of the 6-in. by 6-in. timbers was built the runways or gangways which served to transport the materials. As the wall was built up to the level of the runways the timber work was made higher so as to command the next tier of concrete work.

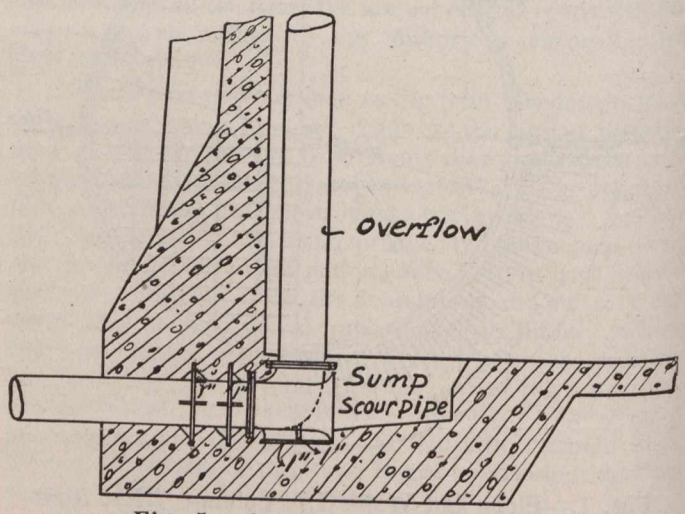

Fig. 5.—Overflow and Scour Pipe.

Roof.—The roof is constructed of 15-in. by 6-in. by 60-lb. rolled steel primary beams, cut to fit the 20-ft. spans and resting on the columns which are 20 ft. apart each way. The secondary beams are 12-in. by 5-in. by 31-lb. rolled steel joists fixed at 6 ft. 8 ins. centres and attached to the primary beams by angle iron brackets. The whole of the roof beams were rivetted together. The cover of the roof consists of 6 ins. concrete, reinforced with half-inch steel bars laid crossways at 6 ins. centres. The roof has a dome formation, being twelve inches higher at the centre than at the perimeter. The surface of the concrete was washed with hot liquid asphalte to prevent frost disintegrating the same.