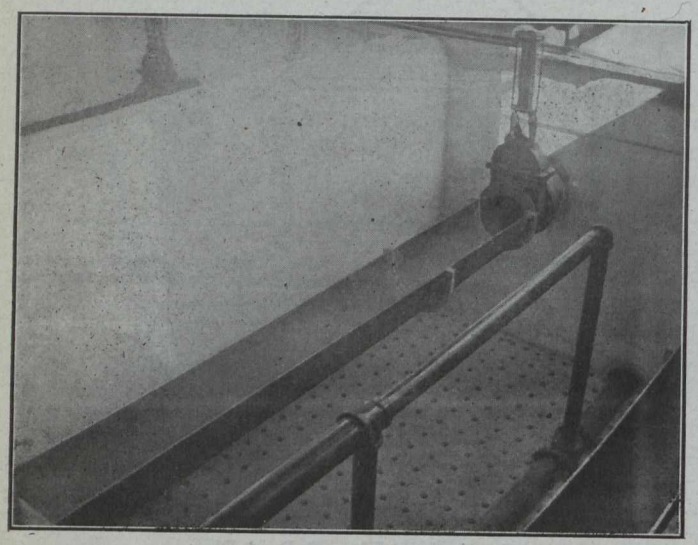
in. drain leads to the river. The coagulating basin is covered on top with 2½ ft. of earth and is banked at one side by an earth fill.

In locating the plant on the property owned by the town, it was necessary to place the back of the coagulating basin on the adjacent property line, and in order to



Bottom of a Filter Before Putting in the Media

prevent the water in the basin freezing, a frost-proof wall was constructed. The back wall of the basin is of concrete, approximately 12 ins. thick. The frost-proof wall consists of the concrete wall backed up by two brick walls, one 4 ins. thick and the other 8 ins. thick, leaving an air space next to the concrete wall and an air space between the two brick walls. This frost casing will prevent the freezing of the water in the basin. Manholes are provided in the top of the basin for entrance into the inlet chamber, overflow chamber, each half of the basin and outlet flume.

The clear-water basin is located immediately below the filters and the pipe gallery. The capacity of this basin is approximately 50,000 U.S. gallons. On the side adjacent to the old pumping station there is provided a sump from which the clear-water suction is taken to the high-lift pumps.

Directly over the clear-water basin are located the filters. These are three in number and back up the coagulating basin wall. Each filter unit has an area of 125 square feet. The full size of the shell, however, is 10 ft. by 13 ft. 9 ins. The filter shells are practically 7 ft. deep.

The Strainer System

The mechanical equipment consists chiefly of the strainer system in the bottom of each filter unit, several pipe lines, operating valves and stands, effluent controllers, down draught tubes, loss-of-head gauges, hydraulic valves, wash-water gutters, wash-water pump and air blower.

The strainer system consists of a cast-iron header which is placed directly in the bottom of the filter. This header is provided with 2-in. outlets on each side, every 6 ins. in its length, into which are jointed wrought-iron laterals, the laterals in turn being tapped on one line every 6 ins. to receive the brass strainer heads and trap tubes. The whole system, when installed in the bottom of the filter, is embedded in concrete, the concrete being brought up to the under side of the strainer cap, or the point of lowest waterway in the cap. All strainer heads are placed at one level. Through them, filtered water passes out and through them, when the filter is being cleaned, air and wash water enter.

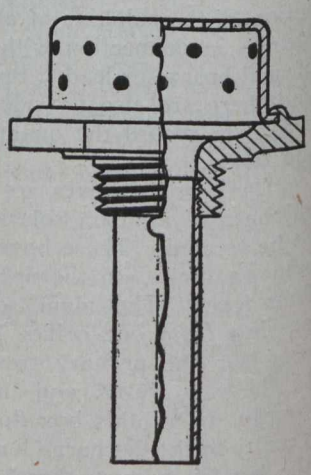
On top of the strainer system there is placed 9 ins. of graded gravel, this gravel being specially prepared and sized, the larger size being from 1 in. to ¾ in. and the smaller size ⅛ in. On top of the gravel is placed 27 ins. of filtering material. This material consists of two-thirds silica sand and one-third crushed marble, the marble being screened to the same size as the sand.

Other Mechanical Equipment

Immediately over the sand, and 13 inches above it, are located two wash-water gutters in each filter. These gutters are of cast iron, the lips being planed to a true line so that all may be placed level. These gutters are practically 12 ins. wide and are 6 ins. deep at one end and 10 ins. deep at the outlet end. At the outlet end they are provided with a casting for placing in the breast wall of the sewer sump.

The several pipe lines, or immediate filter piping, consist of the wash-water drain (or sewer), the effluent pipe, the wash-water main and the air main. The air main is connected to the air blower and passes through the pipe gallery, through the front wall of the filters, downward through the filter bed and connects to the header section of the strainer system. The wash-water main passes through the pipe gallery and is connected to the header section outside of the filter shell. The effluent piping is also connected to the header section of the strainer system outside of the wall. The drains are connected to the sewer sump at the face of the filters. All of these different lines are provided with gates, the stems of these gates reaching to the operating floor, where they are provided with floor stands and hand-wheels, each hand-wheel being plainly marked, denoting which valve it operates.

The effluent controllers used in this plant are of the Venturi type and they serve the purpose of controlling the flow of the effluent from the filters; that is to say, they maintain a constant rate of flow at all times.



Brass Strainer Cap

The loss-of-head gauges, one provided for each filter, are for the purpose of recording the frictional loss of head of the water in its passage through the filter bed. Each loss-of-head gauge consists of two 5-in. tubes in each of which there is a copper float. One tube is connected directly to the water on the surface of the filters and the other tube is connected to the effluent or pipe leading from the header of the strainer system. The float necessarily moves with the water in these tubes, and as the filter becomes clogged and more head is required to force the water through, a suction is effected by the down draught tube through the controller and this head is recorded in the tube provided for that purpose. Through a system of gears and by attaching a cord and weight to the floats, a hand passing over a dial of the loss-of-head gauge indicates this movement. The gauge is also provided with an electric bell and electric connections, so that when a predetermined loss of head is obtained, the bell