

Fig. 2.—Longitudinal Section Through Plant.

The water is distributed from this pipe to each of the ten filters situated in the filter house. Each filter consists of a steel tank 50 feet in diameter and supported by cast iron columns. In the centre of the tank is a circular space 16 feet 8 inches in diameter in which is situated the relief valve apparatus. Each filter is sub-divided into thirty units, twelve in the inner ring and eighteen in the outer ring. These units are separated from each other by steel plates rising about 3 feet above the bottom of the underdrain system. Surrounding each unit is a space  $2\frac{1}{2}$  inches wide in which is placed a standard cast iron extractor system. Through the centre of each of these units is a 6-inch wrought iron pipe conveying the water from the raw water ring main to each of the thirty units in the filter. On the line of this 6-inch pipe is placed a sand washer by means of which the dirty drifting sand is freed from its impurities and after cleansing is caught up into the on-going pipe through an ejector throat placed in the sand washer.

The underdrain system consists of a cast iron collector from which radiates  $1\frac{1}{2}$ -inch sherardized pipes. These  $1\frac{1}{2}$ -inch pipes are placed 6 inches centre to centre and have a  $\frac{3}{8}$ -inch diameter hole placed 6 inches centre to centre drilled in the bottom of each pipe. At the end of each of these pipes there is a sherardized cap. All of the drilling of holes and threading of these pipes is done before they are sherardized. Concrete is filled into the bottom of each of the units up to within 1 inch of the bottom of these collector pipes. Gravel is then placed around these pipes (to a depth of 9 inches) in three layers of different grades varying from  $1\frac{3}{4}$ -inch in diameter down to the size of pea gravel. On top of this is placed the filter sand to a depth of approximately 9 feet. Screens between the gravel and sand have not been adopted as these have

been found to give way during backwash and aggravate the difficulty they were intended to remove.

The back-washing of these filters is to be done entirely with water and the apparatus will be automatically controlled so that the period of back-washing extends over 15 minutes. The control valve is fixed in such a way that

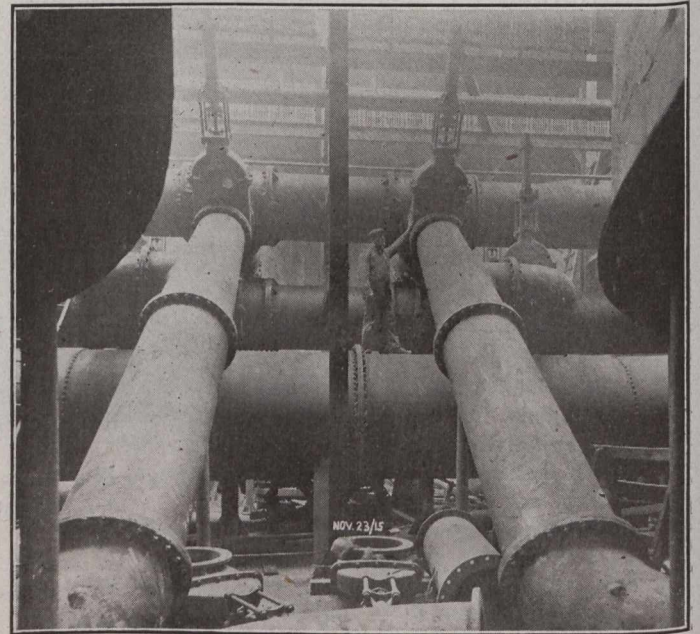


Fig. 3.—View Between Two Filters, Looking Towards Central Gallery.

it takes ten minutes before the full area of the valve is open, and the final five minutes of back-washing has the full capacity of the pipe coming on to the filter. This gradual lifting of the sand and gradually increasing volume of water is depended upon not to blow the gravel up into the filter sand.

The water is collected up into a ring main underneath each filter and from there passes into the central filter

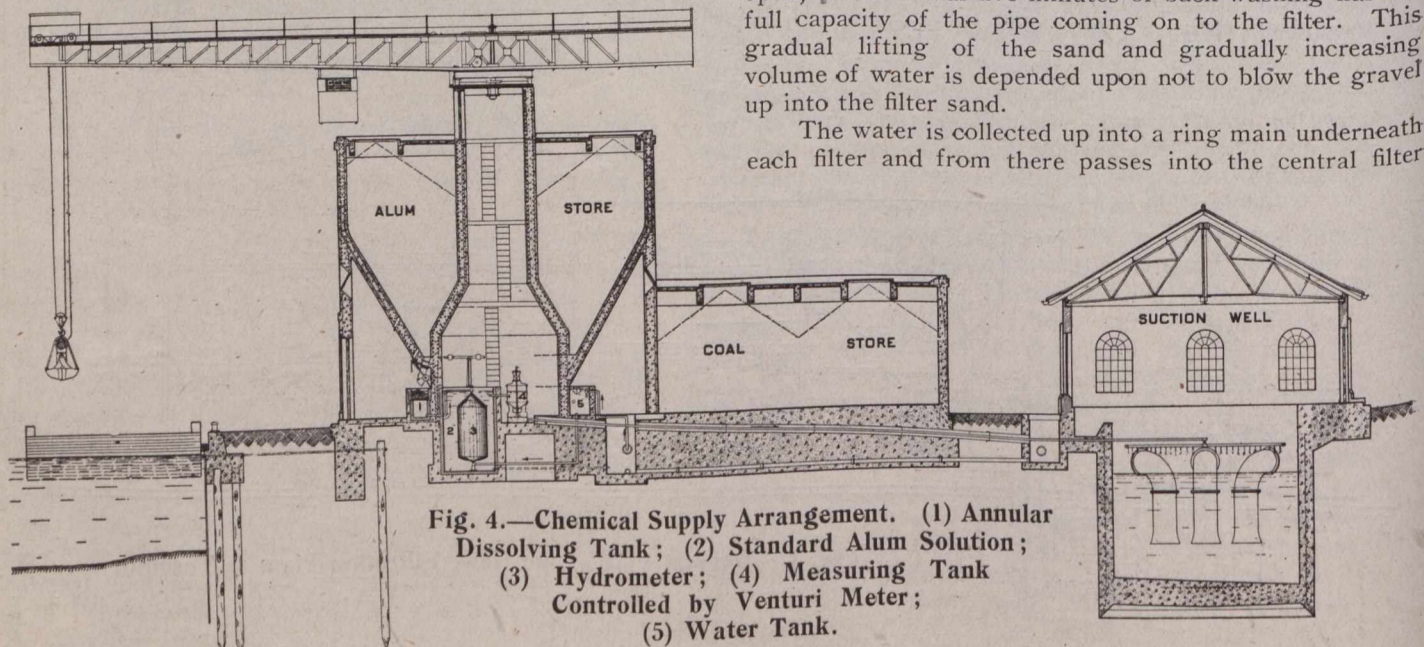


Fig. 4.—Chemical Supply Arrangement. (1) Annular Dissolving Tank; (2) Standard Alum Solution; (3) Hydrometer; (4) Measuring Tank Controlled by Venturi Meter; (5) Water Tank.