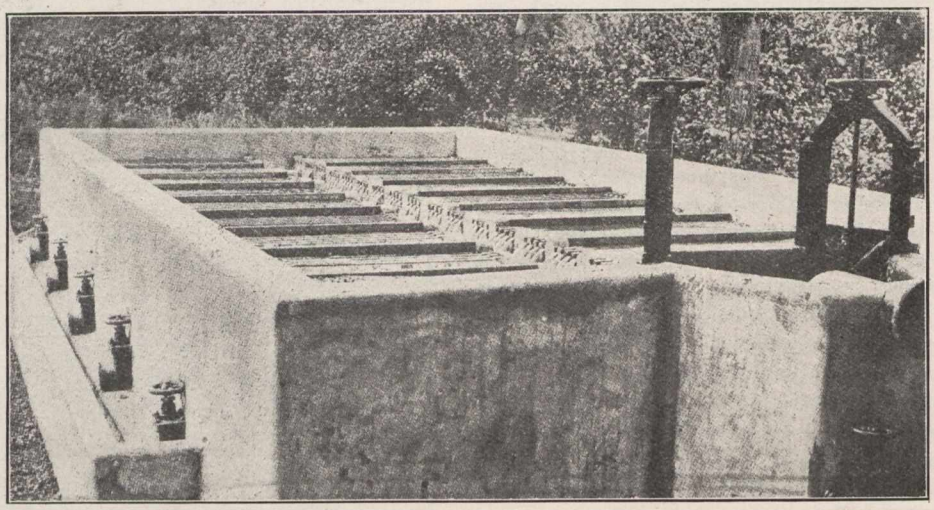
The section of the suspended solids which have a less specific gravity than water accumulate on the underside of the dome cover of the Kessel, and are easily withdrawn therefrom by opening the discharge pipe for gas and fat, closing the valves in the three syphon legs and turning on the water supply.

The liquid portion, freed from solids in suspension, passes off through the effluent carrier either to filters or land. The rate of discharge through the effluent carrier is in exact proportion to the flow entering the inlet chamber. With some sewages the treatment by the Kessel is sufficient to admit of its being passed direct into a stream.

The author is also of opinion that it is desirable to treat in a similar manner all sewage where it is now discharged in a crude state into the sea, as it is scarcely possible to find any important seaside resort without a sewage outfall far too close to the beach set apart for bathing.

The quantity which can be treated depends upon the size of the Kessel used and the nature of the sewage, and will vary from a flow, which will produce an upward motion over the whole sectional area of the Kessel or cylinder of



Separator Treating 30,000 Gallons per Hour. Outside Dimensions 33 ft. by 18 ft.

half to one millimetre per second, or, put into English measure, from 1¼ to 2½ inches per minute.

To give an example of the size required, a Kessel with a diameter of eight feet would deal with from 2,000 to 4,000 gallons per hour; a diameter of 30 feet, 25,000 to 50,000 gallons per hour. The height is, of course, limited by the atmospheric pressure as compared with specific gravity of the liquid dealt with; that is, from 27 to 30 feet. Putting the size of the Kessel in terms of the flow to be treated, it should hold from 1½ to 3 hours' flow.

With regard to the results produced by this class of installation, analyses show that with waste from a paper factory, 75 to 90 per cent. of suspended matter was eliminated according to the rate of flow, whereas with slaughter-house refuse as much as 99.7 of the solids in suspension and 99.6 of fat is removed.

With an ordinary domestic sewage about 70 per cent. of the solids in suspension were removed.

These results compare very favorably with those given in the Royal Commission Report previously referred to. The best examples given of results from treatment by sedimentation tanks show a removal of about 50 per cent. of the suspended solids from tanks which hold as much as from 10 to 15 hours' flow.

The second type of separator consists in its essential features of a shallow tank, the capacity of the grit chamber being sufficient to steady the flow of sewage and admit of the grosser and heavier solids sinking and the lighter solids rising. The exit from the grit chamber to the shallow tank following it is kept well below the surface, and the flow passing forward contains only the more finely divided solids in suspension, the specific gravity of 99 per cent. of which will be found to be slightly in excess of water in almost all sewages.

In the somewhat larger area of the tank these finer solids sink to the bottom if the outlet from the tank is arranged so as to avoid any movement in the liquid, the velocity of which is sufficient to carry the finely divided solids forward with it. To put it in other or more familiar words, there must be no movement in the tank with what we should call in a sewer a "self-cleansing velocity."

The method by which this is attained in the separator now under consideration is by dividing the flow from the tank over the edges of a large number of small channels placed on the surface, all of which are set truly level the one with the other. The flow is thus divided over what may technically be said to be a very long length of weir. The velocity of the approach to the weir is so low that even the finely divided solids are left behind if their specific gravity is the least in excess of water.

In larger plants the shallow tank is divided into sections for the better regulation of the flow through same. (Plate No. 2 shows a separator of this class, capable of dealing with 30,000 gallons per hour of ordinary sewage.) Both the grit chambers and the shallow tanks are fitted with floors and draw-off pipes especially designed for the easy removal of the solids.

For continuous work this type of separator should be arranged in duplicate like that shown in the view, so that one half may be cleared of solids while the other is in action; one section should be cleared daily.

The tanks and grit chambers are both fitted with arrangements for drawing off as much as possible of the supernatant water before the solids are withdrawn.

The total capacity of an effective plant of this type may be kept down as low as half-an-hour's flow of the maximum volume to be dealt with, and such capacity divided into the two sections above referred to.

Some remarkable results have been obtained with a plant of this type at Dorchester, where at least 25 per cent. of the total volume of the sewage is brewery refuse. The proportion of suspended solids removed from the crude sewage in this manner is as high as 96.5 per cent., and at