

L. E. REIN & J. W. COX.
 DEVICE FOR ACTIVATING SLUDGE.
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1,286,775.

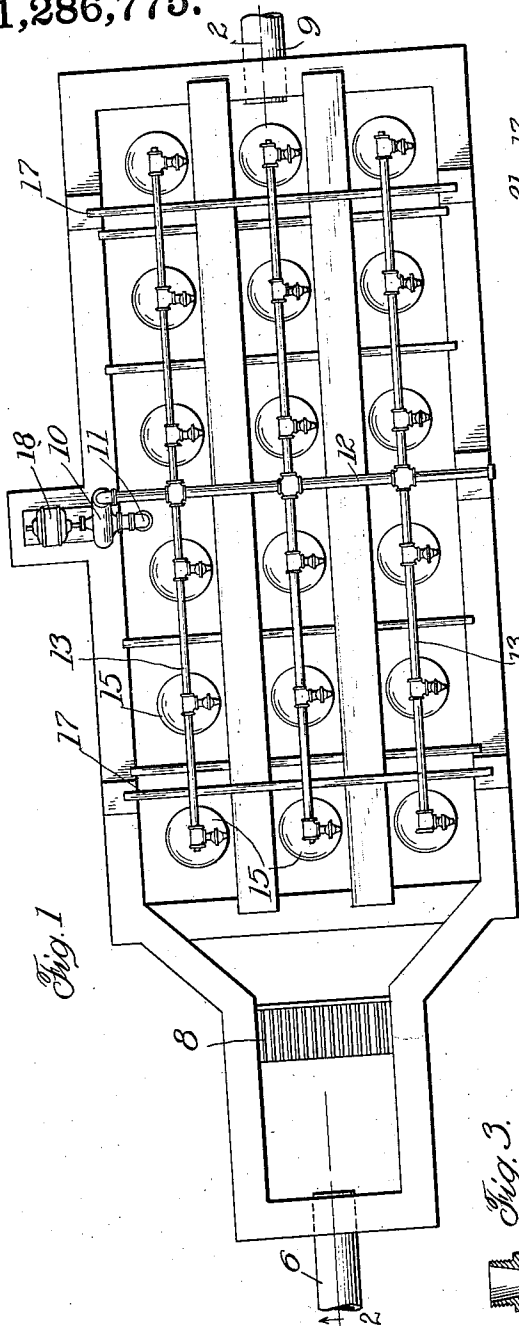


Fig. 1

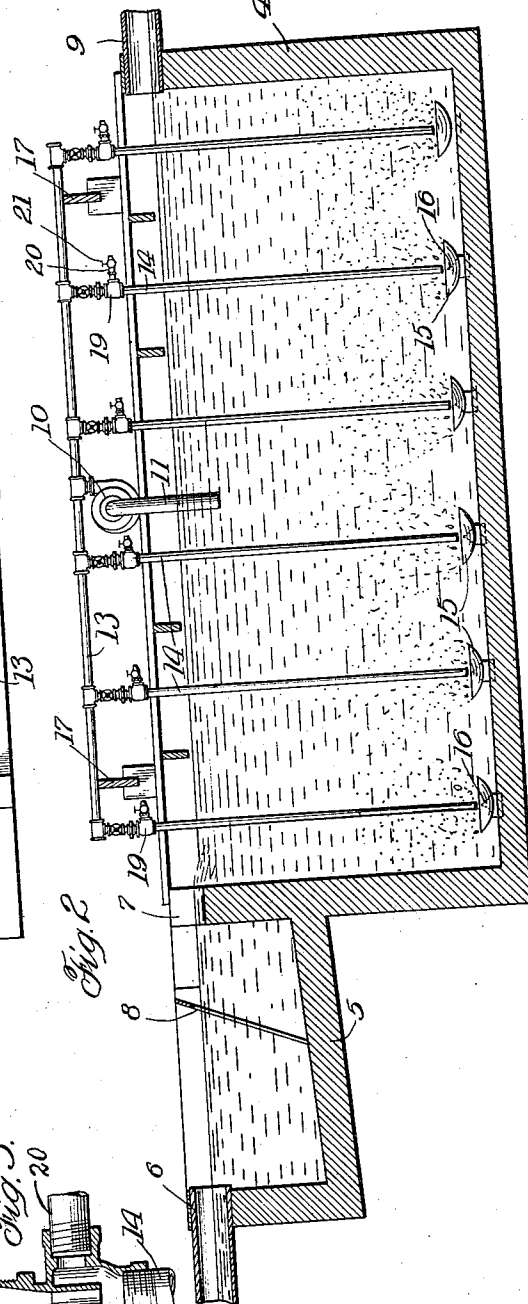


Fig. 2

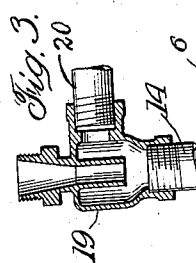


Fig. 3

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UNITED STATES PATENT OFFICE.

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DEVICE FOR ACTIVATING SLUDGE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, LESTER E. REIN and JAMES W. COX, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Devices for Activating Sludge, of which the following is a specification.

Prior to our invention it has been known that sludge, sewage and the like, can be made inoffensive and innocuous by subjecting it to bacterial action, and that this action can be very largely increased and certain chemical changes of a desirable nature effected by aerating the same. Our invention relates to certain improved apparatus for effecting this aeration.

In the accompanying drawing we have shown and in the following specification described in detail a preferred embodiment of our invention. It is to be understood, however, that the specific disclosure is for the purpose of exemplification only and that the scope of the invention is defined in the following claims in which we have endeavored to distinguish it from the prior art so far as known to us without, however, relinquishing or abandoning any portion or feature thereof.

Referring now to the drawing, Figure 1 is a plan view of a preferred embodiment of our invention; Fig. 2 a vertical longitudinal section thereof upon the line 2—2 of Fig. 1, and Fig. 3 a sectional detail.

We have shown our invention as applied to a sewage tank of an ordinary type in which sewage is or may be continually flowing into the tank, and the liquid portion of the products of activation continually withdrawn. It is to be understood, however, that the invention is equally applicable to tanks in which there is no such continual flow. In the particular form of tank shown the main receptacle 4 is provided with a screening tank 5 into which the sewage flows from a supply pipe 6 and from which it flows at 7 over a dam into the main tank. A screen 8 of any suitable form is provided in the chamber. An outlet pipe 9 for permitting the escape of the watery contents of the sludge after it has been submitted to treatment is provided at the end of the main tank remote from the inlet thereto.

Our improved apparatus comprises a pump 10, the inlet 11 of which extends be-

neath the level of the sewage in the tank, and the outlet of which is connected to a transverse distributing pipe 12, from which lead longitudinal pipes 13. Each longitudinal pipe is provided with a series of vertical return pipes 14 depending therefrom and extending nearly to the bottom of the tank, and beneath the lower open end of each pipe 14 is arranged a guide bowl 15 having a central projection 16, the purpose and effect of which is to receive the material flowing through pipes 14 and divert it upward into the body of the material within the tank. This system of piping may be supported in any suitable manner above the tank, as for example, by the beams 17, and the pump is provided with a suitable motor 18. Each of the vertical pipes 14 is provided with an injector nozzle 19 to which is connected a pipe 20 opening to the air and provided with a valve 21 for controlling the same.

The operation of the construction will be readily understood. The pump is continuously operated and draws a constant stream of sewage from the body thereof and distributes it through the various longitudinal pipes and to the vertical pipes which are so numerous arranged as to discharge the material into all portions of the tank. Before its return to the tank, however, the sewage or sludge is aerated, air being drawn in through the injectors above described in a quantity which may be regulated by the valves provided for that purpose. The aerated sludge is discharged at the bottom of the tank and in such manner that it is distributed throughout the body of the sewage, thus supplying air to all the portions thereof. Furthermore the circulation of the sludge by this means effects a constant agitation of the body of the latter whereby the desired changes are hastened.

We claim:

1. An apparatus for activating sludge comprising a sewage tank having an inlet and an overflow outlet, a pump having an inlet member adapted to extend within said tank, a return pipe connected to the exhaust of said pump and means for introducing air into the material intermediate the inlet of the pump and the outlet of the return pipe.

2. In a device of the class described, a sewage tank having an inlet and an over-

flow outlet, a pump having an inlet member adapted to extend into said tank, a series of return pipes connected to the exhaust of the pump and means for introducing air into the return pipes.

5 3. In a device for the purpose described, a sewage tank having an inlet and an overflow outlet, a pump having an inlet member adapted to extend into said tank, a return
10 pipe connected to the exhaust of the pump and an injector adapted to inject air into the material flowing through the pump and return pipe.

4. In a device of the class described, a
15 sewage tank having an inlet and an overflow outlet, a pump having an inlet member adapted to extend into said tank, a return pipe connected to the outlet of the pump and an injector located in the return pipe and
20 adapted to introduce air into the material flowing therethrough.

5. In a device of the class described, a

sewage tank having an inlet and an overflow outlet, a pump having an inlet member adapted to extend into said tank, a system
25 of distributing pipes connected to the exhaust of the pump, a series of return pipes connected to the distributing pipes and injectors connected to the return pipes and adapted to introduce air into material flow-
30 ing thereinto.

6. In a device of the class described, a sewage tank having an inlet and an overflow outlet, a pump having an inlet member adapted to extend into said tank, a return
35 pipe connected to the exhaust of the pump, an injector connected to the return pipe and adapted to inject air into the contents thereof, and a deflector guide arranged at the outlet of the return pipe and adapted to deflect
40 the discharge therefrom into the body of the material in the tank.

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