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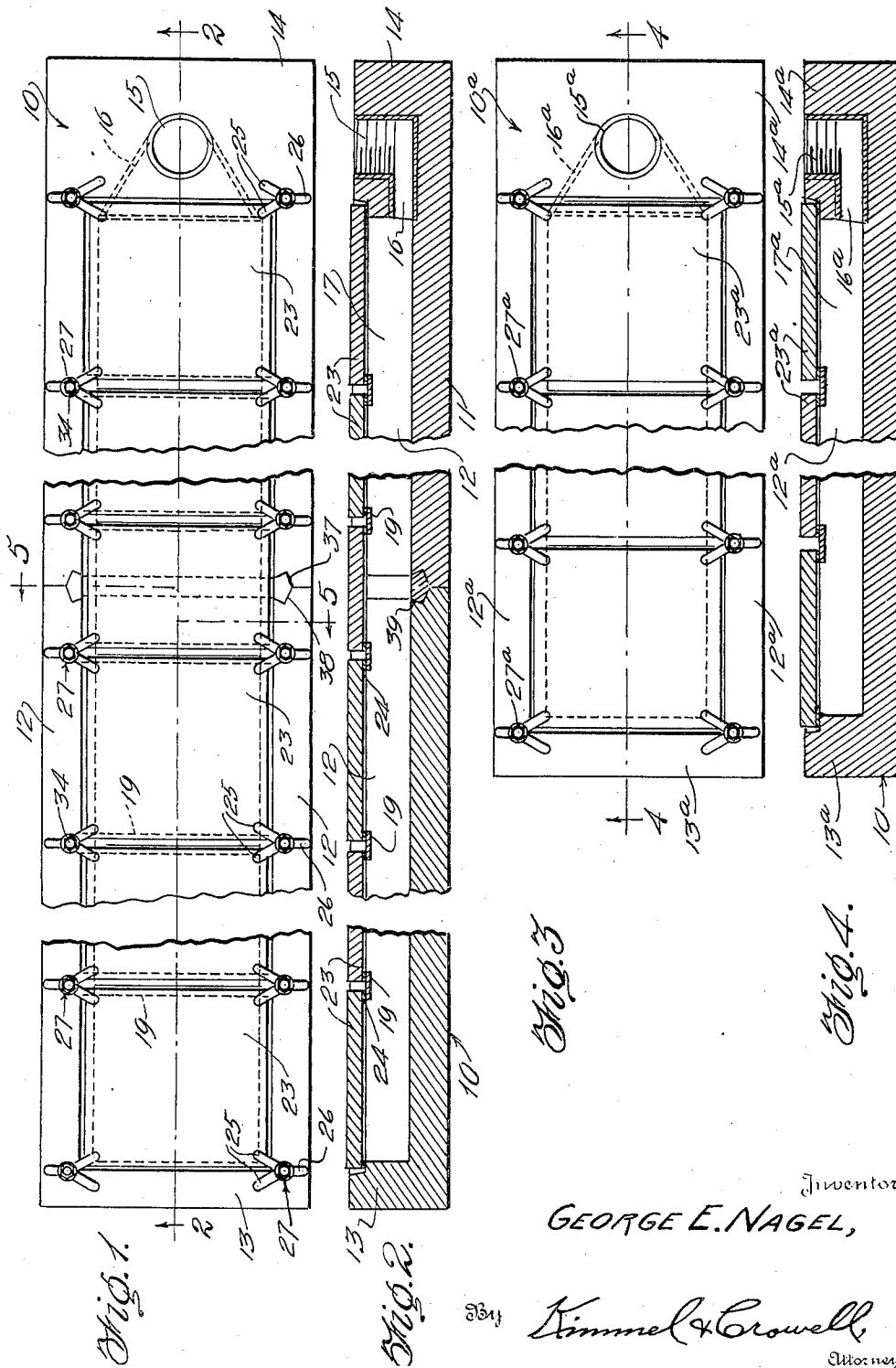
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2,166,017

DIFFUSER PLATE CONTAINER FOR SLUDGE TREATMENT

Filed March 11, 1938

2 Sheets-Sheet 1



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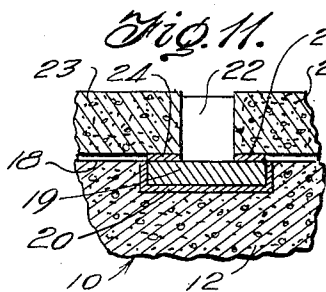
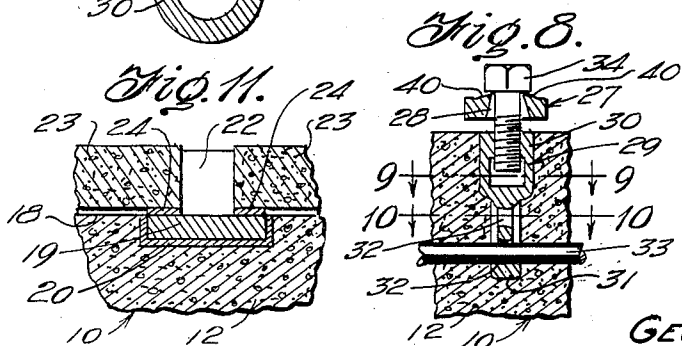
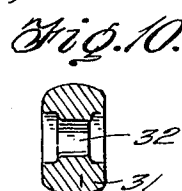
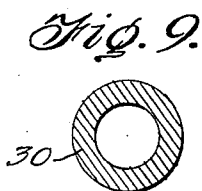
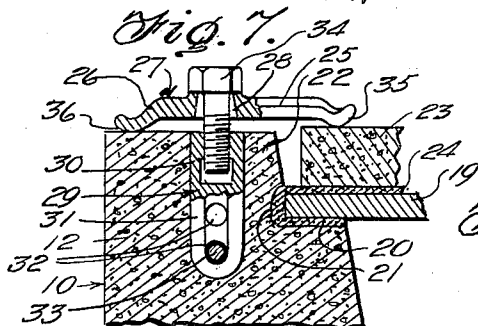
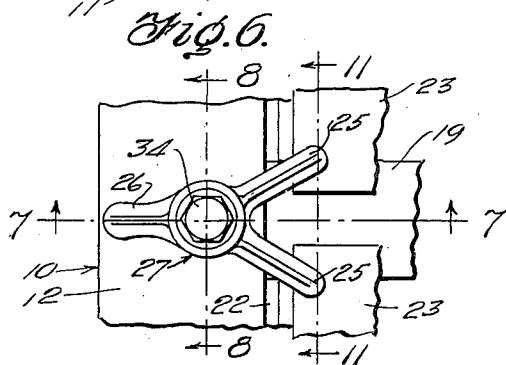
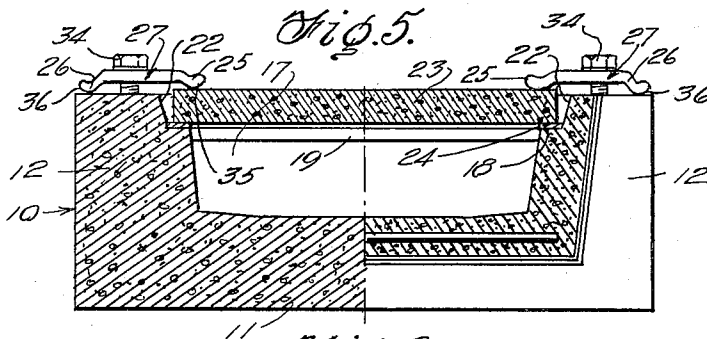
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DIFFUSER PLATE CONTAINER FOR SLUDGE TREATMENT

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2 Sheets-Sheet 2



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DIFFUSER PLATE CONTAINER FOR SLUDGE
TREATMENT

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3 Claims. (Cl. 261-122)

This invention relates to the aerating process for the treatment of activated sludge, and more particularly to an improved container or receptacle for holding the diffuser plates used in distributing the air through the sewage.

An object of this invention is to provide an improved aerated means for the treatment of sludge which is so constructed that the diffuser plates used in diffusing the air through the sludge are detachably held in a container in such a manner that when the plates become somewhat clogged the plates may be readily removed for cleaning purposes.

Another object of this invention is to provide an improved holding or clamping means together with a sealing means for the diffuser plates so that the plates can be properly sealed on the supports thereof and can be readily removed for cleaning after they have been in use for a period of time.

Another object of this invention is to provide an improved clamping means for the plates which is adapted to engage the corners of adjacent or abutting plates so as to place a uniform pressure on the adjacent plates.

To the above objects and others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawings wherein is shown embodiments of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a detail top plan of a sludge treating means, partly broken away, constructed according to an embodiment of this invention,

Figure 2 is a longitudinal section taken on the line 2-2 of Figure 1,

Figure 3 is a detail top plan of a modified form of this device,

Figure 4 is a sectional view taken on the line 4-4 of Figure 3,

Figure 5 is a sectional view partly in elevation taken on the line 5-5 of Figure 1,

Figure 6 is an enlarged fragmentary top plan of one of the clamping or holding means,

Figure 7 is a fragmentary sectional view taken on the line 7-7 of Figure 6,

Figure 8 is a sectional view taken on the line 8-8 of Figure 6,

Figure 9 is a sectional view taken on the line 9-9 of Figure 8,

Figure 10 is an enlarged sectional view taken on the line 10-10 of Figure 8, and

Figure 11 is a sectional view taken on the line 11-11 of Figure 6.

Referring to the drawings, the numeral 10 designates generally a receptacle or container which is preferably constructed initially of plastic material, such as concrete or the like, and is provided with a flat bottom 11, upstanding side walls 12 and end walls 13 and 14. The container or receptacle 10 is provided at one end 14 thereof with an intake pipe 15 which is provided with a flared nozzle 16 discharging into the chamber 17 provided between the upstanding side walls 12 and the upstanding end walls 13 and 14. The pipe 15 is adapted to be connected to a suitable source of air supply and the air is projected through the nozzle 16 under the desired pressure.

The side walls 12 are provided with a horizontally disposed seat or shoulder 18 extending through the length thereof, and a plurality of transversely extending supporting bars 19 are adapted to engage on the shoulder or seat 18. The supporting bars 19 are firmly held on the shoulder or seat 18 by means of cement 20 or the like and preferably, the side walls 12 are cut back as at 21 so that the cement at the ends of the supporting bars 19 will engage in the cut-out or recess portion 21. The side walls 12 are inclined to the vertical as at 22, extending upwardly from the supporting bars 19.

The opposite ends of the supporting bars 19 are preferably countersunk in the shoulder 18 so that the upper ends thereof are substantially flush with the top of the shoulder 18. The diffuser plates 23 are substantially rectangular in plan and are of a size to extend between the side walls 12 so that the opposite edge portions thereof will rest on the opposite shoulders 18 and the width of the plates 23 is such that an edge portion thereof will partially overlie a supporting bar 19 as shown in Figure 1. The adjacent edges of adjacent diffuser plates 23 are preferably spaced apart as shown in Figure 2 so that when it is desired to remove the diffuser plates from the receptacle 10 a tool may be inserted between the adjacent edges of two plates and the desired plate pried up off of the supporting bar, and in like manner the inclined side wall portion 22 provides a sufficient space between the side wall 12 and the adjacent edge of a diffuser plate so that a tool, such as a screw driver or other pry means may be inserted for engagement with the lower edge of the diffuser plate. The diffuser plates are securely held on

the side walls 12 and on the supporting bars 19 by means of a sealing means 24 in the form of cement or other initially plastic material. These diffuser plates are preferably constructed of pervious material which has a construction so that

air may be forced therethrough with the air stream broken up in a manner that the exuding air will be diffused with the sludge engaging on the plates 23.

The plates 23 are also clamped or tightly held on the shoulder 18 and the supporting bars 19 by clamping means comprising a pressure member in the form of a pair of divergent fingers or arms 25 and a third arm 26. The divergent fingers or arms 25 are adapted to engage the adjacent corners of adjacent plates 23 as shown in Figure 6. The clamping member generally designated as 27 is provided with a hole 28 therethrough. An anchoring member generally designated as 29 is embedded in a side wall 12 and comprises an internally threaded sleeve 30 which is provided with a dependent apertured extension 31. The extension 31 is preferably provided with a plurality of apertures 32 and a reinforcing bar 33 is adapted to engage through one of these apertures 32 as shown in Figure 8. A bolt 34 engages through the hole 28 of the clamping member 27 and is threaded into the sleeve 30 so that the tightening of the bolt 34 will place pressure on the fingers 25 and 26. As shown in Figure 7, the lower ends of the fingers 25 and 26 are preferably downwardly off-set and rounded, as at 35 and 36 respectively. In this manner the contacting portions of the fingers 25 and 26 with the plates 23 and the side wall 12 respectively may have slight movement without injury to either the plates or the side wall. The pressure member 27 is also provided with downwardly inclined portions 40 extending from the hole 28 so that in the event one diffuser plate is slightly higher than the other diffuser plate engaged by the same pressure member, the arms or fingers 25 may be disposed in different horizontal planes, but due to the novel construction of the pressure member in the three-point contact between the two plates and the side wall 12, the plates 23 will receive equal pressure irrespective of the fact that one plate may be slightly higher or lower than an adjacent plate.

The construction disclosed in Figure 1 shows the use of a pair of coupled units having confronting keyways 37 and 38 in which a sealing means 39 is positioned to seal the joint between adjacent units. By this means any desired length may be obtained for a complete unit or container.

In Figures 3 and 4, there is disclosed a slightly modified form of this container wherein the container 10^a is constructed as a single unit instead of coupled units as disclosed in Figure 1. In this form the end walls 13^a and 14^a are integral with the side walls 12^a and are also integral with the bottom wall. The pressure members 27^a are similar in every detail to the pressure members 27 and engage the plates 23^a as hereinbefore described. In this form an intake pipe 15^a is provided in the end wall 14^a and a discharge nozzle 16^a of flared form communicates with the air chamber 17^a and with the pipe connection 15^a.

In the use of this aerating device, the container 10 is connected to the air supply by means of the connection 15 which as shown in Figure 2 extends upwardly at right angles to the discharge nozzle

16. The diffuser plates 23 are clamped onto and sealed on the side walls 12 and the supporting bars 19 by means of the clamping members 27 and sealing means 24. The outer edges of the diffuser plates are free of any sealing means as shown in Figure 7 and also in Figure 1 so that when it is desired to remove the plates 23 for cleaning, the clamping members 27 may be released by loosening the bolts 24. A tool such as a screw driver or other pry device is then inserted in the space between the adjacent edges of adjacent plates and between the side walls 12, and the adjacent edges of the plates 23. A slight pressure will release the plates 23 from the sealing means 24 so that the plates may be removed and treated in a suitable manner so that they will be thoroughly cleaned. By means of the aerating device hereinbefore described, the diffuser plates can be used indefinitely and are not readily broken in their removal from the container as is at present the case.

What I claim is:

1. In a receptacle for treatment of sludge, a container provided with upstanding side walls, a plurality of pervious plates engaging said container above the bottom thereof, and means for detachably holding said plates in applied position, said means comprising a pressure bar provided with a downwardly off-set arcuate end portion engageable with the upper side of a side wall, a pair of divergent fingers integral with said bar having downwardly off-set arcuate end portions engageable with the adjacent corners of adjacent plates, said pressure bar having an opening therethrough and oppositely inclined upper side portions extending downwardly from the upper end of said opening, a sleeve embedded in a side wall provided with interior threads, an apertured member carried by said sleeve and extending downwardly thereof, an anchoring bar extending through an aperture of said latter member and a threaded bolt engaging through said opening in said pressure bar and the threads of said sleeve whereby to detachably hold said pressure bar in applied position.

2. In a receptacle for treatment of sludge including a concrete container and a plurality of pervious plates carried by said container; a nut member embedded in a wall of the container, a looped extension carried by the nut, an anchoring bar embedded in said container and engaging through said extension, a triple armed pressure member having one arm thereof engaging a wall of the container and the other arms engaging a pair of adjacent plates, and a bolt engaging through said pressure member and threaded into said nut.

3. In a receptacle for treatment of sludge including a concrete container and a plurality of pervious plates carried by said container; a nut member embedded in a wall of the container, a looped extension carried by the nut, an anchoring bar embedded in said container and engaging through said extension, a triple armed pressure member having one arm thereof engaging a wall of the container and the other arms engaging a pair of adjacent plates, and a bolt engaging through said pressure member and threaded into said nut, said pressure member having a substantially V-shaped upper surface.

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