

**Aug. 4, 1942.**

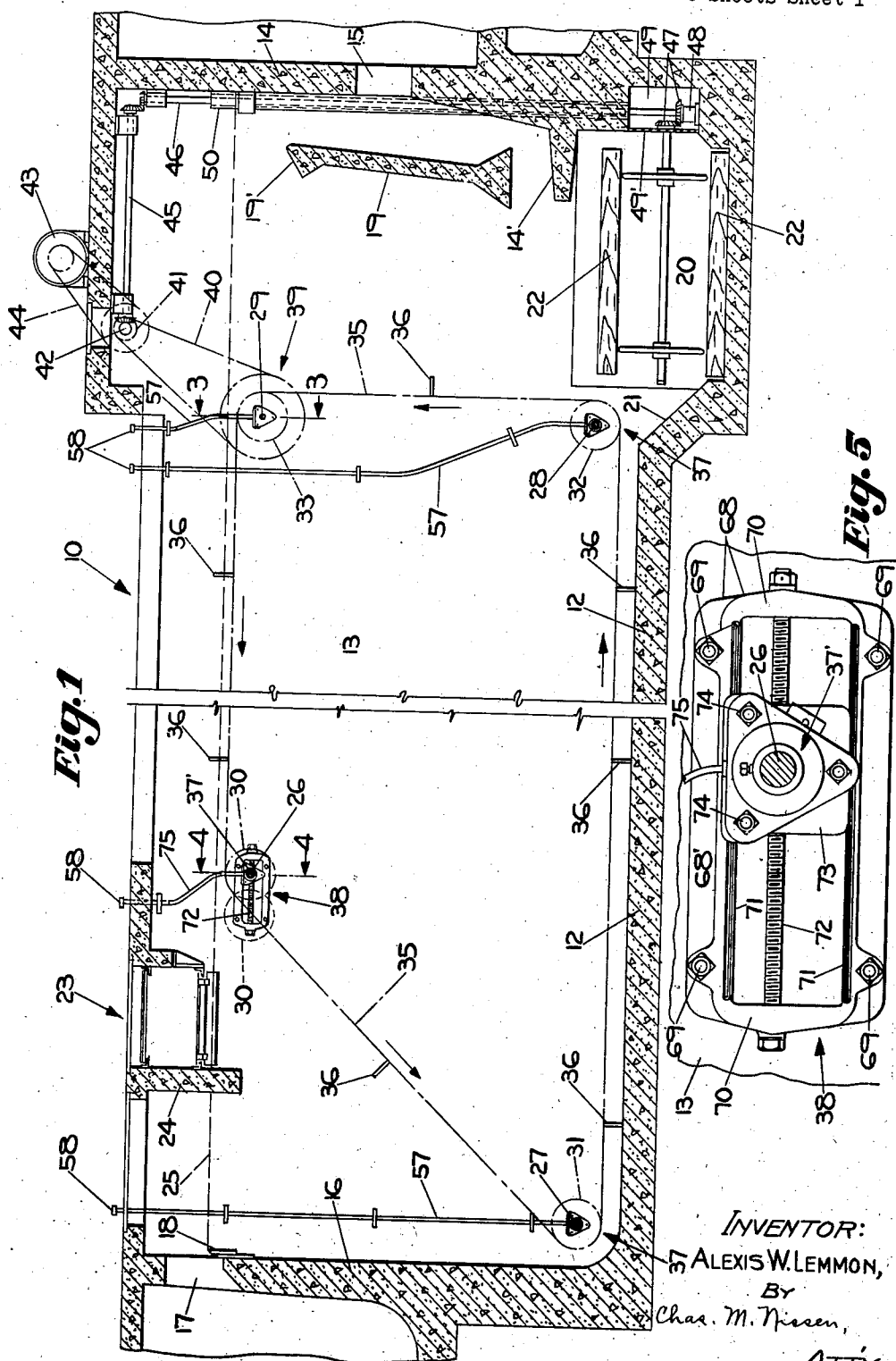
**A. W. LEMMON**

**2,291,641**

## SEWAGE DISPOSAL APPARATUS

Filed Feb. 5, 1938

3 Sheets-Sheet 1



*INVENTOR:*

37 ALEXIS W. LEMMON,

By

Chas. M. Nissen

ΑΤΤΥ.

Aug. 4, 1942.

A. W. LEMMON

2,291,641

SEWAGE DISPOSAL APPARATUS

Filed Feb. 5, 1938

3 Sheets-Sheet 2

**Fig. 2**

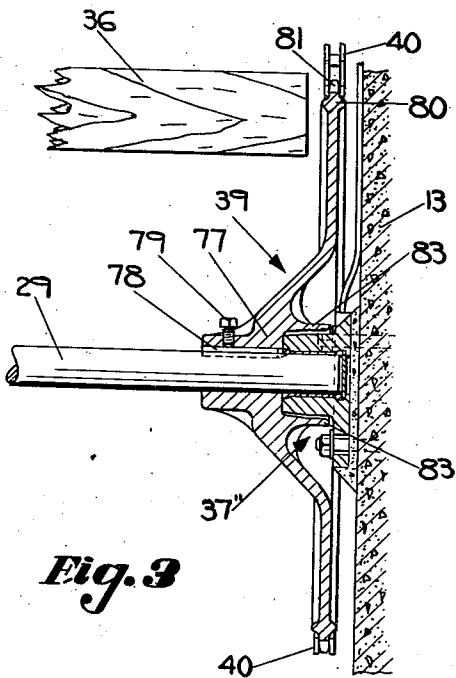
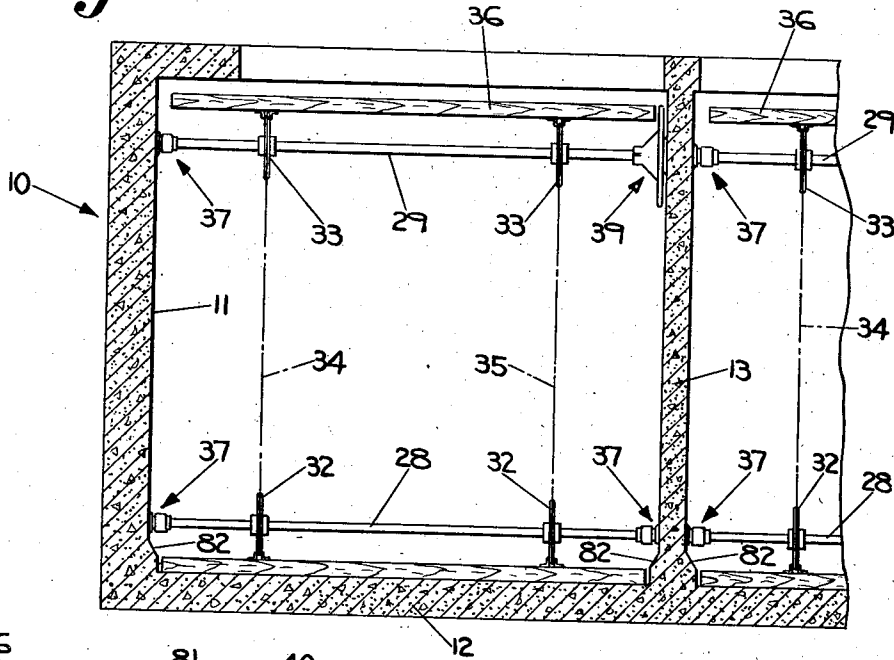


**Fig. 3**

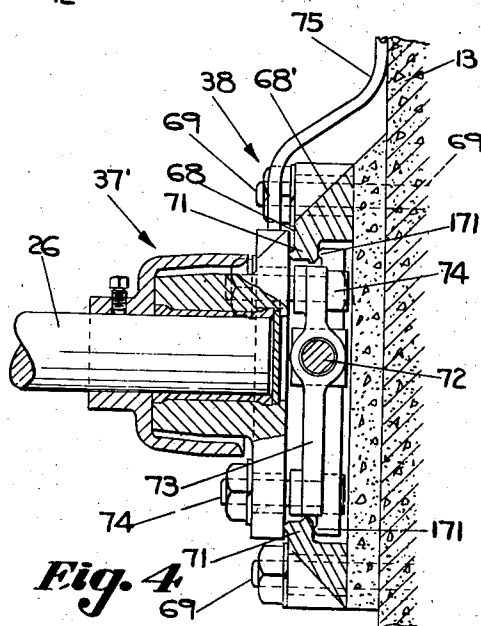


**Fig. 4**

INVENTOR:  
ALEXIS W. LEMMON,  
By  
Char. M. Nissen,  
ATT'Y.

**Aug. 4, 1942.**

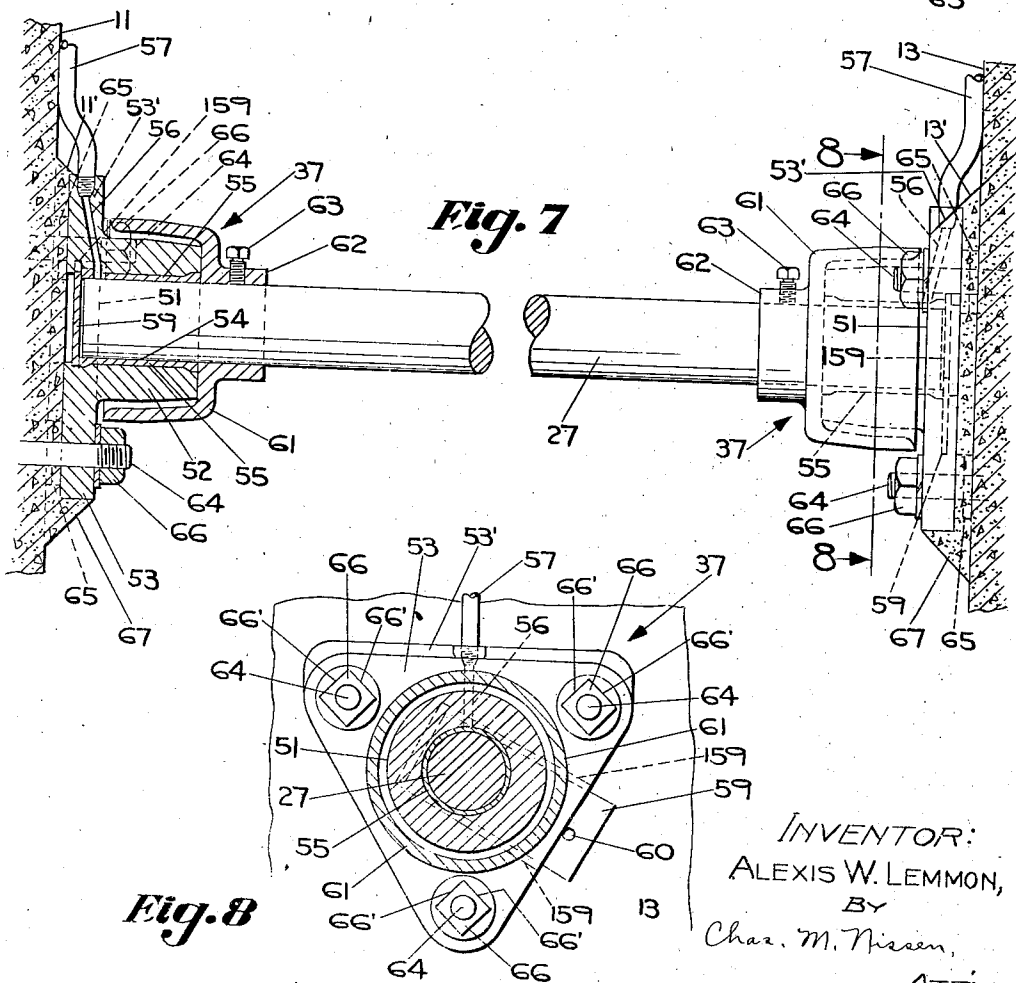
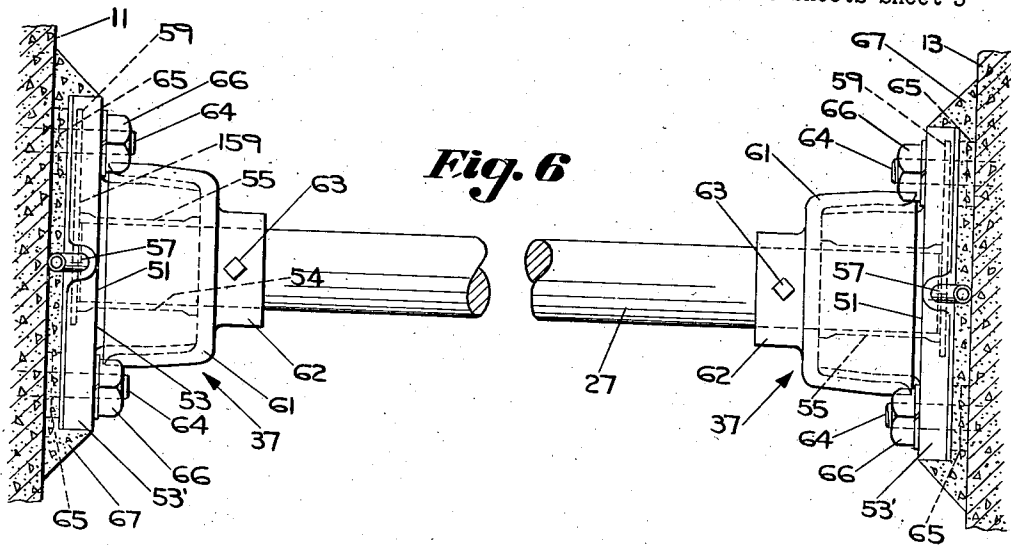
**A. W. LEMMON**

**2,291,641**

# SEWAGE DISPOSAL APPARATUS

Filed Feb. 5, 1938

3 Sheets-Sheet 3



## UNITED STATES PATENT OFFICE

2,291,641

## SEWAGE DISPOSAL APPARATUS

Alexis W. Lemmon, Columbus, Ohio, assignor to  
The Jeffrey Manufacturing Company, a corporation of Ohio

Application February 5, 1938, Serial No. 188,963

26 Claims. (Cl. 210—55)

This invention relates to sewage disposal apparatus and particularly to an improved sedimentation tank and conveyor construction, which is also applicable to other settling tanks such as for coal, clay, sand, water-works and similar apparatus.

An object of the invention is to provide apparatus of the above mentioned type in which the side walls of the sedimentation tank are substantially entirely upright and thus devoid of any material collecting ledges.

Another object of the invention is to provide an improved bearing construction for conveyor apparatus particularly useful to prevent collection of sewage solids in connection with sewage disposal apparatus.

Still another object of the invention is to provide an improved take-up means for conveyor apparatus particularly useful in connection with sewage disposal apparatus.

A further object of the invention is to provide an improved sprocket particularly useful in sewage disposal apparatus.

Other objects of the invention will appear hereinafter, the novel features and combinations being set forth in the appended claims.

In the accompanying drawings,

Fig. 1 is a longitudinal vertical sectional view showing a sedimentation tank for sewage disposal apparatus comprising my invention;

Fig. 2 is a transverse sectional view of the sedimentation tank disclosed in Fig. 1;

Fig. 3 is an enlarged sectional view taken on the line 3—3 of Fig. 1 looking in the direction of the arrows;

Fig. 4 is an enlarged sectional view taken on the line 4—4 of Fig. 1 looking in the direction of the arrows;

Fig. 5 is an enlarged elevational view of the chain tensioning or take-up mechanism included in the conveyor comprising my invention;

Fig. 6 is an enlarged plan view showing a pair of bearing means for supporting a shaft of the conveyor comprising my invention;

Fig. 7 is a combination elevational and sectional view of the apparatus illustrated in Fig. 6; and

Fig. 8 is a sectional view taken on the line 8—8 of Fig. 7, looking in the direction of the arrows.

Referring particularly to Figs. 1 and 2 of the drawings, there is illustrated a sedimentation tank 10 which is formed in a plurality of cells, as illustrated in Fig. 2, of substantially the same construction. Said sedimentation tank 10 is

formed as a monolith of poured concrete comprising main side walls, one of which is seen at 11, bottom 12 and intermediate partition or side walls 13 which divide the sedimentation tank 10 into a plurality of similar cells.

Adjacent the influent end of the sedimentation tank 10 is an end wall 14 provided with an influent opening 15 and adjacent the effluent end of the tank is end wall 16 provided with an effluent opening 17 adjacent which is a vertically adjustable liquid level controlling weir 18.

Disposed opposite the influent opening 15 and extending between and connecting side walls 11 and 13 of the tank 10, is a baffle 19 cooperating with a shelf 14' which aids the immediate settling of large particles of sludge contained in the raw sewage fed to the sedimentation tank 10. The top of baffle 19 is inclined at 19' to prevent an accumulation of sludge or sewage thereon.

Adjacent the bottom 12 of the tank at the influent end, is a sump 20 into which settled sludge is conveyed down an incline 21, as herein-after described in full detail. It may be stated that the sump 20 extends transversely across and is common to all of the cells of the complete sedimentation tank 10 and at one end feeds into a sludge hopper in a manner well understood in this art. A cross conveyor 22 operates in the sump 20 to convey the sludge to said sludge hopper from which it can be removed by pumps or by water pressure in the sedimentation tank in a well-known manner.

Within each compartment of the sedimentation tank I provide an individual conveyor adapted to convey settled sludge by its lower run to the sludge sump 20 and to convey floating scum by its upper run to a cross scum collector or scum conveyor 23 which cooperates with a baffle 24 extending below the normal liquid level in the sedimentation tank 10, as indicated by the line 25, to insure a complete collection of the scum. The scum conveyor 23 conveys the accumulated scum by positive rectilinear motion up an inclined chute leading to a scum trough.

In prior known devices of the general type here disclosed, it has been common to employ a drive sprocket for the main conveyor which was set in a recess in one of the vertical side walls, such as wall 11 or 13, of the sedimentation tank and to place the adjacent supporting bearing for the drive shaft of the conveyor inwardly of said drive sprocket. This has been found to be objectionable for three reasons. In the first place, the wall recess is objectionable because it tends to accumulate sewage or sludge. In

the second place, it requires a rather complicated bearing support for the drive shaft adjacent the sprocket. In the third place, the recess must be very accurately located while the side walls 11 and 12 are being poured, as it has been found very difficult to locate this recess properly. One of the features of the invention herein disclosed therefore, is to provide a mounting for the drive sprocket so that the necessity for a recessed side wall adjacent thereto is eliminated, as a consequence of which the side walls will be practically vertical and devoid of any inclined or horizontal ledges, and the bearings are so constructed as to preclude any accumulation of sewage or sludge.

As seen in Figs. 1 and 2 of the drawings, the main conveyor comprises idler shafts 26, 27 and 28 and drive shaft 29. Said shafts 26, 27, 28 and 29 carry sprockets 30, 31, 32 and 33, respectively, over which are reeved a pair of spaced conveyor chains 34 and 35 carrying transversely extending wooden flights 36. The opposed ends of the idler shafts 27 and 28 are supported from the side walls 11 and 13 by similar bearings 37, 37, the structure of which comprises one feature of my invention, which bearings are described in detail hereinafter. A similar bearing 37 is also provided for supporting one end of the drive shaft 29, as illustrated in Fig. 2 of the drawings. The idler shaft 26 is supported upon improved chain tensioning take-up apparatus 38, the structure of which is also described in detail hereinafter. It may be mentioned, however, that said chain tensioning apparatus 38 provides for the maintenance of the chains 34, 35 in proper tension by adjustment of the sprocket 30 from the positive position illustrated in Fig. 1 of the drawings to the dotted line position there illustrated.

Take-up mechanism of the type illustrated at 38 in Figs. 1 and 5 is disclosed in detail and claimed in my co-pending application, Serial No. 375,962, filed January 25, 1941, for an improvement in take-up mechanism for conveyor apparatus.

To drive the main conveyor I provide a drive sprocket 39 at one end of the drive shaft 29 which is driven by a chain 40 from a sprocket 41 mounted upon a counter-shaft 42, which counter-shaft 42 is driven from a motor 43 by appropriate chain and sprocket mechanism 44. It may also be stated that the cross conveyor 22 is driven from the counter-shaft 42 through a horizontal shaft 45 and a vertical shaft 46 which are interconnected and are connected with the drive shaft of the cross conveyor 22 by appropriate beveled gears.

It may be pointed out that the beveled gears 47 and the bearing 48 located adjacent the bottom of the shaft 46 are contained in a housing 49 having a water-tight removable door 49' and which is supplied with lubricant through a pipe 50, the upper end of which is above the maximum liquid level 25 in the tank 10.

Attention is now directed particularly to Figs. 6, 7 and 8 of the drawings which disclose in detail the construction of the improved bearings 37 comprising one feature of my invention. Each of said bearings 37 comprises a main casting 51 having a cylindrical body portion 52 and a triangular base 53 having a tapered top edge 53' which prevents accumulation of sewage or sludge thereon. The casting 51 has a central bore 54 which extends completely therethrough and is cored to receive a babbit, brass, fiber or other

bushing 55 comprising a journal bearing for the shaft 27.

Extending upwardly through the base 53 is a bore 56 which provides a lubrication conduit leading to the inner end of the bore 54, whereby a lubricant may be supplied to the bushing 55 and the bearing surface of the shaft 27 in contact therewith. A high pressure lubrication conduit 57 provided with an appropriate high pressure fitting 58 (see Fig. 1) adjacent the top of the tank 10 is provided, to the end that bearing 37 may be lubricated at any time. One end of the bore 54 is closed to provide a substantially liquid tight journal box by a tight-fitting slide plate 59 slidably received in top and bottom grooves 159 and provided with a hook receiving opening 60 whereby it may be readily removed, as clearly illustrated in Fig. 8 of the drawings.

To prevent an accumulation of sludge on the cylindrical body portion 52 of the main stationary casting 51 and also to clamp the shaft 27 against endwise movement, I provide cylindrical shields 61, 61, each having a hub 62 which is clamped rigidly to the shaft 27 by means of a set screw 63. The opposing ends of the cylindrical body portions 52 are engaged by the inside bottoms of the cup-shaped shields 61, 61, and therefore such opposing ends act as thrust bearings while at the same time serving to space the ends of the shaft 27 from the slide plates 59 as shown at the left-hand end of Fig. 7.

Also as shown at the left-hand end of Fig. 7, the inner cylindrical wall of the shield 61 is larger in diameter than the diameter of the stationary bearing 52. The left-hand end of the cup 61 is also spaced from the base plate 53. It will thus be evident that when the conveyor apparatus is in operation, the shaft 27 and shields 61 constantly rotate and therefore no deposit of sludge can accumulate thereon. Furthermore, the lubrication or grease supplied to the bearing 55 by way of bore 56 and pipe 57 will be forced outwardly radially along the edges of body portion 52 and fill the space between it and the interior of cup 61 thereby preventing any entrance of abrasive material or other sewage solids therein. There will, therefore, be no deposit of sludge on or near relatively moving parts, and stationary parts remote from moving parts are all provided with inclined surfaces such as at 11', 13', 53', 66' and 19', and 68' from which settled sludge will slide by gravity. The ledge 14' need not be at a steep angle inasmuch as the influent from the inlet 15 will produce a current of sufficient strength to prevent settling of sludge thereon.

In the construction of the apparatus, the sedimentation tank 10 is formed of poured concrete and at suitable points anchor bolts 64 are provided for the bearings 37. In assembling the main conveyor apparatus, the main conveyor bearings including the main castings 51 and shields 61 are slid loosely over the ends of the shaft 27 and the ends of the latter placed adjacent to their final positions at the walls 11 and 13. Preferably the slide plates 59 are removed to facilitate such positioning of the shaft 27.

The main castings 51 may now be placed in their positions where their apertures may be moved over the anchor bolts 64, 64. A variable number of washers 65 previously placed on the bolts 64 back of the base plates 53, may be relied on to adjust the inner ends of the bushings 55 at the inner ends of the shaft 27, this adjustment being in accordance with the length of the shaft.

After proper adjustment has been effected, lock washers are provided of such thickness as to enable the nuts when tightened in place as shown in Figs. 7 and 8, to have a straight edge on top so as to provide sloping sludge shedding surfaces 66'. Now by inserting the slide plates 59 each into its position shown in Fig. 8, these plates may be used as abutments to secure centering of the shaft 27. Whereupon the shields 61 may be brought home and secured to the shaft 27 by means of the set screws 63 so that the parts will occupy the relative positions shown in Fig. 7. Grout 67 is then applied in a manner to avoid all sludge gathering surfaces, particularly by providing sloping sludge shedding surfaces such as 11' and 13' of Fig. 7. However, no grout should be permitted to obstruct the circular opening between the edges of the cups 61 and the base plates 53 and the outer ends of the bolts 64 in the completed structures are preferably flush with the other surfaces of the nuts 66.

It may be stated that before this grout is applied the slide plates 59 will be inserted in position to prevent any entrance of the grout into that portion of the bore 54 provided with the bushing 55.

Turning particularly to Figs. 1, 4 and 5 of the drawings, it will be seen that the chain tensioning devices 38 which are provided at each end of the idler shaft 26, include a bearing construction 37', the structure of which is substantially the same as that of the bearings 37 except for differences which will now be pointed out.

Said chain tensioning device or apparatus 38 comprises a recessed base plate 68 having tapering top wall 68' to shed sewage solids and rigidly attached to wall 11 or 13 by anchor bolts 69. Said base plate 68 carries a pair of spaced end plates 70, 70 between which extends an adjusting screw 72. The adjusting screw 72 is mounted for free rotation and is held against longitudinal movement in base plate 68 and threads through a nut attached to a shifting casting or plate 73 bolted to the base of bearing construction 37' by clamp bolts 74. Base plate 68 also has bearing ways 71 adapted to be clamped between bearing ways 171 on plate 73 and the bottom plate of bearing 37' by bolts 74. It will be evident that upon loosening the clamp bolts 74 the bearing construction 37 may be adjusted along the angle members 71, to adjust sprockets 30 as illustrated in Fig. 1, and when in any desired position of adjustment may be clamped rigid by said clamp bolts 74. (Fig. 4.)

It may be pointed out that the lubrication conduit 75 leading to the chain tensioning apparatus 38 is of flexible construction to permit the aforementioned adjustment.

Attention is now directed particularly to Fig. 3 of the drawings and to the construction of the drive sprocket 39 carried by the drive shaft 29 and the associated bearing 37'' for supporting the end of said drive shaft 29. It may be stated that the bearing 37'' follows the above described construction of the bearing 37 except for the fact that the shield 61 with the hub 62 and set screw 63 are not employed as their function is performed by the particular construction of the drive sprocket 39. Said drive sprocket 39 comprises a hub 77 which is keyed to the shaft 29 by a key 78 and clamped thereto by a set screw 79. The rim 80 of the sprocket 39 is off-set laterally to one side of the hub 77 and is provided with chain receiving teeth 81 cooperating with the aforementioned drive chain 40. It is to be

particularly noted that by virtue of this construction it is possible to mount the bearing 37'' directly on the upright wall 13 of the sedimentation tank 10 and to connect said sprocket 39 on the shaft 29 between said bearing 37'' adjacent thereto and the bearing 37 at the other end of the shaft 29, with the rim 80 closely adjacent the wall 13 to clear the ends of the flights 36.

It is, of course, evident that unless the path of travel of the drive chain 40 associated with the sprocket 39 is out of the path of travel of the flights 36, operation is impossible. It is desirable that the ends of the flights 36 operate as near the wall 13 as possible so that substantially the entire area of the sedimentation tank will be swept by said flights 36. However, the ends of the flights 36 will be slightly spaced from the wall 13 due to the inclined construction thereof adjacent the bottom, as seen at 82 in Fig. 2 of the drawings. The special construction of the sprocket 39 therefore provides for this simple drive means for the drive shaft 29 without requiring any reduction in the length of the flights 36 over that usually employed, and at the same time permits of the use of a bearing 37'', the general construction of which is identical with the other bearings 37 employed to support the shafts 26, 27 and 28 and the other end of the shaft 29, at the same time providing a construction which does not require any recessing of the wall 13 of the sedimentation tank to receive said sprocket 39, thereby eliminating any horizontal or inclined ledges on the side walls of the sedimentation tank which are very difficult and costly to construct and which tend to accumulate sewage sludge.

As above pointed out, the slide plate 59 performs a multiplicity of functions. It closes one end of bore 54 to provide a lubrication pocket for bushing 55 and shaft 27. In addition it prevents grout getting into said bore 54 when the bearing 37 is assembled. It also acts as a temporary centering device for the shields 61 with their hubs 62 which take the lateral thrust on shaft 27. If desirable the opposed slide plates 59 may themselves take this side thrust, as it is relatively small, but I prefer to have hubs 62 take it.

In addition to those elements above described, the drive sprocket 39 is provided with a cylindrical shield 83 formed integral with the hub 77 which cooperates after the manner of the shield 61 to prevent any accumulation of sludge on the bearing 37''.

Obviously those skilled in the art may make various changes in the details and arrangement of parts without departing from the spirit and scope of the invention as defined by the claims hereto appended, and I therefore wish not to be restricted to the precise construction herein disclosed.

Having thus described and shown an embodiment of my invention, what I desire to secure by Letters Patent of the United States is:

1. In sedimentation apparatus, the combination with a sedimentation tank, of a horizontal shaft in said tank in position to be submerged by liquid in said tank, a bearing for one end of said shaft, a sprocket having a hub connected to said shaft to rotate therewith on a horizontal axis, and a cup-shaped extension on said hub concentric with said sprocket in position to telescope over said bearing.

2. In sedimentation apparatus, the combination with a settling tank having inner spaced-

apart side walls, of a conveyor adapted to be immersed in liquid in said settling tank and comprising a horizontal drive shaft and spaced-apart flights having their ends spaced only short distances from said side walls, bearings mounted on said inner side walls to support the horizontal drive shaft between said walls, a drive sprocket mounted on one end of said horizontal shaft with the rim of the sprocket lying in a plane which intersects the adjacent bearing and which is spaced from the adjacent ends of said flights, the hub of said sprocket being located between said bearings, and means on said hub to rotate therewith on a horizontal axis and constantly overlies the adjacent bearing to prevent an accumulation of sediment on said bearing.

3. Sedimentation apparatus comprising a horizontal shaft, a journal bearing for one end of said horizontal shaft and adapted to be secured to an upright wall of a sedimentation tank and to be submerged in liquid in such tank, a sprocket mounted on said shaft to rotate therewith on a horizontal axis, and a cylindrical shield extending from the central portion of said sprocket to surround said journal bearing and rotate with said sprocket on a horizontal axis to prevent sediment from lodging on the upper portion of said journal bearing.

4. Sedimentation apparatus comprising the combination with a shaft and bearing means therefor adapted to be submerged in liquid in a sedimentation chamber and support said shaft in a horizontal position between spaced inner walls of such chamber, said bearing means comprising a cylindrical member and an attaching base, and a shield covering the outer surface of said cylindrical member and mounted on said shaft to rotate therewith on a horizontal axis, the shield acting to sweep such outer surface on said horizontal axis and prevent sediment from lodging thereon during sedimentation in said chamber.

5. Sedimentation apparatus comprising the combination with a shaft, of bearings for the end portions of said shaft, each bearing including a cylindrical journal containing portion, means for securing said bearings to opposite spaced-apart inner walls of a sedimentation chamber to support the shaft in horizontal position, cup-shaped shields one associated with each of said cylindrical journal containing portions of said bearings, and means comprising hubs slidable horizontally along said shaft and secured adjustably there to enable said cup-shaped shields to act as thrust bearings to hold said shaft against endwise movement relative to said bearings.

6. Sedimentation apparatus comprising the combination with a shaft, of a bearing for one end portion of said shaft, said bearing including a cylindrical journal portion adapted to be submerged in liquid in a sedimentation tank, means comprising said bearing for mounting said shaft in horizontal position with said cylindrical journal portion submerged in said liquid, a hub secured to said shaft, and a cup-shaped shield surrounding said cylindrical journal portion almost completely in position to sweep from the latter any material tending to be deposited thereon by sedimentation from said liquid.

7. In apparatus of the class described, the combination with a bearing having a main body portion with a bore entirely through the same, of a shaft adapted to be inserted entirely through said bore, means for securing said main body por-

tion to a wall with the adjacent end of said shaft partially retracted within said bore but remaining journaled therein, and a removable slide plate extending through a slot in said body portion into position to close that end of the bore adjacent to said wall.

8. In a device of the class described, the combination with a shaft, of means for supporting said shaft between opposing inner side walls of a tank, said supporting means comprising a bearing at each end of said shaft, at least one of said bearings comprising a body portion having a through bore through which said shaft may extend during assembly and mounting in said tank, a base surrounding said bore, means for attaching said base to one of said inner side walls, and a plate insertable into said base for closing said bore at its opening adjacent said wall.

9. In apparatus of the class described, the combination with a shaft, of a bearing for supporting said shaft, said bearing having a through bore permitting sliding of the bearing over one end of said shaft and along the latter with the shaft extending entirely through the bearing, means for attaching said bearing to an upright wall with a retracted end portion of the shaft journaled in said bearing for support thereby, and means positioned between one end of said shaft and the wall for closing that portion of the bore in which the shaft is journaled, the construction and arrangement being such that said closing means is insertable and removable while said bearing is attached to the wall and said shaft is supported in operating position by the bearing and the wall.

10. Sedimentation apparatus comprising the combination with a shaft, of a journal bearing for supporting one end of said shaft and including a cylindrical portion and a flat base plate adapted to be attached to an inner upright wall of a sedimentation tank with the shaft horizontal, and a cup-shaped shield mounted on said shaft and extending over substantially all of the cylindrical portion of said bearing with its free edge slightly spaced from said flat base, the construction and arrangement being such that said cylindrical portion while immersed in liquid in the tank remains stationary while said cup-shaped shield rotates with said shaft on a horizontal axis and sweeps around said cylindrical portion to prevent deposit of sediment on the latter.

11. Sedimentation apparatus comprising the combination with a shaft, of means including a journal bearing for supporting said shaft in a horizontal position between inner spaced walls of a sedimentation chamber, a dish-shaped sprocket on said shaft, an integral cup-shaped shield forming a protector for said bearing while the latter is submerged in liquid in the sedimentation chamber, and means for rotating said sprocket to effect rotation of said shaft on a horizontal axis and thereby cause said cup-shaped shield to sweep around said journal bearing on said horizontal axis to prevent sediment lodging thereon.

12. In conveyor apparatus, the combination with a horizontal shaft, of means comprising an integral bearing and support for mounting said horizontal shaft on a wall of a sedimentation tank, a dish-shaped sprocket secured to said horizontal drive shaft with its periphery closely adjacent to said wall, and a cylindrical shield adapted to be immersed in liquid in the sedimentation tank and extending from the dish-shaped

side of said sprocket over said bearing to sweep on a horizontal axis the entire upper surface of the latter at all times during the rotation of said sprocket, said cylindrical shield covering said bearing to prevent sediment accumulating on the latter when said sprocket is not rotating.

13. In conveyor apparatus, the combination with a shaft, of a journal bearing for one end of said shaft, means comprising a base for securing said bearing to the upright inner wall of a tank, said bearing having a bore through the same to enable said bearing to be slid over and back from the end of said shaft for assembly in the tank, means insertable across the bore between the tank wall and the adjacent end of said shaft to act as an abutment for such end of the shaft, and a sprocket mounted on said shaft to rotate therewith.

14. In conveyor apparatus, the combination with a tank having spaced-apart opposed inner walls, of conveyor mechanism comprising a shaft, journal bearings for the ends of said shaft including a journal bearing slidable lengthwise of one end of said shaft and requiring both bearings to be on said shaft before the latter is placed between said walls, means for securing said bearings to said walls while the ends of said shaft are journaled in said bearings, the said slidable bearing being adapted to be moved lengthwise of said shaft so that both bearings contact with said walls before being secured thereto, and an abutment associated with said slidable bearing and movable to a position to limit axial movement of said shaft after being mounted in said bearings and the latter secured to said inner walls of the tank.

15. Sewage disposal apparatus comprising the combination with a settling tank including spaced-apart inner walls, of a conveyor in said tank and including a shaft, means for supporting said shaft in horizontal position from said spaced-apart inner walls comprising journal bearings secured to said walls, thrust bearings between said shaft and said journal bearings, cup-shaped devices slidable horizontally along said shaft into positions to surround and enclose the exterior of said journal bearings, and means for removably securing said cup-shaped devices in such positions to rotate with said shaft on a horizontal axis and prevent the settling of sludge on any stationary parts adjacent said journal bearings.

16. In apparatus of the class described, the combination with a shaft, of a journal bearing with a bore extending entirely through the same to facilitate assembly by sliding the bearing over the end of the shaft, and a slidable plate slidable across one end portion of the bore to afford a lubricant chamber for the journaled portion of said shaft.

17. In apparatus of the class described, the combination with a shaft, of a journal bearing having a base plate with a bore extending entirely through the bearing and the base plate to facilitate assembly by sliding the bearing and the base plate over one end of the shaft, and a plate slidably mounted in the base plate for movement to a position to close the bore at the base plate.

18. The method of assembly which comprises sliding over the end of a shaft a bored journal having a base plate, securing such base plate mechanically to the inner wall of a tank, sliding a closure plate along the base to close the inner end of the bore, and pouring material to anchor the base plate to said inner wall while said closure

plate prevents the poured material from entering the said bore where the adjacent end of a shaft is journaled.

19. The combination with a journal bearing, of a base plate secured thereto, said journal bearing and base plate having openings therethrough to facilitate sliding the journal bearing over one end of a shaft which is to be located between opposing stationary supporting walls, means for securing said base plate to one of said walls adjacent one end of such shaft, and a plate slidably mounted in said base plate for movement to a position closing the opening through said base plate.

20. The combination with a journal bearing having an opening entirely through the same, of a removable valve plate for closing said opening adjacent one end thereof, means affording a lubricant passageway to said opening between said valve plate and the inner end of a shaft when in said journal bearing, and means for securing said journal bearing to a stationary support.

21. The combination with a shaft, of stationary supports spaced apart a distance a little greater than the length of said shaft, journal bearings for the ends of said shaft and each having an opening entirely through the same to facilitate the sliding of the bearings over the ends of said shaft with such ends extending entirely through said openings, means for securing said journal bearings to said supports, and devices insertable transversely of the bearings to serve as closures for said openings between the ends of said shafts and said walls.

22. The method of assembly which comprises sliding over the end of a shaft a bored journal and sliding the journal in the reverse direction toward the inner wall of a tank, securing such journal to the said inner wall, sliding a closure plate transversely of the journal between the wall and the adjacent end of the shaft, and pouring material to anchor the journal to the inner wall while said closure plate prevents such poured material from entering the said bore where the adjacent end of the shaft is journaled.

23. Sedimentation apparatus comprising the combination with a horizontal shaft, of a bearing structure adapted to be secured to the inner upright wall of a sedimentation tank in position to receive and journal one end of said shaft on a horizontal axis, a driving sprocket having an offset hub mounted on said shaft to rotate therewith on such horizontal axis with the peripheral portion of said sprocket closely adjacent to such upright wall, and a cylindrical shield integral with the said sprocket between said hub and a plane extending through the periphery of the sprocket, said cylindrical shield being concentric with said hub and adapted to surround said bearing structure when the peripheral portion of said sprocket is closely adjacent said inner upright wall.

24. Sewage disposal apparatus comprising the combination with a shaft, of bearings on the spaced-apart inner upright walls of a sedimentation tank, said bearings being stationary and projecting inwardly from such walls of the tank in position to receive and journal the ends of the shaft to support the latter in horizontal position between such inner walls while immersed in liquid in the tank, cylindrical shield means slidable horizontally along said shaft to cover or uncover said stationary bearings, and mechanism for releasably securing said cylindrical shield means to said horizontal shaft to rotate therewith while covering said stationary bearings to

prevent sediment from accumulating on said stationary bearings.

25. Sedimentation apparatus comprising the combination with a shaft, of bearings for the end portions of said shaft, means for securing said bearings to opposite spaced-apart inner walls of a sedimentation chamber to support the shaft in horizontal position, means comprising hubs slidable horizontally along said shaft and secured adjustably thereto to enable said hubs to act as thrust bearings to hold said shaft against endwise movement relative to said bearings, and cup-shaped integral extensions on the hubs in positions to sweep around the bearings on a horizontal axis to prevent accumulation of sediment thereon whether said shaft is rotating or not.

26. Sedimentation apparatus comprising the combination with a horizontal shaft, of a shaft bearing secured to an upright inner wall of a

sedimentation tank, a hub slidable horizontally along said shaft into engagement with said shaft bearing, means for securing said hub to said horizontal shaft to rotate therewith while in engagement with said shaft bearing, and cup-shaped mechanism extending from said hub into position to extend over said shaft bearing and sweep around the same during rotation of said shaft on a horizontal axis and to cover said bearing when the shaft is not rotating, the construction and arrangement being such that whether the said shaft while immersed in liquid in said tank is rotating or not said cup-shaped sweeping mechanism acts to prevent sediment from accumulating on said bearing and said hub acts as a thrust bearing to prevent axial movement of said shaft toward said inner wall.

ALEXIS W. LEMMON.