Feb. 24, 1970 J. E. TYSON 3,497,067

DISTRIBUTION MEANS

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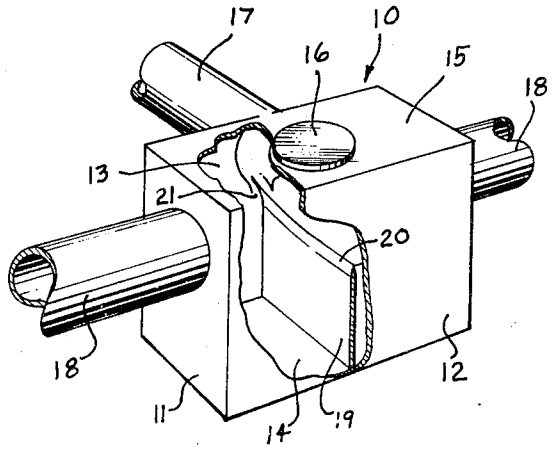


Fig 1

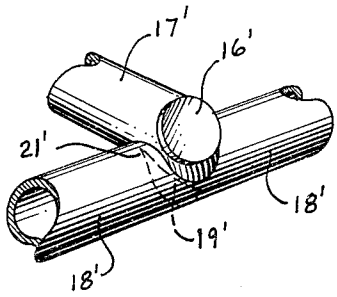


Fig 2

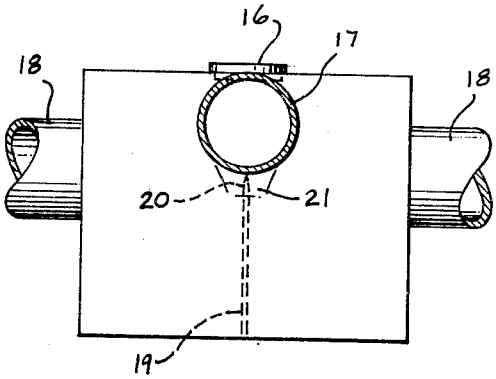


Fig 3

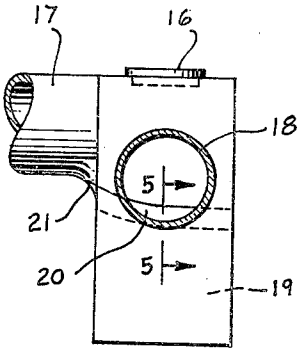


Fig 4



Fig 5

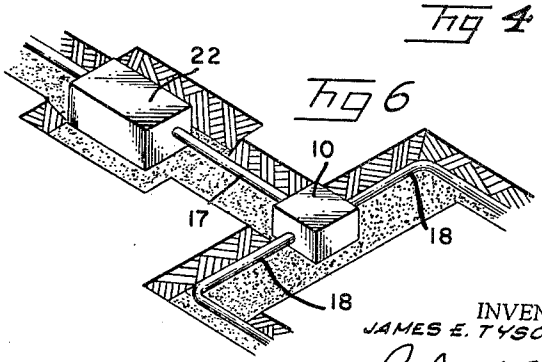


Fig 6

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DISTRIBUTION MEANS

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ABSTRACT OF THE DISCLOSURE

In abstract, a preferred embodiment of this invention is a distribution box or joint used in conjunction with septic tank absorption-field systems. This invention relates to sanitation systems and more particularly to means for accurately controlling the distribution of septic tank effluent in absorption-field systems.

In the past, the absorption-field or subsurface tile structure of septic tank sanitation systems has consisted of a field of twelve-inch links of four-inch architectural drain tile, two to three-foot links of vitrified-clay sewer pipe, or perforated nonmetallic pipe laid in such a manner that the flow from the septic tank is distributed with reasonable uniformity to the soil. It is presently considered essential to have a distribution box in every absorption-field system. The purpose of this box is to insure equal distribution of the effluent from the septic tank to the various lateral lines. This box is necessary to prevent overloading and thus failure of one of the lines while the other or others are left empty. Pipe fittings, T's and Y's have been proposed to replace the distribution box but it is considered by experts in the field to be a rare event, if not a virtual impossibility, to obtain even distribution through their use. Even with the use of a box, which is located between the septic tank and the absorption system, a highly skilled sanitation system engineer must generally be hired to assure that for all practical purposes the installation is perfectly leveled to prevent a failure as hereinabove outlined.

After much study and research into the above mentioned problems and possible solutions therefore, applicant has developed an improved distribution means which will allow variations in the attitude of installation while at the same time preventing the possibility of overloading and failure of one of the lines while leaving the other empty. Applicant has also adapted his invention to give the same advantages found in his distribution box to pipe fittings, T's and W's which are used to replace such distribution boxes.

It is, therefore, an object of the present invention to provide an improved distribution means for the effluent from a septic tank which assures that each line going to the absorption-field system carries its proportional share but no more than its proportional share of such effluent.

Another object of the present invention is to provide a means in a distribution type box used in a sewage sanitation system to assure that near equal distribution of septic tank effluent will be made regardless of possible uneven installation of such box.

Another object of the present invention is to provide a pipe joint incorporating means for accurately dividing the flow of fluid passing therethrough into two or more paths regardless of the level condition of such joint.

A further object of the present invention is to provide an improved distribution means for a septic tank sewage disposal system capable of assuring equal distribution of effluent into each of two or more absorption-field distribution lines.

Another object of the present invention is to provide a

bevel type flow divider to laterally separate the flow of septic tank effluent into two or more distinct paths of flow.

Other objects and advantages of the present invention will become apparent and obvious from a study of the following description and the accompanying drawings which are merely illustrative of the present invention.

In the drawings:

FIG. 1 is a cut away perspective showing a distribution box incorporating the present invention;

FIG. 2 is a perspective of a distribution pipe joint incorporating an embodiment of the present invention;

FIG. 3 is a rear elevational view of a distribution box incorporating the present invention;

FIG. 4 is a side elevational view of the same;

FIG. 5 is a section taken through lines 5—5 of FIG. 4; and

FIG. 6 is a perspective view of a typical septic tank and distribution box installation including an effluent absorption field.

With further reference to the drawings, FIG. 1 discloses a distribution box indicated generally at **10** composed of end walls **11**, front wall **12**, rear wall **13**, bottom **14** and top **15**. Removably mounted within the top portion **15** is a clean out plug **16**.

A hollow inlet line or pipe **17** communitively connects the septic tank **22** to the distribution box **10** through the upper portion of rear wall **13**.

Outlet or distribution lines **18** leading to the absorption field indicated generally at **23** are provided in the center portion of each of the end walls **11**. A flow divider or partition **19** is provided in the lower portion of distribution box **10** and is sealingly secured to rear wall **13**, bottom **14** and front wall **12**. An upwardly projecting knife edged **20** extends along the upper portion of the divider **19** from front wall **12** to the throat area **21** of inlet line **17** particularly as disclosed in FIGS. 1 and 4.

As clearly shown in FIG. 4, there is a downward sweep of the knife edge at the throat which gradually levels into being horizontally disposed adjacent the front wall **12**. The purpose of this angled entrance gradually leveling knife edge shape is to prevent any solid matter contained in the septic tank effluent from accumulating and beginning to build up in the throat area **21**. Instead it will tend to slide down the knife edge away from such area due to the flow of liquid effluent which also tends to separate the solid matter and cause it to fall on either side of divider **19** into the trap pockets formed between the walls of box **10** and divider.

FIG. 2 discloses an embodiment of the present invention using a modified T-joint including an inlet line **17'** with distribution lines **18'** fixedly secured to the lower end portion thereof. A clean out plug **16'** may be provided in the end of inlet line **17'** or the end of this line may be permanently sealed. A flow divider **19'** is provided in the lower portion of distribution lines **18'** and has the same entrance angle at the throat area **21'** which tapers into a horizontally disposed area at its end opposite such throat area. The purpose of this angle area is the same as hereinabove described for the flow divider **19** and knife edge **20** of distribution box **10**. It is to be understood, of course, that flow divider **19'** contains a sharp upper edge similar to knife edge **20** found on flow divider **19**.

In actual use of the flow divider of the present invention, sewage from household or industrial sources passes into the septic tank which retains a substantial amount of the solid material therein while discharging a clarified effluent into distribution box inlet line **17**. This treated effluent as it first comes in contact with the upper edge of knife portion **20** in the throat area **21** of pipe **17** will be divided into two separate flow paths thereby making possible the advantages hereinafter set forth.

Since a septic tank is not completely efficient, some solids are contained in the effluent discharge therefrom. To prevent build-ups of this solid material on partition **19**, which could eventually completely clog inlet **17**, a relatively sharp knife edge upper portion **20** is provided in throat area **21**. As the solid material comes in contact with this knife edge, it will not permanently lodge in the throat but by its own weight, with the help of the liquid effluent, slide down the inclined surface of partition **19** where a combination of the liquid effluent acting thereon in an eroding action and the natural cutting action of knife edge **20**, it will separate and fall into the two traps or settling areas on either side of said partition.

Ordinarily once the sanitation system has been put into operation for a period long enough that the trap area has become filled with liquid effluent, the addition of any further effluent will cause a flow thereof through distribution lines **18** into the absorption-field **23** of the system where such effluent will become absorbed into the soil. Should the distribution box **10** settle on one end or should it have been installed with one of the distribution lines **18** higher than the other, a complete failure of the system would rapidly occur due to all of the septic tank effluent passing into one of the lines to the exclusion of the other due to the natural phenomena of a liquid seeking its lowest level. A distribution box, on the other hand, constructed according to the teaching of applicant's invention would still divide the flow of effluent into each of the distribution lines even though the box **10** was not in a level position. This is due to the fact that partition **19**, including interval knife edge portion **20**, separates the liquid inlet flow of effluent into separate chambers for each of the distribution lines. Once the build-up within any one of these chambers is sufficient, the effluent therein will flow independent of flow from the other chambers. In other words, the flow of effluent from each of the partition areas is completely independent of other chamber or chambers formed by said partition. The only manner of installing a distribution box of the type disclosed so that effluent will be concentrated in only one pipe is to have such distribution box installed at such a large angle from horizontal that the bottom portion of one of the pipes is higher than the apex of edge **20**. This is extremely unlikely since even the most unskilled laborer can readily recognize leveling errors of this magnitude.

The use of a sharpened partition within a pipe joint to eliminate the necessity of a distribution box is obviously shown in FIG. 2 which discloses one possible pipe construction incorporating applicant's invention. This distribution joint assures even effluent flow in each of the distribution lines **18'** in the same manner as hereinabove described for flow from distribution box **10**.

Although only one form of pipe distribution joint is disclosed in the drawings, it is obvious that Y-joints, modified T-joints and the like could as readily be used to practice applicant's invention. Also it is within the contemplation of the present invention that two or more partitions of the general shape of partitions **19** and **19'** could be placed in a distribution box or joint so long as each terminated in the throat area of the inlet pipe thereby allowing three or more distribution lines **18** to be used. Further, it is obvious that several distribution lines similar to those shown could be extended from each side of partition **19** so long as the lower portion of all of the lines on any given chamber are for all practical purposes on the same elevation.

To comply with Health Department regulations and to eliminate the necessity of removing the entire distribution box or joint for cleaning, a removable clean out plug **16** or **16'** may be provided at a convenient location.

It is obvious that the present invention has the advantages of guaranteeing more accurate and complete distribution of septic tank effluent material while at the same time eliminating the necessity of using expensive leveling equipment and experienced personnel while installing distribution means for such effluent. Applicant's invention also has the advantage of allowing the use of Y's, T's and similar types of distribution joints in septic tank distribution systems which had heretofore been considered so unreliable as to be useless. The use of these improved joints in turn also will allow distribution means for septic tank effluent distribution systems to be much more cheaply manufactured and less expensively installed.

The present invention may, of course, be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

What is claimed is:

1. A sewage treatment system comprising a septic tank, a distribution box communicatively connected to said tank by a distribution box inlet line; a sewage absorption field; at least two outlet lines communitively connecting said box to said sewage absorption field, the lower portion of each of said outlet lines where leaving said box being lower than the lowest point of said inlet line where such line enters said box; at least one generally liquid impervious partition extending across and separating the lower interior of said box, one end of said partition being disposed at a point adjacent the lowest point of said inlet line and the upper elevation of said partition being greater than the lower portion of the outlet lines whereby the flow of liquid effluent from said tank will be divided to assure a flow into each of said lower disposed outlet lines.

2. The invention of claim **1** wherein the partition is generally vertically disposed with its upper portion tapering inwardly to form a generally knife shaped upper edge.

3. The invention of claim **2** wherein said partition slopes downwardly from said point adjacent said inlet line to an area no lower than above the lower portion of said outlet lines.

4. A sewage treatment system comprising: a distribution means for dividing treated sewage effluent into two or more paths including an inlet pipe; an outlet pipe having at least two outlet ends; said inlet pipe communitively connected to said outlet pipe intermediate its ends in such a manner that the bottom of said inlet pipe is at a substantially higher elevation than the bottom of said outlet pipe; and a generally vertically disposed partition means extending from a point adjacent the bottom of said inlet pipe across the lower portion of said outlet pipe whereby said partition will divide the flow of the effluent from the inlet pipe into at least two paths which are adapted to flow from each of said outlet ends.

5. The invention of claim **4** wherein the partition includes a knife shaped upper edge for dividing solid material contained in said effluent.

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