Dec. 21, 1965 N. ACHEY 3,224,200

DRAINAGE TILE

Filed April 12, 1963

FIG. 1

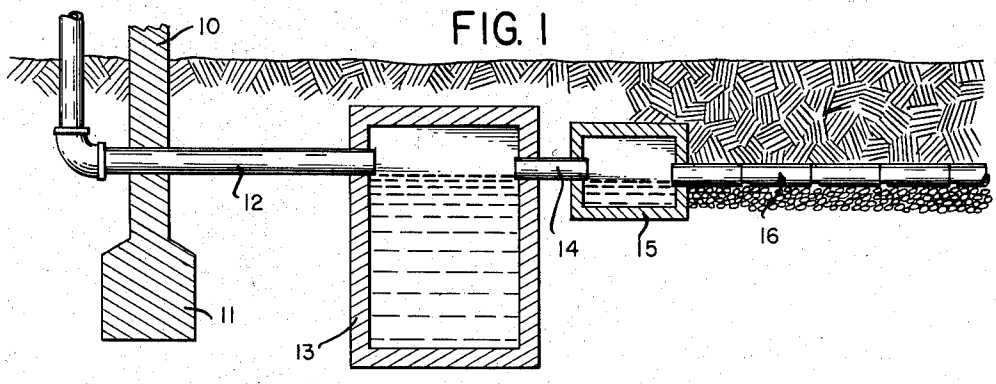



FIG. 2

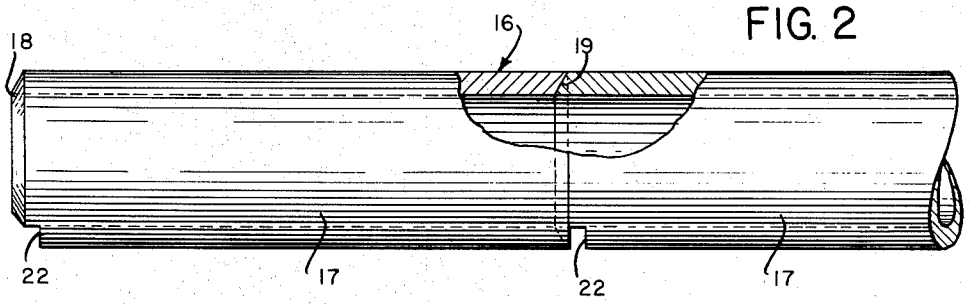



FIG. 3

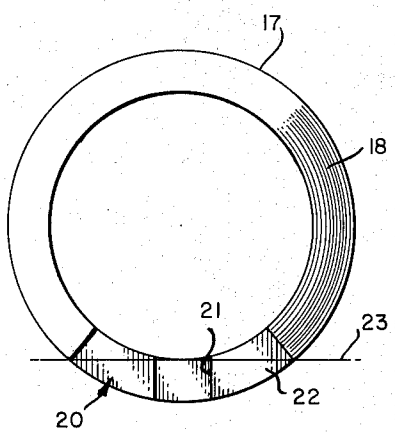
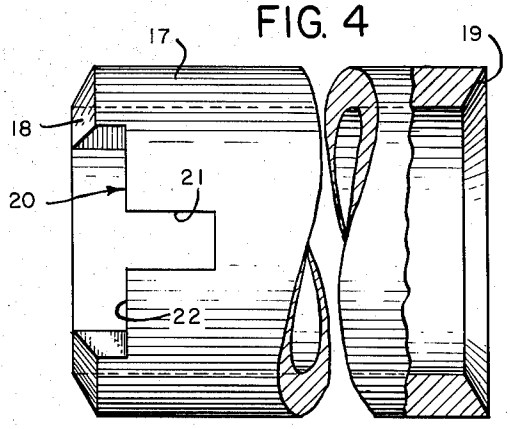



FIG. 4




INVENTOR

NORWOOD ACHEY

BY Wyatt Gerrell & Sturm

ATTORNEY

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# DRAINAGE TILE

Norwood Achey, W. Crest Road, Rossville, Ga.

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4 Claims. (Cl. 61—13)

This invention relates to sanitation, to the safeguarding of public health, and to apparatus and equipment utilized in the disposition or disposal of waste and discarded matter of a contaminating character in a manner not to endanger the health and welfare of human beings and animals.

The invention relates particularly to an improved drain tile for use in the drain field of a septic tank system to dispose of waste matter from buildings in a manner that the supply of water from wells and other sources will not become contaminated and present the resulting threat of typhoid fever or other communicable diseases.

Heretofore, septic tanks have been provided with drain fields in which a series of ditches have been dug on a down-grade from the septic tank and a layer of rock, cinders or gravel has been placed in such ditches and leveled at the proper pitch. Drain tile, which normally has generally flat ends, is then placed in the ditches in end to end relation and a workman manually spaces such tiles apart a predetermined distance in accordance with local building codes, usually from one-quarter of an inch to three-quarters of an inch apart. Strips of waterproof building paper are then placed over the joints and additional rocks or gravel are placed on top of the tile to a predetermined depth after which the ditches are filled. This procedure has been expensive, time-consuming, subject to human shortcomings, and sometimes the strips of building paper have collapsed which resulted in the clogging of the drain field after which it has been very difficult to locate and correct the condition.

It is an object of the invention to overcome the difficulties enumerated and to provide a relatively simple, inexpensive drain tile which may be installed in a minimum of time with a minimum of effort by unskilled workers and will satisfactorily perform its function for a long time without maintenance.

Another object of the invention is to provide a drain tile having end portions interfitting with the end portions of adjacent tiles and which tile has slots or openings which encourage ready drainage and therefore greater distribution of liquid throughout the drain field.

A further object of the invention is to provide a drain tile which reduces the possibility of human error and which eliminates the need of rocks, cinders or gravel on top of the tile.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawing in which:

FIG. 1 is a side elevation of a septic tank system using the tile of the present invention in the drain field;

FIG. 2, an enlarged side elevation of a series of tiles in abutting relation;

FIG. 3, an end elevation of one of the tiles; and

FIG. 4, a fragmentary bottom plan view thereof.

Briefly stated, the present invention is a tubular drain tile having cooperating interfitting male and female ends which permit such tile to be laid in end to end abutting relation and each tile has multiple slots such as a T-slot which allows proper drainage and distributes the fluid throughout the drain field. The T-slot is arranged in such a manner that the point where the cross piece or transverse slot intersects the outer diameter of the drain tile is substantially in alignment with the lowermost portion of the inner diameter so that the rock or gravel covering is eliminated and the dirt covering cannot enter the tile.



With continued reference to the drawing, a house or other building is supported on a foundation **10** mounted on footings **11** and waste material is discharged from the house through a soil pipe **12**. In urban areas the soil pipe is connected to a community sewage system and the waste matter from all of the buildings in the area is processed in a sewage disposal plant. In rural and some suburban areas the community sewers are not available and as a result the waste matter from each building must be disposed of it in a septic tank system.

The septic tank system includes a septic tank **13** into which liquid and solid waste matter are discharged from the soil pipe **12**. The solid matter sinks to the bottom of the septic tank where it decomposes and changes its state from a solid to a liquid. If desired, chemicals may be added to accelerate the decomposition of such solid matter. The liquid is discharged from the septic tank through a pipe **14** into an overflow tank **15** with such pipe **14** being at a slightly lower level than the inlet soil pipe **12**. A series of drain lines **16** are connected to the overflow tank **15** and such lines may be disposed in substantially parallel relation or may extend substantially radially from the overflow tank and form a drain field. The drain lines **16** are connected to the overflow tank **15** at a slightly lower level than the pipe **14** and are located on a slight decline or pitch from the overflow tank to the outer extremity of the lines so that the liquid will flow through such lines by gravity.

Each of the drain lines **16** comprises a plurality of individual drain tiles **17** of substantially cylindrical cross-section and with relatively thick walls. Each tile has a male end including a tapered extremity **18** and a female end having a tapered recess **19** for cooperative engagement with the extremity **18** of a contiguous tile. The drain tiles preferably are constructed of clay, cement or other abrasive material so that when the drain lines are formed with the individual tiles in abutting relation the abrasive engaging surfaces of the interfitting male and female ends will provide sufficient friction to resist rotary motion between adjacent tiles when the ditch in which they are placed is filled.

In order to permit drainage of the liquid in the drain lines, each tile is provided with multiple recesses such as, for example, a T-shaped slot **20** in one end with such slot being positioned along the bottom portion of the drain lines. The T-shaped slot includes a stem or longitudinal slot **21** extending lengthwise of the tile and a cross or transverse slot **22** extending around the periphery thereof. The outer extremities of the transverse slot **22** preferably intersect the periphery of the tile at a point substantially level with the internal radius of such tile. In other words, an imaginary line **23** drawn transversely of the tile would be tangential to the internal radius of the tile and would intersect the external radius at a point where the transverse slot terminates. This construction permits the tiles to be laid end to end in abutting relation in a ditch after which the ditch can be filled with earth and due to the relationship between the outer extremity of the slot and the internal radius of the tile the earth which is deposited around the drain lines will not enter such slot and cause clogging of the lines.

In the operation of the device a conventional septic tank and overflow tank are constructed after which a drain field is provided for disposing of waste liquids. The drain field is constructed by digging a plurality of ditches and partially filling the ditches with rocks, gravel or the like to a predetermined level and at a proper downward slope. Drain tile are then placed in the ditches in end to end abutting relation and the ditches are then filled with earth. Due to the material and the construction of the individual drain tiles such tiles will resist rotary or

lengthwise movement during the filling of the ditch so that such tiles will remain substantially in the same position in which they are laid. Each tile has a slot which permits the discharge of fluid carried by the drain lines and such slots are arranged in such a manner that they encourage distribution of the liquid throughout the entire drain field.

It will be apparent that a relatively simple, inexpensive drain tile is provided having end portions interfitting with the end portions of adjacent tiles and which tile has multiple recesses in the shape of a T-slot which encourages ready drainage and greater distribution of liquid. Likewise, the tiles of the present invention help reduce the initial cost by eliminating the need of rocks, cinders or gravel on top of the tile.

It will be obvious to one skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is illustrated in the drawing and described in the specification, but only as indicated in the accompanying claims.

What is claimed is:

1. A generally tubular drain tile having a tapered extremity at one end and a tapered recess at the opposite end, the tapered extremity of one tile cooperatively engaging the tapered recess of an adjacent tile, a T-shaped opening located adjacent one end of said tile, said T-shaped opening including a transverse portion extending around the periphery of the tile to a position such that an imaginary line drawn through the terminal lines of intersection with the external periphery is tangential with the internal periphery of said tile.

2. The structure of claim 1 in which said tile is constructed of abrasive material so that contiguous tiles may be placed in end to end abutting relation and will be frictionally held in such position.



3. A generally tubular drain tile having relatively thick walls, said tile having means on each end for interfitting engagement with contiguous tiles, a T-shaped slot in each tile and disposed on the lowermost portion of said tile when installed, said T-shaped slot including a longitudinal slot and a transverse slot, said transverse slot terminating in a position such that an imaginary line drawn between the ends of such transverse slot is tangential to the internal periphery of said tile.

4. In a septic tank system having a septic tank, a drain field including a plurality of drain lines, each drain line comprising a series of drain tiles of substantially cylindrical cross-section and having relatively thick walls, each tile having an outwardly tapered portion on the end and a cooperating inwardly tapered recess on the opposite end for cooperative engagement with the extremities of contiguous tiles, each of said tiles having a T-shaped slot adjacent to one end for discharging liquid into the drain field, said T-shaped opening including a transverse portion extending around the periphery of the tile to a position such that an imaginary line drawn through the terminal lines of intersection with the external periphery is tangential with the internal periphery of said tile.

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REUBEN FRIEDMAN, *Primary Examiner.*

D. M. RIESS, *Assistant Examiner.*