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DRAIN TILE

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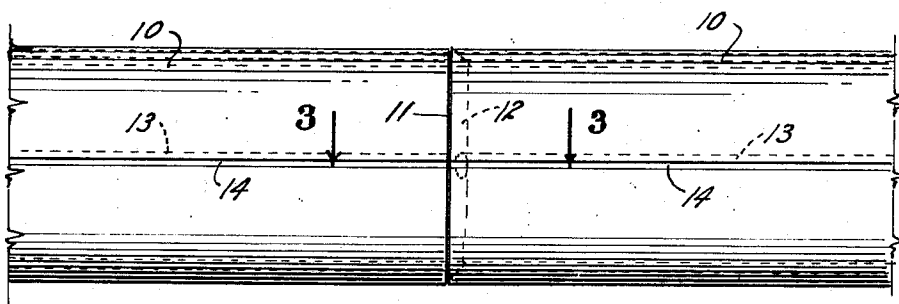


**FIG. 1**

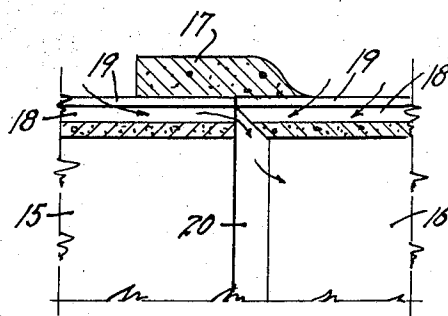
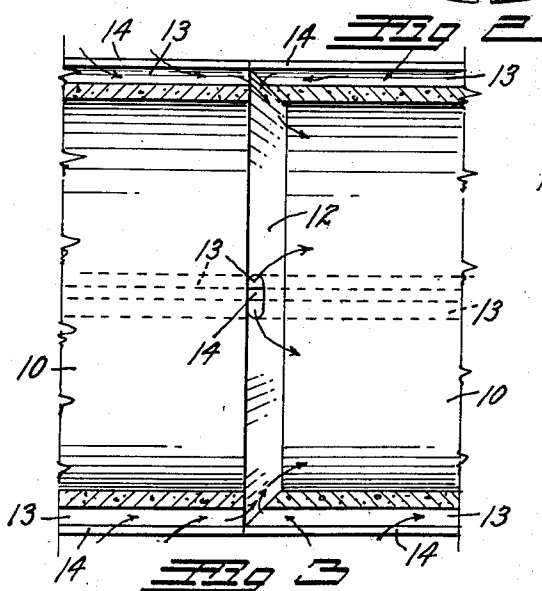
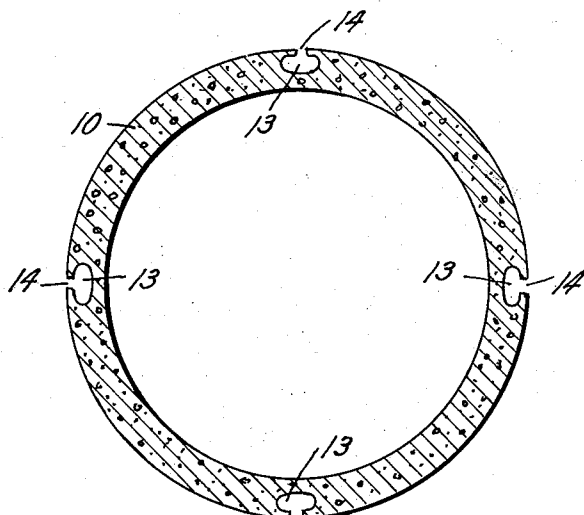


**FIG. 4**

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2,810,264

## DRAIN TILE

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4 Claims. (Cl. 61—11)

This invention relates to a drain tile of the type used for land drainage, for filter beds in water purification plants and for sewage disposal systems.

The usual drainage tile used for these purposes are made in short lengths, usually one foot, and are laid end to end in slightly spaced relation so that water may enter or discharge from the tile between the adjacent short lengths. The short lengths are difficult to accurately lay and it is difficult to maintain them in alignment. As a result, earth and silt enter the tile and quickly clog the water course therein.

The principal object of this invention is to provide a drainage tile which can be made in relatively long lengths so that it can be readily laid and aligned and so that, due to its length, it will maintain its alignment so as to greatly reduce the possibilities of clogging from the entrance of earth and silt and to so construct the relatively long lengths that there will be free passages for water to enter or discharge from each tile throughout the entire length thereof.

The conventional short length drainage tile must be carefully spaced apart by means of wedges or the like to provide water passages between the tiles. Another object of this invention is to provide tiles of this character which can be butted tightly together end to end, to facilitate laying and maintaining the drainage line, and yet which provide free passage for water to and from the tiles throughout the entire length of the line.

A further object of the invention is to provide an improved long-length, free-flow drainage tile which can be manufactured on the present clay sewer pipe and tile presses by a simple die change without disturbing the press construction or its output capacity.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a fragmentary side view illustrating the abutting extremities of two lengths of the improved drainage tile positioned in alignment with each other;

Fig. 2 is an enlarged transverse cross section through a length of the improved tile;

Fig. 3 is a similarly enlarged fragmentary longitudinal section through the abutting extremities of two lengths of the improved tile taken on the line 3—3, Fig. 1; and

Fig. 4 is a similar fragmentary section illustrating an alternate form of the improved tile.

The improved drainage tile comprises an elongated hollow cylindrical length of tile 10 formed of any suitable material such as concrete, metal, plastic or the like. It is more particularly designed to be formed from kiln fired clay similar to that used in sewer pipe and conventional drainage tile.

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One extremity of the tile 10 is flat, that is it terminates in a flat plane transverse of the axis of the cylinder of the tile. The latter extremity is herein designated as the flat end 11.

The other extremity of the tile 10, herein designated as the conical end, is internally inclined to provide an internal conical surface 12. Thus, when two of the tiles 10 are placed in abutting alignment with the flat end 11 of one tile abutting the conical end of the adjacent tile an annular internal pocket of triangular cross section is formed between the tiles as illustrated in Fig. 3.

A plurality of axially extending water passages 13 are formed in the wall of the cylinder forming the tile 10. The passages 13 extend the full length of the tile and open to both extremities thereof, that is, they open through the flat end 11 and through the conical surface 12 at the conical end.

A relatively narrow drainage slit 14 is formed through the external surface of the tile communicating with, and in alignment with, each water passage 13 throughout the entire length thereof. As illustrated, there are four water passages 13 and four of the slits 14 equally spaced about the tile. Any desired number of water passages and slits could be employed in the tile, depending upon the water handling capacity desired.

Let us assume that a plurality of the tiles are buried in end-to-end alignment for drainage purposes. The water from the surrounding earth can freely flow through the slits 14 into the passages 13 at any point along each tile, regardless of the length of the latter. This water flows in either direction along the passages 13 until one of the internal pockets formed by a conical surface 12 is reached, as indicated by the arrows in Fig. 3. Thus, it can be seen that there is a free flow provided for external water to enter the tile at any point.

For water dispersion services such as in filtration plants and in sewage disposal plants an equally free reverse flow is provided, that is, the water from the interior of the line of tile enters the annular pockets formed by the conical ends and flows from thence into the water passages 13 and discharges through the slits 14 throughout the entire length of the tile.

In Figs. 1 and 3, the water passages 13 of adjacent tiles have been shown in alignment with each other. This alignment is not essential, since the free flow of water remains the same, regardless of whether the adjacent passages are aligned. It is desired to call attention to the fact that the water passages 13 are transversally wider than the slits 14 therefore it is impossible for foreign materials of sufficient size to clog the passages to enter the latter.

The tiles illustrated in Figs. 1, 2, and 3 are designed to be laid in simple aligned, abutting relation. They could be provided at their one extremities with bells for receiving the spigot extremity of the adjacent tile so that the tiles would be mechanically maintained in alignment, similar to the conventional sewer tile.

Such an arrangement is illustrated in Fig. 4 wherein the spigot extremity of one tile is illustrated at 15 and the bell extremity of an adjacent tile is illustrated at 16. The bell extremity is provided with an enlarged bell 17 for slidably receiving the spigot extremity 15. The tiles 15 and 16 are provided with water passages 18 and longitudinal water-receiving slits 19, similar to the water passages 13 and the slits 14 previously described.

The bell extremity is provided with an internal, inclined, conical end surface 20 similar to the conical surface 12 previously described, and the water passages 18 may extend through the bell 17 and terminate in the conical surface so that the water may flow into the line of tiles or discharge from the line of tiles, as indicated by the arrows in Fig. 4 and as previously described.

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While the bell 17 has been illustrated as positioned on the conical extremity of the tile, it could, without affecting the function, be placed upon the flat extremity thereof.

The usual sewer pipe and drainage tile is formed by extruding clay through an annular die. This improved drainage tile could be similarly formed, it being only necessary to provide grooving devices on the interior of the die for forming the water passages 13 and the slits 14 in the external surface of the extruded clay as will be apparent to one skilled in the art.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A drainage tile comprising: an elongated cylindrical tile; an inwardly inclined annular end surface on one extremity of said tile forming an internal, conical end thereon; an annular flat surface on the other extremity of said tile lying in a plane transverse to the axis thereof which will form an annular internal pocket of V-shaped cross-section when abutted against the inwardly inclined end surface of an adjacent tile; a plurality of axially extending, spaced-apart water passages formed in the wall

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of said tile and opening to both extremities thereof; and means for admitting water from the exterior of said tile to said passages, said water discharging into said tile through the medium of the V-shaped pockets formed at the extremities thereof by abutment with adjacent tiles.

2. A drainage tile as described in claim 1 in which the means for admitting water comprises: longitudinally extending slits formed in the external surface of said tile in alignment with and communicating with said passages there being no communication from said passages through the internal surface of said tile.

3. A drainage tile as described in claim 2 having a bell formed on the extremity of one tile and adapted to receive the extremity of an adjacent tile so that said V-shaped pockets will be formed within the bells of adjacent tiles.

4. A drainage tile as described in claim 3 in which said passages extend through said bell.

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