June 13, 1939. L. M. CHRISTIE ET AL 2,161,999

FILTER TILE

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FIG. 1

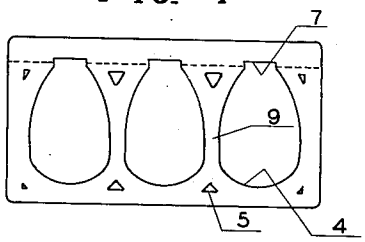


FIG. 2

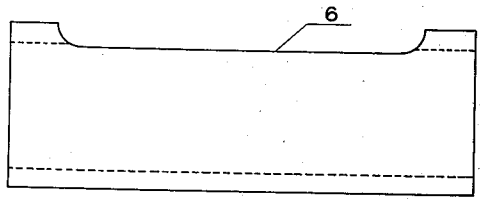


FIG. 3

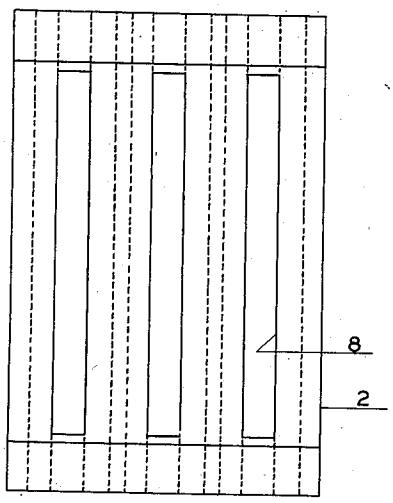


FIG. 4

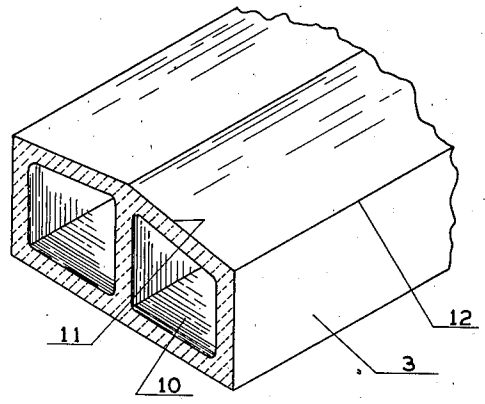
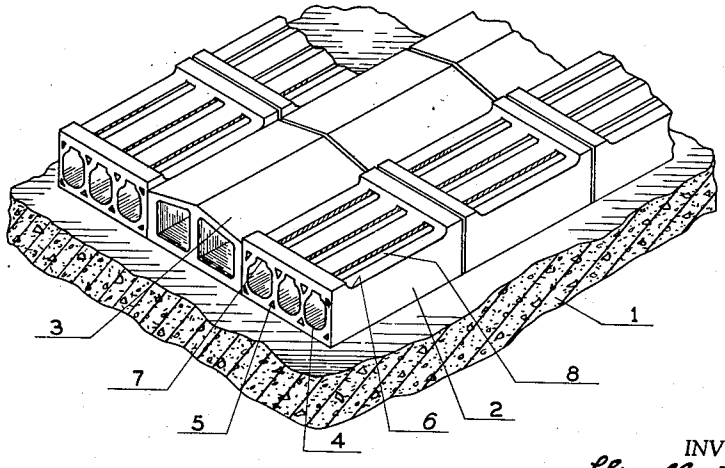


FIG. 5



INVENTORS.
Llewellyn M. Christie
Edward T. Wanner 2nd
Arthur S. Brewer

BY
William B. Jaspert
ATTORNEY.

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FIG. 6

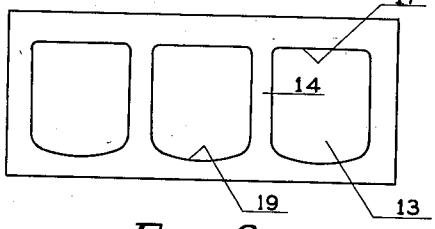


FIG. 7

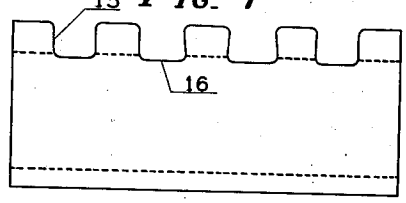


FIG. 8

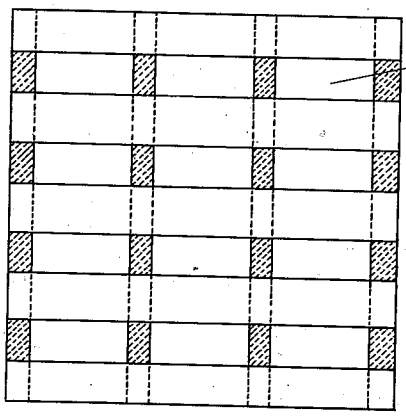


FIG. 10

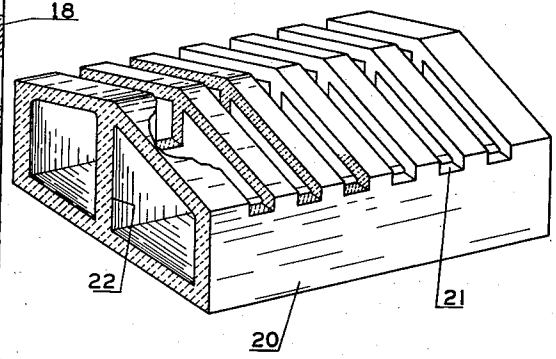
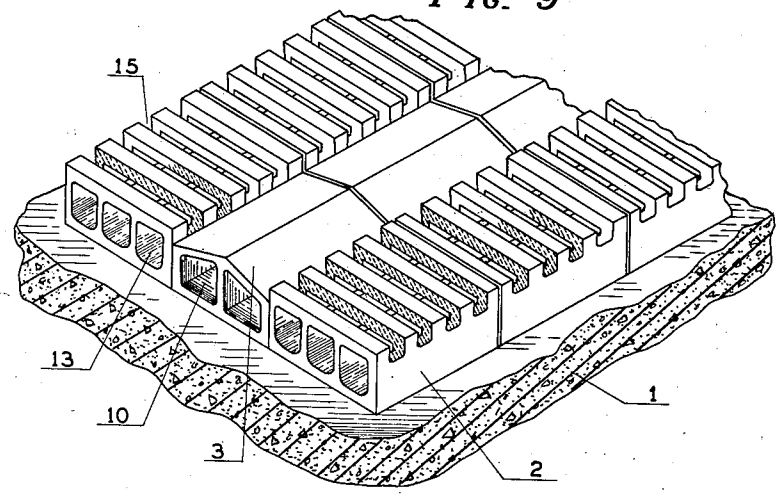


FIG. 9



INVENTORS.
Llewellyn M. Christie
Edward F. Warner
Arthur S. Brewer
William B. Jaspert

BY

ATTORNEY.

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UNITED STATES PATENT OFFICE

2,161,999

FILTER TILE

Llewellyn M. Christie, Edward F. Wanner, and Arthur S. Brewer, Pittsburgh, Pa., assignors to National Fireproofing Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Application March 23, 1935, Serial No. 12,698

2 Claims. (Cl. 210—148)

This invention relates to new and useful improvements in filter blocks, and it is among the objects thereof to provide a tile structure having an integrally formed drain trough and supporting grid structure adapted for use with hollow spacer blocks to form a trickling filter bed.

The conventional trickling filter floor construction consists of trough blocks and grid blocks built up to form a drain and supporting structure for a bed of coarse material such as gravel, broken stones or the like, and in this form the supporting concrete bed on which the filter floor is constructed usually forms a portion of the drain troughs.

In accordance with the present invention, the tile is constructed to have the drain troughs formed therein, thus facilitating the assembly of the tile or blocks and providing a smooth glazed surface for the passage of the sewage effluent to obtain a more or less self-cleaning effect. Such a structure is readily kept open by flushing, and there are no crevices or joints in which substances may accumulate and finally clog up the flow passage.

The nature and contruction of the invention will be more apparent from a description of the accompanying drawings constituting a part hereof in which like reference characters designate like parts and in which:

Figs. 1, 2 and 3 are a front and side elevation, and top plan view, respectively, of a preferred embodiment of the invention;

Fig. 4 a view in perspective of a fragmentary portion of spacer block;

Fig. 5 a view in perspective of the filter and spacer blocks of Figs. 1 to 4 when assembled;

Figs. 6, 7 and 8 are front and side elevations, and a plan view, respectively, of a modified form of filter block;

Fig. 9 a view in perspective of the blocks of Figs. 6 to 8 assembled with the spacer blocks of Fig. 4; and

Fig. 10 a view in perspective of a modified form of filter block.

Referring to Fig. 5 of the drawings, numeral 1 designates a concrete foundation which is of sloping construction for supporting filter blocks 2 and spacer blocks 3. The latter may be omitted and concrete poured in the space between adjacent filter blocks. The blocks 2 are provided with drain troughs 4 in spaced relation and intervening spaces 5 to reduce the weight of the blocks. Blocks 2 have a plain face at the bottom and are recessed at 6 on the top a sufficient distance to cut away the neck-like recesses 7 at the top of the drain troughs 4 to form slots 8 in parallel relation which constitute the supporting grid for coarse filter materials such as stone, gravel, clinkers or the like.

This construction affords maximum flow passage for the effluent coupled with maximum strength of the solid vertical webs 9 and extreme lightness for handling and shipping. The spacer block 3 is likewise provided with hollow chambers 10 to lighten the block and has a chamfered upper surface 11 for diverting the flow on each side towards the filter blocks, the bottom edge 12 of the chamfered faces being of substantially the same height as the recess 6 or slightly higher to cause drainage of the fluid to the recess 6, thence through slots 8 to the drain troughs 4. The spacer blocks 3 maintain proper alinement of the filter blocks and prevent their displacement.

In the construction shown in Figs. 6 to 9 inclusive, a plurality of large parallel drain troughs 13 are provided with heavy webs 14, the blocks being of elongated shape and provided with transverse parallel slots 15 forming the grid structure, the bottoms 16 of the slots being slightly below the upper wall 17 of the troughs 13 to form slotted openings 18 for the passage of the effluent through the top of the block to drain troughs 13. The drain trough has a curved bottom wall 19 to accelerate the flow of the drainage fluid. When assembled in the manner shown in Fig. 9, the grid slots 15 are transversely disposed relative to the flow troughs 13 while in the blocks of Figs. 1 to 5 inclusive the grid slots 8 are parallel with the flow troughs 4. Spacer blocks 3 are employed between the filter blocks 2 in the same manner as in the structure of Fig. 5 although, as before stated, the filter blocks may be assembled as shown and concrete poured between the assembled rows.

In the construction shown in Fig. 10, a tile 20 of the form of the spacer block 3 of Figures 4, 5 and 9 may be employed as a filter block by cutting transverse slots 21 across the sloping top as shown. Such a block is inexpensive to fabricate and by the employment of a central web 22 is strong in compression to withstand the weight of a filter bed. It is also apparent that any of the filter blocks with the slots may be assembled without spacer blocks or other intervening spacing materials.

It is evident from the foregoing description of the invention that filter tile or blocks made in accordance therewith and assembled with spacer tile furnish a large drainage surface and a strong supporting grid for the filter bed. The blocks are

of structural form in cross-section and provide maximum strength combined with minimum weight and the blocks of Figs. 1 to 5 are especially easy to manufacture as it merely requires the cutting away of the top recess after the blocks are extruded from a die to form the grid work.

Although several embodiments of the invention have been herein illustrated and described, it is apparent that modifications may be made in the details of construction without departing from the principles herein set forth.

We claim:

1. A trickling filter floor comprising rows of hollow filter blocks in end to end relation each having a plurality of partition walls dividing the hollow blocks into parallel drain troughs extending longitudinally of the blocks and rows to provide uninterrupted flow passages through successive blocks, the top of the blocks having horizontal walls provided with slots transversely of the drain troughs and extending below the top wall of the partition walls to form a grid structure to support a filtering bed thereon.

2. A trickling filter floor comprising rows of hollow filter blocks in end-to-end relation, each block having a plurality of partition walls dividing their hollow interiors into parallel drain troughs which are rounded at the bottom and horizontal at the top and extending longitudinally of the blocks and rows to provide uninterrupted flow passages through successive blocks, the top wall of the blocks being provided with slots extending transversely of the drain troughs and below the top of the partitions walls to form a grid structure to support a filtering bed thereon.

LLEWELLYN M. CHRISTIE.
EDWARD F. WANNER.
ARTHUR S. BREWER.