

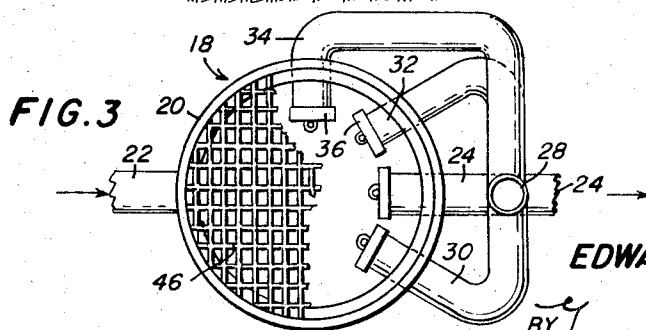
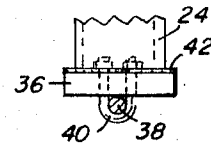
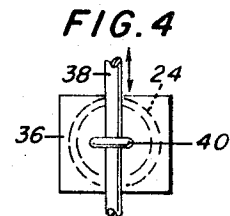
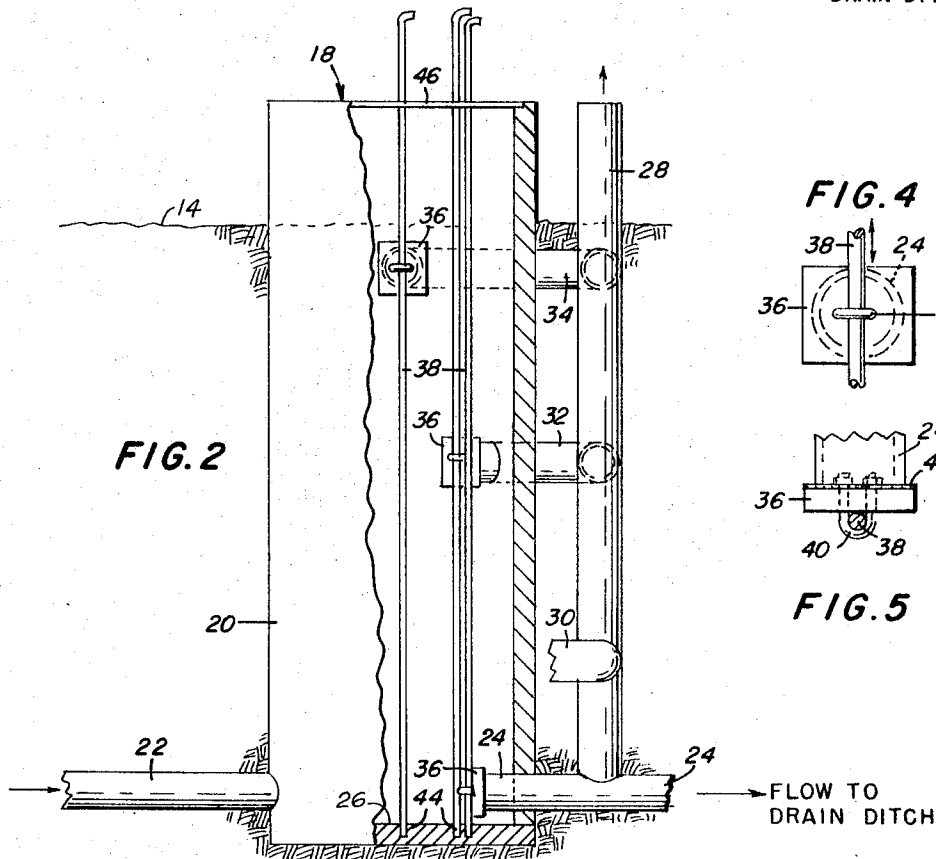
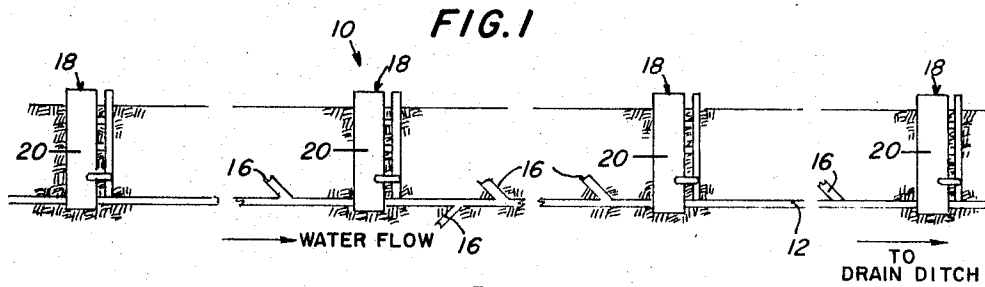
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GROUND WATER TABLE LEVEL CONTROL WELL GATE SYSTEM

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## GROUND WATER TABLE LEVEL CONTROL WELL GATE SYSTEM

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### ABSTRACT OF THE DISCLOSURE

This invention is a ground water table level control well system and is used in connection with land having drain tile pipe for the purpose of irrigating or draining the land.

The invention includes a well, and level control means at suitable distances along the drain tile. At one side, the well receives water, and discharges it through level control outlets in the other side, there being a plurality of outlets, the control for each outlet operable from above ground level, all connected through a common vertical tile through the outlet tile, the common vertical tile also providing an air escape to prevent pressure from building up in the tile.

This invention relates to a system of controlling the ground water table level of land having drain tile therein for subirrigation or for drainage or for both, and has for an object to provide an improved system for this purpose and improved structure forming part of this system.

A further object of this invention is to provide one or more water level control well systems, including an air vent outlet in the drainage side of the control well, which outlet vent also serves as a connection to the outlet tile from the portion of the well that is above the level of the outlet tile.

A further object of this invention is to provide manually operable and adjustable level control gates in the well for selectively connecting the well to a desired outlet tile leading to the drainage side of the control well.

Yet a further object of this invention is to provide an air vent from the drainage tile to the atmosphere, and thus prevent blowouts of the tile often caused by accumulating air pressure in the drainage tile.

Still a further object of this invention is to use this same air vent as a part of the level control for the well and thus for the land by connecting outlet tiles at different levels from the control well to the air vent tile and thus also to the drainage tile leading to a drainage area.

In brief, the system of this invention is used on land provided with drainage tile for drainage or for subirrigation thereof, or both, whereby the level of the water table therein may be controlled as desired to provide an optimum water table as desired. One or more control well systems are interposed in the substantial length of drainage tile in the land, such tile often being about four feet below the ground, but such depth is often even greater, depending on local conditions, evenness or slope of land, etc. Each control well is interposed in the length of underground tile, possibly one well at every eighty rods along the length of tile. Each well may be two feet or more in diameter, according to the diameter of the tile, which may be four, six or even ten or twelve inches in diameter, a larger diameter well being provided for the larger tile sizes.

Each well system consists of a substantially impervious well, preferably cylindrical in shape, having a bottom located about four and one half feet below ground level and extending about two feet above ground level, and the drainage tile is cut so as to extend into the well from opposite sides, thus providing an inlet tile on one side and

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an outlet tile on the other side, with the outlet side extending sufficiently into the well that a gate adjustably supported on a gate stem may be inserted into the bottom of the well and either fully or partially close off the outlet tile.

Adjacent the well, an air vent tile, of the same diameter as the drainage tile already buried in the ground, is vertically interposed in the out tile side and extends above ground the same two feet as the well. At vertically spaced intervals, circumferentially spaced about the well, additional outlet tiles of the same size are connected from the well to the outlet side of the drainage tile, preferably through the air vent, each provided with similar gates, preferably rectangular in shape and adjustably secured on their gate stem so that they may completely or partially close their respective outlet tiles, as desired. Inasmuch as water seeks its own level, the level of water maintained in the well by selective use of the gates will determine the water table level in the land on the inlet side.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawing, in which:

FIG. 1 is a vertical section showing a layout of this invention.

FIG. 2 is an enlarged vertical detail, partly in section, showing one of the control wells of this invention.

FIG. 3 is a top plan view of FIG. 2.

FIG. 4 is an enlarged elevation of one control gate.

FIG. 5 is a top plan view of FIG. 4.

In the drawing like numbers refer to like parts, and for purposes of explication, marshalled below are the numbered parts of the improved ground water table level control well system:

10 water level control system for tiled land

12 length of tile

14 ground level

16 laterals

18 level control well system

20 well

22 inlet tile of 12

24 lowermost outlet tile of 12

26 well floor

28 air vent tile

30 next lower outlet tile

32 next upper outlet tile

34 uppermost outlet tile

36 control gate

38 gate stem

40 U-bolt and nuts about stem 38 through gate 36

42 felt sealing facing of gate 36

44 recesses in well floor 26 for bottom ends of gate stems 38

46 lattice work or grid at top of well 20

There is shown at 10 a layout of the ground water table level control well system of this invention as applied to tiled land, that is, farm land having a substantial length of underground drainage or subirrigation tile 12 buried therein, of a suitable diameter, but often approximately four inches, and buried about four feet below ground level 14. Laterals 16 may also be present.

Such drainage or subirrigation tile 12 is well known and conventional, leading to a drainage area or ditch at one end, and provided, when subirrigation is used, with a source of water at the other end. This invention consists of interposing one or more water level control well systems 18 at approximately every eighty rods along the length of the tile 12 between its water supply source and its drainage area.

Each control well system includes a well 20, interposed in the tile 12 thus providing an inlet tile 22 on one side and an outlet tile 24 on the other side, the outlet tile 24 extending a substantial distance through the side of the well 20, while the inlet tile 22 may terminate at the inner surface of the well 20. The well 20, as shown, may be cylindrical in shape with a well floor 26 a couple of inches below the bottom of the inlet and outlet tiles 22 and 24, and the well may be of impervious material, such as concrete, and may extend about two feet above ground level 18.

Vertically extending from the outlet tile 24 adjacent the well 20 is an air vent tile 28, of the same diameter as the tile 12. Vertically spaced at suitable intervals are a plurality of additional outlet tiles 30, 32 and 34, circumferentially spaced about the side of the well 20 adjacent the outlet side of the tile 12, and each outlet tile 24, 30, 32 and 34 is provided with a separate control gate 36 on a separate gate stem 38, preferably a piece of half inch pipe, to which it is adjustably secured by a U-bolt and nuts 40. Each gate is at least the size of the tile, and is preferably rectangular in shape, and has a sealing facing 42 of felt on the side proximate its outlet tile.

The bottom end of each gate stem 38 may be inserted into an appropriate recess 44 in the well floor 26, and the top end of the stems 38 extend through a lattice work or grid 46 placed on top of the well 20, both to prevent animals or other objects from falling into the well, as well as to provide a means for securing the gate stems 38 in upright position, to which it may be tied, if desired, by a suitable cord (not shown).

In operation, when a gate 38 is placed with its facing 42 sealing the lowermost outlet tile 24, the water level will rise in the well as far as the level of the next outlet tile 30, or if similarly sealed by a gate 38, then to the next outlet tile 32, or if desired, outlet tile 32 is similarly closed, then to the next outlet tile 34. If desired, the topmost outlet tile in use may be partially rather than fully closed off by loosening the nuts on its U-bolt 40 and then adjusting it an inch or two, as desired, downwardly, thus changing the water level accordingly by a few inches. The well gates are individually manually inserted, according to the judgment of the operator. Normally, the well farthest from the drainage area will be first opened to control the water level to the desired depth, then in about an hour, the next well system will be opened to the desired depth, and then successive well systems will be similarly opened until the water level is at the desired depth. When further drainage is desired, lower outlet tiles may be opened, if more subirrigation is de-

sired, and control gates are closed to maintain the desired water table level. The presence of the air vent tile 28 at each well prevents an accumulation of air pressure in the tile, and thus prevents blowouts caused by an accumulation of air pressure.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. In a water level control well system for tiled land having a substantial length of drain tile leading to a drain outlet; a vertically extending well interposed in the length of tile thereby providing an inlet tile and an outlet tile into said well, said inlet tile being unimpeded, an air vent tile extending vertically from said outlet tile alongside said well and draining into said outlet tile, a plurality of vertically spaced outlet tiles connecting said well to said vertical air vent tile, and gate means in said well for selectively impeding one or more of said outlet tiles from said well, said gate means comprising an individual well closure gate for each said outlet tile, each said outlet tile being displaced circumferentially from each other outlet tile, said gate being of a size at least equal to the side of the outlet tile, and a sealing facing on the side of said gate proximate the outlet tile, a gate stem for each gate, said well having gate stem receiving sockets in the bottom thereof, and means for securing the upper ends of said gate stems in position.

2. The structure of claim 1, and adjustable means for securing each gate to its gate stem comprising a U-bolt extending about each said gate stem and through the said gate and nut means secured thereon, for clamping said gate to its stem.

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