United States Patent

Soileau

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[54] WATER LEVEL CONTROL DEVICE

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[52] **U.S. Cl.** **61/12**

[51] **Int. Cl.** **E02b 13/00**

[58] **Field of Search** 61/10–15, 17, 18; 138/155, 177; 285/302, 303; 137/577

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[57] **ABSTRACT**

A water levelling device for use in a rice field, comprising an L-shaped conduit embodying a horizontal branch embedded beneath a levee and a complemental vertical upstanding branch at the inner end which is also embedded. The inner end has an elbow whose upper shoulder-equipped end supports a cylindrical adapter which, in turn, provides a coupling for an extensible and contractible water level controlling sleeve. This sleeve is insertable and removable and has an adjustively applicable rubber joint sealing ring seated atop a limit stop shoulder at the upper end of the adapter.

6 Claims, 3 Drawing Figures

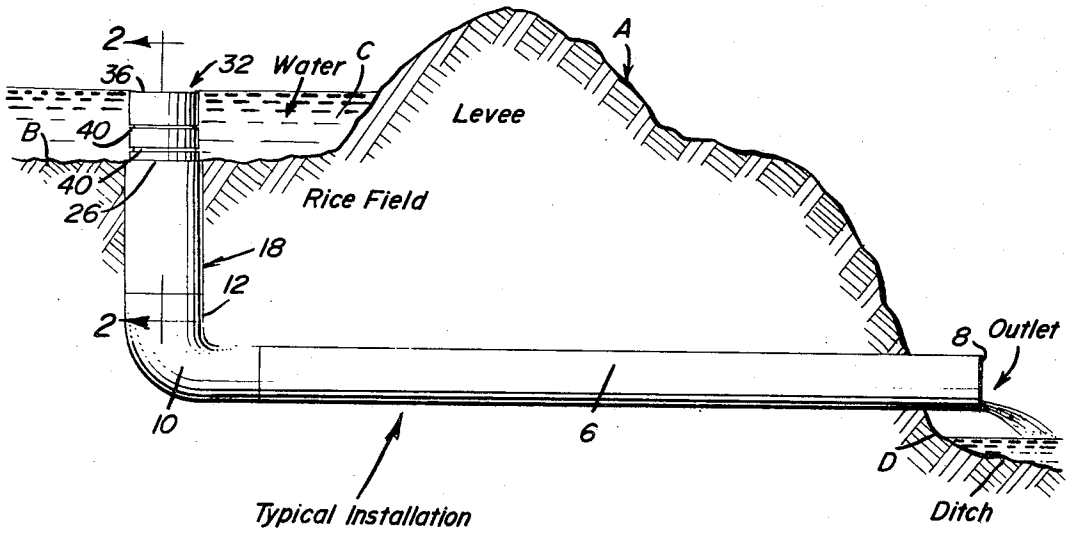


Fig . 1

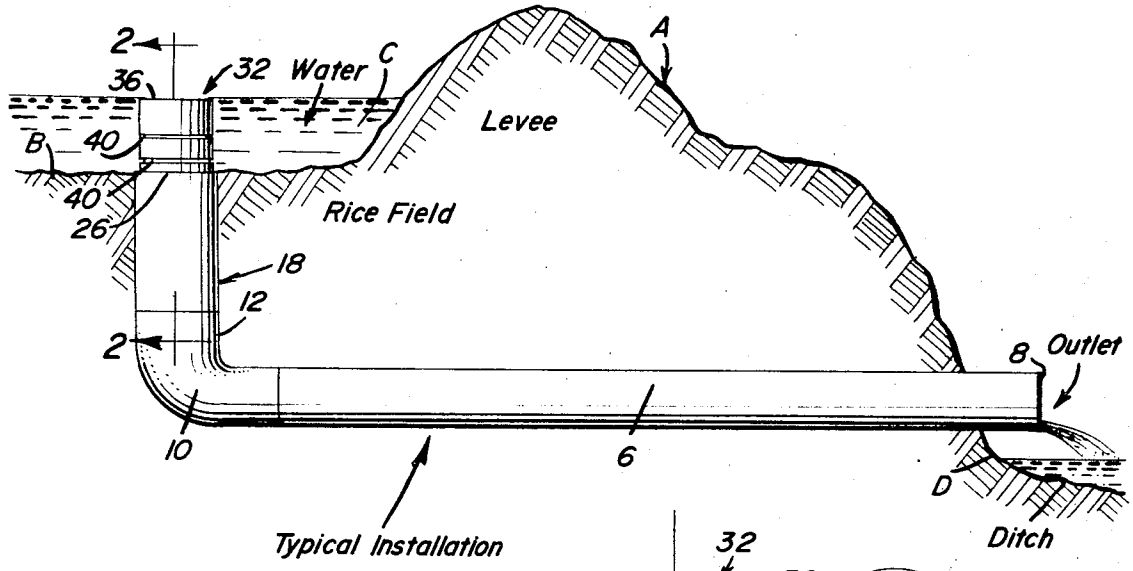
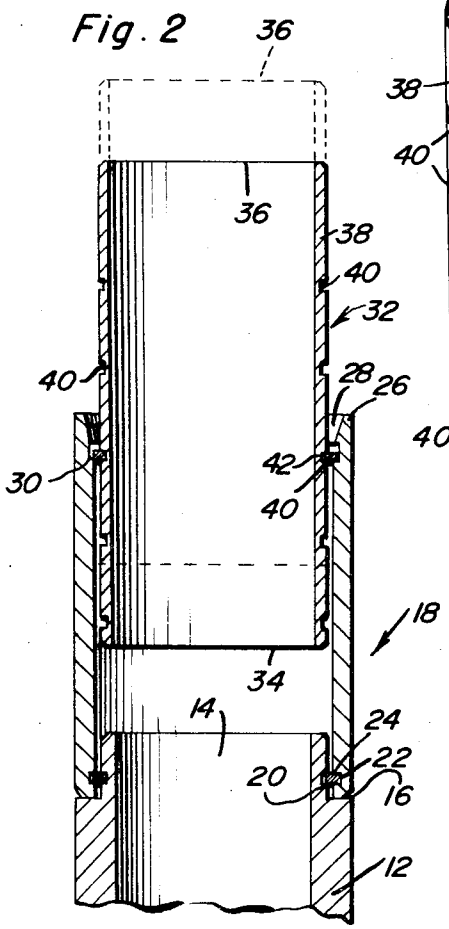


Fig . 2



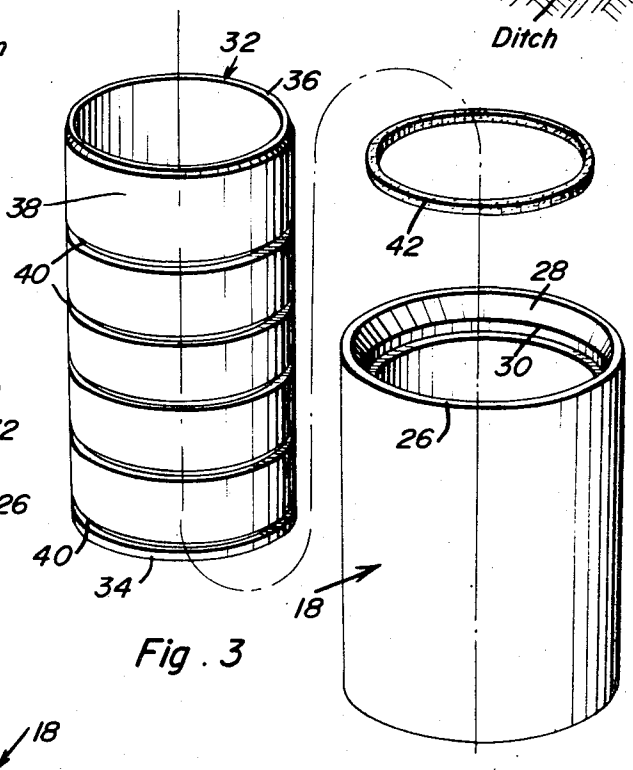


Fig . 3

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WATER LEVEL CONTROL DEVICE

This invention relates to a certain new and useful improvements in an adjustable water level controlling device which, broadly stated, is characterized by a conduit and which, in turn, comprises a long horizontal branch open at its outward end and provided at its inward end with vertically disposed and vertically adjustable branch by way of which the area irrigating water level can be regulated and controlled at will.

Although the invention lends itself to use in a field or irrigating environment different from that herein explicitly disclosed it is believed that it is uniquely and expressly designed and adapted for use when and where necessary and in association with irrigated land, a rice field for example, more particularly, an arrangement which is marginally encompassed by a levee-type embankment. To the ends desired the invention has been found to be feasible and ideal for establishing and then automatically controlling the level of the entrapped water or for optionally emptying the water for complete drainage into an adjacent area alongside and outwardly of the levee.

Briefly, the invention viewed in side elevation comprises a drainage conduit, that is, an adaptation which is appropriately designed and well adapted to be embedded in the ground at the locale desired. The conduit is substantially L-shaped in side elevation and embodies a relatively long horizontal pipe line, also referred to herein as a drainage line, which in practice is embedded in a plane underneath the levee or embankment. This branch or pipe line has an outward discharge or outlet end which is constantly open and is communicable with an adjacent land area atop which the discharged water is emptied. The inward end of the pipe line is equipped, as is usual, with either an elbow or a T-shaped fitting which is herein referred to as a union. The upstanding part of this union constitutes a component part of the upstanding vertically disposed means which serves for receiving the overflow and delivering the same to the inlet end of the horizontal pipe line by way of the union. In addition to said union the vertical branch embodies a sleeve-like adapter. This adapter is coupled to and rises from the upper shouldered neck equipped end of the union. The adapter comprises an open-ended cylinder. The lower end is seated on the shoulder and sealed to the neck. The upper end is provided with a beveled surface and a complemental shoulder. This shoulder and beveled end portion serves to guide and pilot the lower end of the adjustable sleeve in place. This sleeve is the water level setting and controlling component of the over-all conduit.

It will be noted that the adjustable level establishing and maintaining sleeve is unique in that it is open-ended and the outer peripheral surface is provided at vertically spaced points with correspondingly dimensioned endless grooves or channels. These grooves are selectively used to accommodate an insertable and removable rubber ring. The ring is normally seated on the shoulder at the upper end of the adapter and can be shifted or changed from time to time in order to raise or lower the upper intake end of the overflow sleeve.

As will be hereinafter observed a typical and acceptable installation of the invention is novel in that the components, except the packing rings, are made of any

practical and recommended class of asbestos cement, that is moldable cement. The purpose of using asbestos cement pipe parts eliminates the problem of corrosion and rust and virtually makes the installation as permanent as can be.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a view of a typical installation showing a rice field charged with irrigating water with the right hand margin situated within the confines of the mound of a levee or similar embankment and showing what is more significant the embedded substantially L-shaped conduit and the component parts united to provide the level control and draining result desired.

FIG. 2 is an enlarged detailed sectional view taken approximately on the plane of the vertical section line 2—2 of FIG. 1 looking in the direction of the indicating arrows.

FIG. 3 is an exploded perspective view showing the specially designed adapter coupling at the right, the adjustable insertable and removable level control sleeve at the left, and a manually applicable and removable sleeve seating and retaining packing ring oriented therein.

With reference now to the typical installation illustrated in FIG. 1 the embankment, that is the levee-type embankment, is denoted by the reference character A, the irrigated area or rice field is denoted at B, the irrigation water at C and the accumulation ditch at D.

The overall conduit is approximately L-shaped and comprises a horizontal long branch **6** which is also referred to as a drainage pipe or line. The open or discharge end is denoted at **8** and it will be noted that when the pipe or branch is embedded underneath the embankment the outer end protrudes and empties into the ditch D. The union **10** at the left in FIG. **1** is an elbow type and in practice it could be a tee-shaped type (not shown). The vertical portion of the elbow denoted at **12** in FIG. **2** has a reduced neck **14** surrounded by a shoulder **16**. This neck equipped shouldered end serves to accommodate the attachable and detachable cylindrical adapter or coupling **18**. This coupling comprises an open-ended sleeve whose lower end portion is seated on the shoulder **16**. The exterior surface of the neck **14** and interior surface of the coupling **18** have grooves **20** and **22** which are aligned and accommodate the sealing and packing ring **24**. The upper end **26** has a downwardly sloping annular bevel **28** merging into an endless limit stop shoulder **30**. This beveled shouldered end serves to accommodate an insertable and removable end portion of the sleeve **32**. This sleeve is of requisite diameter and the outside diameter is coordinated with the inside diameter of the bore of the adapter. The lower end **34** fits into the adapter and the upper end **36** is adjustable to regulate the level desired. The upper end portion is denoted at **38** and the peripheral circumferential spaced parallel grooves are denoted at **40** and serve to accommodate the attachable and detachable packing ring **42**.

The specific construction of the unique asbestos cement components is shown in FIG. 3 illustrating the cylindrical adapter or coupling 18 and which serves to accommodate the insertable and removable level adjusting extensible and retractable sleeve 32. The manner in which these two parts are telescopingly fitted together is illustrated in particular in FIG. 2. In addition this FIGURE shows the shoulder 16 of the union 12 and the neck 14 to accommodate the lower packing equipped end of the adapter coupling 18. More particularly FIG. 2 shows the coordinate association of the piloting bevel 28 and the limit stop shoulder 30 for the attachable and detachable packing ring 42.

The over-all L-shaped conduit is brought out in FIG. 1 where it is shown embedded with the horizontal part lying in a plane beneath or below the mound of the levee A. The vertical branch is also here shown in cooperation with the water containing rice field B. A water tight joint or seal is provided as at 22, 24 and 20 in FIG. 2. Also, the same type of a seal is shown at the upper end of the adapter coupling 18 of the same view. Manifestly by changing the rubber ring, that is the part 42, to any of the selected grooves the sleeve part 32 can be raised lowered and maintained to achieve the water level desired. When complete drainage is desired the sleeve 32 is bodily removed and the adapter coupling 18 remains in place (not illustrated). In actual practice the upper end of the adapter is usually set approximately six inches below ground line. Accordingly, complete drainage can then be accomplished in a seemingly evident manner.

Reverting to the connection between the adapter 18 and the coacting upper end portion of the union 12 it should be pointed out here that it is within the purview of the invention to make a substantially permanent jointing connection between the parts in lieu of the grooves 20 and 22 and intervening packing ring 24 which is lodged in these grooves. This is to say, a permanent epoxy joint (not shown) can be provided. It follows that the manner and means of interconnecting the union 12 and adapter 18 can be varied in actual practice.

It is deemed significant to mention here that the invention is structurally and functionally designed to drain, irrigate and to handle the overflow of surplus or excess water in the event of sudden rainfall immediately after irrigation and, in addition, to also handle excessive overflow of water which may have been pumped into the field. It will save farmers a considerable amount of costly time and labor, will reduce objectionable erosion to a minimum and will function to maintain water level from 1 to 7 inches as desired. In addition, it will maintain the desired level by overflowing and preventing levee washouts. Then too, it functions to virtually eliminate the necessity of cutting portions of levees open and subsequently having to close the cutouts every time the irrigation step is completed.

It is believed that a consideration of the description in conjunction with the views of the drawing will enable the reader to obtain a clear understanding of the individual component parts which go to make up the L-shaped conduit and the manner in which the same is embedded and used. Under the circumstances a more detailed description is deemed to be unnecessary.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. For use when and where necessary in association with irrigated land, a rice field for example which is marginally encompassed by a levee-type embankment: a device (1) for establishing and automatically controlling the level of the entrapped water or (2) optionally emptying the water for complete drainage into an adjacent area provided for that purpose comprising; a drainage conduit which is designed and adapted to be embedded in the ground at the place desired, said conduit embodying a horizontal pipe line which is adapted to be embedded in a plane underneath the embankment and which has an outward outlet end communicable with said adjacent area, and inward upstanding vertically disposed means for receiving the overflow and delivering the same to the inlet end of said horizontal pipe line, said means embodying a union operatively joined to said inlet end, an adapter coupled to and rising from said union, and a sleeve whose lower end is telescopingly, adjustably and removably fitted into said adapter in a manner that the upper end controls the level of the water, said adapter being secured to a coacting upper end of said union, the upper end of said adapter being interiorly bevelled and provided with an annular limit stop shoulder, said bevel serving to guidingly pilot the lower end of the sleeve into the adapter for retentive seating on said limit stop shoulder.

2. The device defined in and according to claim 1, and wherein said adapter is cylindrical in cross-section and constitutes a coupling for said sleeve, said sleeve being likewise cylindrical in cross-section and of an outside diameter slightly less than the inside diameter of the adapter and the outer peripheral surface of said sleeve having longitudinally spaced parallel circumferential grooves, and a rubber packing and adjusting ring manually placeable in a selected groove, said ring being adapted to be seated on said limit stop shoulder in a manner to adjustably connect the sleeve to said adapter.

3. A water level and drainage control device for an irrigated land area comprising a sectional conduit which is L-shaped in side elevation and comprises a horizontal branch having an open outer water discharge and emptying end and an inner end provided with a complemental elbow providing a vertical upstanding union, said elbow having a reduced upstanding neck surrounded by an annular shoulder constituting a ledge, a cylindrical sleeve-like adapter constituting a vertical coupling, said adapter having an upper end which is interiorly bevelled and which is provided adjacent but below the level of said adapter with an annular limit stop shoulder, the lower end of said adapter snugly surrounding said neck and being seated on said ledge, said neck and a coacting interior surface of said adapter having like aligned and cooperating grooves, and a packing and sealing ring simultaneously lodged in

both grooves and providing a water-tight joint between said union and said adapter.

4. The water level and control device defined in and according to claim 3 and, in combination, an extensible and contractable water level determining and control sleeve, said sleeve being of an outside diameter slightly less than the inside diameter of said adapter, the upper end of said adapter being interiorly bevelled and the bevel merging into a coacting annular limit stop shoulder, said bevelled surface serving to guidingly pilot the lower end of said sleeve into the adapter in a manner to orient itself with and seat itself firmly and retentively on said limit stop shoulder.

5. The device defined in and according to claim 4, and wherein said adapter is cylindrical in cross-section and constitutes a coupling for said sleeve, said sleeve being likewise cylindrical in cross-section and of an outside diameter slightly less than the inside diameter of the adapter and the outer peripheral surface of said sleeve having longitudinally spaced parallel circumferential grooves, and a rubber packing and adjusting ring manually placeable in a selected groove, said ring being adapted to be seated on said limit stop shoulder in a manner to adjustably connect the sleeve to said adapter.

6. For use when and where necessary in association with irrigated land, a rice field for example which is marginally encompassed by a levee-type embankment: a device (1) for establishing and automatically controlling the level of the levee-entrapped irrigation water or (2) optionally emptying said water for complete drainage into an adjacent ditch provided for that purpose comprising a drainage conduit which is designed and adapted to be wholly embedded in the ground, said conduit embodying a horizontal drainage pipe line which is adapted to be embedded in a plane underneath the embankment and which has a constantly open outward outlet end communicable with said ditch, and rigid inward upstanding vertically disposed means for receiving the overflow of irrigation water and delivering the same by gravity to the inlet end of said horizontal pipe line, said means being rigidly operatively joined to said inlet end, and an upstanding overflow inlet sleeve having a constantly open upper end and a lower end telescopingly, adjustably and removably connected with said vertically disposed means in a manner that said upper end of said sleeve controls the level of the irrigation water, said upstanding vertically disposed means embodying a vertical branch constituting a coupling and having an upper terminal end which is interiorly bevelled, said sleeve constituting an extensible and retractable water level determining and control member and being readily attachable to and detachable from the upper end of said vertical branch, and an elastic sleeve supporting joint sealing ring surrounding and adjustably mounted on an exterior peripheral surface of said sleeve, the upper end of said vertical branch providing a limit stop shoulder and said ring being of a size that it is seatable atop said limit stop shoulder.

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