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MOISTURE RELEASABLE DRAIN VALVE

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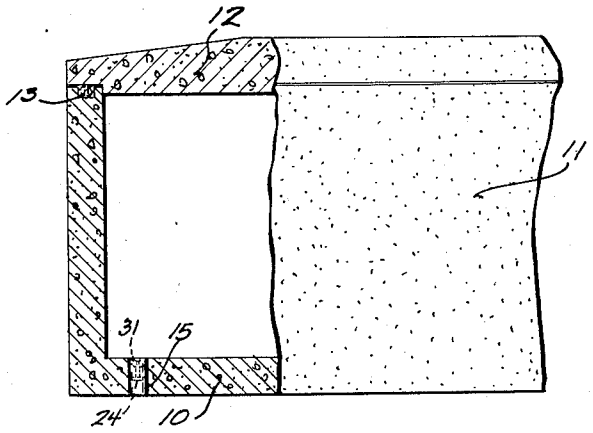

Fig. 1

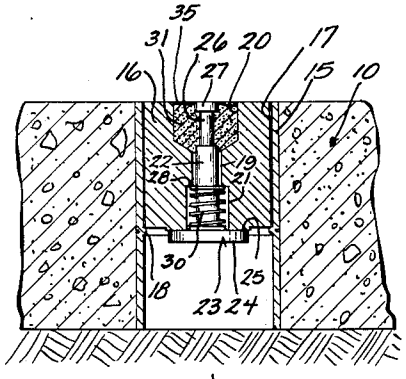

Fig. 2

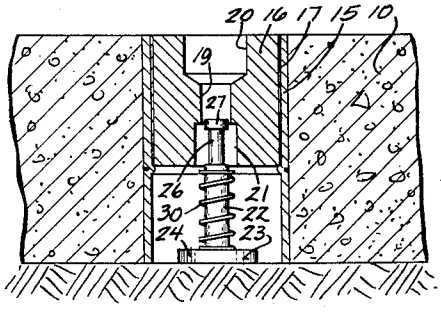

Fig. 3

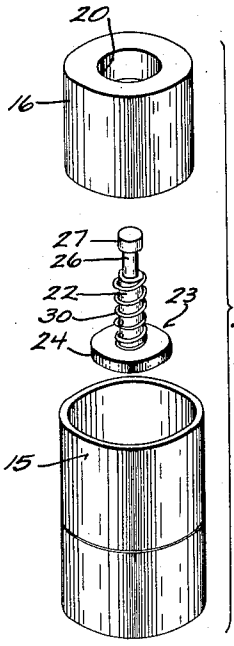

Fig. 4

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MOISTURE RELEASABLE DRAIN VALVE

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6 Claims. (Cl. 137—67)

My invention relates to a moisture releasable drain valve.

More particularly stated, my invention includes a valved apparatus comprising a closure to prevent passage of liquids, gases, and other substances, but in the continued presence of liquids to open a passage for drainage. Furthermore, the construction is such that if liquid seeks to pass the valve in one direction, the liquid is prevented from reaching a valve releasing element and thus the opening of the valve is prevented.

Features of the invention include the immobilization of a valve element by means of a soluble substance; the placement of the soluble substance in position to block and seal passage to prevent movement of any substance through the valve body, and the forming of a soluble substance about the "moving" parts of a valve whereby to immobilize the parts until the presence of a solvent frees them.

Furthermore, my invention includes novel means for blocking a passage for fluid through the use of alum formed in the passage by pressure or compaction which results not only in a harder alum body, but also in an effective seal of the passage.

My invention is especially suitable to provide drain mechanism for a burial vault.

In the drawings:

Fig. 1 shows a side elevation of a portion of a burial vault, the extreme end of the vault being broken away to show in vertical section the installation of my improved drain valve.

Fig. 2 is a full sized vertical section of my valve installed in the bottom of a concrete burial vault shown fragmentarily in section, the section through my device being diametrical; the adjustable parts of the valve being shown in side elevation.

Fig. 3 is a view similar to Fig. 2 but showing the position of the parts of my valve when the soluble material has been dissolved.

Fig. 4 is an exploded view of the metal parts of my valve and the sleeve in which it is mounted.

Probably one of the best illustrative uses of my invention is that shown in Figs. 1, 2 and 3 of the drawings wherein my device is installed in the concrete bottom **10** of a concrete burial vault **11**. The vault has side and end walls integrally formed of concrete in the usual manner, such walls being made or treated so as to be impervious to water. The top **12** of the vault is similarly water tight and is applied upon the top margins of the side walls and ends of the vault with a suitable sealing compound **13**.

Experience has shown that under certain circumstances, portions of a burial vault, usually the top **12** may be cracked so as to admit water to the vault, and if no means are provided to drain the water from the vault, the accumulation of moisture therein may be objectionable.

Provision of an open hole in the bottom **10** of a burial vault for drainage purposes is objectionable and in some jurisdictions is even contrary to law, but it will be understood from the following description that my drain valve meets any of the objections to previously known valves or drain facilities. Obviously, the accumulation of quantities of moisture within the vault is as objectionable as any of the constructions against which laws or statutes regarding drains are directed.

In the drawings, my drain valve is mounted in a sleeve **15** cast into the concrete of the bottom **10** of a grave vault. The sleeve **15** is preferably made of copper, brass or bronze. In the upper portion of the sleeve is a valve body **16** so installed in the sleeve as to provide a permanent mechanically strong and moisture-proof bond **17** to the sleeve. To facilitate assembly of the valve body and sleeve, I provide a rib **18** to support the valve body in the sleeve.

The valve body **16** is bored at **19**, counterbored at **20**, and recessed at **21** to receive the stem **22** of valve **23**. The valve has a disc shaped head **24** to bear against a faced portion **25** of the bottom of the valve body. At the upper end of the valve stem, the stem itself is machined to a smaller diameter at **26** and is provided at **27** with a small bulbous enlargement.

In the recess **21** and positioned to bear against a shoulder at **28** is a compression spring **30** oppositely bearing on the inner face of valve head **24** so that the valve is biased to open position.

When my drain valve device is being made ready for installation, the valve head **24** is pressed tightly against the face **25** of the lower end of the valve body, the spring **30** is, of course, compressed in the recess **21** and the parts are held in that position while alum is inserted into the counterbore space at **31** where it is compacted under great pressure. The alum adequately bonds to the valve parts to hold the stem of the valve rigidly in relation to the valve body so as to hold the valve in closed position despite the bias of the spring **30**, and I have found that the bond of alum **31** to the walls of the counterbore **20** and to the stem of the valve is adequate to provide a seal preventing passage of gases into and out of the vault **11**. Mechanically, hydraulically, and pneumatically, therefore, the drain device is closed.

If moisture accumulation in the vault **11** is sufficient to contact the alum **31** in the counterbore **20**, the alum will slowly dissolve until, if the amount of moisture is adequate, the entire amount of alum will be placed in solution thus freeing the stem **26** and its bulbous enlargement **27** with a result that the spring **30** may open the valve by pressing the head **24** away from the face **25** or even dropping the entire valve and its stem to the position shown in Fig. 3. The bore **19**, counterbore **20**, and recess **21** are thus left open for the passage of liquid out of the vault **11**; however, the parts are still in position to prevent entry of rodents or other vermin.

I have found that alum is probably the best material to use where water is the solvent to be released by my valve. It solidifies and bonds to the parts readily. However, if the valve is to respond to other solvents, the material to be cast about the moving parts is a normally solid substance adequately strong to resist the bias of the valve to open position but yieldable when affected by the solvent. For instance, natural, but vulcanized rubber may be cast or pressed about a valve member to hold the valve closed until a fluid hydrocarbon softens the rubber.

It will be noted that because of the tight seal of the valve body **16** in the sleeve **15** and the placement of the valve body in the upper portion of the sleeve, the possibility of access of liquid from the outside of the vault is minimized. Because of the pneumatic sealing of the upper portion of the sleeve **15**, air trapped below the head **24** of the valve will prevent access of liquid to the alum **31** located in the upper portion of my device.

It is an important feature of my invention that the

alum or other soluble substance used to prevent opening of the valve **23** closes the actual passage through which the liquid must pass if it is to escape through my device. Therefore, the soluble substance not only performs the function of sealing the liquid passage, but also mechanically controls the position of the valve.

I have found that the crystalline alum when placed under pressure as by pounding it into position with a mallet and "dye" shaped to the passage provides an extremely hard substance which seals itself to the walls of the passage and is an excellent seal mechanically, pneumatically, and hydraulically.

Under some circumstances, delayed action of the liquid with reference to the soluble substance **31** may be desirable, and to provide this delay I surface the alum or other soluble substances **31** with a lacquer-like substance **35**. The coating for this purpose is very thin and it is intended to withstand the action of most liquids for a sufficient length of time so that mists or vapors will not slowly dissipate the mechanical functions of the soluble material **31**; however, the light lacquers used for this purpose will be perforated or dissipated by long continued presence of moisture and ultimately an accumulation of liquid will gain access to the alum or other soluble substances.

I claim:

1. A valve body having a passage therethrough shaped for passage of liquid, an adjustable valve member positioned to control the movement of fluid through the passage, and a soluble substance shaped and positioned in said passage to provide a fluid tight plug for the passage and positioned to interfere with the adjustment of the valve member.

2. A valve body having a passage therethrough shaped for passage of liquid and providing a guide for a valve member, an adjustable valve member guided by the valve body and positioned to control the movement of fluid through the passage, and a soluble substance providing a fluid tight plug in said passage positioned to interfere with the adjustment of the valve member.

3. For installation in a predetermined upright position the device of claim 2 in which the soluble substance is positioned to seal the passage and is mounted in the upper portion of an air tight vertically positioned sleeve providing a chamber below the valve whereby air in the chamber trapped below said body prevents liquid from reaching the soluble substance in said passage.

4. A valve body having a passage therethrough shaped for passage of fluid and providing a guide for a valve member positioned to interact with said valve body, an adjustable valve member normally positioned to stop the movement of fluid through the passage, said valve member having a stem provided with a bulbous enlargement in said passage, soluble material in said passage positioned to provide a complete fluid tight stoppage of the passage and to engage mechanically with said stem and hold it in valve closed position, the valve being provided with means biasing the valve to open position.

5. A conduit for passage of liquid alternatively in either of two directions and a blockading substance in the conduit comprising a crystalline material soluble in said liquid and pressure compacted in position in the conduit, and a normally closed valve biased to open position and located in said conduit in position to shield the soluble crystalline material from liquid approaching from one of said directions, said soluble crystalline material being bonded to said valve whereby positively to hold the valve in closed position against its normal bias whereby only liquid approaching from the other of said directions into contact with said soluble material may solubly remove the blockading substance and permit the valve to open.

6. The conduit of claim 5 wherein the liquid soluble material comprises crystalline alum compacted under pressure sufficient to bond the alum to the conduit.

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