

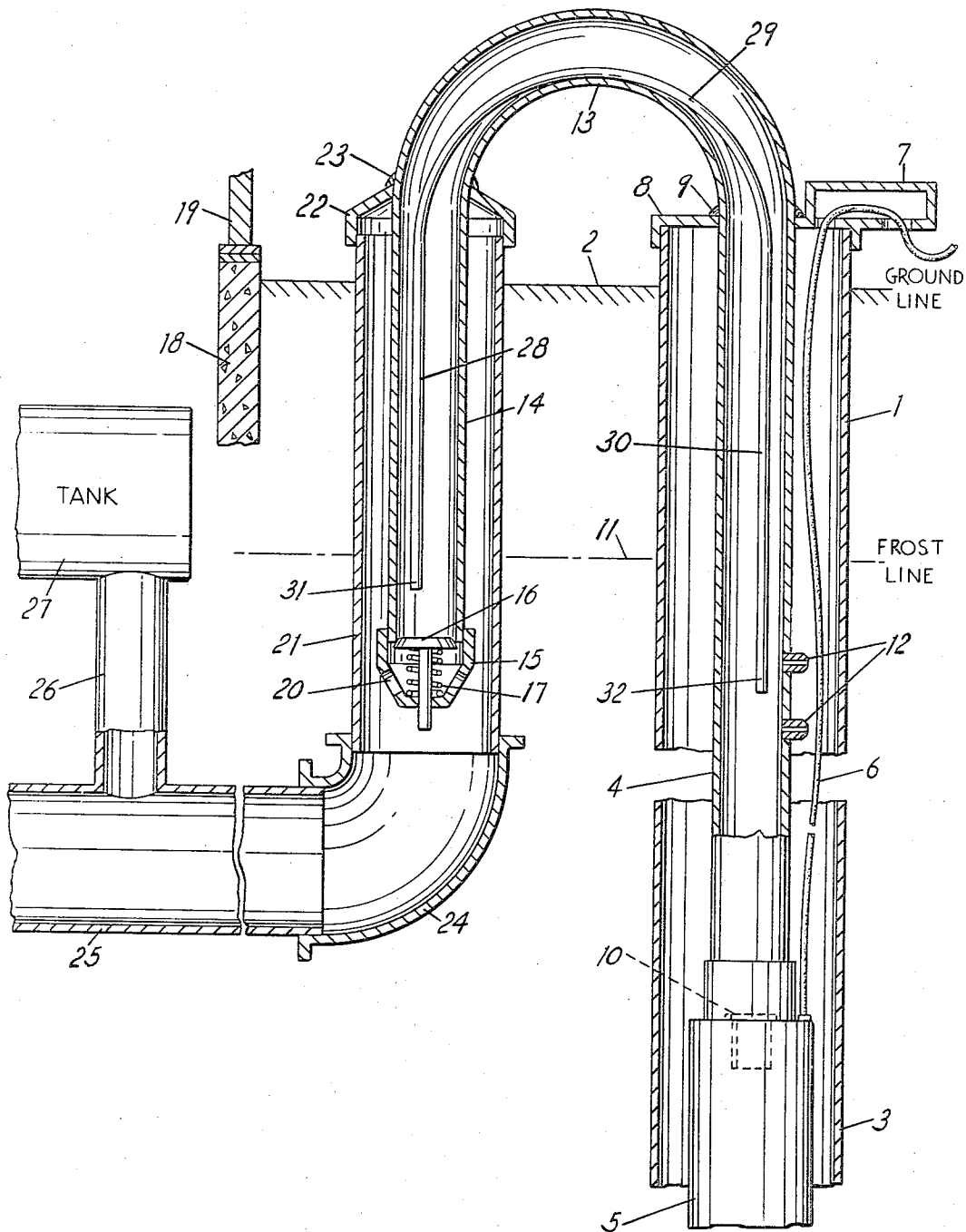
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OVER-THE-TOP DELIVERY FOR PUMPS HAVING ANTI-FREEZE PROPERTIES

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OVER-THE-TOP DELIVERY FOR PUMPS HAVING ANTI-FREEZE PROPERTIES

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3 Claims. (Cl. 103—221)

This invention relates to improvements in over-the-top delivery for pumps with antifreeze properties.

The principal objects of this invention are:

First, to provide a pump delivery from a well casing to a distribution system in which the drop pipe from the well passes above ground level and downwardly in a delivery pipe to below the frost line with the delivery pipe enclosed in a pressurized casing connected to the delivery system with a rearwardly setting check valve in the bottom of the delivery pipe and with a siphon tube extending from below the frost line within the delivery pipe to below the frost line and below the first end of the siphon tube in the drop pipe.

Second, to provide an antifreeze siphon system which will empty the delivery pipe of an over-the-top pump delivery when the pump is not in operation to prevent freezing of the delivery pipe and in which the delivery pipe is enclosed in a casing subject to the pressure of the distribution system or storage tank to which the pump delivers so that there is no chance of seepage of surface water into the water system.

Other objects and advantages of the invention will be apparent from a consideration of the following description and claims. The drawing, of which there is one sheet, illustrates a highly practical form of the delivery system of the invention.

The drawing is a fragmentary cross sectional view illustrating the parts of the delivery system in somewhat conventionalized form.

It is an old and well-known practice to provide wells having casings which project above the ground level in outside or exposed positions where they are subjected to freezing and to provide drop pipes within the casing extending downwardly to submerged pumps which intermittently pump water up through the top of the casing and then downwardly through a discharge pipe for connection to a water main, tank or distribution system. The name, over-the-top delivery, is derived from this positioning of the drop pipe and its connection to the discharge pipe and various methods have been proposed for draining those portions of the delivery system which are above the frost line so as to prevent freezing of the system when the pump is not in operation. The drawing conventionally illustrates the casing 1 of a well which is extended from above the groundline 2 to a lower end below the water table at 3. Positioned within the casing is a drop pipe 4 which extends downwardly to a pump conventionally illustrated at 5. The pump is electrically driven and an electric cable 6 for energizing the pump extends upwardly through the casing to a well breather box 7 mounted on a well casing cover 8. The cover 8 functions to support the drop pipe 4 within the casing as by a welded connection at 9 or other suitable and well-known means. The drop pipe is provided with a foot valve conventionally indicated at 10 at its lower end which closes when the pump is not in operation as illustrated in the drawing. The casing and drop pipe extend downwardly below the frost line or line of freezing temperatures indicated at 11 and the drop pipe is provided with one or more bleeders 12 positioned below the frost line which function to drain water out of the upper end of the drop pipe back into the well casing and admit air into the drop pipe from within the casing when the pump is not in operation.

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The upper end of the drop pipe 4 is connected to a cross-section 13 of delivery pipe 14 which extends downwardly to below the frost line and which is provided at its lower end with a suitable cage and guide 15 for a check valve 16 which seats rearwardly against the flow of water under the influence of a spring 17 when the pump is not in operation. A fragment of a building foundation 18 and building wall 19 indicate that the well casing and delivery pipe are positioned exteriorly of any protective cover and thus subject to freezing temperatures.

The delivery pipe 14 delivers through openings 20 in the valve cage 15 when the pump is operating to within a casing 21 positioned in spaced relation around the delivery pipe 14 and extending above the ground level 2 to a cover fitting 22 which is sealed to the exterior of the drop pipe as indicated at 23. The casing 21 connects at its lower end to an elbow 24 which in turn connects to a water main or other part of a water distribution system 25. The main 25 is subject to pressure in the system as from other pumps connected to the same system or by connection at 26 to a tank 27 protected from freezing and within which air under pressure may be trapped when the pump 5 is operating.

In operation of the system the pump 5 is started on demand causing the foot valve 10 to open and causing water to be delivered upwardly through the drop pipe and the crossover 13 to the delivery pipe 14 where the pressure of the water opens the check valve 16 and water is delivered to the distribution system through the main or other tank 27. Positioned within the delivery pipe 14 is the short leg 28 of a constantly open siphon tube 28 which extends through the cross-over at 29 and downwardly in a long leg 30, within the drop pipe and to below the frost line. The short leg 28 of the siphon tube also extends to below the frost line as at 31 and the long leg 30 extends to below the level of the short leg as at 32, desirably between the bleeder valves 12. Flow of water through the drop pipe and the delivery pipe when the pump is operating fills the siphon tube including both its long and short legs.

When the pump is stopped the foot valve 10 closes the bottom of the drop pipe and back pressure in the system delivered through the main 25 closes the check valve 16 so that the drop pipe and delivery pipe are isolated from the pump and the distribution system. Water in the upper portion of the drop pipe flows by gravity through one of the bleeders 12 back into the casing and as the level of water in the drop pipe falls below the level of water in the delivery pipe the siphon tube commences to siphon water from the delivery pipe into the drop pipe. This action will continue until the delivery pipe is emptied of water to the level of the end 31 below the frost line and until the siphon tube itself is emptied. Air from the well casing enters one of the bleeders 12 to fill the cross-over section 13 and the portions of the delivery pipe and drop pipe above the bleeders and above the frost line so that no water remains in a position where it will freeze. It is a feature of the system that air forced through the delivery pipe when the pump is started escapes through the check valve 16 and rises in the delivery pipe casing 21 thus forming a cushion above the level of water in the casing 21 so that all underground portions of the delivery system are under positive pressure preventing the leakage of surface water into the system at any time.

What is claimed as new is:

1. An over the top delivery system for a well having a casing, a drop pipe with a foot valve and submerged pump at the bottom thereof located below the frost line in the casing, a bleeder opening between said drop pipe and the inside of the casing below the frost line, and a delivery pipe extending from the top of said drop pipe above

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ground level and downwardly to below the frost line exteriorly of the casing,

characterized by a second delivery pipe casing extending in surrounding relation to said delivery pipe to above ground level and sealed to the delivery pipe above ground level,

said second casing defining a chamber along said delivery pipe and being adapted to be connected at its lower end to a water distribution system under pressure,

a check valve connected to the lower end of said delivery pipe and within said chamber below the frost line and arranged to seat rearwardly towards said pump,

and a siphon tube having a short leg opening at the bottom in said delivery pipe below the frost line and

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above said check valve and extending to a long leg opening in said drop pipe below the frost line and below the level of the end of said short leg.

2. A well delivery system as defined in claim 1 in which said siphon tube extends entirely within said delivery pipe and the connection thereof to said drop pipe.

3. A well delivery system as defined in claim 1 in which said long leg of said siphon tube extends to below said bleeder.

References Cited by the Examiner

UNITED STATES PATENTS

1,557,949	10/1925	Walton	-----	103—221
3,045,607	7/1962	Lindner	-----	103—221

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