July 16, 1935. A. W. WHEATON 2,008,375

ANTIFREEZE VALVE

Filed July 10, 1934

Fig. 1

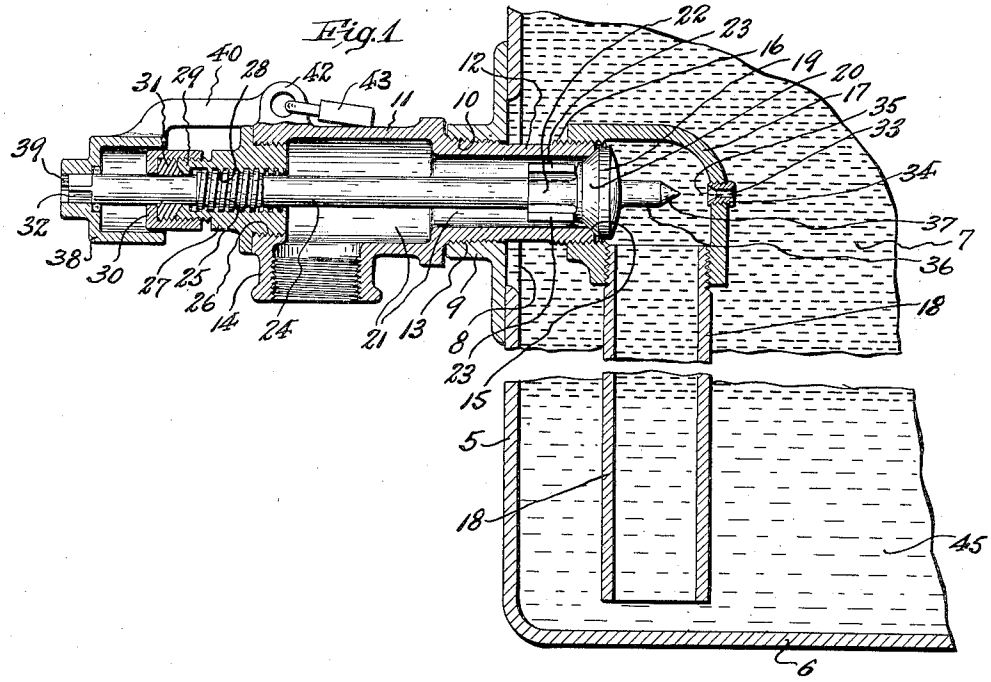
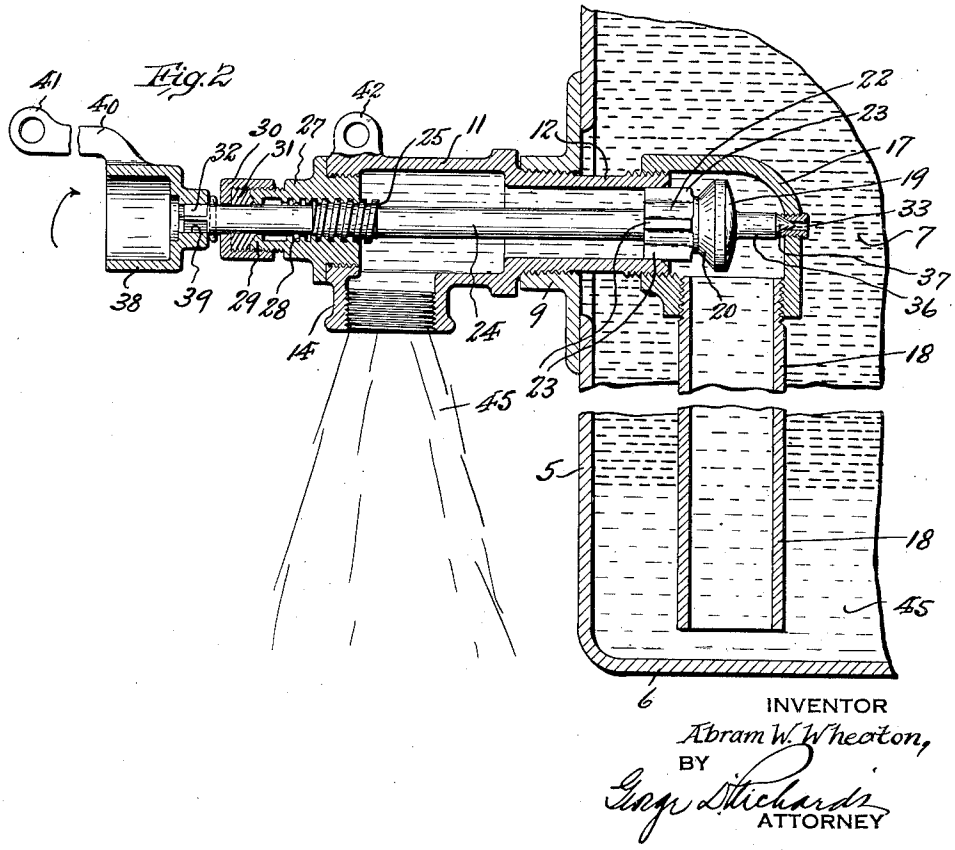


Fig. 2



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ANTIFREEZE VALVE

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4 Claims. (Cl. 137—21)

This invention relates to improvements in anti-freeze valves; and the invention has reference, more particularly, to a novel construction of anti-freeze valve for draining water or other freezable liquid from oil storage tanks, or from other storage or like reservoirs containing any fluid from which water or other freezable liquid settles.

Oil, gasoline, and similar fluids frequently initially contain a percentage of water admixed therewith which, when the fluid is stored in a tank or reservoir, being of greater specific gravity than the fluid, will settle out of the latter to the bottom of the tank or reservoir. The present invention has for its principal object to provide a novel anti-freeze drainage valve which, when opened, will permit the settled water or the like to discharge therethrough from the tank or reservoir interior under the weight and pressure of the oil or other fluid content of the latter. With this object in view, the present invention provides a novel valve structure which, when closed, is freed from contact with the water content of the tank by the admission of oil or the like thereinto in the vicinity of the valve elements per se, but which, when open closes off direct communication with the oil or like content of the reservoir or tank and admits only the water to the valve elements for discharge passage therethrough. By reason of this novel arrangement and construction, the valve mechanism is efficiently protected against damage by expansion of freezing water therein, and is maintained in operative condition regardless of low temperature conditions to which it and the tank or reservoir may be subjected.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of this invention is shown in the accompanying drawing, in which:—

Fig. 1 is a vertical sectional view of a portion of a storage tank equipped with the novel anti-freeze drainage valve according to this invention, said valve being shown in closed condition; and Fig. 2 is a similar sectional view showing the valve in open condition for discharging from the lower portion of the tank any water there accumulated.

Similar characters of reference are employed in the above-described views, to indicate corresponding parts.

Referring now to said drawing, the reference character 5 indicates a side and 6 the bottom of a storage tank in which is stored, e. g., a quantity of oil 7. Provided in the side 5 of the tank, at a desired predetermined distance above the tank bottom 6, is an opening 8, and secured to the exterior of said tank side 5, in alignment or registration with said opening 8 is a flanged collar 9 having an internally threaded bore 10. The reference character 11 indicates a valve casing or barrel which is preferably of cylindrical form, and which is provided at its inner end with a tubular shank 12, preferably integral therewith. That portion of said shank 12 which is adjacent to the barrel 11 is externally threaded, as at 13, to screw into the internally threaded bore 10, thereby to affix said casing or barrel in operative connection and communication with the tank. Integral with the casing or barrel 11, adjacent its outer end, is a preferably downwardly directed discharge spout or neck 14, which may be internally threaded to receive connection of a discharge hose or conduit thereto, if desired.

The inner extremity of the shank 12, when the barrel is attached to the tank, projects somewhat within the tank interior. The inner extremity of said shank 12 is provided with a chamfered internal valve seat 15 at its periphery. The inner end portion of said shank 12 is externally threaded, as at 16, to receive connection therewith of the horizontal arm of an elbow 17. Threaded into or otherwise suitably coupled with the downwardly directed arm of said elbow 17 is a downwardly extending intake or foot pipe 18, which terminates in relatively closely spaced relation to the tank bottom 6.

The reference character 19 indicates a main valve member having a conical face 20 adapted to normally engage and seat itself upon the valve seat 15, thereby closing the internal passages 21 of the barrel 11 and its shank 12 against the outflow of fluid therethrough. Said valve member 19 is provided with a guide portion 22 having spaced radial ribs 23 to slidably engage the internal surfaces of the shank 12, thereby to support the valve member 19 in axial alignment with the valve seat 15 during opening and closing movements of said valve member. Connected with said valve member and its guide portion, and extending outwardly through the barrel and its shank, is a valve stem 24, provided adjacent to its outer end with a screw-threaded section 25. The outer end of the casing or barrel is provided with an internally threaded opening 26 into which is screwed an end closure member 27. Said end closure member is provided with an internally screw-threaded bore 28 which is engaged by the screw threaded section 25 of said valve stem. Extending from the outer end of said closure mem-

ber 27 is a gland portion 29 upon which is screwed a stuffing box nut 30 adapted to confine a suitable packing 31 around the exteriorly projecting end portion of said valve stem 24. The external extremity of said valve stem 24 is provided with a squared end-piece 32.

The wall of said elbow 17 is provided, at a point opposite and axially aligned with the main valve and its stem, with a secondary valve port 33. Preferably this valve port 33 is provided by the bore of a nipple or bushing 34 which is screwed through the elbow wall, and at the internal end of said bore is formed a chamfered annular seat 35. Extending axially from the main valve 19 is a secondary valve member 36, having at its extremity a conical valve portion 37 to engage the seat 35 of said secondary valve port 33, thereby to close the same. Said secondary valve member 36 moves with the main valve 19, and is so related thereto that it functions to open the secondary valve port 33 when the main valve is closed, but operates to close said secondary valve port 33 when the main valve is open.

Engageable with the squared end-piece 32 of the valve stem 24 is a detachable cap 38 having a squared socket 39 at its closed end to receive said squared end-piece 32 of said stem. When the main valve 19 is in normal closed position (as shown in Fig. 1), the cap 38 is so engaged with the valve stem and its squared end piece as to enclose the exposed exterior portions thereof. Formed integrally with said cap 38, so as to be laterally offset therefrom, and so as to extend longitudinally over the exterior end portion of the casing or barrel 11, when the cap is applied to the stem in enclosing relation thereto, is an arm 40 having a perforate end portion 41. The perforate end portion 41 of said arm 40 is alignable with a perforate lug 42 which projects from said casing or barrel 11, whereby the hasp of a pad-lock 43 may be engaged through the aligned perforations of the arm and lug and locked, thus retaining the cap against unauthorized removal from its enclosing relation to said valve stem 24 and its squared end-piece 32. By this arrangement unauthorized actuation of the valve mechanism is prevented. When, however, the pad-lock 43 is removed, said cap 38 may be removed and reversed so that its squared socket may be engaged with the squared end piece 32 of the valve stem 24 (as shown in Fig. 2), and thereupon utilized as a wrench for turning the valve stem to actuate the valve mechanism.

When oil 7 is stored within the tank and stands therein, any water contained in the oil, by reason of its greater specific gravity, will tend to separate from the oil and sink to the bottom portion of the tank to form an accumulated body or mass of water 45 at the tank bottom. When the water is thus separated and accumulated, it is desirable to draw off the same, and this may be done by opening the main valve 19, so that the pressure of the body of oil 7 upon the accumulated mass of water 45 will force the latter upwardly through the foot pipe 18, past the open valve 19, and thence through the passages 21 of the casing or barrel 11 and its shank 12 for discharge through the spout or neck 14. Under such water discharging conditions, the secondary valve member will occupy its closed relation to the secondary valve port 33, and consequently no oil can escape through the latter so as to be discharged with the outflowing water. When the valve 19 is closed, the secondary valve member 36 is retracted to withdraw its conical valve portion 37 from the seat 35 of the bushing 34, thus opening the secondary valve port 33. Under these latter conditions oil may flow from the tank interior into the interior of the elbow and foot pipe, so as to surround the inner side of the main valve 19. Since the oil has a much lower freezing point than that of water, such admission of oil drives out any water from the intake portions of the valve and thus avoids any risk of freezing water damaging the valve mechanism with consequent risk of leakage and loss of the oil contents of the tank.

Having described my invention, I claim:—

1. The combination with a tank or the like of conduit means having an intake at its lower end in communication with the tank interior adjacent its bottom and an outlet at its upper end disposed exterior of the tank, a main valve to open and close at will the outlet of said conduit means, and a secondary valve means movable with said main valve and adapted to open communication between the upper interior of the conduit means and the interior of the tank substantially above the bottom portion of the latter when said main valve is closed but adapted to close such communication when said main valve is open, and means to actuate said main and secondary valve means from the exterior of the tank.

2. The combination with a tank or the like of conduit means having an intake at its lower end in communication with the tank interior adjacent its bottom, said conduit means extending upwardly for a distance within said tank and having an outlet at its upper end disposed exterior of the tank, a main valve to open and close at will the outlet of said conduit means, and a secondary valve means movable with said main valve and adapted to open communication between the upper interior of the conduit means and the interior of the tank substantially above the bottom portion of the latter when said main valve is closed but adapted to close such communication when said main valve is open, and means to actuate said main and secondary valve means from the exterior of the tank.

3. The combination with a tank or the like of a valve casing extending through a side wall of said tank and provided with a main valve seat at its inner end and a discharge outlet at its exterior end portion, an elbow connected with the inner end of said casing, a foot pipe extending downwardly from said elbow and terminating adjacent to the tank bottom, a main valve cooperative with said main valve seat and manipulatable to open or close communication between said casing and foot pipe, said elbow having a secondary valve port in its wall aligned with said main valve, and a secondary valve means movable with said main valve and adapted to cooperate with said secondary valve port, whereby direct communication is established between the interior of said elbow and the interior of said tank when said main valve is closed but such communication is shut off when said main valve is open.

4. The combination with a tank or the like of a valve casing extending through a side wall of said tank and provided with a main valve seat at its inner end and a discharge outlet at its exterior end portion, an elbow connected with the inner end of said casing, a foot pipe extending downwardly from said elbow and terminating adjacent to the tank bottom, a main valve cooperative with said main valve seat and manipulatable to open or close communication between said casing and foot pipe, said elbow having a secondary

valve port in its wall aligned with said main valve, and a secondary valve means movable with said main valve and adapted to cooperate with said secondary valve port, whereby direct communication is established between the interior of said elbow and the interior of said tank when said main valve is closed but such communication is shut off when said main valve is open, a valve stem extending outwardly through said casing and a threaded connection between said valve stem and casing for effecting movements of said main valve when said valve stem is turned.

ABRAM W. WHEATON.