May 1, 1951 J. H. WIGGINS 2,551,404

LIQUID SEALING MEANS FOR FLUID STORAGE APPARATUS

Original Filed Feb. 13, 1946

FIG. 1.

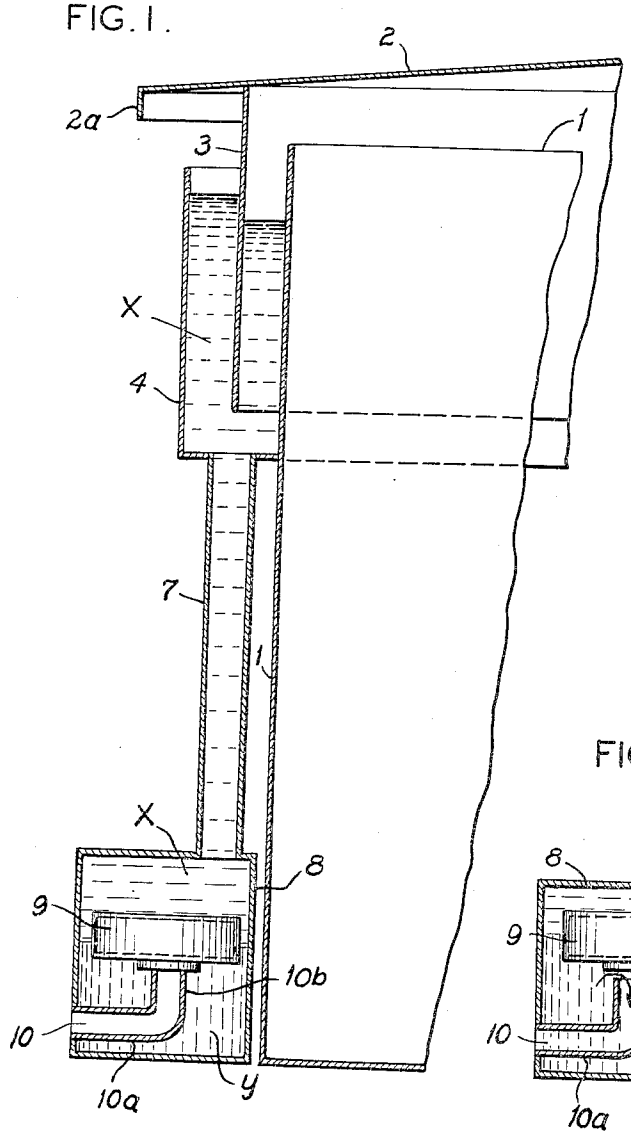
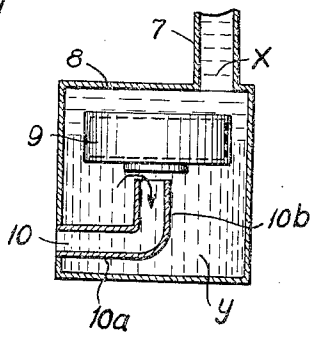


FIG. 2.



INVENTOR;
JOHN H. WIGGINS
BY Wells L. Church
ATTORNEY

Patented May 1, 1951

2,551,404

UNITED STATES PATENT OFFICE

2,551,404

LIQUID SEALING MEANS FOR FLUID STORAGE APPARATUS

John H. Wiggins, Chicago, Ill.

Original application February 13, 1946, Serial No. 647,384. Divided and this application November 5, 1949, Serial No. 125,703

2 Claims. (Cl. 48—176)

1

This invention relates to fluid storage apparatus of the type that consist of a tank or equivalent stationary container having a side wall, a "lifter" roof or vertically-movable roof for said tank and a depending skirt or side wall portion on said roof whose bottom edge is immersed in liquid confined in a reservoir extending circumferentially around the tank side wall, my present application being a division of my pending application Serial No. 647,384, filed February 13, 1946, now Patent No. 2,546,572.

The object of my present invention is to provide as apparatus that embodies the general characteristics and desirable features of the apparatus disclosed in my said pending application and which is equipped with a novel means for automatically discharging rain water from the annular reservoir on the tank side wall that seals the depending skirt on the vertically-movable roof of the tank.

Figure 1 of the drawings is a vertical sectional view of an apparatus embodying my present invention, showing the water discharge valve in its closed position; and

Figure 2 is a fragmentary view of the structure illustrated in Figure 1, showing the discharge valve in its open position.

The drawings illustrate an apparatus primarily adapted for storing oil and other volatile liquids and comprising the following parts, to wit: a tank provided with a stationary side wall 1, a lifter roof or vertically-movable roof 2 for said tank provided with a depending skirt or side wall portion 3 arranged in telescopic relation with the tank side wall, and an annular trough or reservoir 4 extending circumferentially around the tank side wall at or near the top edge of same and containing oil or some other suitable sealing liquid x of a similiar nature that will maintain a gas-tight joint between the side wall 1 and the depending side wall portion 3 of the roof, when the roof rises and falls to vary the volume of the gas space of the apparatus.

The means that is used for automatically discharging rain water from the reservoir 4 comprises a drain pipe 7 that leads downwardly from the bottom of the reservoir 4, through the top of a gas and liquid-tight receptacle 8 equipped with a water discharge passageway 10 leading from the interior of said receptacle, and an automotive valve, such as a float valve for automatically controlling the escape of water from said discharge passageway. In the form of my invention herein shown the said discharge passageway is formed by a tubular member having a horizontally-disposed portion 10a that constitutes the outlet of the passageway 10, and a vertically-disposed inlet portion 10b that is open at its upper end and disposed so as to constitute a horizontally-disposed seat for the float valve 9. The drain pipe 7 and the closed receptacle 8 are of such relative dimensions and are disposed in such relationship with each other and with the reservoir 4, that normally, the drain pipe 7 and the upper portion of the closed receptacle 8 will be filled with sealing liquid x, and the lower portion of said receptacle will contain a body of water y whose level is in such relationship with the seat of the control valve 9, that said valve will bear upon said seat. In the event rain water enters the reservoir 4, said water will separate from the sealing liquid in the reservoir, in the drain pipe 7, and in the upper portion of the receptacle 8, due to the greater specfiic gravity of said rain water, thereby causing the level of the body of water y in the lower portion of the said receptacle to rise, whereupon the valve 9 will rise from its seat, as shown in Figure 2, and permit sufficient water to escape through the discharge passageway 10 leading from the receptacle 8, to restore the valve 9 to its normal position in engagement with its seat at the upper end of the intake portion 10b of the discharge passageway 10.

2

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A fluid storage apparatus, comprising a tank having a side wall portion, a vertically-movable roof provided with a depending side wall portion arranged in telescopic relationship with the tank side wall, a reservoir extending circumferentially around the tank side wall and adapted to contain a sealing liquid in which the depending side wall portion of the roof is immersed, and an automatic water discharge device at the lower end of said reservoir comprising a vertically-disposed, tubular member depending from the bottom of said reservoir, a closed receptacle into which said tubular member discharges water that has entered the reservoir and separated from the sealing liquid due to the greater specific gravity of said water, and an automatically operable valve operating in response to the interface level between the water and the sealing liquid for permitting the water to automatically escape from said receptacle.

2. A fluid storage apparatus, comprising a tank having a side wall portion, a vertically-movable roof provided with a depending side

wall portion arranged in telescopic relationship with the tank side wall, a reservoir extending circumferentially around the tank side wall and adapted to contain a sealing liquid in which the depending side wall portion of the roof is immersed and an automatic water discharge device at the lower end of said reservoir comprising a vertically-disposed, tubular member depending from the bottom of said reservoir, a closed receptacle into which said tubular member discharges water that has entered said reservoir and separated from the sealing liquid due to the greater specific gravity of said water, a water outlet for said receptacle, and a float valve in said receptacle that seals and unseals said water outlet according to the depth of the layer of water in the lower portion of said receptacle.

JOHN H. WIGGINS.

No references cited.