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E. G. FRIEDMAN

1,754,091

TANK SEALING DEVICE

Filed Jan 4, 1929

Fig. 1.

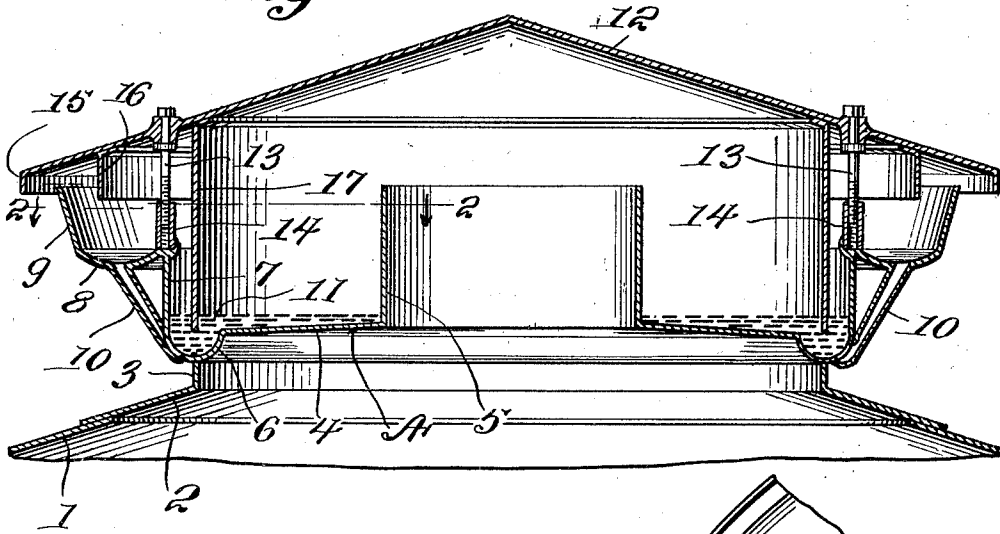


Fig. 2.

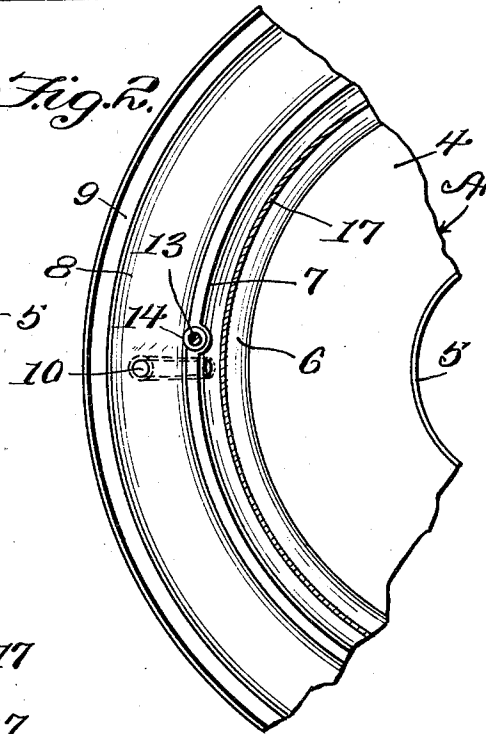


Fig. 5.

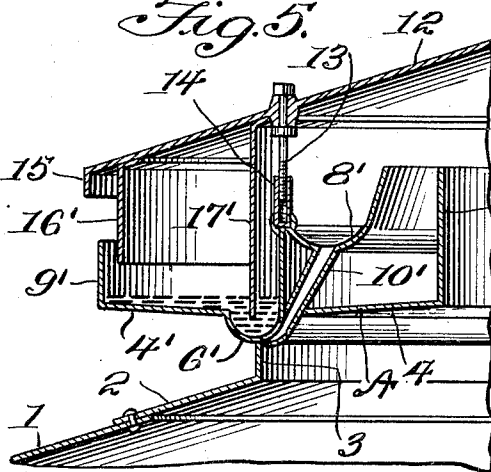


Fig. 3.

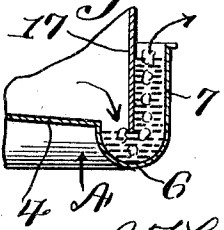
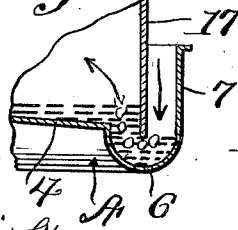


Fig. 4.



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TANK-SEALING DEVICE

Application filed January 4, 1929. Serial No. 330,215.

This invention relates to a tank sealing device, the general object of the invention being to provide means whereby the tank can "breathe", or compressed air or gas in the tank can escape therefrom and air can enter the tank if a vacuum occurs therein, the passage through which the compressed fluid escapes and the air enters being sealed by mercury or the like which acts to retain the gases in the tank and prevents fire.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a sectional view through the top of the tank, showing the invention in use.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a sectional detail view, showing how the compressed gases escape from the tank.

Figure 4 is a similar view, showing how the air enters the tank when a vacuum occurs therein.

Figure 5 is a sectional view similar to Figure 1, but showing a modification.

In these views, the numeral 1 indicates the top of the tank which is formed with an opening and 2 indicates an annular member which is fastened to the top around the opening, this member being formed with an upstanding flange 3 at its inner periphery. A covering member A is attached to the flange and is formed with a downwardly and outwardly sloping portion 4 of annular shape having a cylindrical part 5 connected to its inner periphery and an annular gutter part 6 connected to its outer periphery and a vertically arranged cylindrical part 7 is connected with the outer wall of the gutter part. A second gutter part 8 has its inner wall connected with the top of the cylindrical part 7 and an upwardly and outwardly sloping flange 9 is

connected with the outer wall of the gutter part 8. The central portion of the gutter part is connected with the flange 3. Tubes 10 connect the gutter part 8 with the gutter part 6. Mercury or the like is placed in the member A, as shown at 11, this mercury filling the gutter part 6 and covering the part 4. A roof part 12 is adjustably supported on the cylindrical part 7 through means of the threaded rods 13 connected with the roof part and engaging threaded sockets 14 formed on the upper edge of the cylindrical part 7. This roof part is provided with a depending flange 15 at its periphery which is spaced from the upper edge of the flange 9 and prevents rain or the like from entering the space between the upper edge of the flange 9 and the roof part. A second depending flange 16 is connected with the roof part and extends into the space formed by the flange 9 and the upper end of the cylindrical part 7. A third flange 17 is connected with the roof part and extends into the mercury in the gutter part 6, this latter flange acting to prevent the gases from the tank which pass through the cylindrical part 5 from flowing out between the roof part and the part A. However, when the gases within the tank are compressed to a certain point, they will force the mercury upwardly between the flange 17 and the part 7 so that they can pass under the flange 17 and through the mercury, as shown in Figure 3, the gases escaping through the space between the outer portion of the roof part and the gutter 8 and its flange 9. If these gases force any of the mercury over the upper edge of the part 7 into the gutter 8, this mercury will return to the gutter 6 through the tubes 10. The flange 16 prevents any of the mercury passing entirely over the gutter part 8 and acts as a splash flange for the sealing liquid 11. The cylindrical part 5 acts as a splash flange to keep the sealing liquid from splashing into the tank. By adjustably connecting the roof part 12 to the part 7, the degree of pressure at which the gases will escape can be regulated. This arrangement also facilitates the assembling of the parts.

From the foregoing it will be seen that this device will permit the tank to "breathe", for

the gases within the tank can escape through the sealing liquid when the pressure reaches a predetermined point and when a vacuum occurs in the tank, air will pass through the sealing liquid into the tank. The passage of
 5 air is in a reverse direction to that of the gases, as shown in Figure 4.

In the modification shown in Figure 5, the part 4' is arranged exteriorly and is connected
 10 with the low exterior wall of the gutter 6' and the gutter 8' with its tubes 10' are arranged within the space formed by the flange 17'. In this form, the flange 16' is of greater length than in the first form and overlaps the
 15 flange 9' which is formed on the exterior edge of the part 4'. The operation of this form of the invention is the same as the first form, but in this form, the gases in the tank can escape more easily than in the first form and
 20 the air in the first form can enter more easily into the tank than in the modified form. The first form of the invention is designed for tanks having a high pressure discharge and a low pressure intake, while the second
 25 form of the invention is designed for tanks having a low pressure discharge and a high pressure intake.

This invention will allow a tank to "breathe" through a sealed passage when the
 30 breathing becomes necessary while filling, pumping out or by natural causes. Its tendency is to eliminate breathing by creating a pressure to exhale and a vacuum to inhale. The device is a fire prevention, is fool-proof,
 35 will not freeze or rust and eliminates evaporation by retaining the gases inside the tank under pressure.

A drain plug may be placed in the lower part of the gutter 6 for cleaning purposes
 40 and an inspection plug or high level plug may be placed on one side of this gutter.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:—

50 1. In combination with a container having a "breather" passage in its upper part, a gutter in the lower wall of the passage, one wall of the gutter being higher than the other,
 55 a flange connected with the top wall of the passage and extending into the gutter, said gutter containing a sealing fluid whereby the sealing fluid offers more resistance to the passage of the gases or air in one direction
 60 than it does to the passage of air or gas in the opposite direction, a second gutter connected with the high wall of the first gutter and tubes connecting the second gutter with the first gutter.

65 2. In combination with a container having

a "breather" passage in its upper part, a gutter in the lower wall of the passage, one wall of the gutter being higher than the other, a flange connected with the top wall of the passage and extending into the gutter, said
 70 gutter containing a sealing fluid whereby the sealing fluid offers more resistance to the passage of the gases or air in one direction than it does to the passage of air or gas in the opposite direction, a second gutter connected
 75 with the high wall of the first gutter, tubes connecting the second gutter with the first gutter, and means for adjusting the upper wall of the passage in relation to the lower wall thereof.

3. In combination with a container having an opening in its top, a flange surrounding the opening, a gutter formed in the top and surrounding and spaced from the flanged opening, said gutter containing a sealing
 80 fluid, one wall of the gutter being higher than the other wall, a second gutter connected with the high wall of the first gutter, tubes connecting the second gutter with the first gutter, a roof member covering the flanged opening
 85 and the gutters, adjustable supports for the roof member, an annular flange depending from the roof member and extending into the sealing fluid in the first gutter, a depending flange at the periphery of the roof
 90 member and an intermediate flange depending from the roof member and extending into one of the gutters.

In testimony whereof I affix my signature.

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