April 6, 1926. 1,579,225

J. J. McBRIDE

TANK VALVE MECHANISM

Filed June 15, 1922 3 Sheets-Sheet 1

Fig. 1.

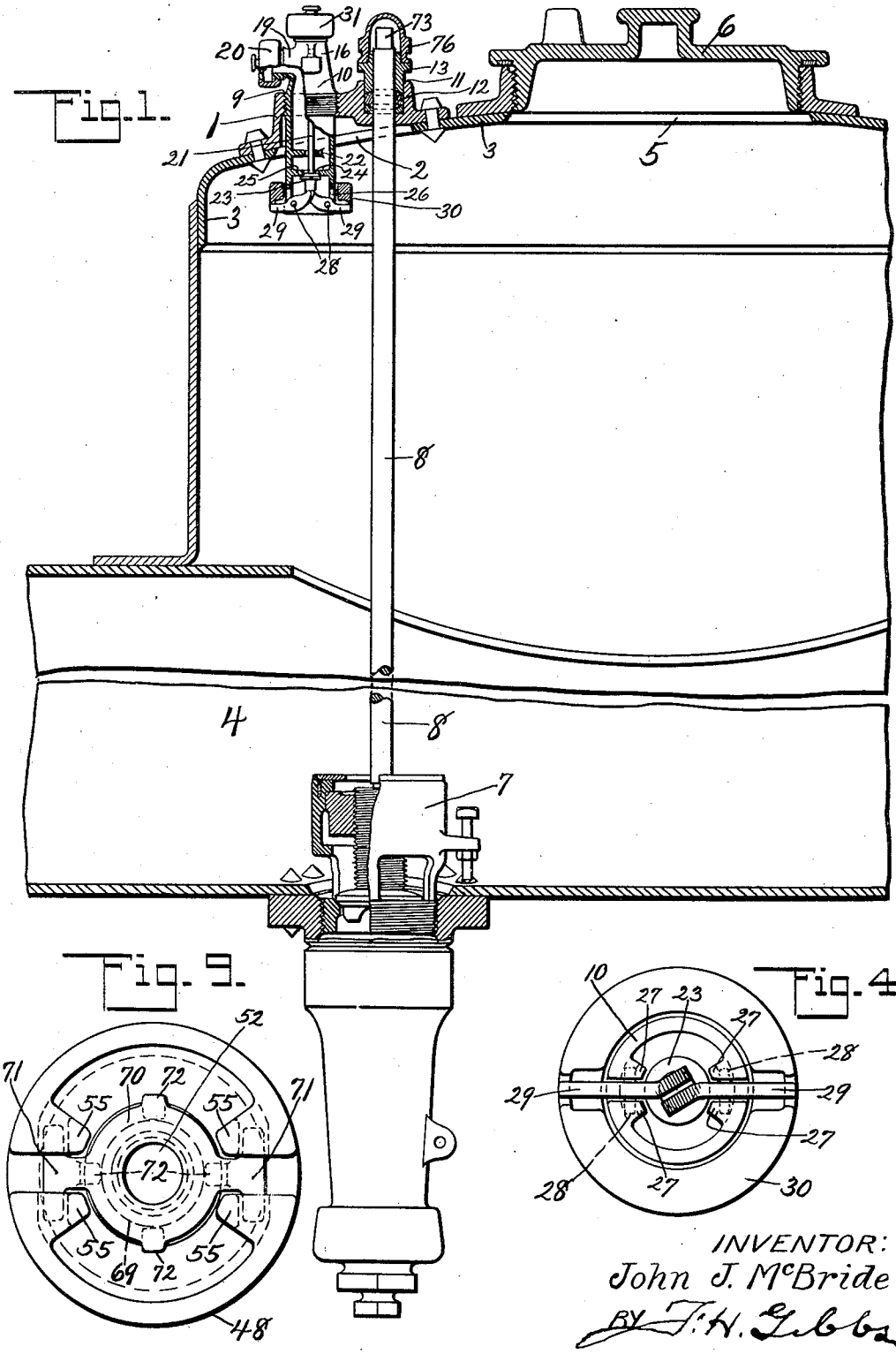

Fig. 3.

Fig. 4.

INVENTOR:
John J. McBride
BY T. H. Gibbs
ATTORNEY.

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Filed June 15, 1922 3 Sheets-Sheet 2

Fig. 2.

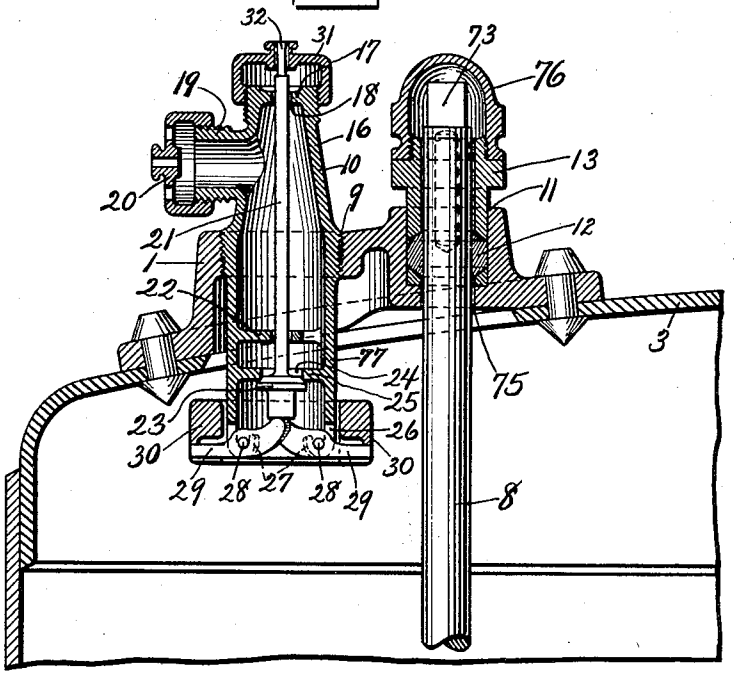
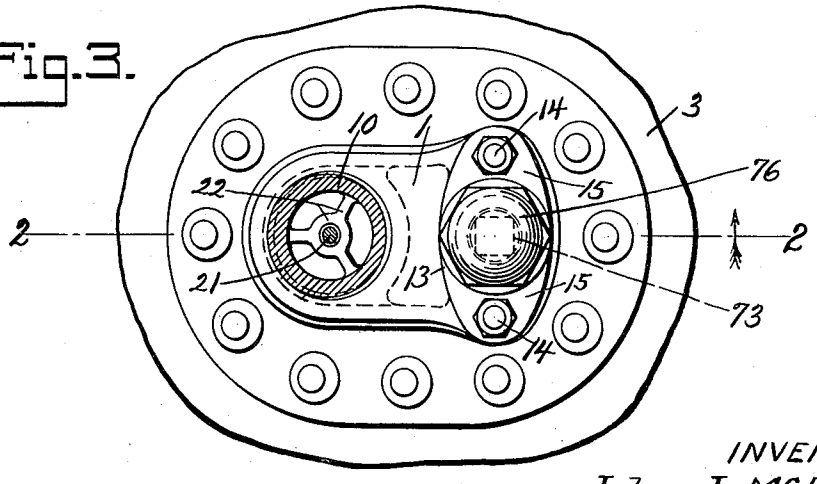


Fig. 3.



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Filed June 15, 1922 3 Sheets-Sheet 3

Fig. 5.

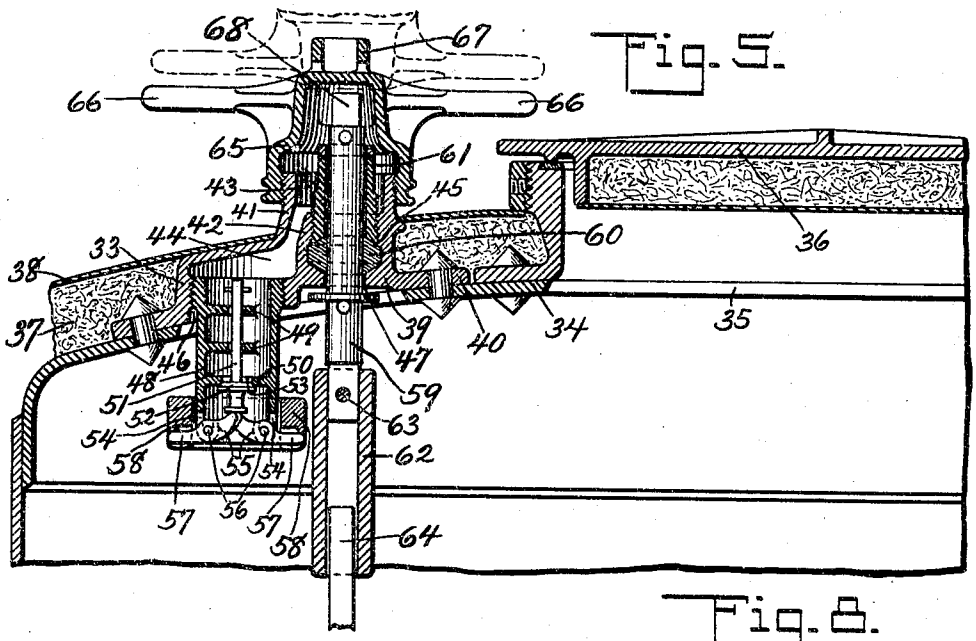


Fig. 6.

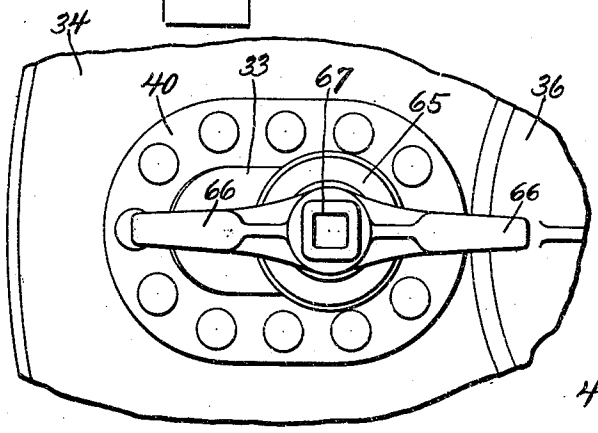


Fig. 7.

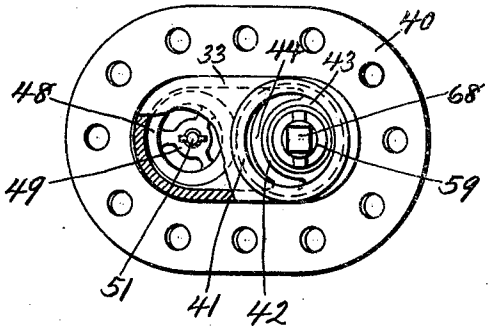
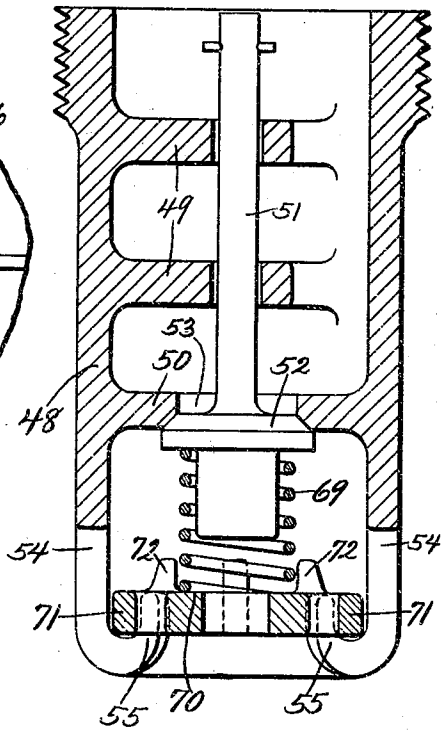


Fig. 8.



INVENTOR:
John J. McBride
BY J. H. Gibbs
ATTORNEY.

Patented Apr. 6, 1926. 1,579,225

UNITED STATES PATENT OFFICE.

JOHN J. McBRIDE, OF BAYONNE, NEW JERSEY, ASSIGNOR TO AMERICAN CAR AND FOUNDRY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TANK-VALVE MECHANISM.

Application filed June 15, 1922. Serial No. 568,509.

To all whom it may concern:

Be it known that I, JOHN J. McBRIDE, residing at Bayonne, Hudson County, State of New Jersey, and being a citizen of the United States, have invented certain new and useful Improvements in a Tank-Valve Mechanism, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and to use the same, reference being had to the accompanying drawings, which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

In said drawings:

Fig. 1 is a broken central vertical section of a portion of a car tank showing my valve mechanism applied thereto;

Fig. 2 is a view, in section and on a larger scale, of part of the structure shown in Fig. 1, the section being taken on the line 2—2 of Fig. 3;

Fig. 3 is a top plan view, with a part shown in section, of the structure shown in Fig. 2;

Fig. 4 is a bottom plan view of the valve casing with the air inlet valve and valve controlling means assembled therewith;

Fig. 5 is a central vertical section of part of an insulated car tank dome with a modified form of my device mounted thereon;

Fig. 6 is a top plan view of the device shown in Fig. 5, the insulation being removed;

Fig. 7 is a top plan view, detached from the tank, of the device shown in Fig. 5, with parts broken away and the cap removed;

Fig. 8 is a central vertical section of the valve casing with the air inlet valve and a modified form of valve controlling means assembled therewith; and

Fig. 9 is a bottom plan view of the structure shown in Fig. 8.

It is an object of my invention to provide an improved valve mechanism for use with tanks having bottom discharge outlet valves that are adapted to be operated without opening the manhole in the tank dome. It is also an object of my invention to provide an improved means for mounting the valve mechanism in the tank dome that will also provide a means for mounting the discharge valve operating rod in a suitable manner.

With these and other objects in view, my invention comprises a flanged member 1 riveted, or otherwise secured about an opening 2 in a dome sheet 3 of a car tank 4 having the usual manhole opening 5 closed by a cover 6. The tank is provided with a discharge valve 7 operated by a rod 8, the valve shown being the self-grinding valve shown in the application of A. E. Ostrander, Serial No. 565,484 filed June 2, 1922, but it to be understood that my invention is not limited to the type of valve shown as any suitable discharge valve may be used.

The flanged member 1 is provided with a threaded opening 9 in which is mounted a valve casing 10 and with a cylindrical chamber 11 provided with an opening 75 at its bottom through which the rod 8 extends. Surrounding the rod 8 in the recess 11 is packing 12 held in place by a packing collar 13 secured to the member 1 by bolts 14 which pass through openings in the lugs 15 formed integral with the collar 13. The upper end of the collar 13 is threaded to receive a cap 76 which covers the end of the rod 8.

The valve casing 10 mounted in the member 1 comprises a tubular portion 77 and a tapered portion 16 closed by an end wall 17 having an opening 18 and having a tubular projection 19 normally closed by a perforated cap 20. The end wall 17 serves as a guide for a valve stem 21 which is also guided by guides 22, formed integral with the casing 10, and carries a valve 23 adapted to control an opening 24 in the wall 25 formed in the casing 10. The tubular portion 77 is slotted as at 26, and on both sides of each slot there are provided hook-shaped portions 27 which receive the pivots 28 fixed in levers 29. The levers 29 have one end engaged with the valve 23 and the other end engaged by an annular weight 30 which surrounds the casing 10 and, through levers 29, serves to keep the valve 23 normally in engagement with its seat in the wall 25. Threaded on the tapered portion 16 is a cap 31 having an opening adapted to receive a portion 32 of the valve stem 21 of less diameter than the remainder of the stem. By screwing the cap 31 on the casing 10, the

cap may be made to engage with the shoulder formed where the portion 32 joins the remainder of the valve stem 21 and to force the valve 23 to the open position.

In the modified form of my device shown in Figs. 5, 6 and 7, a flanged member 33 is secured to a dome head 34 having the usual manhole opening 35 closed by a cover 36. As shown in Fig. 5, the tank is provided with a layer of heat insulating material 37 and an outer protecting sheath 38. The flanged member 33 is formed with a base portion 39 having a flange 40 adapted to be secured by rivets or otherwise, to the dome head 34 and projecting walls 41 and 42. The wall 42 is lower than the wall 41 and is joined to the inside of the wall 41 as well as to the base portion 39. Together with the base portion 39, the walls 41 and 42 form a chamber 43 in open communication with an irregular passage 44 and a chamber 45, the passage 44 and chamber 45 leading to a threaded opening 46 and an opening 47, respectively, in the base portion 39.

Mounted in the threaded opening 46 is a tubular valve casing 48 having guides 49 and a separating wall 50 formed integral therewith, the guides being adapted to receive the stem 51 of a valve 52 which controls an opening 53 in the wall 50. The casing 48 is slotted, as at 54, and at both sides of each slot hook-shaped portions 55 are formed integral with the casing wall to receive pivots 56 carrying levers 57. The levers 57 each have one end engaging the valve 52 and the other end engaged by an annular weight 58 which surrounds the casing 48 and normally keeps the valve 52 in engagement with its seat on the wall 50. Mounted in the opening 47 is a valve operating rod 59 which extends through chambers 45 and 43 and is surrounded in chamber 45 by packing 60 which is held in place by a packing nut 61 having threaded engagement with the wall 42. The lower end of the valve rod is squared and engages in the correspondingly shaped bore of a sleeve 62. The sleeve 62 is fixed to the rod 59 by pin 63 and slidably receives the squared upper end of a valve rod 64. The upper end of the wall 41 is exteriorly threaded to receive a cap 65 which is provided with arms 66 and a socket 67 adapted to fit the squared upper end 68 of the valve rod 59.

In the modified structure shown in Figs. 8 and 9, the valve casing 48 is provided with a wall 50 engaged by a valve 52 but the valve is normally held to its seat by a spring 69 which is supported on a spring seat 70 having T-shaped arms 71 which engage the hook-shaped portions 55. Lugs 72 secure the spring 69 in position on the seat 70.

When it is desired to discharge the contents of a tank equipped with the structure shown in Figs. 1 to 4, the cap 76 is removed and the discharge valve operated by applying a suitable wrench or other operating means to the squared end 73 of the rod 8. As the contents lower in the tank the pressure in the tank will be reduced until a partial vacuum is established whereupon the air will enter through the perforated cap 20 and operate the valve 23 against the resistance of the weight 30. Where it is desired, the valve 23 may be held in open position by screwing down the cap 31. Unscrewing the cap 31 will permit the weight 30 to return the valve 23 to its seat. When the tank is loaded the pressure which ordinarily accumulates in the tank will aid in keeping the valve 23 seated.

In the case of the structure shown in Figs. 5, 6 and 7, the cap 65 is removed and turned over so as to engage the socket 67 with the squared end 68 of the rod 59 to operate the discharge valve. Removing the cap 65 opens the passage 44 so that air may pass through the valve 52 to the tank as the contents are discharged from the tank.

In the valve shown in Figs. 8 and 9, the spring 69 replaces the weights shown in the other figures. Both the spring and the weight controlled valves are designed to be opened before the degree of vacuum in the tank will endanger the tank.

What I claim is:

1. In a car tank having a discharge valve at the bottom thereof, a dome head having an opening therein, a member secured to said head about said opening, a valve mounted in said member and operating automatically upon the operation of said discharge valve and means mounted in said member adapted to operate said discharge valve.

2. In a car tank having a discharge valve at the bottom thereof, a dome head having an opening therein, a member secured to said head about said opening, an air inlet valve having a passage leading thereto mounted in said member and operating automatically upon operation of said discharge valve and a discharge valve operating rod mounted in said member, said valve rod and passage being covered.

3. In a car tank having a discharge valve at the bottom thereof, a dome head having an opening therein, a member secured to said dome head about said opening, a valve casing mounted in said member, an air inlet valve mounted in said casing and adapted to open automatically upon the opening of said discharge valve and discharge valve operating means carried by said member, said valve and rod being covered.

4. In a car tank having a discharge valve at the bottom thereof, a dome head having an opening therein, a member secured to said dome head about said opening, a valve casing mounted in said member, an air inlet valve mounted in said casing and adapted

to open automatically upon the opening of said discharge valve, means normally holding said valve to its seat and discharge valve operating means carried by said member.

5. In a car tank having a discharge valve at the bottom thereof, a dome head having an opening therein, a member secured to said dome head about said opening, a valve casing mounted in said member, an air inlet valve mounted in said casing and adapted to operate upon operation of said discharge valve, means adapted to yieldingly hold said valve to its seat and operating means for said discharge valve mounted in said member.

6. The combination with a car tank having a discharge valve at the bottom thereof, of an integral member carried by said tank and having a chamber therein, an operating rod for said discharge valve mounted in said chamber and an automatically operating air inlet valve mounted in said member.

7. The combination with a car tank having a discharge valve at the bottom thereof, of a member carried by said tank and having a chamber therein, an operating rod for said discharge valve mounted in said chamber, an opening in said member and an automatically operating air inlet valve mounted in said opening, said rod and a passage to said valve being covered.

8. The combination with a car tank having a discharge valve at the bottom thereof, of a member formed integral with said tank, projecting walls carried by said member and forming a chamber, an operating rod for said discharge valve mounted in said chamber and an automatically operating air inlet valve carried by said member.

9. The combination with a car tank having a discharge valve at the bottom thereof, of a member formed integral with said tank, projecting walls carried by said member and forming a chamber, an operating rod for said discharge valve mounted in said chamber and an automatically operating air inlet valve carried by said member, said rod and a passage to said valve being covered.

10. In a tank car, a dome head having an opening therein, a flanged member secured to said head about said opening, a valve casing mounted in said flanged member, an automatically operating valve mounted in said casing and means adapted to hold said valve open.

11. In a tank car, a dome head having an opening therein, a flanged member secured to said head about said opening, a valve casing having an outlet mounted in said member, an automatically operating valve mounted in said casing, a stem for said valve and means engaging said valve stem and valve casing adapted to hold said valve in open position.

In witness whereof I have hereunto set my hand.

JOHN J. McBRIDE.