

Oct. 12, 1926.

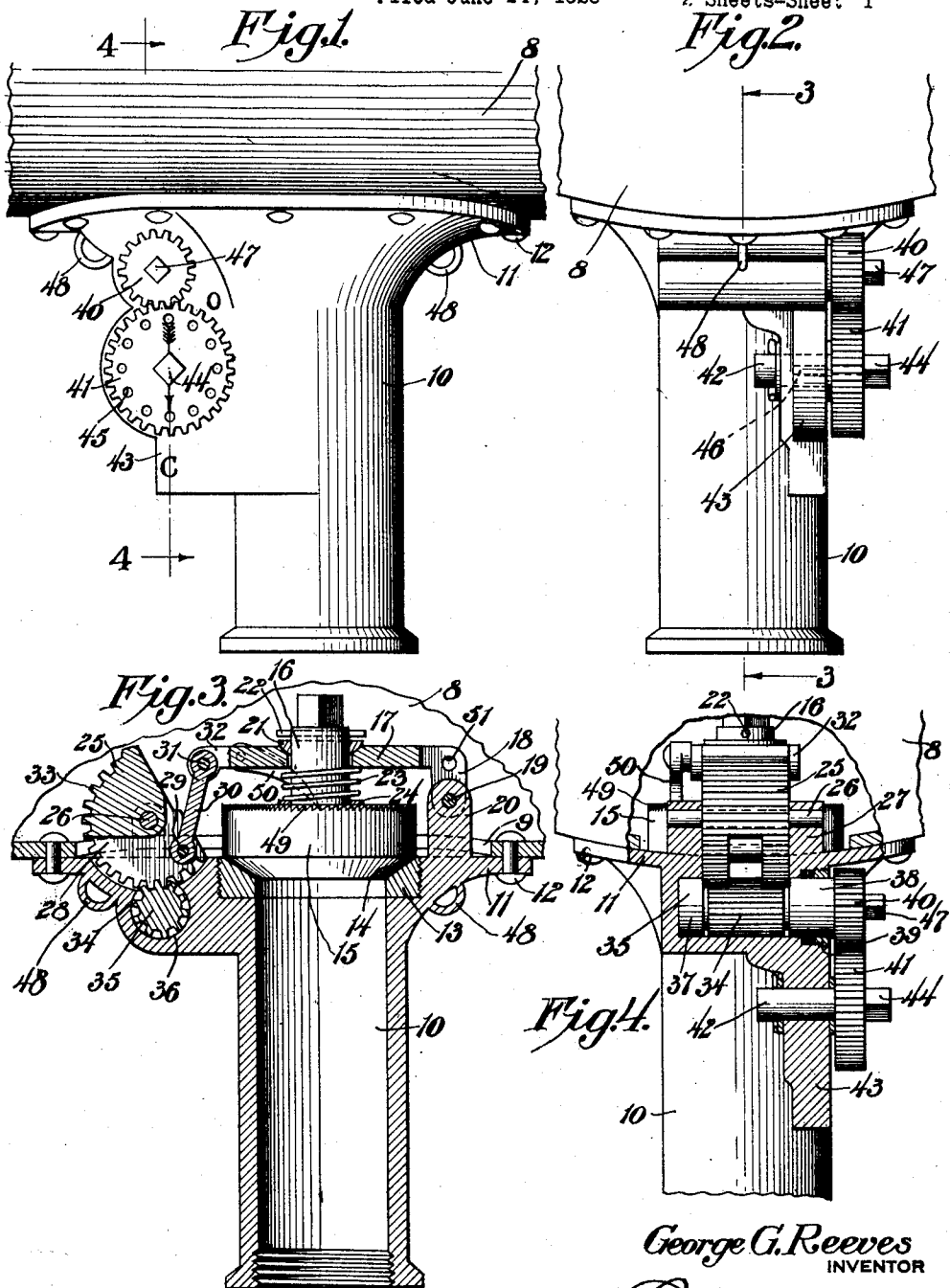
G. G. REEVES

1,602,936

OUTLET VALVE

Filed June 14, 1926

2 Sheets-Sheet 1



WITNESSES

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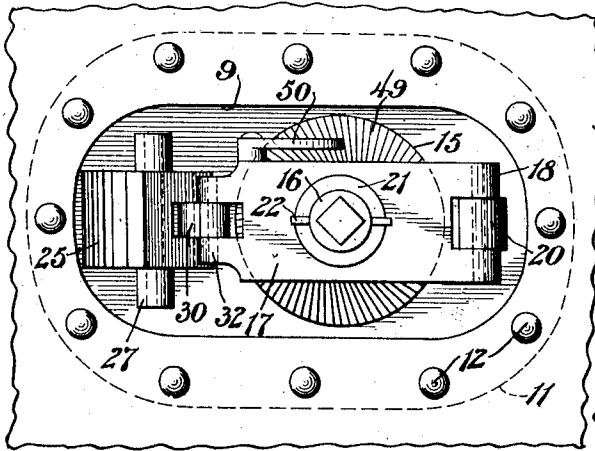


Fig. 5.

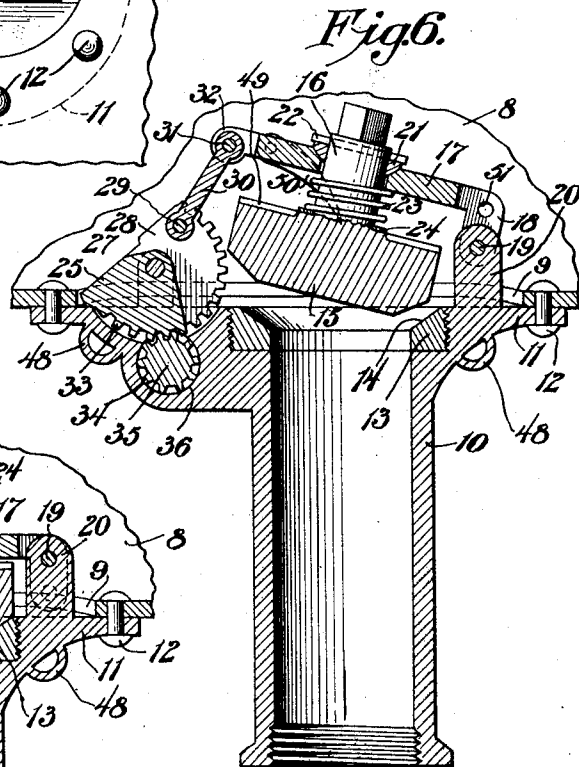


Fig. 6.

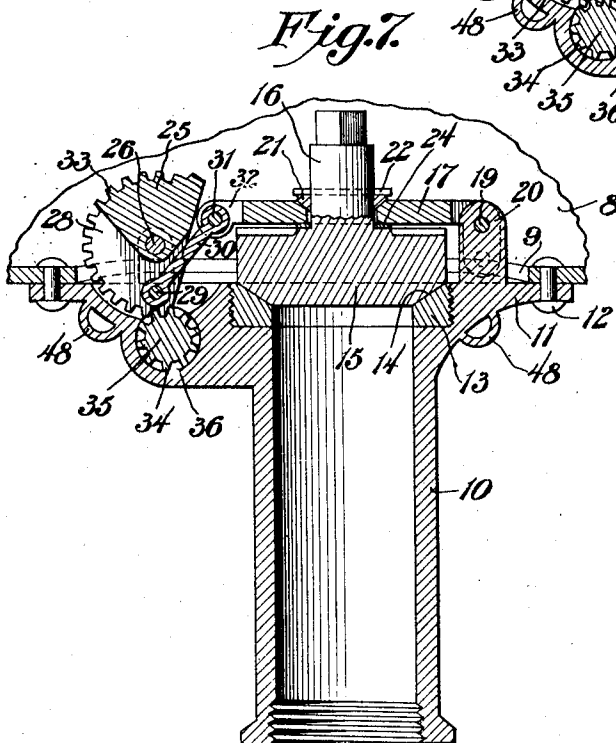


Fig. 7.

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OUTLET VALVE.

Application filed June 14, 1926. Serial No. 115,950.

This invention relates to outlet valves, especially adapted for use on tank cars and similar liquid containers.

The object of the invention is to provide a valve for this purpose, and mechanism for actuating the same which is simple and inexpensive in its construction, direct and positive in its action and easy to operate; and especially to provide a valve for tank cars, which may be opened or closed from the outside of the car without opening the dome, or otherwise gaining access to the interior of the container.

A further object of the invention is to provide means for imparting to the valve a positive rotary motion as it is closed and while it is yieldingly held against its seat, so as to eliminate any foreign matter which might lodge between the valve and its seat, and to insure a tight closure which will not leak. The mechanism for actuating the valve is for the most part contained within the tank where it is safe from injury. By means of this mechanism, the valve may be closed before the car has been filled, or opened to empty the car in far less time than the style of valve heretofore used.

The specific construction of the invention and the advantages thereof will be more fully explained in the following detailed description, which is to be read in connection with the accompanying drawings illustrating the same in its preferred form.

In the drawings:

Figure 1 is a side elevation of the invention.

Figure 2 is a front elevation thereof.

Figure 3 is a vertical section taken on the line 3—3 of Figure 2.

Figure 4 is a vertical section taken on the line 4—4 of Figure 1.

Figure 5 is a plan view of the invention.

Figure 6 is a view similar to Figure 3, but showing the valve open.

Figure 7 is a view similar to Figure 3, but showing a modified arrangement.

The invention is illustrated in connection with a portion of a tank car or similar liquid container 8, having an outlet 9 in its bottom. Leading from the outlet is a substantially cylindrical housing 10, having an outwardly turned flange 11 at its upper end, which is riveted, or otherwise, secured to the bottom of the container, as shown at 12. A bushing 13 is secured at the mouth of the

outlet 10, and is formed with a conical surface 14, constituting a seat for the outlet valve 15.

The valve 15 is formed with an upwardly projecting stem 16, which extends through an opening in a yoke 17. This yoke is formed at its rear end with downturned ears 18, which are pivoted on a pin 19, mounted in a lug or ear 20 extending upwardly from the flange 11. A collar 21 surrounds the stem 16, and is retained thereon by a pin 22. The lower face of this collar is rounded to fit a correspondingly shaped seat formed in the yoke 17. The valve 15 is urged downwardly by a coiled spring 23 acting between the yoke and a washer 24 which surrounds the lower portion of the stem.

A toothed segment 25 is mounted for rocking movement on a spindle 26 between two ears or lugs 27, which project upwardly from the flange 11 beneath the front end of the yoke 17. This segment is formed with a channel 28, which is traversed by a pivot pin 29, and a link 30 connects the pin 29 with a similar pin 31 mounted between two ears 32 formed at the front end of the yoke 17. The teeth 33 of the segment mesh with teeth 34 formed on a mandrel 35, which is rotatably mounted in a bore 36 formed in the housing. The points of the teeth 34 lie in the same cylindrical surface as the smooth end portions 37 and 38 of the mandrel, so that the latter may be easily inserted in the bore and retained against longitudinal movement therein by the teeth 33 engaging the opposed shoulders formed at the inner ends of the portions 37 and 38. The outer portion 38 is surrounded by a packing gland 39, which effectually prevents leakage from the container.

The outer end of the mandrel 35 is formed with gear teeth 40, which are in mesh with a gear 41 carried by a spindle 42, which is rotatably mounted in a flange 43, forming an integral part of the housing 10. The gear 41 may have an arrow or pointer therein, which in conjunction with the letters C and O on the housing indicate whether the valve is closed or open. The outer end 44 of the spindle 42 is polygonal in shape, and adapted to receive a wrench for turning the same to open or close the valve. The gear 41 is formed with numerous holes 45 near its periphery, one of which may be connected by

a car seal to a hole 46 formed in the flange 43, thus making it impossible to open the valve without breaking the seal.

The outer end 47 of the mandrel 35 is also polygonal in shape, so that the wrench may be applied thereto in case the gear 41 becomes broken, or accidentally detached. Eyes 48 may be formed on the housing for attaching small chains to which removable parts may be attached to prevent loss of the same.

The upper face of the valve 15 is formed with radial ratchet teeth 49, which are adapted to be engaged by the end of a pawl 50, pivoted to the yoke 17, and urged into engagement with said teeth either by a spring or by gravity. As the yoke is rocked up and down, therefore, the pawl 50 will drop behind successive teeth 49 and rotate the valve 15 on its seat, thereby insuring close contact and eliminating any foreign matter, which might otherwise prevent a tight closure. The valve may be thus rotated without raising the yoke 17 sufficiently to lift the valve from its seat.

The yoke 17 is provided with an additional hole 51, so that in case the coiled spring 23 is broken or dispensed with, the yoke may be mounted as shown in Figure 7, and will act directly and positively upon the valve as the segment 25 is rocked to close the same. In this arrangement, the pin 22 is inserted at a lower point in the valve stem 16, so that the valve may be opened with little or no lost motion.

From the foregoing description, it will be understood that the valve may be opened or closed merely by rotating the mandrel 35, and at the same time the engagement of the pawl 50 with the teeth 49 will cause a rotary motion of the valve, and, in connection with the pressure of the spring 23 will insure a proper seating of the same without any possibility of leakage.

While I have shown and described the preferred embodiment of the invention, it is obvious that various modifications may be made in the details of construction, and in the arrangement of the various parts thereof without any material departure from the salient features of the invention as expressed in the claims.

What is claimed is:

1. The combination with a housing adapted to be secured to a liquid container and having an outlet formed with a valve seat, of a valve cooperating with said seat and having an upwardly disposed stem, a yoke pivoted at its rear end to the housing and connected with said stem, a rotatably mounted member within the container near the outlet, a link connecting the rotatable member with the front end of the yoke to swing the latter up or down to raise or lower the valve as the rotatable member is actuated, gearing

for actuating said member, and means operable from outside the container for actuating said gearing.

2. The combination with a housing adapted to be secured to a liquid container and having an outlet formed with a valve seat, of a valve cooperating with said seat and having an upwardly disposed stem, a yoke pivoted at its rear end to the housing and having an opening in which said stem is rotatably held, means for swinging said yoke upwardly or downwardly to open or close the valve, and means for imparting to the valve a rotary movement as the yoke is swung to close the same, so as to secure the tight seating of said valve.

3. The combination with a housing adapted to be secured to a liquid container and having an outlet formed with a valve seat, of a valve cooperating with said seat and having an upwardly disposed stem, a yoke pivoted at its rear end to the housing and having an opening receiving said stem, means for retaining the stem in said opening so as to permit a rotary movement and a limited longitudinal movement of the stem therein, a spring urging the valve and stem toward the valve seat, means for swinging the yoke upwardly or downwardly to open or close the valve, and means for imparting to the valve a rotary movement as the yoke is swung to close the same and while the spring holds the valve against its seat, so as to insure the tight seating of said valve.

4. The combination with a housing adapted to be secured to a liquid container and having an outlet formed with a valve seat, of a valve cooperating with said seat and having an upwardly disposed stem, a yoke pivoted at its rear end to the housing and having an opening in which said stem is rotatably held, a rotatable member mounted on a horizontal axis within the container near the outlet, a link connecting the rotatable member with the front end of the yoke to swing the latter upwardly or downwardly to raise or lower the valve as the rotatable member is actuated, gearing for actuating said member, means operable from outside the container for actuating said gearing, and means for imparting to the valve a rotary movement as the yoke is swung to close the same, so as to insure the tight seating of said valve.

5. The combination with a housing adapted to be secured to a liquid container and having an outlet formed with a valve seat, of a valve cooperating with said seat and having an upwardly disposed stem, a yoke pivoted at its rear end to the housing and having an opening receiving said stem, means for retaining the stem in said opening so as to permit a rotary movement and a limited longitudinal movement of the stem therein, a toothed segment rotatable about a

horizontal axis within the container near the outlet, a link connecting the segment with the front end of the yoke to swing the latter upwardly or downwardly to raise or lower the valve as said segment is rotated, gearing for rotating said segment, means operable from outside the container for actuating said gearing, ratchet teeth formed on the upper face of said valve, a pawl pivoted to the yoke and engageable with said teeth to rotate the valve as the yoke is swung downwardly to close said valve, and a spring urging the valve toward the valve seat as it is rotated, so as to insure the tight seating of said valve.

6. The combination with a housing adapted to be secured to a liquid container and having an outlet formed with a valve seat, of a valve cooperating with said seat and having an upwardly disposed stem, a yoke pivoted at its rear end to the housing and connected with said stem, a toothed segment rotatably mounted within the container near the outlet, a link connecting the segment with the front end of the yoke to swing the latter to raise or lower the valve, a mandrel having teeth meshing with the teeth of the segment, said housing having a bore receiv-

ing the mandrel, the overall diameter of the toothed portion of the mandrel being not greater than the diameter of the end portions thereof, whereby the teeth of the segment engage said end portions to prevent longitudinal movement of the mandrel, and means for rotating said mandrel to open or close the valve.

7. The combination with a housing adapted to be secured to a liquid container and having an outlet formed with a valve seat, of a valve cooperating with said seat, a toothed segment, means operable by rotation of the segment to open or close the valve, a mandrel having teeth meshing with the teeth of the segment, said housing having a bore receiving the mandrel, the overall diameter of the toothed portion of the mandrel being not greater than the diameter of the end portions thereof, whereby the teeth of the segment engage said end portions to retain the mandrel in the bore, and means operable from outside the housing to rotate said mandrel to open or close the valve.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

GEORGE G. REEVES.