Jan. 23, 1934. R. M. CALLAWAY 1,944,401

OUTLET CONSTRUCTION

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Fig. 1.

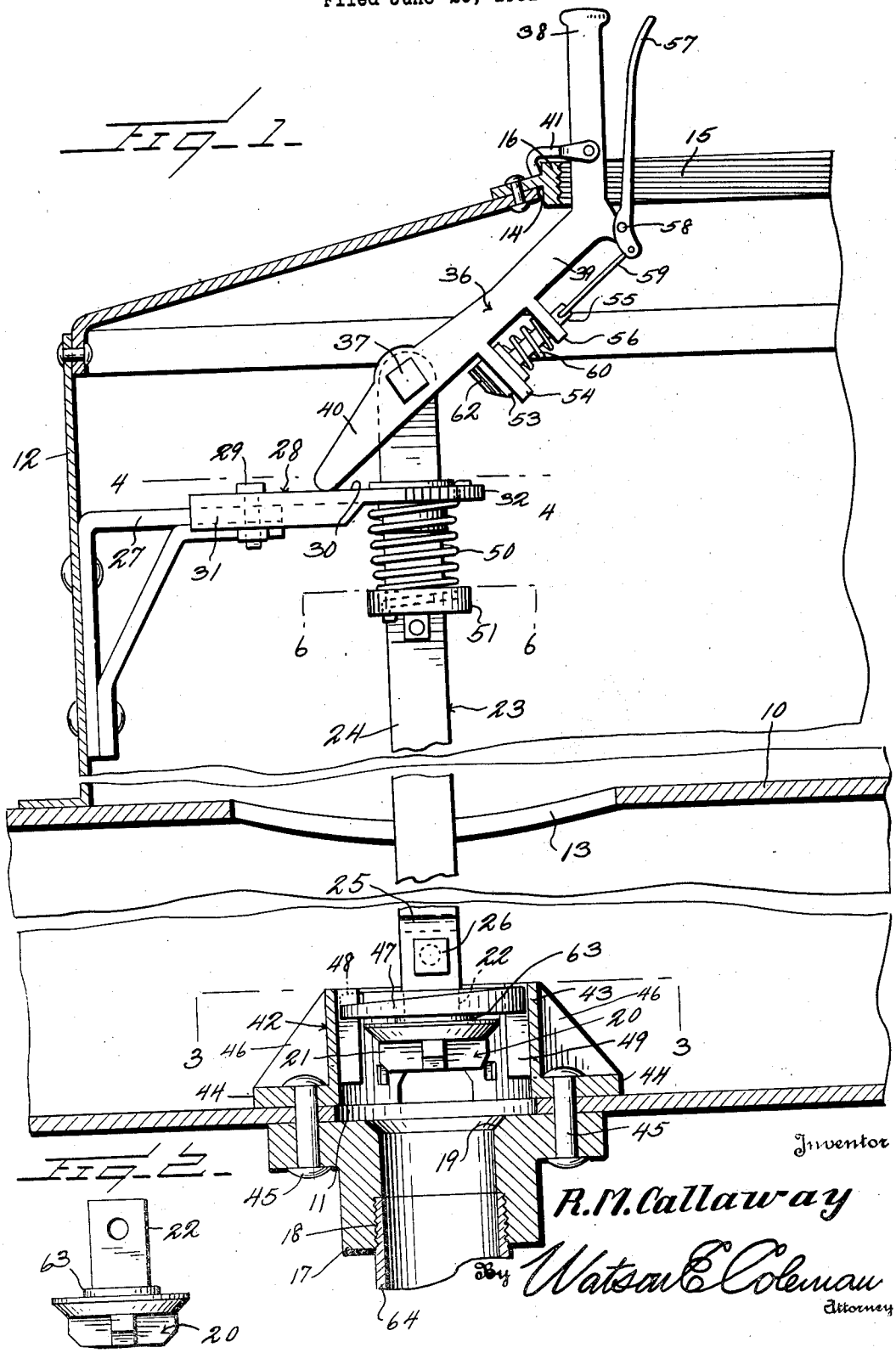


Fig. 2.

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Fig. 3.

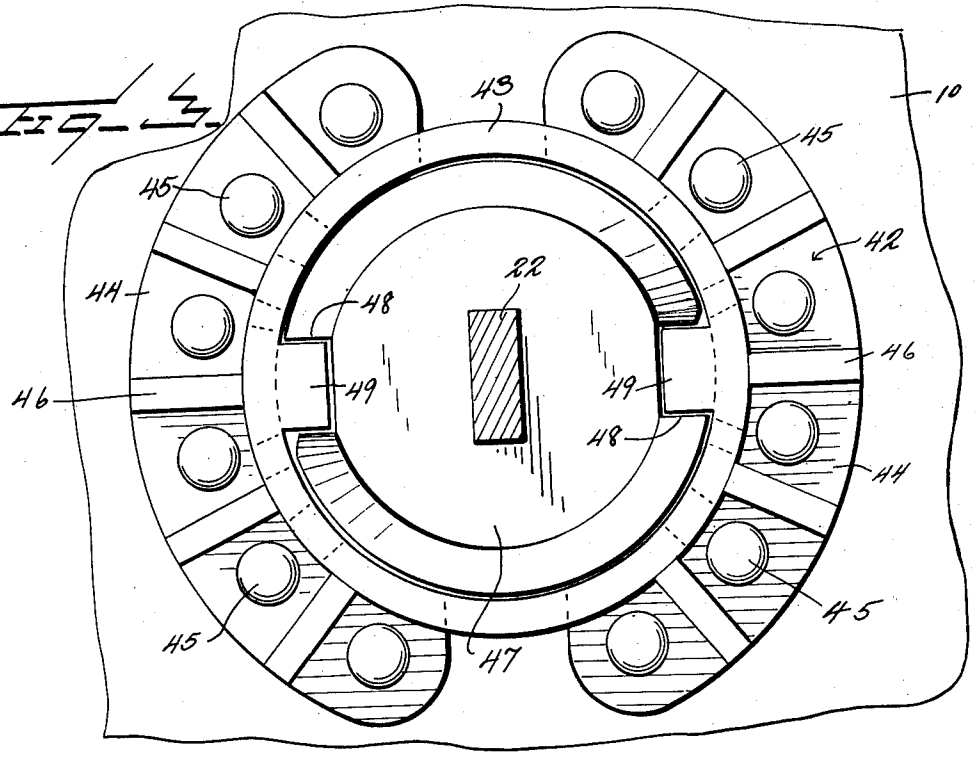


Fig. 4.

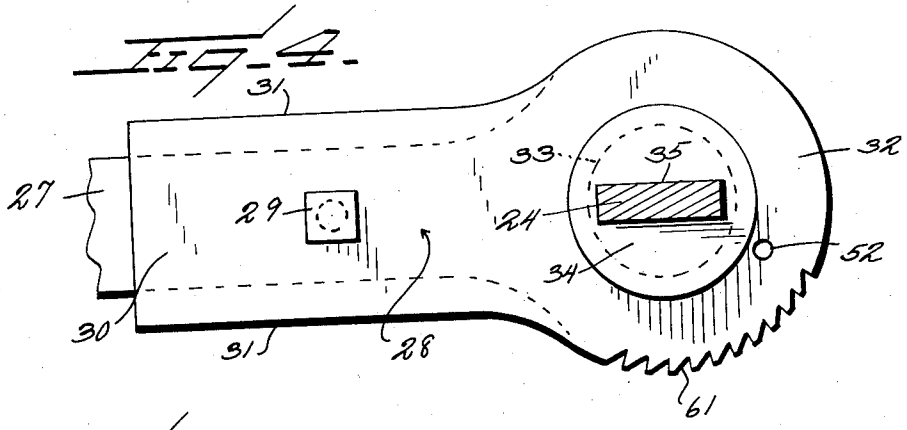
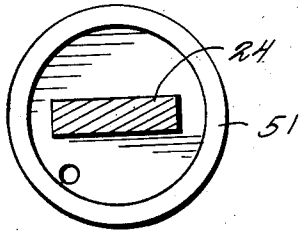


Fig. 6.



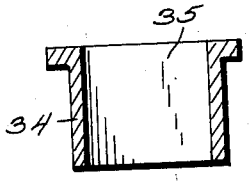


Fig. 5.

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Patented Jan. 23, 1934 1,944,401

UNITED STATES PATENT OFFICE

1,944,401

OUTLET CONSTRUCTION

Robert M. Callaway, Waco, Tex.

Application June 20, 1931. Serial No. 545,737

2 Claims. (Cl. 137—21)

This invention relates to outlet constructions for tank cars or similar liquid constructions, and is an improvement over my Patent No. 1,785,766, issued December 23, 1930.

An object of this invention is to provide in a construction of this kind means for operating a valve at a point remotely therefrom, the operating means for the valve being disposed within the dome of a tank car or the like.

Another object of this invention is to provide a valve operating mechanism which is so constructed that when the valve is in open position, the cover for the dome cannot be replaced, thereby serving as a factor of safety so that the dome will not be closed with the valve in open position.

A further object of this invention is to provide in a construction of this kind means whereby the valve cannot be opened from below or from the outlet side of the tank thereby preventing unauthorized removal of any contents of the tank.

A still further object of this invention is to provide in a valve construction of this kind means whereby the valve will be automatically snapped into closed position upon release of the locking mechanism.

This invention has for a still further object the provision of a valve and operating means therefor, which upon turning over or upsetting of the tank car and distortion of the walls of the car, breakable means whereby the valve operating means will be released from the upper wall or dome of the car without effecting the opening of the valve and at the same time permit subsequent opening of the valve when the car has been placed in upright position.

The above and various other objects and advantages of this invention will in part be described in and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawings, wherein:—

Figure 1 is a fragmentary side elevation partly in section of a device constructed according to the preferred embodiment of this invention mounted on a tank which is shown in fragmentary form and partly in section;

Figure 2 is a detail side elevation of the valve member;

Figure 3 is a sectional view partly in detail taken on the line 3—3 of Figure 1;

Figure 4 is a sectional view partly in detail taken on the line 4—4 of Figure 1;

Figure 5 is a sectional view taken substantially through the center of the operating rod bearing, and

Figure 6 is a sectional view partly in detail taken on the line 6—6 of Figure 1.

Referring to the drawings, wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 10 designates generally a tank car or liquid container having an intake or inlet opening 13 and an outlet opening 11. A dome 12 is mounted on the upper portion of the tank 10 and disposed about the inlet opening 13, this dome having an inlet port 14 in the top thereof, which is defined by a threaded annulus 15. This annulus 15 has an upstanding rib 16, the purpose for which will be hereinafter described. The annulus 15 is adapted to receive a conventional cover or closure member which is threadably disposed therein.

A flanged casting 17 is secured to the bottom of the tank 10 and disposed about the outlet opening 11, this casting 17 having a bore therethrough which is threaded adjacent the lower end thereof, as at 18, and the upper edge of the casting 17 about the bore is provided with a valve seat 19. A valve member, generally designated as 20, which has a guide portion 21 is adapted to engage the valve seat 19 for closing of the outlet port 11. This valve member 20 is provided with a valve stem 22 which is substantially rectangular in cross section, and a valve operating mechanism, generally designated as 23, engages the stem 22 for opening and closing of the valve. This valve operating mechanism 23 comprises an elongated rod 24 through the lower end portion 25 of which a bolt 26 extends, this bolt also extending through the valve stem 22.

A bracket 27 is secured to the dome 12 and is provided with a guide rod support, generally designated as 28, which is secured thereto by means of a fracturable or breakable bolt 29. This support 28 comprises a flat body portion 30 which is flanged, as at 31, on each side thereof, these flanges 31 engaging on the opposite sides of the horizontal portion of the bracket 27. The inner end of the support 28 has a rounded portion 32 having an aperture 33 axially therethrough for rotatably receiving a bushing 34. This bushing 34 has a rectangular-shaped opening 35 therethrough for receiving the operating rod 24.

An operating lever, generally designated as 36 is pivoted to the upper end of the rod 24 by means of a pivotal member 37, and this lever 36 has a handle portion 38 which is angularly disposed with respect to the body portion 39 of the lever. The pivot 37 is disposed intermediate the

ends of the body portion 39 of the lever 36, the extended portion 40 of this lever providing a cam for engagement with the upper surface of the supporting member 38 for vertically moving the operating rod 24.

A hook 41 is pivoted to the handle 38, this hook being adapted to engage the rib or flange 16 of the annulus 15, so as to hold the lever 36 in upraised position and coactively hold the valve 20 in open position. In order to securely hold the valve 20 in closed position, I have provided a locking cage, generally designated as 42. This locking cage 42 has a vertically disposed cylindrical portion 43 and a pair of base portions 44 which are adapted to be secured to the bottom of the tank 10 by means of rivets 45 or the like. These rivets 45 are also used for securing the flanged casting 17 about the outlet 11.

In order to properly support the cylindrical portion 43, I have provided a plurality of radially disposed ribs 46 which engage the flanges or base members 44 and the outer wall of the cylindrical portion 43. A cam member 47 is secured to the stem 22 of the valve 20 above the top of the valve, this cam member 47 being provided with notches 48 which are adapted to loosely engage vertical guides 49 carried by the inner surface of the cylindrical guide member 43. These guide members 49 are preferably disposed in opposed relation to each other although I, of course, do not wish to be limited to this construction as, if desired, any number of guide members 49 may be provided. These guide members 49 terminate at a point upwardly from the base members 44 and the cam surface of the cam member 47 is adapted to engage the lower ends of these guide members so as to tighten the valve 20 upon rotation of the rod 24 and the lever 36.

In order to automatically rotate the valve member 20, I have provided a spring 50 which is secured at one end to a ring or cup member 51 carried by the operating rod 24 at a point below the support 28 and the upper end of the spring 50 is secured to the support 28 in an aperture 52. This spring 50 is adapted not only to rotate the cam member 47 together with the rod 24 and the lever 36, but is also adapted to initially move the operating rod 24 vertically and downwardly so as to carry the cam member 47 below the lower ends of the guide members 49. In order to releasably hold the lever 36 in closed position, I have provided a pawl 53 which is slidable in a guide 54 carried by the lever 36, this pawl 53 having a stem 55 which is also slidable in a guide 56 disposed on the lever 36 in spaced relation to the first guide 54.

A pawl operating lever 57 is pivoted to the lever 36 at a point intermediate the ends thereof, as at 58, and a connecting link 59 connects the free end of the lever 57 with the pawl stem 55. A spring 60 engages one end of the pawl 53 and the opposite end of the spring 60 engages against the guide 56, this spring constantly urging the pawl 53 outwardly of the guide 54. The periphery of the rounded head 32 of the supporting plate 28 is provided with a plurality of teeth 61 which are adapted to be engaged by the pawl 53 when the operating lever 36 is in horizontal position and the lower surface of the operating lever 36 engages against the upper surface of the supporting plate 28. In this manner, when the spring 50 moves the operating rod 24 downwardly, the beveled edge portion 62 of the cam 53 will engage the periphery of the head 32 and force the dog 53 outwardly, further rotation of the operating rod 24 and the lever 36 carrying the dog 53 into engagement with the teeth 61 so that the lever 36 will be held in locked position away from the opening 14 of the dome 12. A boss 63 is interposed between the bottom of the cam member 47 and the top of the valve 20, so as to dispose the valve 20 below the cam member 47.

In the operation of this device, when it is desired to fill the tank 10, the lever 36 which is normally disposed closely adjacent the vertical wall of the dome 12 is rotated by first moving the releaving lever 57 inwardly toward the handle 38 and then rotating the lever 36 so that the guide slots 48 will register with the guide members 49. The handle 38 may then be lifted upwardly or vertically, thereby causing the extension 40 to engage against the upper surface of the plate 28 and raise the connecting rod 24 and coactively move the valve 20 away from its seat 19. When the lever 38 is raised to a point closely adjacent the annulus 15, the hook 41 may be swung into engagement with the rib 16 so as to hold the lever 36 in upraised or open position. If it is desired to maintain the valve in open position without raising the lever 36, as for instance, where it is desired to apply air pressure to the contents of the tank 10 so as to more readily force the contents outwardly thereof, the rod 24 may be moved vertically by inserting wedges or the like beneath the lower or horizontal face of the lever 36. In this position, the handle 38 will not prevent the threading of a connecting pipe or the like onto the annulus 15, but the valve 20 may be maintained in open position. The casting 17 is preferably of sufficient strength so that in the event the outlet pipe 64 is broken off, it will not effect the seating of the valve 20. This outlet 64 can be readily replaced by applying a short length of pipe to the threaded portion of the casting 17.

It will be obvious, from the foregoing, that in the event an unauthorized person attempted to remove the outlet pipe connection 64 and attempted to turn the valve member 20, that this could not be readily accomplished in view of the locking dog 53 which holds the valve 20 against turning movement. This bolt 29 for securing the plate 28 on the bracket 27 is lighter in construction than the bolt 26 which holds the connecting rod 24 onto the valve stem 22 so that in the event the tank car turns over and the configuration of the tank 10 changes so that the normal distance from the plate 28 to the valve seat 19 will be greater, the bolt 29 will be fractured without turning of the lever 36 or moving the valve 20 into open position.

It is, of course, obvious that when the bolt 29 is fractured and the plate 28 is pulled away from the bracket 27, the spring 50 will rotate the released plate 28 without turning the connecting rod 24. When the tank car is again righted, the cover of the dome may be removed and the lever 36 swung or rotated toward the cover opening so as to move the valve 20 into open position and permit the discharge of the contents of the tank 10 through the discharge opening 11.

It is, of course, understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

I claim:—

1. In a valve construction including a valve member and an elongated valve stem, means for securing the valve to the stem, a support within which one end of the valve stem is rotatable, said support comprising a bracket, a plate engaging the stem whereby to permit rotary and longitudinal movement of the stem through the plate, a second securing means for securing the plate to the bracket, said second securing means being structurally weaker than said first named means, an operating lever pivoted to the stem, means carried by the lever to impart longitudinal movement to the valve, a toothed ratchet carried by the plate, said teeth being tangentially directed, and a pawl member yieldably carried by the lever and engaging the ratchet upon vertical rocking of the lever in a movement to a substantially horizontal position, said teeth permitting free rotation of the lever in a horizontal plane in one direction, unaccompanied by vertical rocking of the lever, while holding the lever against rotation in the opposite direction in a horizontal plane.

2. The combination with a tank having alined inlet and outlet ports, a valve seat disposed about the outlet port, a valve member engaging said seat for closing of the port, an elongated stem extending upwardly from the valve through said intake port, means carried by the tank for supporting the extended end of said stem, said means including a member having a round end, an operating lever pivoted intermediate its ends to said stem, said lever upon vertical movement thereof moving said valve into open or closed position, means for holding said lever in upraised position whereby to maintain the valve in open position, a ratchet carried by a portion of the round end of the support, the teeth of the ratchet being tangentially directed, a pawl member slidably carried by the lever, and means for moving said pawl longitudinally of the lever, said pawl upon downward movement of the lever engaging said ratchet whereby to hold said lever against swinging movement, said ratchet teeth permitting free horizontal swinging of the lever in one direction while holding the lever against swinging in the opposite direction and in a horizontal plane.

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