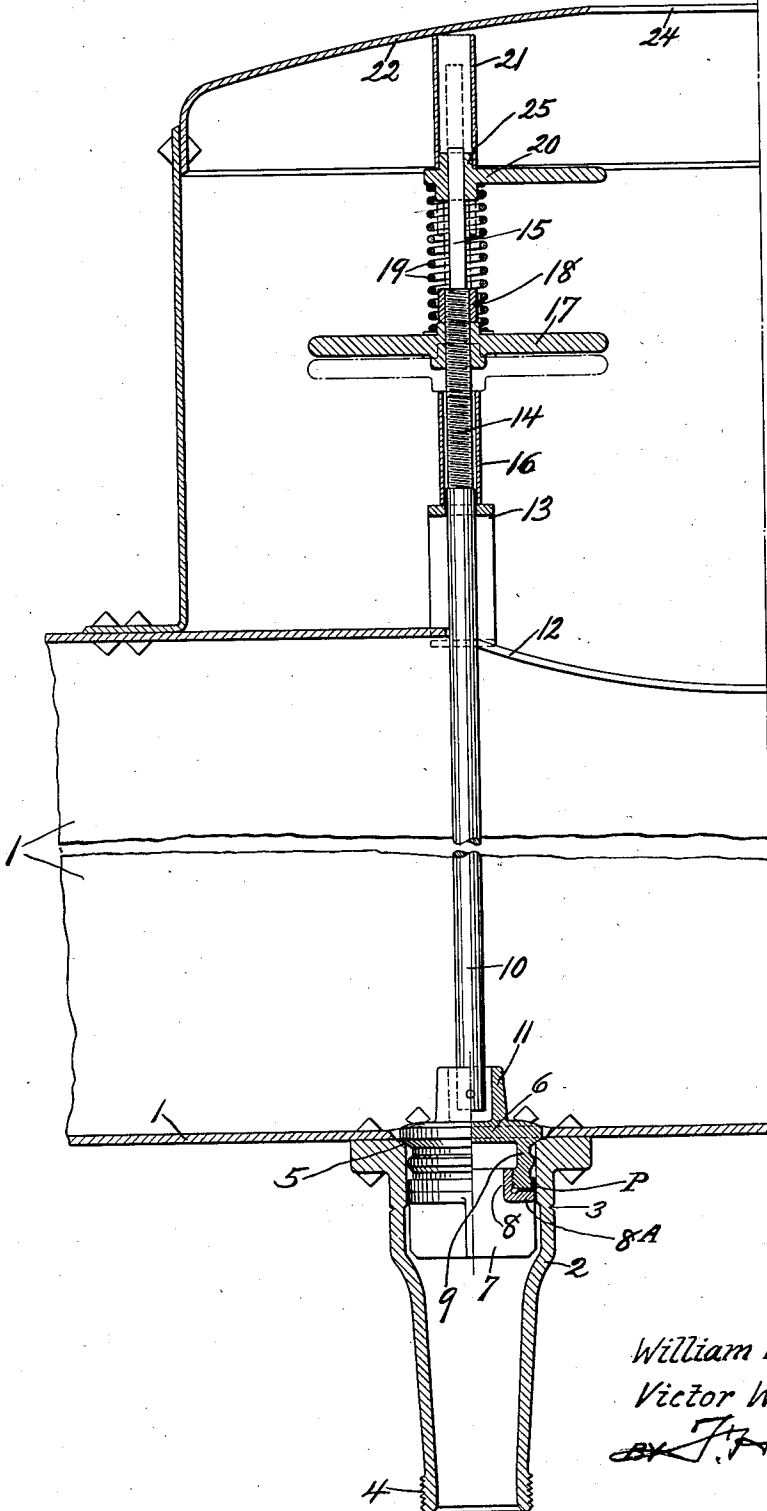


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V. WILLOUGHBY ET AL  
ADAPTER VALVE FOR TANK OUTLETS

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INVENTORS  
William L. Lapworth  
Victor Willoughby  
BY *J. H. Gibbs*  
ATTORNEY

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## ADAPTER VALVE FOR TANK OUTLETS

Victor Willoughby, Ridgewood, N. J., and William L. Lapworth, Wantagh, N. Y., assignors to American Car and Foundry Company, New York, N. Y., a corporation of New Jersey

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This invention relates to discharge valves for tank car tanks and more particularly to an improved valve wherein it may be easily opened and closed and the valve subjected to a wiping action if desired so as to insure proper seating of the valve and accordingly insure reduction or elimination of leakage.

One object of this invention is to provide improved means for opening and closing the valve without necessarily subjecting the same to a rotary action and yet permit such rotary action for valve seat wiping purposes in case it is desired. A further object is to provide an improved arrangement of parts for yieldingly holding the valve in closing position. A further and more specific object is to have the improved arrangement disposed within the tank dome and partially supported thereby and to have the various parts of simple and durable construction and yet adapted to be freely and easily operated.

This invention also contemplates the provision of a new and improved valve mechanism for car tanks or other containers including a spring pressed valve and a valve rod with means for actuating the valve to and from closed or seated position, said means being operative to vary or regulate the action of the spring.

As another object, the present invention provides a simple and rugged valve mechanism in which the valve is resiliently and constantly urged in the direction of closing movement, the said mechanism also including a valve operating element which is shiftable to regulate the spring action and which in one position is adapted to support the valve in open position.

Other objects and advantages will be more apparent to those skilled in the art from the accompanying drawing which is a vertical section through a fragmentary portion of a tank with the discharge valve partially shown in elevation.

In the drawing there is shown one specific embodiment which the invention may take and wherein a tank 1 is provided preferably at its lowermost portion with a discharge nozzle 2 having the usual breaking groove 3. This nozzle is riveted or otherwise suitably secured to the tank and has a threaded end 4 for receiving a closure cap and a tapered seat 5. A valve 6 has a tapered surface for seating upon seat 5 and also suitable guiding flanges 7 which project downwardly from an annular ring 8 which has a threaded connection with a cylinder 9 of the valve 6.

To operate the valve and also to partially rotate the same for wiping purposes a valve operating rod 10 is pivotally connected in an enlarged opening of a socket member 11 projecting upwardly from the valve. The actuating rod extends upwardly through the opening 12 in the top of the tank and thence through a suitable bracket 13 secured thereto. The upper end of the actuating rod is provided with a threaded portion 14 and a shank 15 of square cross-section. The bracket 13 supports an abutment 16 comprising in the instance shown, a sleeve through which the valve rod 10 extends and against the upper edge of which a hand-wheel 17 is adapted to engage, the upper edge of the sleeve forming a bearing surface upon which said hand-wheel rotates. Obviously the bracket and abutment may be a unitary structure if desired. The hand-wheel 17 is supported by the valve rod and preferably is threadedly mounted thereon to be movable relative to the valve rod between the abutment 16 and a collar 18 secured to the valve rod. A spring 19 is interposed between the hand wheel 17 and a valve wiping handle 20 which engages the lower end of a stationary sleeve 21. This sleeve engages the top 22 of the dome so as to hold all of the parts in their operating relation. Access to the parts is had through the usual dome opening 24 whereby it is seen that an operator may reach the handle 20 or hand wheel 17 merely by inserting his arm through the dome opening 24.

In operation the valve is in closed position when the hand wheel is in its full line position as shown. If it is desired to open the valve the hand wheel is rotated counter-clockwise looking down upon the same until by being screwed downwardly along the threads 14 it will engage the upper edge of sleeve 16, whereupon further rotation of the hand wheel will cause upward movement of the actuating rod and valve. This movement being continued until the ring 18 engages the lower side of handle 20, at which time the guide flanges 7 will be elevated in the nozzle 2, but a sufficient portion of the flanges or ribs will remain within the nozzle passage so as to prevent lateral displacement of the valve. To reclose the valve the hand wheel is turned in the opposite direction that is, to the position shown in full lines in the drawing, thereby compressing spring 19 which bears upon the hand-wheel 17 at its lower end and against the handle 20 at its upper end and due to the compressive force generated in the spring 19, the valve will

be actuated until finally the valve engages its seat, whereupon the hand wheel can be further rotated so as to be entirely clear of the sleeve 16, or if it is desired to wipe the valve seat, rotation of the hand wheel may be stopped just as the valve engages its seat, whereupon the handle 20 may be oscillated so as to oscillate shaft 10 and valve 6. However, there is no reason why this wiping action may not be effected even with the hand wheel in its full line position as shown, because the spring 19 exerts only a yielding seating force on the valve and accordingly the wiper handle 20 may be operated. This may be a preferred operation although it will also be readily seen that a varying degree of seating pressure may be applied to the valve merely by varying the position of the hand wheel between the sleeves 16 and 18. The construction as shown can utilize the wiping mechanism to insure positive operation of the hand wheel in case it should become stuck after long non-use of the equipment. For instance, if the engagement between the hand wheel and shaft 10 should become stuck so that upon rotation of the hand wheel it would rotate the shaft instead of rotating relatively thereto, the operator may grasp the handle 20 and thus hold the shaft against rotation with the hand wheel. A further advantage of the arrangement here shown is that it may be easily applied to any existing equipment merely by providing a suitable opening in the side of the tank opening 12 and securing the bracket 13 to the top of the tank. Thereafter the valve rod, hand wheel, sleeve 21 and other parts may be inserted within the dome and the spring 19 compressed to permit sleeve 21 to be inserted over the hub 25 of wiper handle 20, whereafter the spring will move the sleeve 21 upwardly to be supported against the top 22. The parts will thereby be held in assembled and operative relation without any further fastening elements.

Intermediate the lower face of the cylindrical portion 9 of the valve and the horizontal portion 8A of the annular inner valve ring 8, and held in locked position thereby, is a yieldable or flexible packing P of angular shape in cross section.

The packing P bears against the inner face of the nozzle 2 and serves as an effectual seal to prevent leakage of the contents of the tank in the event of foreign substance lodging on the beveled valve seat 5.

As the two valve parts 8 and 9 are connected by screw threaded engagement it is obvious that the packing P is readily removable for replacement when desired.

What is claimed is:

1. A car tank discharged valve mechanism comprising a valve seat and valve, a reciprocable valve operating rod, means for rotating said rod including a handle having a slidable but non-rotatable connection with said rod, and means including a spring for holding said handle in position and yieldingly holding said valve to its seat.

2. A car tank discharge valve mechanism comprising a valve seat and a reciprocable valve, a threaded valve operating rod, a hand wheel engaging said threads, a stop adapted to be engaged by said wheel during opening of the valve, a valve wiping handle slidably but non-rotatably mounted on said rod for oscillating said valve on its seat, a spring interposed between said handle and wheel, and a stop for

preventing upward displacement of said handle by said spring.

3. In a discharge valve mechanism, a valve and a valve rod, a compression spring acting in the direction of closing movement of the valve for urging the valve to seated position, means slidably engaged with the valve rod for oscillating the latter to grind the valve on its seat, and means carried by and shiftable on the valve rod to increase the spring action when the valve is seated.

4. In a discharge valve mechanism, a valve and a valve rod, a fixed abutment, a hand-wheel threadedly engaged with and rotatable a limited distance on the valve rod into engagement with the abutment, continued rotation of said hand-wheel on the abutment actuating the valve rod relative to the hand-wheel to un-seat the valve, spring means acting against the hand-wheel and normally urging the valve towards seated position, and a stop on the valve rod to limit movement of the hand-wheel in the opposite direction.

5. In a discharge valve mechanism comprising a valve and a valve rod, a handle member slidably and non-rotatably connected with the valve rod, said member being operative to oscillate the valve on its seat, a fixed abutment, a hand-wheel rotatably mounted on the valve rod, spring means interposed between said handle member and hand-wheel to normally urge the valve towards seated position, said hand-wheel being operative in one direction into engagement with the abutment to be rotatable thereon to actuate the valve rod whereby the valve is un-seated and said hand-wheel being operative in the opposite direction to increase the spring action whereby the valve is seated by said spring, and a stop on the valve rod for limiting the movement of the hand-wheel.

6. In a valve mechanism comprising a valve, a valve rod, a compression spring normally urging said valve to its seat, and a valve rod guide, the combination of an abutment supported by the valve rod guide, and a valve operating device carried on said rod in engagement with said spring and movable relative to the rod to regulate the action of the spring against said valve when the latter is seated, said device being adapted to engage the abutment to hold the valve in open position.

7. In a valve mechanism including a valve, a valve rod, a hand-wheel threadedly supported on the rod, a fixed abutment, a compression spring engaging against the upper surface of said hand-wheel and normally urging said valve to its seat, said hand-wheel being rotatably shiftable relative to said rod in one direction to reduce the pressure of the spring and into bearing engagement with said abutment to positively control the movement of the valve from its seat and being shiftable in the opposite direction to compress said spring to increase the pressure thereof against said valve when the latter is seated.

8. A discharge valve mechanism comprising a valve, a valve rod, a spring retaining the valve in seated position, means for oscillating the valve, said means having a free sliding connection with said valve rod, but being incapable of rotary movement relative thereto, a fixed abutment, and means engaging said spring and rotatably shiftable on the valve rod towards the abutment to reduce the spring action against said valve when the latter is seated, continued rotation of said rotatable means into and during

bearing engagement against the abutment actuating the valve rod relative to the rotatable means to positively control the movement of the valve from its seat.

5 9. In a discharge valve mechanism comprising a valve and a valve rod, the combination of means slidably and non-rotatably engaged with said rod for oscillating the valve on its seat, a fixed abutment, a hand-wheel threaded on the  
10 rod and rotatable into engagement with said abutment for moving the valve from and to its seat independently of the oscillation of said valve, and a stop on said rod to limit movement of said hand-wheel relative to said rod away  
15 from said abutment.

10. In a discharge valve mechanism, in combination with a valve, a valve seat and a valve rod, a handle on the valve rod so arranged as to actuate the rod to oscillate the valve, said  
20 rod being longitudinally movable relative to said handle, and means for applying variable pressure to said valve on its seat comprising a fixed abutment adjacent the valve rod, a hand-wheel rotatably mounted on the valve rod, a compression  
25 spring interposed between the hand-wheel and handle, said hand-wheel being operable in one direction to increase the spring action whereby to increase the pressure on the valve rod and valve and said hand-wheel being operable in the  
30 opposite direction into supporting engagement with said abutment to free the valve rod of spring pressure, said hand-wheel being rotatable on said abutment to actuate the valve to open position while free of spring pressure.

35 11. A discharge valve mechanism for car tanks comprising a valve having a valve rod, a fixed abutment within the tank, a collar secured to the valve rod, and means for operating the valve to

open and closed positions comprising a hand wheel secured to the valve rod in such a manner as to be capable of movement relative thereto between and into contact with the abutment and collar respectively to limit the movement of the  
5 hand wheel on the valve rod, said hand wheel being rotatable during its contact with the abutment to operate the valve, and spring means bearing against the hand wheel and normally urging the valve in the direction of closing movement.  
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12. A valve mechanism comprising a valve, a valve rod, a hand wheel shiftable on said valve rod, a compression spring above the hand wheel and bearing against the upper surface thereof to  
15 constantly urge the valve in the direction of closing movement, and a fixed abutment below the hand wheel, said hand wheel being shiftable on the valve rod to increase the spring action when the valve is seated and being shiftable  
20 into contact with the abutment whereby continued operation thereof will shift the valve rod and open said valve.

13. A discharge valve mechanism comprising a valve, a valve rod, a spring retaining the valve in  
25 seated position, oscillating means for the valve slidably and non-rotatably connected with the valve rod, a fixed abutment, and means engaging said spring and rotatably shiftable on the valve rod into contact with the abutment to reduce the  
30 spring action against the valve when the latter is seated, continued rotation of said rotatable means while in contact with the abutment actuating the valve rod relative to the rotatable means to positively control the movement of the  
35 valve from and to its seat.

VICTOR WILLOUGHBY.  
WILLIAM L. LAPWORTH.