May 21, 1940. V. WILLOUGHBY 2,201,805

OUTLET VALVE

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Fig. 4.

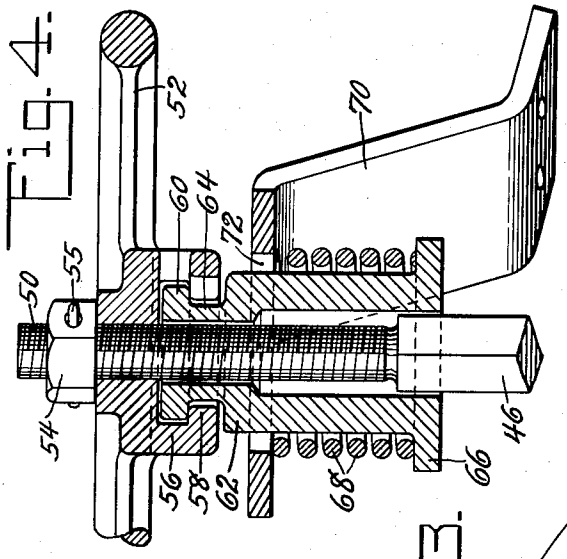

Fig. 5.

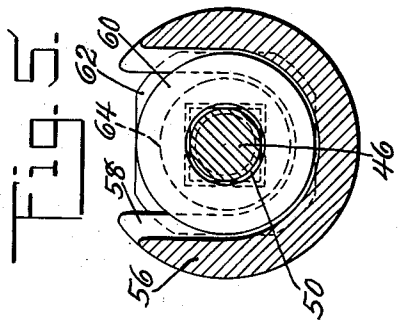

Fig. 3.

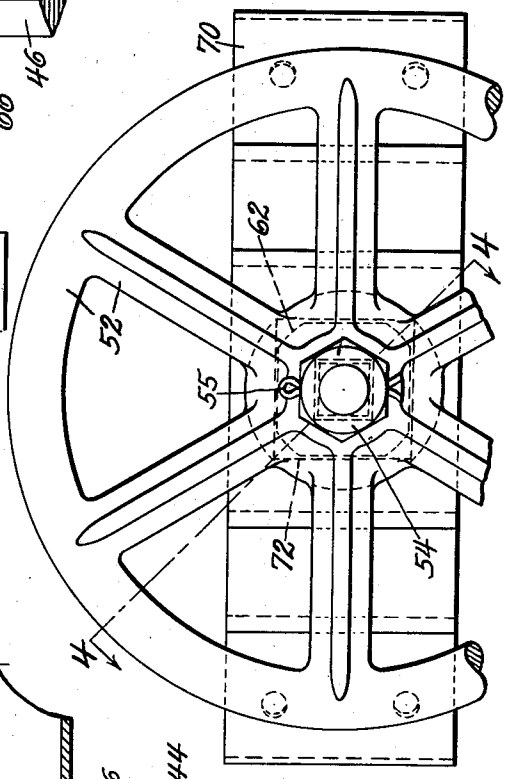

Fig. 6.

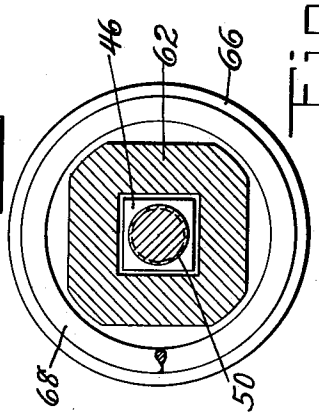

Fig. 1.

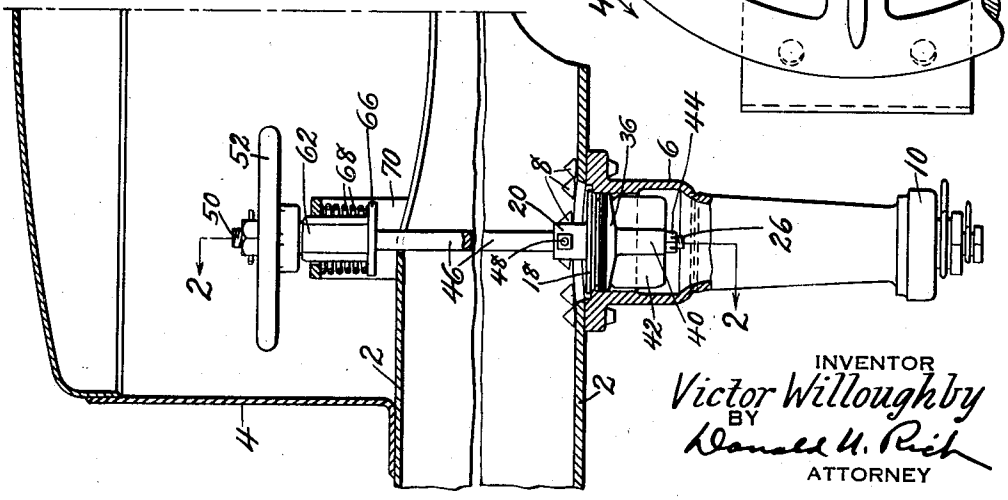

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Fig. 2.

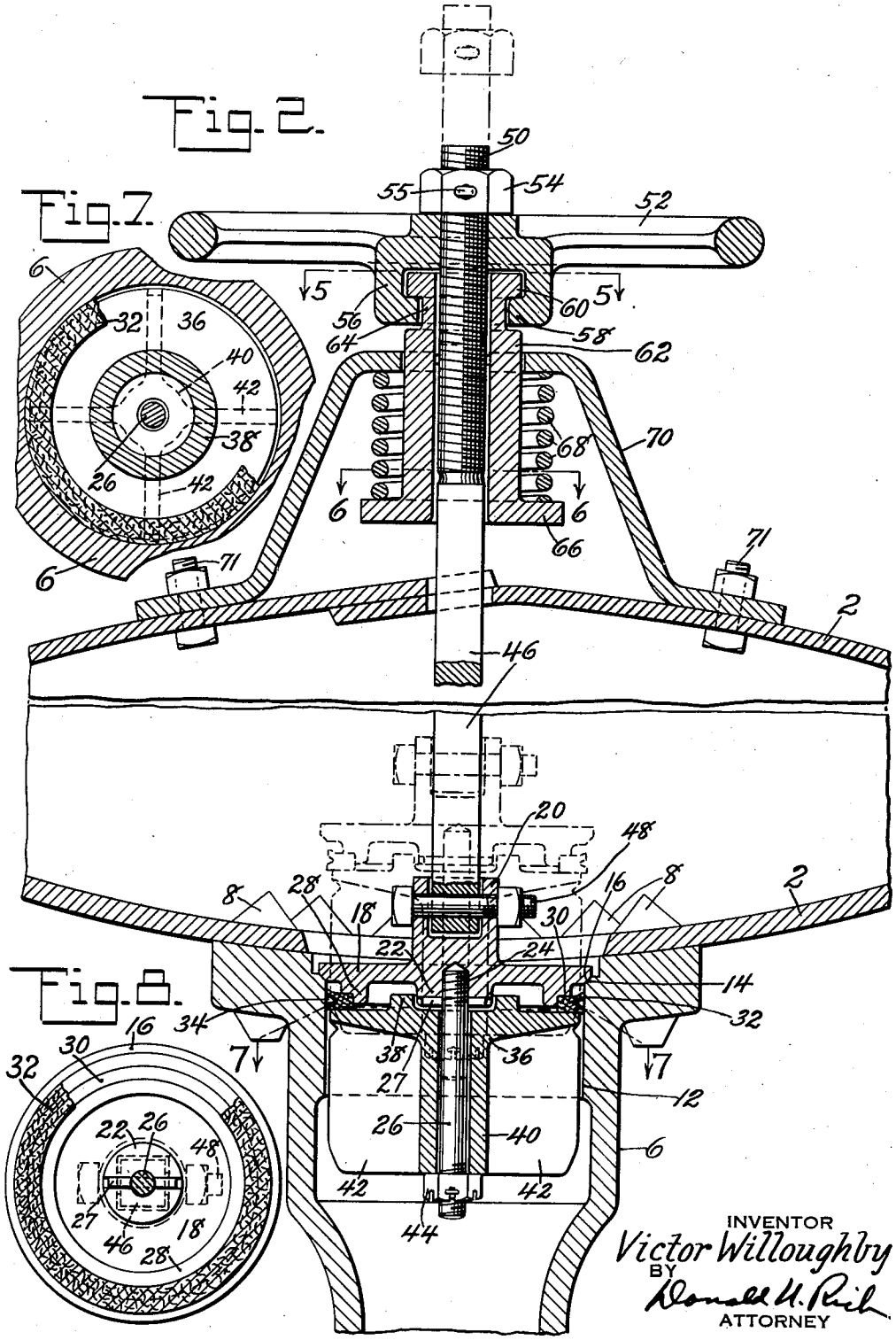

Fig. 7.

Fig. 8.

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2,201,805

OUTLET VALVE

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Application January 19, 1938, Serial No. 185,739

1 Claim. (Cl. 137—21)

This invention relates in general to valves and in particular to valves intended for use on tank cars or other bottom discharge containers.

In the past valves have been constructed in which no provision was made for expansion and contraction of the operating stem and it is an object, therefore, of the present invention to provide a valve operating means which is free of direct connection to the tank or container shell.

A further object of the invention is the provision of a valve and operating means which will permit the so-called breathing of the tank or container without affecting the valve setting.

A still further object of the invention is the provision of a valve and its operating means in which the valve is resiliently held on its seat only by the desired compression of a spring and the weight of the operating stem.

A yet further object of the invention is the provision of a valve for tanks or containers in which the valve has a metallic and non-metallic seal to retain the material within the tank or container.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawings, in which

Figure 1 is a partial sectional view showing the improved valve and operating means;

Fig. 2 is a sectional view taken substantially on line 2—2 of Figure 1;

Fig. 3 is an elevational view of the operating means showing its relation to the supporting bracket;

Fig. 4 is a sectional view taken substantially on line 4—4 of Fig. 3;

Fig. 5 is an enlarged detail sectional view taken substantially on line 5—5 of Fig. 2;

Fig. 6 is an enlarged sectional view taken substantially on line 6—6 of Fig. 2;

Fig. 7 is a sectional view taken substantially on line 7—7 of Fig. 2 and showing the bottom half of the valve, and

Fig. 8 is a sectional view taken substantially on line 7—7 of Fig. 2 but looking in the opposite direction and showing the upper half of the valve.

Referring now to the drawings in detail, it will be seen that the valve has been illustrated as applied to a conventional tank car having shell 2, dome 4, outlet casting 6 riveted to the shell as at 8, inclosed at its lower end by safety cap 10. The outlet casting is of generally conventional form having an upper cylindrical bore 12 provided at its upper edge with an inclined seat 14 adapted to contact the correspondingly beveled seat 16 formed on the upper valve member 18. This upper valve member is formed as a casting having an upwardly extending operator receiving portion 20 and a centrally located downwardly projecting lug 22 adapted to be drilled and tapped as at 24 for the reception of a clamping bolt 26 having a pin 27 engaged in a slot of the lug to prevent loosening of the bolt. The lower surface of the upper valve member is also formed with a downwardly projecting annular flange 28 shouldered as at 30 in order to receive a non-metallic annular sealing gasket 32 which preferably has its outer surface notched as at 34 (Fig. 2) in order to provide two separate non-metallic sealing surfaces, thus giving a more resilient sealing gasket. The lower valve member 36 is formed with an upper substantially plain surface adapted to abut the annular sealing gasket for clamping the same and with an upwardly projecting annular central portion 38 adapted to surround the projecting lug of the upper portion and position the lower portion relative thereto. The lower valve part is formed on its lower portion with a downwardly extending tubular-like projection 40 from which three or more positioning wings 42 extend for guiding the valve assembly within the tubular bore of the outlet casting. The tubular projection just referred to is adapted to fit over the clamping bolt 26 and be forced toward the upper valve member by means of nut 44 thus securely clamping the annular sealing gasket between the two halves of the valve.

In order to operate the valve a squared operating rod 46 is adapted to have its lower end extend into the projection 20 and be secured therein by a bolt or other means 48. The upper end of the operating rod is made round and threaded as at 50 in order to receive and be controlled by corresponding threads formed in the hub portion of an operating wheel or handle 52 held in position upon the rod by means of securing nut 54 and cotter 55. The lower portion of the wheel hub is formed with a U-shaped projection (Fig. 5), the sides and back of which are formed by a web 56 terminating in an inwardly directed flange 58, thus forming an open ended slot within which may be received the flange 60 of a spring casting member 62. The flange 60 is joined to the main body of the spring casting by means of a circular collar 64, thus forming a T-head on the spring casting which may be rotatably received within the U-shaped slot of the operating wheel. The main portion of the spring casting is substantially square (Figs. 3 and 6)

and is provided at its lower end with an outstanding flange 66 adapted to receive one end of a compression spring 68, the other end of which bears upon bracket 70 removably secured to the tank shell by bolts 71 and having a square central opening 72 adapted to receive the squared portion of the spring casting (Fig. 3).

The assembly and operation of the improved valve device is as follows: The annular sealing gasket will be placed upon the shoulder of the upper valve element and securely clamped in position by the lower valve element through the clamping bolt 26 and nut 44 and the entire assembly placed in its proper position upon the outlet casting. With the valve assembly in position the operating shaft 46 may be secured thereto and the bracket 70 with spring and spring casting in proper position lowered over the upper end of the rod until the flanges 60 are slightly below the upper threaded end of the rod. With the spring casting in this position the open ended slot of the operating wheel may be engaged with the flanges 60 and the entire assembly lowered on the rod under control of the hand wheel after which the retaining nut 54 is locked in position and the bracket 70 secured to the tank shell. With the valve and operating mechanism assembled as described and shown in Fig. 2 any rotation of the hand wheel in a clockwise direction as viewed from above will cause a lifting of the spring casting and a compression of the spring which will react through the casting, hand wheel and operating rod to cause the valve to be more firmly pressed upon its seat. Counterclockwise rotation of the hand wheel will cause a lowering of the spring casting until such time as the flanges 58 of the hand wheel engage the bracket, after which continued rotation will cause a direct lifting of the rod and its connected valve, first separating the metallic seats 14 and 16, then later removing the resilient sealing gasket from the bore of the outlet casting and permitting discharge of material from the tank or container. In returning the valve to its seated position the weight of the valve and its operating rod 46 will in most cases be sufficient to place the valve in closed position, but if this weight is insufficient, then continued rotation of the hand wheel will cause compression of the spring and the valve will be forced to its final seated position in which both a metallic and a non-metallic seal is provided to prevent leakage of material.

While the device has been described more or less in detail, it is obvious that various modifications and rearrangements of parts will be apparent to persons skilled in the art and all such modifications and rearrangements are contemplated as fall within the scope of the following claim.

What is claimed is:

An outlet valve for tank cars comprising in combination, an outlet casting having a valve seat and a concentric bore, a valve formed of upper and lower parts, the upper valve part including a seating face for engaging with said valve seat, a centrally positioned downwardly projecting concentric lug, and an annular depending flange spaced intermediate of the seating face and lug, said lug being formed with a threaded bore and a transverse slot and said depending flange being provided with an outwardly facing shoulder to provide an annular groove, a packing element in said groove of greater width than said shoulder and projecting below same, a lower valve part including a plate like body formed with a flat upper marginal edge portion for engaging the projecting portion of said gasket for compressing the same into sealing contact with the concentric bore of the outlet casting, an upwardly projecting annular central portion for seating about said lug, a centrally positioned depending tubular portion having a plurality of radiating guide wings, and a clamping bolt extending through the depending tubular portion of said lower valve part and threaded into the bore of said lug, said bolt having a lock pin extending transversely therethrough seated in the slot in said lug and a nut threaded onto the outer end thereof for clamping the valve parts together.

VICTOR WILLOUGHBY.