

Sept. 11, 1945.

H. C. KRONE ET AL

2,384,628

TANK TRUCK BOTTOM LOADING AND DISCHARGE MEANS

Filed June 6, 1944

3 Sheets-Sheet 1

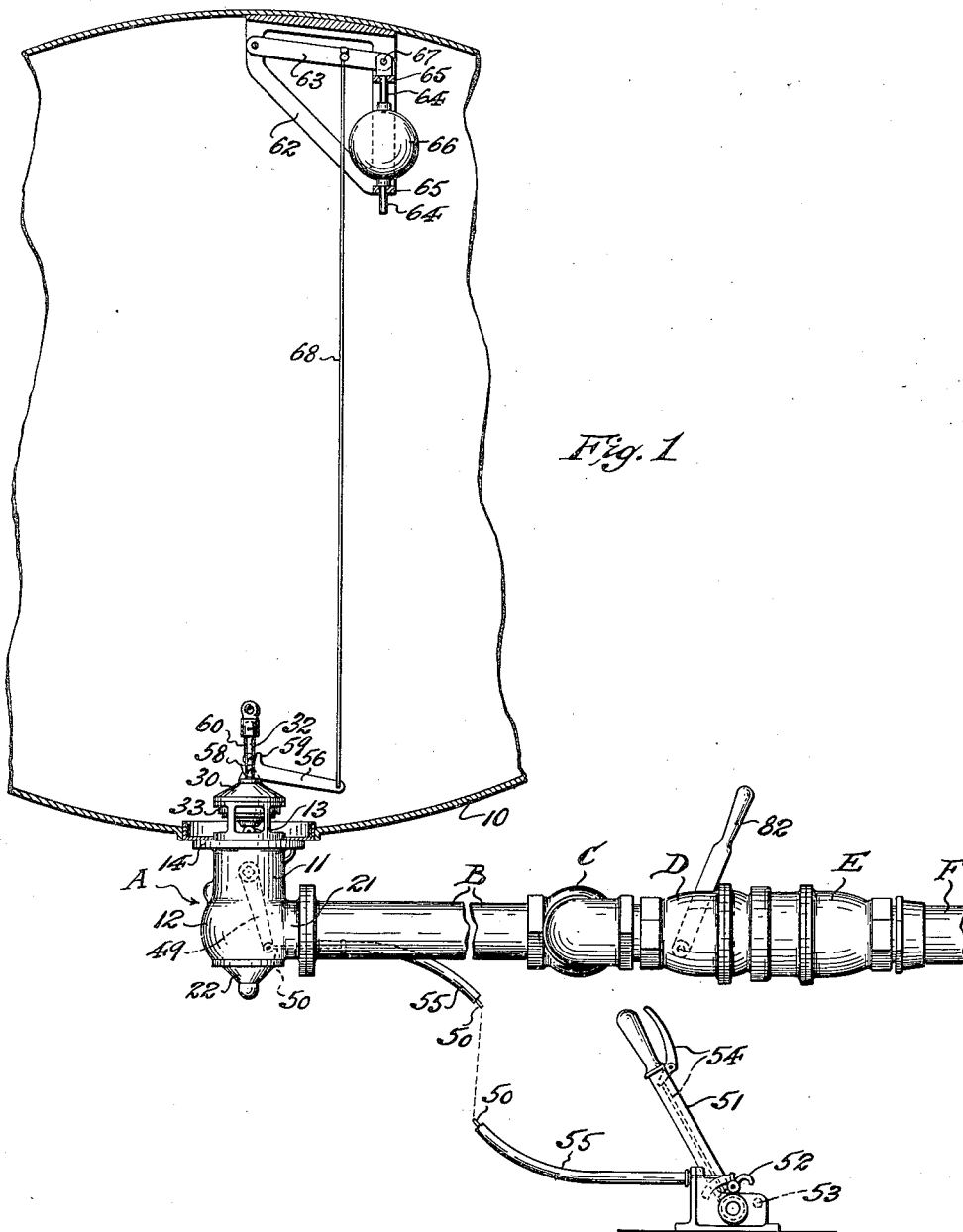


Fig. 1

INVENTORS:
Howard C. Krone & William Meyer,
BY
George D. Richards,
ATTORNEY.

Sept. 11, 1945.

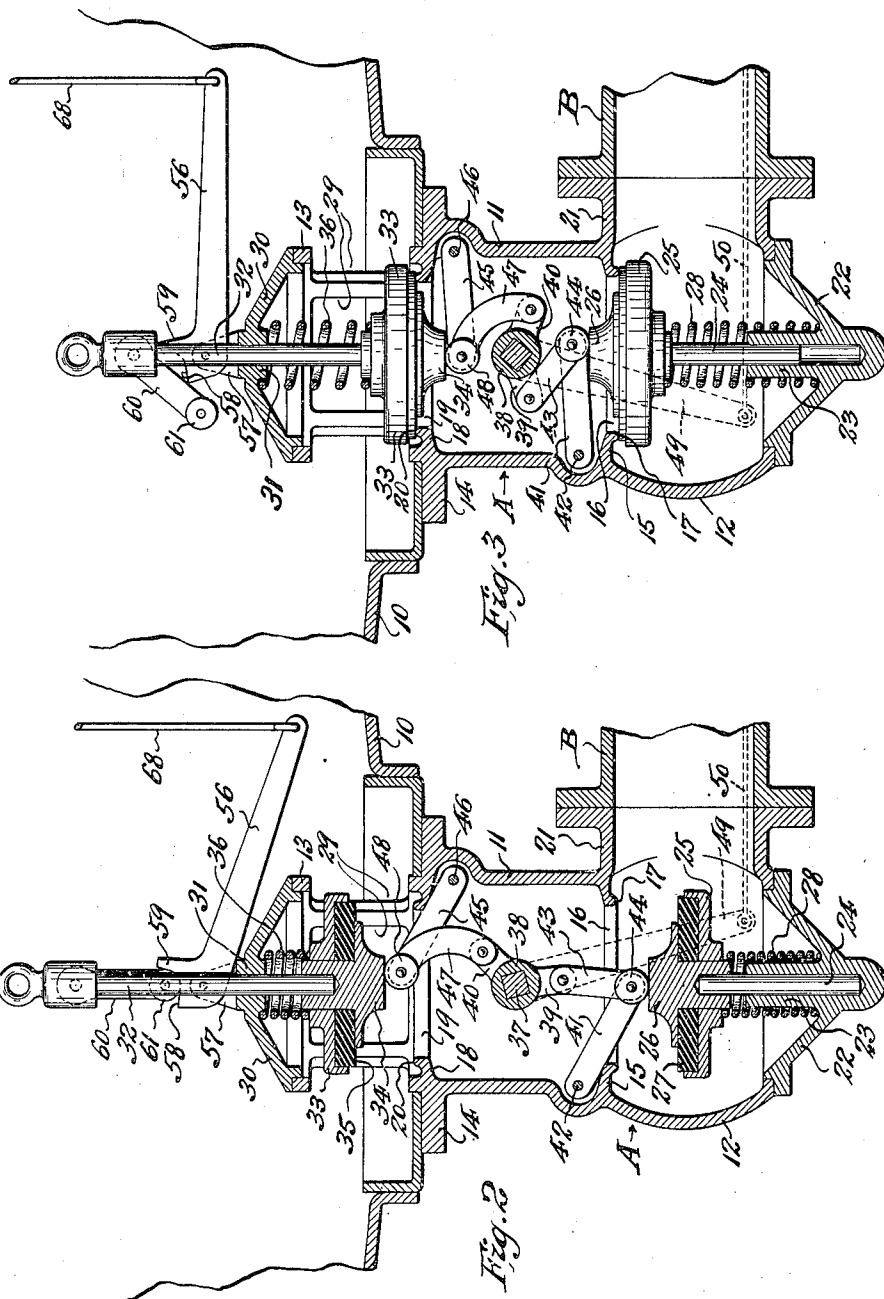
H. C. KRONE ET AL

2,384,628

TANK TRUCK BOTTOM LOADING AND DISCHARGE MEANS

Filed June 6, 1944

3 Sheets-Sheet 2



INVENTORS:
Howard C. Krone & William Meyer;
BY
George S. Richards
ATTORNEY.

Sept. 11, 1945.

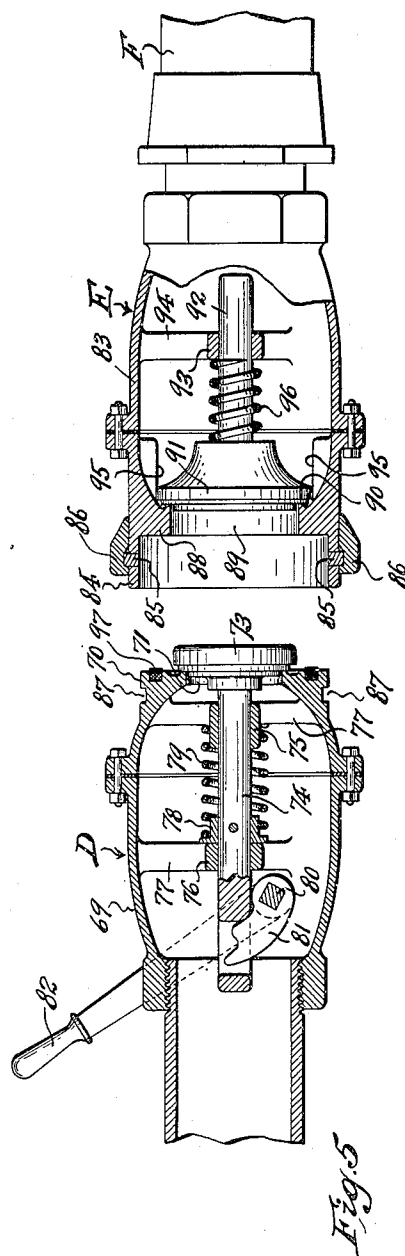
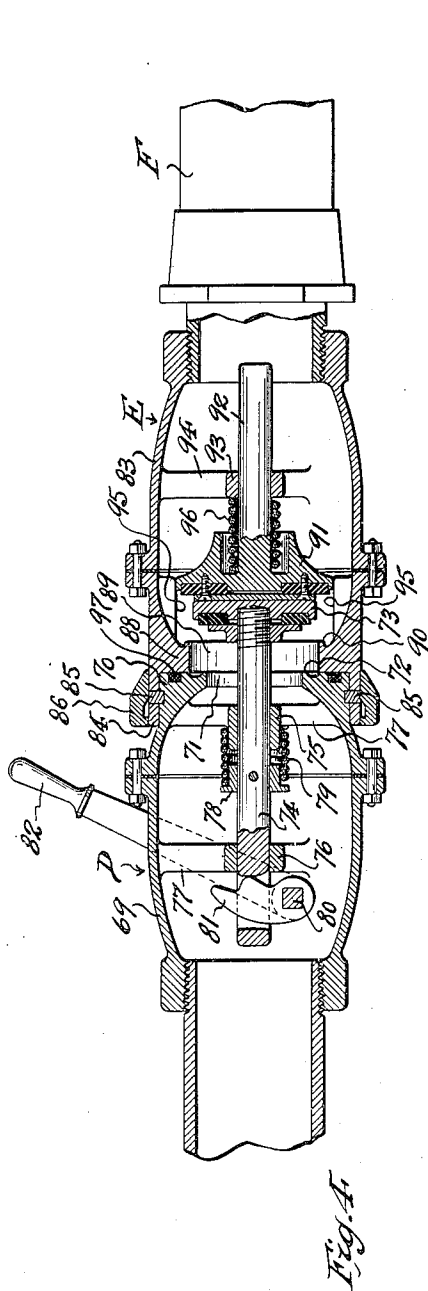
H. C. KRONE ET AL

2,384,628

TANK TRUCK BOTTOM LOADING AND DISCHARGE MEANS

Filed June 6, 1944

3 Sheets-Sheet 3



INVENTORS:
Howard C. Krone & William Meyer,
BY
George S. Richards,
Attorney—

UNITED STATES PATENT OFFICE

2,384,628

TANK TRUCK BOTTOM LOADING AND
DISCHARGE MEANS

Howard C. Krone, Ridgewood, and William Meyer,
East Orange, N. J., assignors to Wheaton Brass
Works, Newark, N. J., a corporation of New
Jersey

Application June 6, 1944, Serial No. 538,950

12 Claims. (Cl. 137—68)

This invention relates to improvements in means for loading and discharging tank trucks such as used for transporting various kinds of liquids, and especially liquids such as oil and gasoline or other combustible liquids.

The invention has for an object to provide novel means for loading and discharging tank trucks, whereby the same valve and conduit system employed for discharging the liquid content of a tank truck may also be used for filling or loading the same; whereby the tank loading or filling operations may be more rapidly carried out; whereby losses incidental to filling and discharging operations are substantially prevented; and whereby accident and fire hazards during both loading and discharging operations are substantially eliminated.

The invention has for another object to provide at the bottom of a tank truck a novel construction of dual emergency valve means having in combination therewith means for manually opening the same; said dual emergency valve means including self-contained means for holding the same open during filling operations, and cooperative float controlled means for automatically closing the same when the liquid loaded into the tank reaches a predetermined level.

The invention has for a further object to provide a conduit system extending from said dual emergency valve means including, at its outer terminal end, a manually actuatable intake and discharge valve means and a cooperating loading valve means respectively provided with cooperative quick acting coupling means for joining the same in operative relation, whereby, when so joined, opening of the intake valve means automatically opens the loading valve means, while closing of said intake valve means automatically closes the loading valve means; thus assuring closed condition of both said valve means before they are disconnected one from the other, and consequently eliminating drainage or spill of liquid therefrom, so that losses are substantially prevented, and, when the liquid is combustible, fire hazards are substantially avoided.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Fig. 1 is an elevational view of the novel loading and discharge means as applied to the tank of a tank truck.

Fig. 2 is an enlarged sectional view of the dual

emergency valve means which is mounted in the bottom of the tank of the tank truck, showing said valve means in open condition; and Fig. 3 is a similar view, showing said valve means in closed condition.

Fig. 4 is an enlarged sectional view of the intake valve means and loading valve means operatively coupled together, and with the valve members thereof shown in open condition; and Fig. 5 is a similar view, showing the intake valve means and loading valve means in disconnected relation with their valve members closed.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

In the drawings, the reference character 10 indicates the tank of a tank truck, the truck chassis by which it is carried being omitted. Mounted in the bottom of said tank 10 is a dual emergency valve means A, from the exterior end of which extends a conduit B. If the tank is divided interiorly into several compartments, as is frequently the case, each compartment is served by a similar dual emergency valve means A and connected conduit B, in which case, the several conduits B are joined to a common manifold C, in the manner well known to the art. Affixed to the intake end of the manifold C is an intake and discharge valve means D to which is detachably coupled, by suitable coupling means, a loading valve E which may be optionally connected to and carried by an end of a filling or discharge hose F, as the case may be.

The dual emergency valve means A comprises a casing suitably shaped to provide an external body portion 11 having a lower valve chamber 12 extending from its bottom end, and an upper valve chamber 13 extending from its top end. Said body portion 11 is provided with an annular flange 14 adjacent its top end by which the same may be secured to the bottom of the tank 10 so as to depend therefrom, and so as to dispose the upper valve chamber 13 within and in communication with the lower interior of said tank.

Extending transversely across said body portion 11, intermediate its lower end portion and the lower valve chamber 12, is a transverse partition 15. Said partition is provided with a lower valve port 16, around the under side margin of which is a downwardly offset valve seat 17. In like manner, extending transversely across said body portion 11, intermediate its top end portion and the upper valve chamber 13, is a second transverse partition 18. Said partition 18 is provided with an upper valve port 19, around the upper side

margin of which is an upwardly offset valve seat 20.

Leading into the side of said lower valve chamber 12 is a liquid passage extension 21 to which a conduit B may be suitably connected. The bottom end of said lower valve chamber 12 is closed by a detachable bonnet 22 having an axial guide member 23, in which is slidably supported the stem 24 of a lower valve member 25 which is opposed to the lower valve port 16 for cooperation with its valve seat 17. Said lower valve member 25 is provided on its upper or port facing side with a thrust receiving member 26. Secured between the valve member 25 and said thrust receiving member 26 is a valve washer 27 of suitable material for cooperation with said valve seat 17. Said lower valve member 25 is yieldably urged toward the valve seat 17 by a compression spring 28.

The upper valve chamber 13 is provided in its sides with openings 29 to afford communication between its interior and the interior of the tank 10 into which it projects. The top end of said upper valve chamber 13 is closed by a detachable bonnet 30 having an axial guide member 31 through which slidably extends the upwardly projecting stem 32 of an upper valve member 33 which is opposed to the upper valve port 19 for cooperation with its valve seat 20. Said upper valve member 33 is provided on its lower or port facing side with a thrust receiving member 34. Secured between said valve member 33 and said thrust receiving member 34 is a valve washer 35 of suitable material for cooperation with said valve seat 20. Said upper valve member is yieldably urged toward the valve seat 20 by a compression spring 36.

Journalled across the axis of the valve body portion 11, intermediate the lower and upper valve members 25 and 33 is a transverse spindle 37 upon which is fixed, to turn therewith, the hub 38 of a bell-crank member having lower and upper radial arms 39 and 40 disposed in suitable angular relation. An exterior end of said spindle 37 projects exteriorly from a side of said valve body portion 11 through a stuffing-box (not shown), but in a manner well known to the valve art. The lower bell-crank arm 39 is connected with a lower toggle-lever means which cooperates with the lower valve member 25 for moving the latter to open position; and, in like manner, the upper bell-crank arm 40 is connected with a similar upper toggle-lever means which cooperates with the upper valve member 33 for moving it to open position. Said lower toggle lever means comprises a lever bar 41, one end of which is pivotally connected by a pivot pin 42 to the valve body portion 11 at one side thereof (e. g. the left hand side as shown in Figs. 2 and 3), somewhat above the lower valve port 16. Interconnecting the free end of said lever bar 41 with the free end of the lower bell-crank arm 39 is a link 43. Mounted in connection with the pivotally joined ends of said lever bar 41 and link 43 is an anti-friction roller 44 which engages the thrust receiving member 26 of the lower valve member 25. Similarly, said upper toggle lever means comprises a lever bar 45, one end of which is pivotally connected by a pivot pin 46 to the valve body portion 11 at the opposite side thereof (e. g. the right hand side as shown in Figs. 2 and 3), somewhat below the upper valve port 19. Interconnecting the free end of said lever bar 45 with the free end of the upper bell-crank arm 40 is a link 47. Mounted in connection with the pivotally joined ends of said lever bar 45 and link 47 is an anti-

friction roller 48 which engages the thrust receiving member 34 of the upper valve member 33.

Affixed to the external end of the spindle 37 is a toggle lever system actuating lever 49. Connected with said actuating lever 49 is a pull-cable 50 which extends to an emergency valve operator means, which e. g. is preferably of the general type and kind shown in our prior United States Letters Patent No. 2,220,420, dated Nov. 19, 1940, and which is usually located at the rear of a truck tank. In a general way, such emergency valve operator means comprises a pivoted hand lever 51 to which the outer end of the pull-cable 50 is suitably attached, said hand-lever having a latch means 52 engageable with a holding means 53 for detaining, at desired times, the hand lever in emergency valve opening position, and including trip means 54 for releasing said latch means from engaged relation to said holding means. Preferably, said pull-cable runs through a guide conduit 55 arranged to extend from said operator means to a point adjacent to said actuating lever 49.

Trippable detent means is provided for releasably holding the valve members 25 and 33 in an open position, after the same have been moved thereto by operation of the toggle lever system. This detent means comprises a trip lever 56 pivotally mounted on an external fulcrum ear 57 which projects externally from the bonnet 30 of the upper valve chamber 13 adjacent to the upwardly and externally extending portion of the upper valve member stem 32. Said trip lever 56 is provided with a suitably shaped seat or stop shoulder 58, having, at its inward side, an upstanding push finger 59. Pivotaly suspended from the upper free end portion of the valve stem 32 is a swingable detent member 60 which is provided, at its lower free end, with an anti-friction roller 61 adapted to engage the seat or stop shoulder 58 of the trip lever 56.

Said trippable detent means is subject to operation by a float controlled means which is mounted within the upper interior of the tank 10 (see Fig. 1). In an illustrative form thereof, as shown, said float controlled means comprises a supporting bracket fixture 62, which is suitably affixed to the tank wall. Pivotaly supported by said bracket fixture 62 is a lift lever 63. Slidably supported by its oppositely extending perpendicular slide rods 64, which are slidably mounted in and between vertically spaced perforate guide members 65 with which the bracket fixture is provided, is a float member 66. Said float member 66 is connected, by a pivotal connection 67, with the free end of the lift lever 63, whereby to produce upward swinging movement of the latter when said float member is buoyed up by the rising liquid delivered into the tank through the open valve members 25 and 33. Said trip lever 56 is interconnected with said lift lever 63 by a cable or rod 68.

The intake and discharge valve means D (see Figs. 4 and 5) at the outer terminal end of the conduit system B-C, comprises a suitably formed casing 69 having a spigot portion 70 at its free end. The transverse face wall of said spigot portion 70 is provided with an axially aligned valve port 71, around the exterior side margin of which is an outwardly offset valve seat 72. Cooperative with said valve port 71 and its seat 72 is an outwardly opening intake and discharge valve member 73, the stem 74 of which extends rearwardly into the interior of the casing 69, being slidably supported by spaced axial guide members

75 and 76 which are carried by spider arms 77 extending between the same and the side walls of said casing 69. Fixed on said valve stem 74 is a thrust collar 78, upon which bears a compression spring 79 operative to yieldably urge said valve member 73 toward the seat 72 and to closed relation to the valve port 71. Journaled across the casing 69 in suitable location is a spindle 80 upon which is fixed an actuating cam 81 cooperative with said stem 74 for moving the valve member 73 to outwardly projected valve port opening position. An exterior end of said spindle 80 projects exteriorly from a side of said valve casing 69 through a stuffing box (not shown), but in a manner well known to the valve art. Affixed to the external end of said spindle 80 is hand lever 82 for turning the same and the cam 81 carried thereby.

The loading valve E which is connected with the free end of a conduit or hose F, and which is adapted to be detachably coupled to the intake and discharge valve D, comprises a suitably formed casing 83 having a bell portion 84 at its free end which is telescopically engageable with and over the spigot portion 70 of said intake and discharge valve D. Means is provided for releasably coupling these bell and spigot portions against separation, the same preferably comprising a quick acting type such as disclosed in our co-pending application for United States Letters Patent Serial No. 513,518, filed Dec. 9, 1943, which is characterized by spring released latch-pieces 85 carried by the bell portion 84 subject to inward movement by an external slide collar 86 mounted on the latter, whereby to enter an annular latch socket 87 with which said spigot portion 70 is provided.

Said loading valve casing 83 is provided, behind the bell portion 84 thereof, with a transverse partition or wall 88. Said partition or wall 88 is provided with an axially aligned valve port 89, around the inner side periphery of which is an inwardly offset valve seat 90. Cooperative with said valve port 89 and its seat 90 is an inwardly opening valve member 91, the stem 92 of which extends into the interior of the casing 83, being slidably supported by a guide member 93 which is carried by spider arms 94 extending between the same and the side walls of said casing 83. Said valve member 91 may be further guided by guide ribs 95 with which the adjacent walls of said casing 83 are internally provided. A compression spring 96 yieldably urges the valve member 91 toward the seat 90 and to closed relation to the valve port 89. Mounted on the face wall of the intake and discharge valve spigot portion 70 is a suitable sealing gasket 97 adapted to engage the outer face of the loading valve partition or wall 88 when these valves are operatively coupled, whereby to assure a leak-proof joint therebetween.

In the operation of the system for loading or filling the tank 10, a hose or conduit F leading from a source of liquid supply, and which is provided at its free end with the loading valve means E, is coupled to the intake and discharge valve D, as shown in Figs. 1 and 4. To open the dual emergency valve A, the hand lever 51 is pulled back from the released position shown in Fig. 1, thereby pulling outwardly on the pull-cable 50 and thus swinging the emergency valve actuating lever 49 in counter-clockwise direction. Such movement of said lever 49 rotates the bell crank means 38—39—40 in like direction, whereby to transmit, through

the links 43 and 47, movement to the lever bars 41 and 45 adapted to swing the same and their anti-friction rollers 44 and 48 toward and in operative engagement with the respective thrust receiving members 26 and 34 of the respective lower and upper valve members 25 and 33, thereby moving the latter to their open positions as shown in Fig. 2.

As the lower valve member 25 completes its movement to full open position, it is preferable that the pivotal connection of the lower bell-crank arm 39 with the link 43 cross somewhat beyond a dead center line extending between the axis of the spindle 37 and the pivotal connection between the lever bar 41 and opposite end of the link 43, whereby to brace these parts for resistance to the thrust of said lower valve member exerted by the compressed closing spring 28 of the latter (see Fig. 2). At the same time, the upward opening movement of the upper valve member 33, produced by the bell crank means, slides upwardly its stem 32 to carry upwardly therewith the swingable detent member 60, so that its free end, and the anti-friction roller 61 thereon, can swing, under gravity, downwardly over the seat or stop shoulder 58 of the normally lowered trip-lever 56, whereby to be engaged on said seat or stop shoulder so as to resist the thrust of the upper valve member exerted by the compressed closing spring 36 thereof (see Fig. 2). When the described parts are so positioned, the valve members 25 and 33 will be automatically detained in their open positions subject to the free flow of liquid past the same and into the bottom of the tank 10. This having been accomplished, the hand lever 51 is returned to released position, whereby to relax the pull-cable 49 so as not to impede the reverse valve closing movements of the bell-crank means when the detent means is tripped in the manner hereinafter described.

After the dual emergency valve means has been moved to and detained in open condition as above set forth, the intake and discharge valve means and cooperating loading valve means are opened to the flow of liquid from the source of supply into the tank 10. This is accomplished by pulling back the hand lever 82, whereby to rotate the cam 81 for thrust against the stem 74 of the intake and discharge valve 73 so as to move the same to open position (see Fig. 4). Since the intake and discharge valve 73 abuts the loading valve 91, when the casing of the latter is coupled to that of the former, the opening movement of said intake and discharge valve 73 exerts an opening thrust upon the loading valve 91, so that both said valves are simultaneously opened to the tank loading flow of liquid (see Fig. 4). The hand lever 82 may be held open by the operator, or releasable detent means (not shown) may be provided for holding the same open if desired.

The system being opened to the flow of liquid therethrough, said liquid will be loaded into the bottom of the tank so as to fill the latter. As the level of liquid so loaded into the tank rises, and approaches the top of the latter, it will contact the float member 56 so as to buoy up the same. As said float member rises, it will cause an up-swinging movement of the lift lever 63 which will be transmitted through the cable or rod 68 to the trip lever 56, whereby to swing the latter upward. The up-swinging movement of said trip lever 56 thrusts its push finger 59 laterally against the roller 61 of the detent member

60, thereby displacing the roller from the trip lever seat or stop shoulder 58 and out-swinging the detent member to released position (see Fig. 3). The restraint of the detent member being thus removed, the spring 36 is released so as to exert closing thrust upon the upper valve member 33 of the dual emergency valve means. The closing movement of the upper valve member 33 swings downward the lever bar 45, and through the link 47 reverses the rotation of the bell-crank means, thus collapsing the toggle lever system so that both said upper valve member 33 and lower valve member 25 are moved by their springs to closed positions, and in-flow of liquid into the tank is automatically arrested.

The tank 10 having been loaded, the intake and discharge valve D is closed, thereby at the same time automatically closing the loading valve E, so that the latter may thereupon be disconnected and separated from the former. Liquid in the conduit B-C will be trapped by the thus closed intake and discharge valve D, and liquid in the hose or conduit F will be likewise trapped by the thus closed loading valve E. The amount of liquid trapped between the two valves D and E when their valve members are closed, and before the casings are separated, is negligible, and consequently not only is wasting drainage of liquid prevented, but fire hazards are substantially eliminated. In practice a removable closure cap (not shown) would be coupled to engage with the spigot portion 70 of the valve D, after valve E is detached therefrom.

The described system is not only usable for loading the tank 10, but also for discharging, at will, the liquid from the latter. To discharge the tank, a suitable delivery hose (not shown) is coupled to the spigot portion 70 of the valve D. Before opening the intake and discharge valve 73, the dual emergency valve means is opened. This is done by pulling back the hand lever 51 to engage its latch means 52 with the holding means 53. The amplitude of hand lever 51 movement for this purpose is less than that required to open the dual emergency valve means far enough to permit engagement of the detent member 60 with the seat or stop shoulder 58 of the trip lever 56, so that the valve members 25 and 33 are not, under such circumstances, subjected to the restraint of the float controlled detent mechanism, but are held open only by said latching of the hand lever 51, although sufficiently open to allow required out-flow of liquid from the tank 10 through the dual emergency valve means. As thus opened, the valve members 25 and 33 are free to close when the hand lever 51 is released. The emergency valve means being thus opened to out-flow of liquid from the tank 10, the intake and discharge valve 73 may be opened by manipulation of the hand lever 82, whereby to discharge liquid from the tank 10 through the delivery hose to the place of delivery.

We are aware that changes could be made in the devices and parts making up the tank truck bottom loading and discharge means, and that many widely different embodiments of the features of this invention could be made without departing from the scope thereof as defined in the following claims. It is therefore intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. Bottom loading and discharge means for

tank trucks comprising emergency valve means communicating with the bottom interior of the truck tank, a conduit system communicating with the exterior portion of said emergency valve means, a manually operable intake and discharge valve at the terminal end of said conduit system adapted to receive coupled connection therewith of a separable liquid conveying means, means for manually opening said emergency valve means, said emergency valve means having self-contained detent means for holding the same open when moved to fully open condition, and liquid level actuated means within the truck tank for automatically releasing said detent means to close said emergency valve when liquid loaded into the tank therethrough reaches a predetermined level.

2. Bottom loading and discharge means for tank trucks comprising emergency valve means communicating with the bottom interior of the truck tank, a conduit system communicating with the exterior portion of said emergency valve means, a manually operable intake and discharge valve at the terminal end of said conduit system adapted to receive coupled connection therewith of a separable liquid conveying means, said liquid conveying means having at its coupling end a self-closing valve means adapted to be opened by opening movement of said intake and discharge valve, means for manually opening said emergency valve means, said emergency valve means having self-contained detent means for holding the same open when moved to fully open condition, and liquid level actuated means within the truck tank for automatically releasing said detent means to close said emergency valve when liquid loaded into the tank therethrough reaches a predetermined level.

3. Bottom loading and discharge means for tank trucks comprising emergency valve means communicating with the bottom interior of the truck tank, a conduit system communicating with the exterior portion of said emergency valve means, a manually operable intake and discharge valve at the terminal end of said conduit system adapted to receive coupled connection therewith of a separable liquid conveying means, said liquid conveying means having at its coupling end a self-closing valve means adapted to be opened by opening movement of said intake and discharge valve, means for manually opening said emergency valve means, said emergency valve means having self-contained detent means for holding the same open when moved to fully open condition, and a float controlled means within said truck tank for automatically tripping and releasing said detent means to close said emergency valve when liquid loaded into the tank therethrough reaches a predetermined level.

4. Bottom loading and discharge means for tank trucks comprising dual emergency valve means communicating with the bottom interior of the truck tank, a conduit system communicating with the exterior portion of said emergency valve means, a manually operable intake and discharge valve at the terminal end of said conduit system adapted to receive coupled connection therewith of a separable liquid conveying means, said dual emergency valve means having a spring-closed valve opening inwardly toward the tank interior and a second spring closed valve opening outwardly toward said conduit system, an actuating means intermediate said valves for effecting simultaneous opening movements thereof, means for manually operating said actuating means for

opening said valves, detent means for holding said valves open when the same are moved by said actuating means to fully open condition, and liquid level actuated means within the truck tank for automatically releasing said detent means to close the valves of said emergency valves when liquid loaded into the tank therethrough reaches a predetermined level.

5. Bottom loading and discharge means for tank trucks comprising dual emergency valve means communicating with the bottom interior of the truck tank, a conduit system communicating with the exterior portion of said emergency valve means, a manually operable intake and discharge valve at the terminal end of said conduit system adapted to receive coupled connection therewith of a separable liquid conveying means, said dual emergency valve means having a spring closed valve opening inwardly toward the tank interior and a second spring closed valve opening outwardly toward said conduit system, an actuating means intermediate said valves for effecting simultaneous opening movements thereof, means for manually operating said actuating means for opening said valves, detent means for holding said valves open when the same are moved by said actuating means to fully open condition, and a float controlled means within the truck tank for automatically tripping and releasing said detent means to close the valves of said emergency valve means when liquid loaded into the tank therethrough reaches a predetermined level.

6. Bottom loading and discharge means for tank trucks comprising dual emergency valve means communicating with the bottom interior of the truck tank, a conduit system communicating with the exterior portion of said emergency valve means, a manually operable intake and discharge valve at the terminal end of said conduit system adapted to receive coupled connection therewith of a separable liquid conveying means, said liquid conveying means having at its coupling end a self-closed valve means adapted to be opened by opening movement of said intake and discharge valve, said dual emergency valve means having a spring closed valve opening inwardly toward the tank interior and a second spring-closed valve opening outwardly toward said conduit system, a toggle lever means intermediate said valves for effecting simultaneous opening movements thereof, means for manually actuating said toggle lever means for opening said valves, detent means for holding said valves open when the same are moved by said toggle lever means to fully open condition, and liquid level actuated means within the truck tank for automatically releasing said detent means to close said emergency valves when liquid loaded into the tank therethrough reaches a predetermined level.

7. Bottom loading and discharge means for tank trucks comprising dual emergency valve means communicating with the bottom interior of the truck tank, a conduit system communicating with the exterior portion of said emergency valve means, a manually operable intake and discharge valve at the terminal end of said conduit system adapted to receive coupled connection therewith of a separable liquid conveying means, said liquid conveying means having at its coupling end a self-closed valve means adapted to be opened by opening movement of said intake and discharge valve, said dual emergency valve means having a spring closed valve opening inwardly toward the tank interior and a second spring-

closed valve opening outwardly toward said conduit system, a toggle lever means intermediate said valves for effecting simultaneous opening movements thereof, means for manually actuating said toggle lever means for opening said valves, detent means for holding said valves open when the same are moved by said toggle lever means to fully open condition, and a float controlled means within the truck tank for automatically tripping and releasing said detent means to close said emergency valves when liquid loaded into the tank therethrough reaches a predetermined level.

8. In bottom loading and discharge means for tank trucks, a dual emergency valve means communicating between the bottom interior of said tank on the truck conduit system having a manually operable intake and discharge valve means at its outer end to receive coupled connection therewith of a separable liquid conveying means, said dual emergency valve means having a spring-closed valve opening inwardly toward the tank interior and a second spring-closed valve opening outwardly toward said conduit system, an actuating means intermediate said valves for effecting simultaneous opening movements thereof, said inwardly opening valve having a stem projecting into the tank interior, a movable detent means carried by said stem, a pivoted trip lever having means operatively engageable by said detent means for holding said valves open when the same are moved by said actuating means to fully open condition, and a float actuated means within the truck tank and connected with said trip lever for moving the latter to disengage the detent means for closing said emergency valves when liquid loaded into the tank therethrough reaches a predetermined level.

9. In bottom loading and discharge means for tank trucks, a dual emergency valve means communicating between the bottom interior of said tank and the truck conduit system having a manually operable intake and discharge valve means at its outer end to receive coupled connection therewith of a separable liquid conveying means, said dual emergency valve means having a spring-closed valve opening inwardly toward the tank interior and a second spring-closed valve opening outwardly toward said conduit system, a rotatable bell-crank means intermediate said valves, toggle lever means for each said valve operable by said bell-crank means for effecting simultaneous opening movements of said valves, a spindle for mounting said bell-crank means having a portion exteriorly projecting from said emergency valve means, an actuating lever on the exterior portion of said spindle, a pivoted hand lever remote from said emergency valve means, a pull-cable operatively interconnecting said actuating lever and hand lever, detent means for holding said valves open when the same are moved to fully open condition, and liquid level actuated means within the truck tank for automatically releasing said detent means to close said valves when liquid loaded into the tank therethrough reaches a predetermined level.

10. In bottom loading and discharge means for tank trucks, a dual emergency valve means communicating between the bottom interior of said tank and the truck conduit system having a manually operable intake and discharge valve means at its outer end to receive coupled connection therewith of a separable liquid conveying means, said dual emergency valve means having a spring-closed valve opening inwardly toward the

tank interior and a second spring-closed valve opening outwardly toward said conduit system, a rotatable bell-crank means intermediate said valves, toggle-lever means for each said valve operable by said bell-crank means for effecting simultaneous opening movements of said valves, a spindle for mounting said bell-crank means having a portion exteriorly projecting from said emergency valve means, an actuating lever on the exterior portion of said spindle, a pivoted hand lever remote from said emergency valve means, a pull-cable operatively interconnecting said actuating lever and hand lever, said inwardly opening valve having a stem projecting into the tank interior, a movable detent means carried by said stem, a pivoted trip lever having means operatively engageable by said detent means for holding said valves open when the same are moved to fully opened condition, and a float actuated means within the truck tank and connected with said trip lever for moving the latter to disengage the detent means for closing said emergency valves when liquid loaded into the tank therethrough reaches a predetermined level.

11. In bottom loading and discharge means for tank trucks, a dual emergency valve means communicating between the bottom interior of said tank and the truck conduit system having a manually operable intake and discharge valve means at its outer end to secure coupled connection therewith of a separable liquid conveying means, said dual emergency valve means having a valve opening inwardly toward the tank interior and a second valve opening outwardly toward said truck conduit system, an actuating means intermediate said valves for effecting

simultaneous opening movements thereof, said actuating means including an operating spindle having a portion exteriorly projecting from said emergency valve means, an actuating lever on said exterior portion of said spindle, a pivoted hand lever remote from said emergency valve means, a pull-cable operatively interconnecting said actuating lever and hand lever, detent means for holding said valves open when the same are moved to fully open condition, and a float controlled means within the tank for automatically tripping and releasing said detent means to close said valves when liquid loaded into the tank therethrough reaches a predetermined level.

12. A dual emergency valve means to communicate with the bottom interior of a truck tank, said valve means having a valve opening inwardly toward the tank interior and a second outwardly opening valve, an actuating means intermediate said valves for effecting simultaneous opening movements thereof, a manually operable means remote from but connected with said actuating means for operating the latter, said inwardly opening valve having a stem projecting into the tank interior, a movable detent means carried by said stem, a pivoted trip lever having means operatively engageable by said detent means for holding said valves open when the same are moved to fully opened condition, and a float actuated means within the truck tank and connected with said trip lever for moving the latter to disengage the detent means for closing said emergency valves when liquid loaded into the tank therethrough reaches a predetermined level.

HOWARD C. KRONE.
WILLIAM MEYER.