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F. G. GARLICK

TANK CAR

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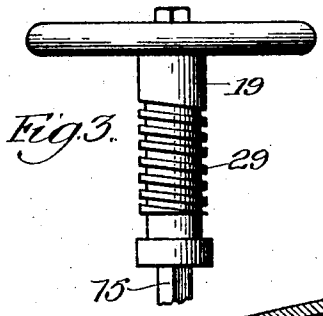


Fig. 3.

Fig. 1.

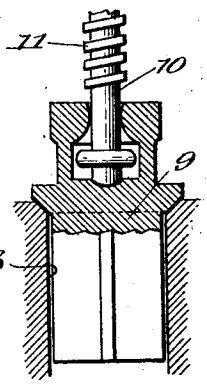


Fig. 4.

Fig. 2.

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TANK CAR.

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As a preface to the description of my improvement, it may be stated that it is desirable that the discharge valve, usually provided on the tanks of tank cars, be closed before the dome cover is closed, it being my primary object to provide a construction whereby the operator may be apprised of the open condition of the discharge valve, or be prevented from securing the dome cover in place until the discharge valve is closed, and preferably both, and by the use of mechanism which shall not only be of simple and economical construction, but positive in operation, and the proper functioning of which will not be affected by relative movement of the upper and lower portions of the wall of the tank.

Referring to the accompanying drawing:—

Figure 1 is a broken view in sectional elevation of a portion of the tank of a tank car embodying my improvement, with certain portions of the structure broken away. Figure 2 is a plan sectional view taken at the line 2 on Fig. 1 and viewed in the direction of the arrow. Figure 3 is a view in elevation of the upper end portion of the discharge-valve-operating mechanism; and Figure 4, a broken section taken at the line 4 on Fig. 1 and viewed in the direction of the arrow.

In the particular arrangement shown, the dome, such as that commonly provided as a part of tank cars, is represented at 5, the manhole therein being indicated at 6. The plate portion 7 represents the bottom of the tank which contains the lower discharge opening 8 through which the contents of the tank may be discharged, this discharge opening being controlled by a valve 9 connected with the lower end of a valve stem 10 provided adjacent its lower end with a right-hand screw-threaded portion 11 which has threaded engagement with a bracket 12 located in the tank and connected to the bottom plate 7 thereof by rivets 13 passing through the arms 14 of the bracket and openings in the bottom plate 7, whereby the valve 9 is seated to close the valve 9 by rotation of the stem 10 in clockwise direction in Fig. 2.

The upper end of the valve stem 10 is square in cross section, as represented at 15, and extends upwardly freely through an opening 16 in a bracket 17 secured to the side wall 18 of the dome 5. Mounted on the squared portion 15 of the valve stem 10 is a stem-rotating element 19 shown as in the form of a hand-wheel positioned to be accessible to the operator by reaching downwardly through the manhole 6. The wheel 19 which is provided with a depending sleeve portion 20 contains a square opening 21 therein into which the squared portion 15 of the valve stem extends and in which it is vertically movable, the lower end of the sleeve 20 having a reduced portion 22 providing a shoulder 23. The sleeve 20 extends downwardly through the opening 16 in the bracket 17 and is confined against vertical movement in this bracket by overlapping engagement of the shoulder 23 with a bearing ring 24 surrounding the sleeve and resting on the upper surface of the bracket 17, and by a collar 25 located below the bracket 17 and surrounding the reduced portion 22 of the sleeve to which it is rigidly secured as by the set screw 26, the provision of the valve-operating means as described permitting the operator, by operating the hand-wheel 19 in one direction or the other, to open or close the valve 9 at will, the sleeve equipped hand-wheel 19 remaining at the same elevation at all times, and the sliding driving connection between the wheel 19 and the valve stem 10 permitting of the raising and lowering of the stem in the rotation of the latter and in the relative vertical movement of the brackets 12 and 17 due to expansion and contraction of the tank and distortion of the latter under load.

Cooperating with the discharge valve and its operating mechanism above described, are means for apprising the workmen of the open condition of the valve 9 and preventing the dome cover, represented at 27, from being seated to close the manhole 6, these means, in accordance with the preferred illustrated embodiment of my invention comprising a nut 28 which is internally screw-threaded and surrounds, and threadingly engages, a left-hand screw 29 provided on the sleeve 20, this nut being provided with spaced ears 30 carrying a pivoted pin 31 passing through one end of a lever 32 fulcrumed between its ends on a pin 33 carried by an upright support 34 on the inner end of the bracket 17. The other end of the lever 32 is pivotally connected at 35, to the lower

end of a rod 36 the upper end of which slides in a guide 37 secured to the dome 5, the upper end of the rod 36 extending within the confines of the wall of the manhole 6 and being movable vertically into and out of the dotted position shown in Fig. 1, the dome cover 27 being provided with a depending projection 38, which may be a continuous flange, if desired, which extends in direct vertical alignment with the rod 36 and with which the latter is adapted to engage.

The operation of the mechanism is as follows: Rotation of the hand-wheel 19 in clockwise direction in Fig. 2 which operates to cause the valve 9 to become closed as shown in the drawings, operates, by reason of the engagement of the left-hand screw thread 29 on the sleeve 20 with the nut 28, to raise the latter to the position shown in Fig. 1 thereby rocking the lever 32 in clockwise direction in this figure and lowering the rod 36 to the full line position therein shown in which the upper end of this rod is in such a position that it does not interfere with the proper seating of the cover 27 upon the dome. Rotation of the hand-wheel 19 in the opposite direction to unseat the valve 9 operates to lower the nut 28 to the dotted position shown in Fig. 1, thus raising the rod 36 to the dotted position shown in Fig. 1 in which it extends above the wall of the manhole 6 and in such position that it is readily exposed to view and the cover 27 may not be seated on the dome, and requiring that the wheel 19 be rotated in a direction to seat the valve 9, before the dome cover can be applied to operative position, it being understood from the foregoing that the means for preventing the dome cover from being applied to closed position is operated automatically by the mechanism which controls the position of the valve 9, whereby seating the dome cover while the discharge valve is open is rendered impossible. The rod 36 being readily visible to the workmen when the discharge valve is in open condition, serves as a means apprising the workmen of the open condition of the valve and its cooperation with the dome-cover as stated prevents the cover from being closed until the discharge valve is closed, should the workmen fail to notice the indicator device, or ignore it, and attempt to secure the dome-cover in place.

One of the advantages of my construction is that the valve and indicator, or stop forming member, will be maintained at all times in the proper relative positions irrespective of relative movement of the upper and lower portions of the wall of the tank.

Furthermore, by providing the double screw portions, reversely threaded, the construction is adapted for use with threaded valve structures which are required to be screwed to their seats and involve threads of low pitch requiring that the operating mechanism therefor be rotated a plurality of revolutions to seat or unseat the valve, and it also lends itself to application to tanks as commonly provided.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as the same may be variously modified and altered without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is:

1. In a tank structure having an opening in its upper portion and an outlet, a cover for said opening, a valve for said outlet, a stem operatively connected with said valve and having a threaded portion, a stationary member with which said threaded portion engages, a second member operatively engaged by, and rotatable with, said stem and relative to which said stem is movable lengthwise, said second member being threaded reversely to said first-referred-to threaded portion, a nut engaging the threads on said second member, a fulcrum mounted contiguous to said second member, a telltale device mounted near said fulcrum, and a lever mounted on said fulcrum, one end of said lever being connected to said nut and the other end of said lever being connected with said telltale device.

2. In a tank structure having an opening in its upper portion and an outlet, a cover for said opening, valve mechanism for said outlet comprising a valve device provided with a threaded portion having threaded engagement with a stationary part of the structure and a threaded member rotatable therewith, said valve and threaded member being relatively movable lengthwise thereof, a nut engaging the thread on said member and movable thereby, a fulcrum mounted contiguous to said member, a telltale device mounted near said fulcrum, and a lever mounted on said fulcrum, one end of said lever being connected to said nut and the other end of said lever being connected with said telltale device.

3. In a tank structure having an opening in its upper portion and an outlet, a cover for said opening, a vertically movable valve for controlling said outlet, an upwardly-extending stem operatively engaging said valve and having a threaded portion, a stationary member having threaded engagement with said threaded portion, a sleeve operatively engaged by, and rotatable with, said stem, and relative to which said stem is movable up and down, said sleeve being threaded reversely to the threaded portion of said stem, a nut engaging the threads on said member, a fulcrum mounted contiguous to said sleeve, a telltale device mounted near said fulcrum, and a lever

mounted on said fulcrum, one end of said lever being connected to said nut and the other end of said lever being connected with said telltale device.

4. In a tank structure having an opening in its upper portion and an outlet, a cover for said opening, a vertically movable valve for controlling said outlet, an upwardly-extending stem operatively engaging said valve and having a threaded portion, a stationary member having threaded engagement with said threaded portion, a bracket in the tank containing an opening through which said stem extends, a sleeve extending into the opening in said bracket and operatively engaged by, and rotatable with, said stem, and relative to which said stem is movable up and down, means engaging said bracket for confining said sleeve against vertical movement, said sleeve being threaded reversely to the threaded portion of said stem, a nut engaging the threads on said member, a fulcrum mounted contiguous to said sleeve, a telltale device mounted near said fulcrum, and a lever mounted on said fulcrum, one end of said lever being connected to said nut and the other end of said lever being connected with said telltale device.

5. In a tank structure having an opening in its upper portion and an outlet in its lower portion, a cover for said opening, valve mechanism for said outlet comprising relatively longitudinally movable sections one of which is rotatable by the other thereof, said sections having threaded portions, the threaded portion of one of said sections having threaded engagement with a stationary part of the structure and controlling the opening and closing of said outlet, the other of said sections being rotatable on, and movable vertically with, the uper part of the tank structure, a nut engaging the threads of said last-referred-to section, a fulcrum mounted contiguous to said last-referred-to section, a telltale device mounted near said fulcrum, and a lever mounted on said fulcrum, one end of said lever being connected to said nut, and the other end of said lever being connected with said telltale device.

6. In a tank structure having an opening in its upper portion and an outlet in its lower portion, a cover for said opening, valve mechanism for said outlet comprising relatively longitudinally movable sections one of which is rotatable by the other thereof, said sections having reversely threaded portions, the threaded portion of one of said sections having threaded engagement with a stationary part of the structure and controlling the opening and closing of said outlet, the other of said sections being rotatable on, and movable vertically with, the upper part of the tank structure, a nut engaging the threads of said last-referred-to section, a fulcrum mounted contiguous to said last-referred-to section, a telltale device mounted near said fulcrum, and a lever mounted on said fulcrum, one end of said lever being connected to said nut, and the other end of said lever being connected with said telltale device.

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