April 21, 1925. 1,534,139

A. E. OSTRANDER

DISCHARGE VALVE MECHANISM

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Fig. 1.

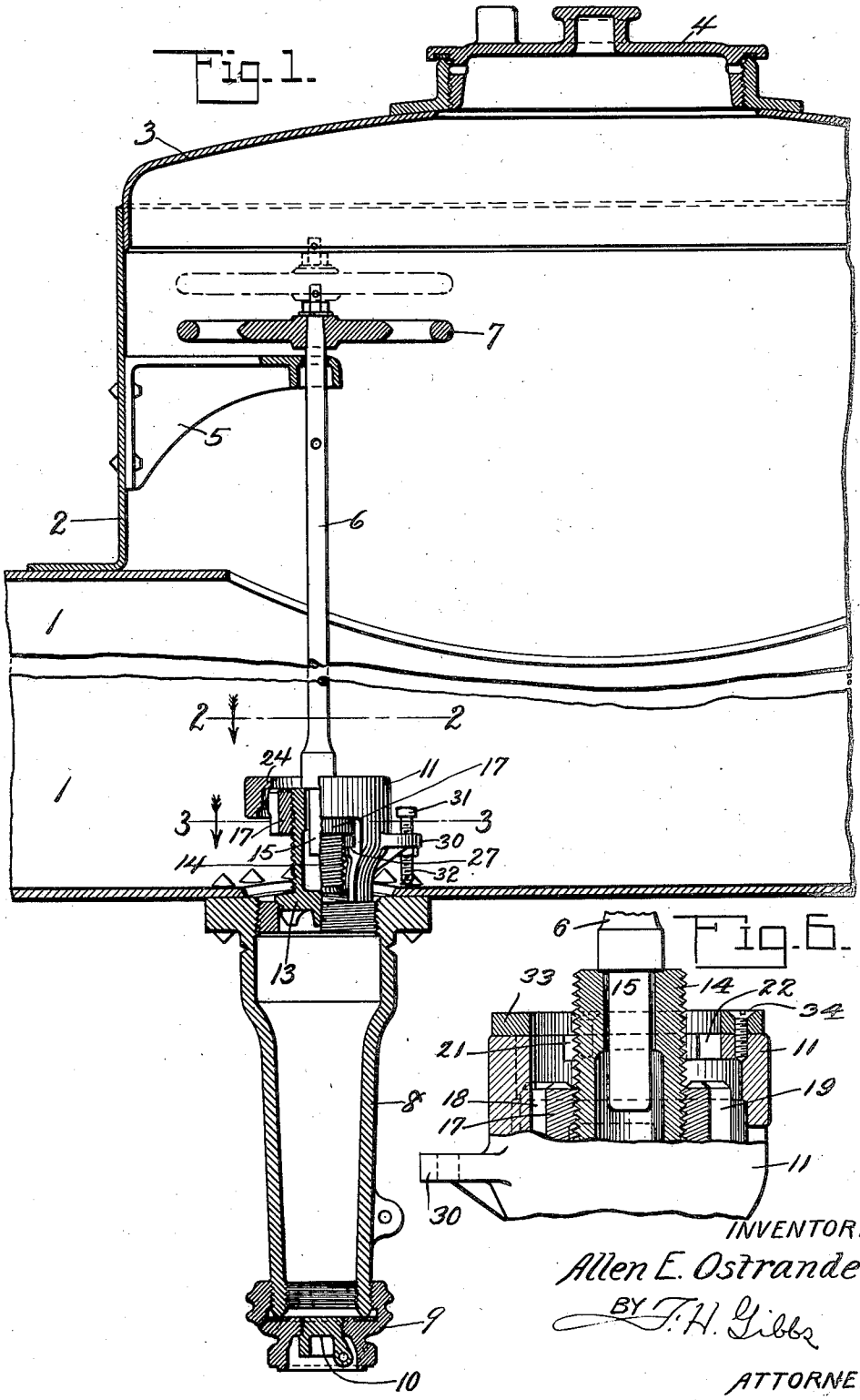

Fig. 6.

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Fig. 2.

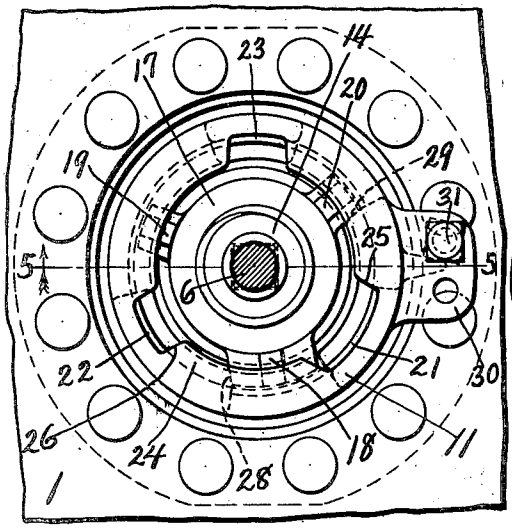


Fig. 3.

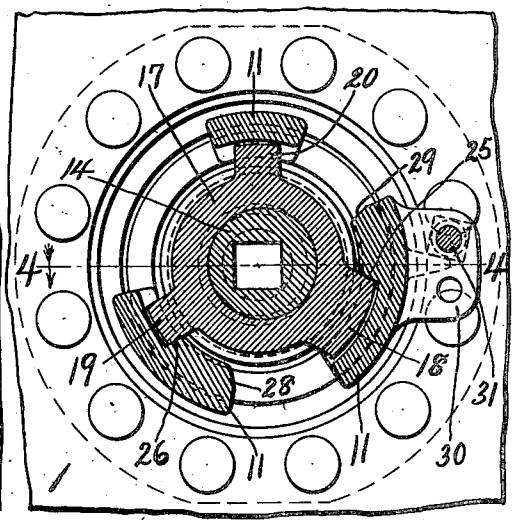


Fig. 4.

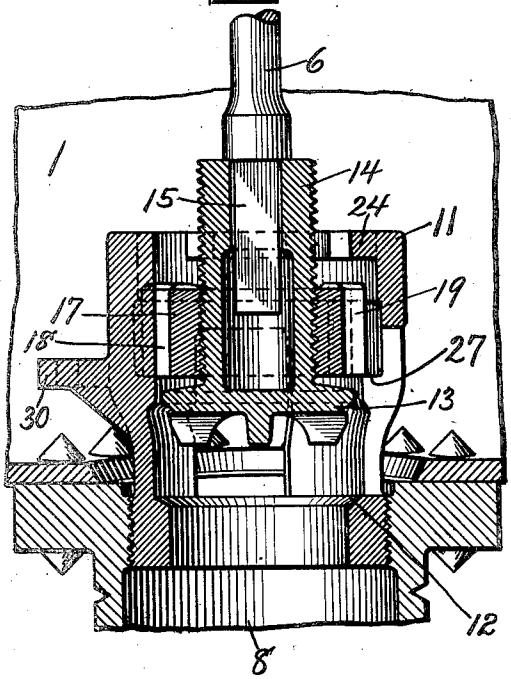
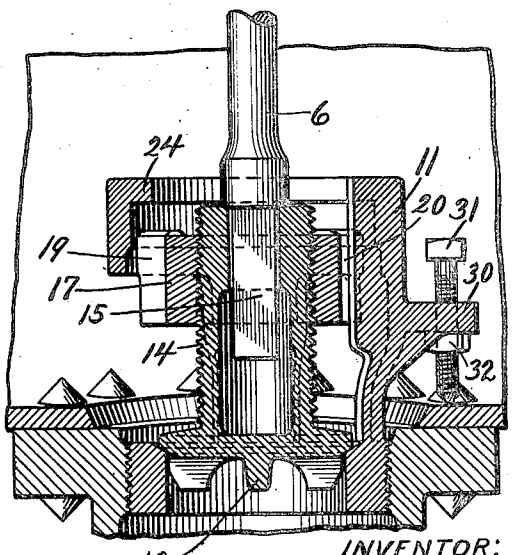


Fig. 5.



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Patented Apr. 21, 1925. 1,534,139

UNITED STATES PATENT OFFICE.

ALLEN E. OSTRANDER, OF BRONXVILLE, NEW YORK, ASSIGNOR TO AMERICAN CAR AND FOUNDRY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

DISCHARGE-VALVE MECHANISM.

Application filed June 2, 1922. Serial No. 565,484.

To all whom it may concern:

Be it known that I, ALLEN E. OSTRANDER, residing at Bronxville, Westchester County, State of New York, and being a citizen of the United States, have invented certain new and useful Improvements in a Discharge-Valve Mechanism, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and to use the same, reference being had to the accompanying drawings, which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

In said drawings:

Fig. 1 is a vertical longitudinal section of a car tank equipped with my improved valve mechanism, the valve cage being shown partly in elevation;

Fig. 2 is a section taken on line 2—2 of Fig. 1 showing the valve sleeve in the position taken during the closing of the valve;

Fig. 3 is a section taken on line 3—3 of Fig. 1 showing the valve sleeve in the position taken during the opening of the valve;

Fig. 4 is a section taken on line 4—4 of Fig. 3 showing the valve in open position;

Fig. 5 is a section taken on line 5—5 of Fig. 2 showing the valve in engagement with its seat; and

Fig. 6 is a fragmentary view, partly in section and partly in elevation, of the valve cage with a retaining ring secured thereto.

It is an object of my invention to provide an improved discharge valve mechanism for tank cars and it is also an object of my invention to provide a valve structure of the self grinding type wherein the valve may be lifted out of the cage for inspection without removing the valve cage from the tank.

In the drawings which show the preferred construction of my device the car tank 1 has the usual dome 2 provided with a dome head 3 in which is the usual manhole opening closed by a cover 4. Secured to the dome 2 is a bracket 5 in which a valve rod 6 provided with a hand wheel 7 is rotatably mounted. Riveted to a bottom tank sheet is a discharge outlet casting 8 provided at one end with an outlet cap 9 having an opening that is closed by a screw threaded plug 10.

At its other end the outlet casting 8 is interiorly threaded to receive a valve cage 11. The valve cage 11 is provided with a valve seat 12 to receive a valve 13 having a cylindrical threaded stem 14 in which is a square opening to receive the squared end 15 of the valve rod 6. Threaded on the valve stem 14 is a valve sleeve 17 having the lugs 18, 19 and 20. In assembling the device, the sleeve 17 is threaded on to the stem 14 and the valve 13 and sleeve 17 are inserted through the opening in the top of the valve cage 11, openings 21, 22 and 23 being provided in the flange 24 of the valve cage 11 to permit the passage of the lugs 18, 19 and 20. The end 15 of the rod 6 is then fitted into the opening in the stem 14.

With the valve 13 engaging the seat 12, as shown in Fig. 1, operating the hand wheel 7 to open the valve will cause the valve 13 to rotate upon the seat 12 carrying the sleeve 17 with it until the lugs 18 and 19 engage the faces 25 and 26 formed on the valve cage 11. With the sleeve 17 thus held against rotation, continued operation of the hand wheel 7 rotates the valve 13 on the seat 12 and causes the sleeve 17 to travel in the cage 11 until the lugs 18, 19 and 20 engage the shoulder 27 (Figs. 1 and 4), whereupon continued rotation of the hand wheel will cause the valve 13 to be raised from the seat 12 (as shown in Fig. 4). With the valve in the open position, operating the hand wheel to close the valve will cause the valve 13 to rotate carrying with the sleeve 17 and causing the lugs 18, 19 and 20 to travel on the shoulder 27 (Figs. 1 and 4) until the lugs 18 and 20 engage the faces 28 and 29 as shown in Fig. 2 whereupon the sleeve 17 will stop rotating and the valve 13 will advance in the sleeve 17 until it engages the seat 12 as shown in Fig. 5. Continued rotation of the hand wheel 7 will then cause the valve 13 to rotate on the seat 12, grinding the valve to its seat, and will cause the sleeve 17 to travel in the cage 11 until the lugs 18, 19 and 20 engage beneath the flange 24 and thus force the valve 13 against the seat 12. Where the tank is used for transporting heavy liquids it may be desirable to close the openings 21, 22 and 23 in the

flange 24 by means of a ring 33 secured to the flange 24 by screws 34.

To remove the valve 13 from the cage 11, the valve 13 is operated to the open position, as shown in Fig. 4, wherein the lugs 18, 19 and 20 aline with the openings 21, 22 and 23 in the flange 24 of the cage 11, the valve rod 6 withdrawn and the ring 33 removed, if applied, whereupon the sleeve 17 and valve 13 can be lifted from the cage 11.

Integral with the cage 11 is a lug 30 provided with a plurality of openings so spaced that a set screw 31 threaded into one of the openings and secured by locknut 32 will engage with the head of one of the rivets that secure the outlet casting 8 to the tank and prevent the cage 11 from being unscrewed from the outlet casting 8.

What I claim is:

1. In a discharge valve mechanism, a discharge outlet having a threaded opening, a valve cage threaded in said opening, an arm carried by said cage and means mounted in said arm to prevent rotation of said cage in said opening.

2. In a discharge valve mechanism for tanks, a discharge outlet having an opening, means securing said outlet to the tank, a valve cage threaded in said opening and means carried by said cage adapted to engage said securing means to lock said cage to said outlet.

3. In a discharge valve mechanism for tanks, a discharge outlet, means securing said outlet to the tank, a valve cage, means securing said cage to said outlet independently of said outlet securing means and means carried by said cage adapted to engage said outlet securing means to lock said cage to said outlet.

4. In a discharge valve mechanism, a discharge outlet, a valve cage mounted in said outlet, an arm carried by said cage and means carried by said arm locking said cage in said outlet.

5. In a discharge valve mechanism, a valve cage, a valve in said cage and a sleeve on said valve adapted to reciprocate said valve upon rotation of said valve, said sleeve having a limited rotative movement with respect to said cage upon rotation of said valve.

6. In a discharge valve mechanism, a valve cage, a valve in said cage, a sleeve on said valve adapted to reciprocate said valve upon rotation of said valve and cooperating means on said sleeve and cage permitting limited longitudinal and rotative movements of said sleeve with respect to said cage upon rotation of said valve.

7. In a discharge valve mechanism, a valve cage, a valve in said cage, a sleeve on said valve adapted to reciprocate said valve upon rotation of said valve, projecting lugs on said sleeve and contact faces on said cage engaged by said lugs upon limited rotative movements of said sleeve.

8. In a discharge valve mechanism, a valve cage, a valve in said cage, a sleeve on said valve having lugs adapted to engage said cage and a flange on said cage having openings for the insertion of said lugs, said sleeve having limited rotative and longitudinal movements with respect to said cage upon the operation of said valve.

9. In a discharge valve mechanism, a flanged valve cage having openings in said flange, a valve in said cage and a sleeve carried by said valve having lugs adapted to be inserted through the openings in said flange, said sleeve being adapted to be rotated to interlock with said cage upon operation of said valve.

10. In a discharge valve mechanism, a flanged valve cage having openings in said flange, a valve in said cage and a sleeve on said valve having lugs adapted to be inserted through the openings in said flange, said lugs being adapted to be shifted from a position out of engagement with said flange to a position in which they engage with said flange upon rotation of said valve.

11. In a discharge valve mechanism, a flanged valve cage having openings in said flange, a valve in said cage, a sleeve on said valve having lugs adapted to be inserted through the openings in said flange and means on said cage cooperating with said lugs to operate said valve and permitting limited rotative and longitudinal movements of said sleeve with respect to said cage.

12. In a discharge valve mechanism, a flanged valve cage having an opening in said flange, a valve in said cage, a sleeve on said valve having a lug adapted to be inserted through the opening in said flange and a contact face on each side of said opening, said lug being moved past said opening from engagement with one contact face into engagement with the other contact face upon operation of said valve.

13. In a discharge valve mechanism, a flanged valve cage having openings in said flange, a valve in said cage, a sleeve on said valve, lugs on said sleeve adapted to be inserted through the openings in said flange and contact faces on said cage adapted to be engaged by said lugs, said sleeve having a limited rotative movement with respect to said cage upon operation of said valve and positioned by one of said lugs for removal from said cage.

14. In a discharge valve mechanism, a valve cage, a valve in said cage, a sleeve on said valve having lugs adapted to engage said cage, a flange on said cage having openings for the insertion of said lugs and means closing the openings in said flange.

15. In a tank discharge valve mechanism,

a discharge outlet for said tank, a valve cage mounted in said discharge outlet and lying within said tank and means within said tank securing said cage against rotation.

16. In a tank discharge valve mechanism, a discharge outlet for said tank, a valve cage threaded in said discharge outlet and lying within the tank and means inaccessible from without the tank preventing unscrewing of said valve cage.

17. In a tank discharge valve mechanism, a discharge outlet for the tank having a threaded opening, a valve cage threaded in said discharge outlet opening and means carried by said valve cage in the tank preventing removal of the valve cage.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ALLEN E. OSTRANDER.

Witnesses:
FRED. H. GIBBS,
R. W. SMITH.