G. A. GASE.

CHECK VALVE.

APPLICATION FILED JUNE 22, 1914.

1,142,513. Patented June 8, 1915.

Fig. 1.

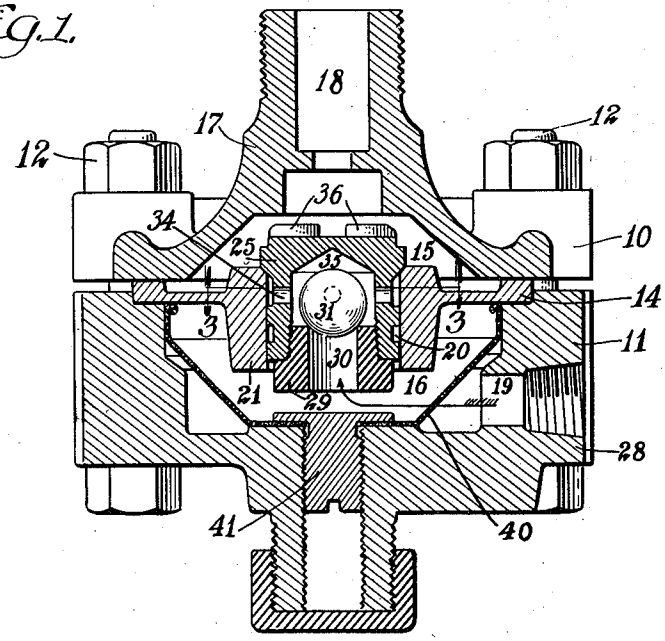


Fig. 2.

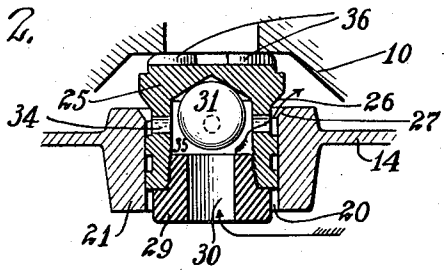


Fig. 3.

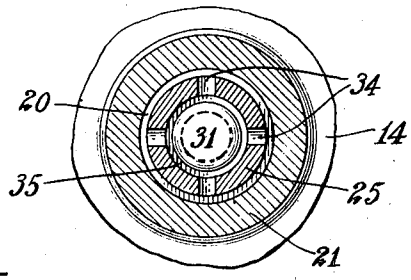
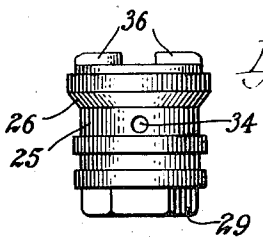


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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CHECK-VALVE.

1,142,513. Specification of Letters Patent. Patented June 8, 1915.

Application filed June 22, 1914. Serial No. 846,563.

To all whom it may concern:

Be it known that I, GEORGE A. GASE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Check-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to check valves and more particularly to check valves adapted for use in passages for volatile liquids or vapors.

The object of my invention is to provide a check valve which shall be strong and durable in construction and entirely automatic in its action, and which shall contain as few moving parts as is compatible with the other objects hereinafter set forth.

A feature of my invention is that I provide a main valve closure, and a secondary valve closure co-acting with the same and adapted to readily find its seat by gravity. These closures are so arranged that the return of the main valve closure to its seat is caused by the back pressure of the fluid in the passage when the secondary closure is seated, and accordingly this closing operation is not dependent on gravity or spring action.

Another feature of my invention is that it provides a double check valve, thereby decreasing the liability of leakage.

My invention is hereinafter more fully described in connection with the drawings and the essential characteristics are set forth in the claims.

In the drawings, Figure 1 is a vertical central section through the valve; Fig. 2 is a detail of the valve when open; Fig. 3 is a horizontal section of the valve on the line 3—3 of Fig. 1; Fig. 4 is a side elevation of the main valve plug.

Referring to the drawings by numerals, the housing for my valve as shown, comprises two chambered members 10 and 11 clamped together at their margins by suitable bolts 12 and embracing between them a disk 14 which is flanged at its periphery to provide a tight joint, and also to provide a thin portion preventing distortion of the middle portion when clamped into position. This disk is adapted to divide the space between the members 10 and 11 into two separate chambers 15 and 16 respectively, communicating with each other only through an axial bore 20 in centrally disposed bosses 21, formed on the disk 14. The upper shell chamber 10 is provided with a centrally located boss 17 having a reduced threaded portion at its outer end adapted to be connected by a suitable coupling (not shown) to one end of a break in a line pipe. An axial bore 18 in the boss 17 provides communication between the pipe and the chamber 15. At one side of the lower shell member 11 is shown a boss 28 provided with a passage 19, communicating at one end with the chamber 16 and being internally threaded at its outer end for connection to the other end of the above mentioned break in the line pipe, in which the valve is to be placed. These openings form the outlet and inlet passages respectively under normal conditions, and the valve closures hereinafter described are adapted to prevent a reverse of the conditions.

A main closure or valve plug 25 comprising a head and tubular stem is provided at its lower end with annular ridges adapted to slidably engage the walls of the bore 20 and provide the familiar "groove packing". The head of the plug is flanged, forming a shoulder beveled as at 26 and adapted to co-act with a beveled edge 27 of the bore 20, thus forming the main valve closure. Threaded into the lower end of the stem is shown a bushing 29 having an axial bore 30, the lower end of which communicates with the chamber 16 and the upper end of which provides a seat for a ball 31, which is the secondary valve closure. A number of ports 34 are provided at points in the circumference of the wall of the valve 25, between the upper annular ridge and the beveled shoulder of the head.

It will be seen that the pressure transmitted from the line pipe through the passage 19 and into the chamber 16 is at all times acting on the exposed area of the valve closures thereby tending to raise the same. As long as this pressure continues, the fluid may hold the closures open and flow through the same from the chamber 16 to the chamber 15, and from the passage 18, as described. On the upper surface of the valve 25, are lugs 36 adapted to abut the upper surface of the chamber 15 when the valve is open, thereby limiting the upward movement of the same but allowing com-

munication between the chamber 15 in the axial bore and the passage 18. If at any time the pressure in the chamber 16 falls below that of the chamber 15, the ball 31 being loose in its chamber 35, will readily fall by gravity to its seat and shut off any return of the liquid through the bore 30, and the preponderance of pressure in the chamber 15, acting on the exposed surface of the valve closures, in addition to their weight, will automatically close the same and hold them closed until the pressure in the chamber 16 again rises.

A strainer 40 dividing the chamber 16 into two compartments is provided to prevent the entrance of extraneous matter into the valve and is held in place by being clamped between a flanged end of a screw 41 and the lower face of the chamber 16.

It will be seen that I have provided a valve which accomplishes the purposes above set forth, and it will be noted that the secondary valve closure coacting with the first valve closure in the manner described, not only provides a double closure for the valve, but causes this secondary closure to control the operation of the main closure by causing the back pressure to act on its surface and force the same to its seat.

Having thus described my invention, what I claim is:

1. In a check valve, the combination with a body, of a member having a cylindrical bore forming a passage and having a seat, a main closure having a hollow stem extending into said bore and slidably engaging the same and having an enlarged portion fitting said seat, an opening leading from the interior of the stem under said enlarged portion, a contracted portion within the stem forming the seat, and a ball closing said seat.

2. In a check valve, the combination with a chambered casing, of an intermediate member dividing the chamber and having a cylindrically bored boss, a valve seat at one end of the bore, a closure for said bore having a portion fitting said seat and having a hollow portion fitting into said bore, a groove on the exterior of the hollow portion contiguous to the bore, a member secured to said hollow portion and having an opening therethrough, and a ball closing said opening.

3. In a check valve, the combination with a pair of chambered members, of a disk-like member clamped between them and having a centrally disposed boss and a bore forming a passage through the boss, a plug slidable in said bore and having an enlarged portion closing the end thereof, a passage through said plug opening beneath the enlarged portion, a member threaded into said plug and having an opening therethrough communicating with said last named passage, and a ball closing said opening.

4. The combination of a casing, a partition across the casing, a tubular guide carried thereby, a hollow plug slidable in said guide and having an annular shoulder adapted to engage a seat formed on the guide, a member secured to the plug and providing a second seat, and a ball retained within the plug and adapted to seat on the second seat.

5. The combination of a casing, a member carried thereby and having a tubular guide, a plug slidable within the guide and co-acting with it to form a valve, said plug having a recess, a sleeve carried by the plug and providing a seat, and a movable valve member confined by the sleeve within the plug.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

GEORGE A. GASE.

Witnesses:
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