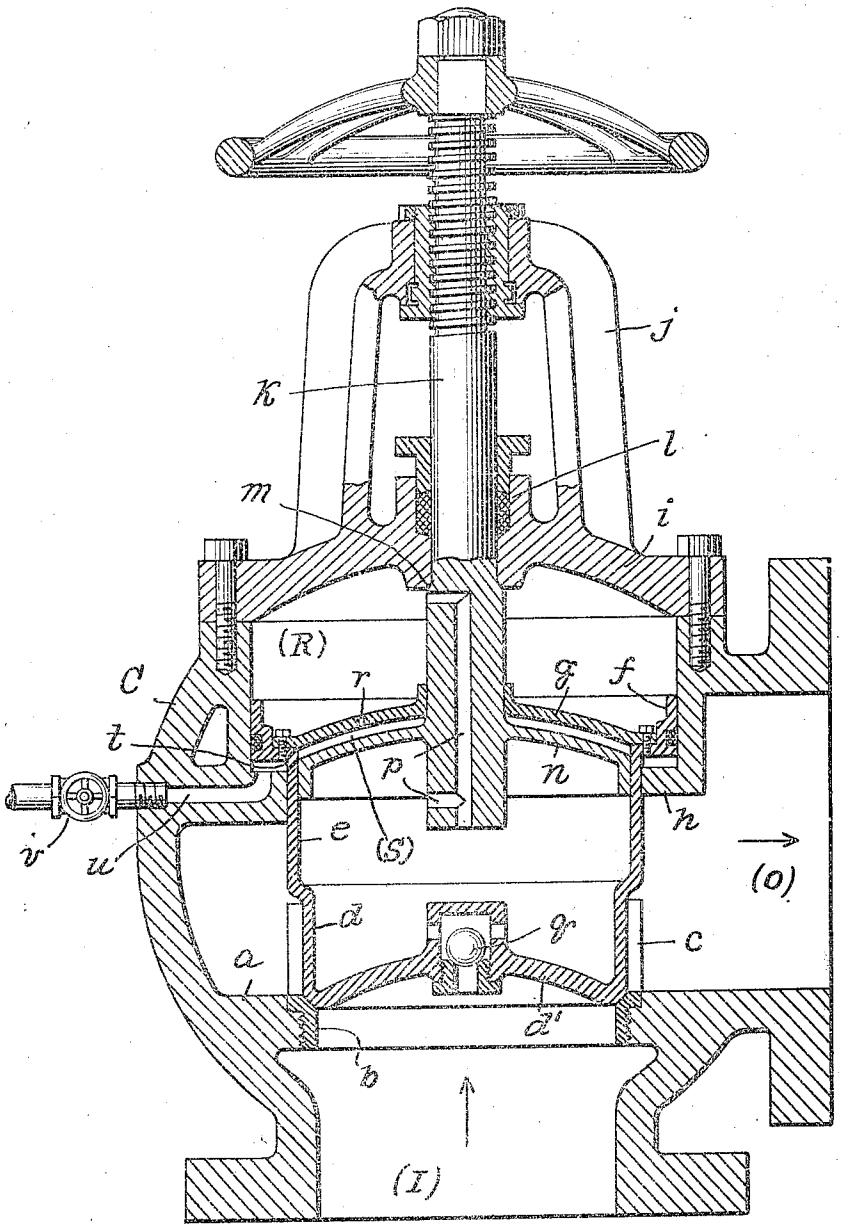
E. V. ANDERSON.

CUSHIONED VALVE.

APPLICATION FILED JULY 14, 1915.

1,209,796. Patented Dec. 26, 1916.



WITNESSES

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CUSHIONED VALVE.

1,209,796. Specification of Letters Patent. Patented Dec. 26, 1916.

Application filed July 14, 1915. Serial No. 39,776.

To all whom it may concern:

Be it known that I, EDWARD V. ANDERSON, a citizen of the United States, residing at Monessen, in the State of Pennsylvania, have invented certain new and useful Improvements in Cushioned Valves, of which the following is a specification.

My invention relates more particularly to double-acting non-return valves, and its primary object is to provide a valve which is completely balanced and cushioned in both positions and movements, and when closed by unbalancing such pressure, is closed by the full power of the inlet pressure on a full area of the balancing device.

I have illustrated the invention in the form of a steam valve, in the accompanying drawing, which represents a vertical central section of an angle valve to go on a boiler.

In this structure the inlet (I) communicates through the perforated partition *a* and valve seat *b*, with the outlet (O). The valve seat is provided with a series of guide posts *c*, within which is embraced a closed cylindrical valve body *d* preferably made with an enlarged portion *e* above the guide post *c*. It has integral with it, a piston *f* and a cover plate *g*, completely closing the valve body except for certain ports hereafter described. The cylindrical portion *e* may itself form the piston in some cases, but I prefer the enlarged piston *f* in order to secure an additional cushioning function underneath it and in connection with the inwardly projecting ledge *h* of the main valve casing C.

The main valve casing has a cap or hood *i* with a bracket *j* carrying the screw threaded valve stem *k* passing through the hood by way of a stuffing box *l* and preferably provided with a ground shoulder *m* making an additonal seal when the valve stem is up in its normal position. This stem carries at its bottom an inside piston *n* fitting the interior walls of the valve body *e*, and by means of port *p* giving communication between the inside of the valve body with the chamber (R) above the movable disk *f*. Thus the chamber (R) and the interior of the valve body are both supplied with live or inlet pressure by way of the ball check valve *q* in the bottom of the valve body. Either by leakage or by means of a small leakage port *r*, the chamber (R) communicates with the chamber (S) between the top *g* and the stationary disk *n*, and this latter space communicates by ports *t* and *u*, and any convenient form of pilot valve or other valve *v*, either with the atmosphere or with the delivery line. (Ordinarily this will be an automatic pilot connected to the header and normally closed).

It will be seen that normally the valve will stand open with equal and opposite pressure from the boiler exerted on both sides of the valve itself, and of the piston *g*, *f*. Whenever the pressure is released in the intervening chamber (S), which may be brought about either intentionally and by manipulation of the small valve *v*, or automatically in case this is a pilot arranged for this purpose, then the valve will be closed by full boiler pressure exerted on the entire area on top of the piston *g*, *f*, and while the valve disk *d'* itself is under balanced pressure. By this construction also it will be seen that the valve is completely cushioned in both opening and closing movements, avoiding any chattering or hammering, and that, meantime, a sudden reduction of pressure on the inlet side, as by the bursting of the boiler, will cause the valve to instantly close, by the pressure trapped behind the check valve *q* and in the chamber (R). The structure is particularly strong and simple and effective, by reason of the use of the stationary disk *n* on the stem *k* and the valve body being entirely closed. Many other advantages of the construction will readily occur to those familiar with the art.

Having thus described my invention and illustrated its use, what I claim is the following:

1. A valve comprising a closed hollow body, forming, in conjunction with a valve casing, a piston dashpot cushioning device, a relatively stationary piston in said valve body and dividing it into two chambers, suitable ports through the valve to normally balance it under live pressure, and means to unbalance and close it by exhaust of pressure above said stationary piston.

2. A valve comprising a casing with an apertured diaphragm and valve seat therein and a cylinder arranged concentrically with said valve seat, a cylindrical closed hollow valve having an enlarged portion coöperating with said casing cylinder to form a dash-pot, a stem extending into said valve and provided with a piston fitting the inside of the hollow

valve, ports to supply the dash-pot piston chamber and the inside of the valve body with pressure fluid from the inlet of the casing, and means to release the pressure between said internal piston and the external piston whereby to close the valve by pressure on the full area of the dash-pot piston.

3. In a valve a cushioning and closing means comprising a casing having a valve seat and a cylinder, a hollow valve body engaging said seat and having a piston engaging said cylinder and coöperating therewith to form a dash-pot, a fixed piston located inside the valve body and engaging the walls thereof, a check valve inlet to the valve body, a port through the fixed inside piston communicating with the dash-pot, and a valve escape port arranged to exhaust pressure between the top of the valve body and said interior piston, substantially as described.

4. A valve comprising a casing having a perforated partition with a valve seat and a cylindrical portion above the valve seat, a cylindrical hollow valve body working in and forming a dashpot with said casing cylinder, a supplemental and relatively stationary piston working in and forming a dashpot with the valve body and dividing the latter into two chambers, suitable passages and ports through the valve body and stem of the stationary piston adapted to normally equalize pressure on both said dashpot pistons, and means to exhaust the presssure in both dashpots so as to close the valve, substantially as described.

5. A double-cushioned valve comprising the combination with a casing having a valve seat and a cylindrical portion with its axis in the axis of the valve seat, of a closed hollow cylindrical valve body engaging said seat and having a larger piston attached thereto and engaging the cylinder in the casing, a fixed shaft projecting through an opening in the top of said valve body and a supplemental piston on said shaft engaging the inside of the valve body, and suitable ports to introduce live pressure through the valve body and said shaft to both sides of the enlarged piston of the valve body, whereby to cushion the valve on the both movements and allow closing the valve under full pressure of live steam when pressure is exhausted under the enlarged piston.

In testimony whereof I have hereunto signed my name.

EDWARD V. ANDERSON.