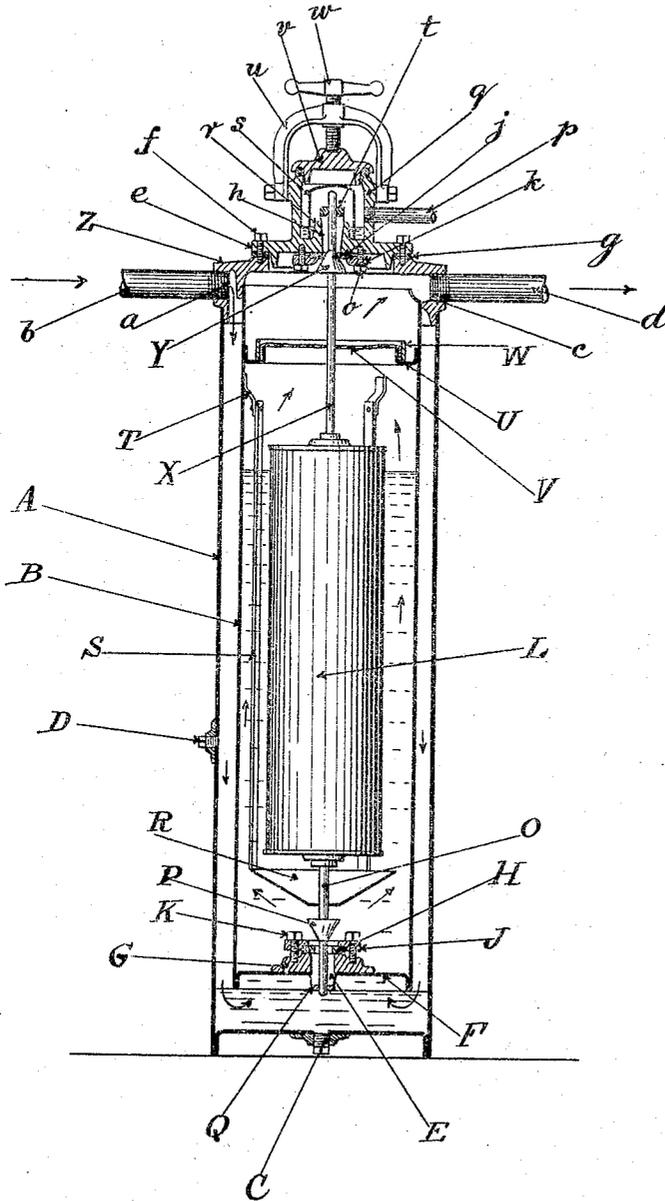


N. GOODYEAR.
 SAFETY VALVE.
 APPLICATION FILED JAN. 16, 1910.

985,160.

Patented Feb. 28, 1911.



Witnesses:
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UNITED STATES PATENT OFFICE.

NELSON GOODYEAR, OF NEW YORK, N. Y., ASSIGNOR TO MAINE DEVELOPMENT CORPORATION, A CORPORATION OF MAINE.

SAFETY-VALVE.

985,160.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed January 15, 1910. Serial No. 538,200.

To all whom it may concern:

Be it known that I, NELSON GOODYEAR, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Safety-Valves, of which the following is a specification accompanied by drawings.

This invention relates to hydraulic back pressure or safety valves through which gas or other fluid, for example acetylene or oxygen, may be passed in one direction only, and the objects of the invention are to simplify the construction of such devices, reduce the cost of manufacture, and obtain certain and efficient operation.

One of the preferred embodiments of the invention is described and claimed in this specification and shown in the accompanying drawing, which is a vertical sectional view of the safety valve constructed in accordance with the invention.

Referring to the drawings, A represents an outer casing, B represents an inner container or casing, both adapted to contain water, substantially the normal water levels being shown in the drawing. The outer casing may be provided with the water outlet C and the overflow D normally both closed. The inner casing or container communicates with the outer casing as by means of the opening E in the bottom F. Around the opening E is preferably arranged an annular piece G upon which is placed the rubber valve seat or ring H held in place by the washer J and bolts K.

Within the inner container B is a float L provided with a lower valve stem O having the valve P cooperating with the valve seat H. The lower end of the stem O is preferably guided in the guide Q. A deflector plate R is supported between the float L and the valve P as by means of the rods S connected to the sides of the inner container as by means of the brackets T. Supported by the flange U in the upper portion of the inner container B is a suitable filter cloth V, for example flannel or felt, held to the flange U by the ring W. The float L is provided with the upper valve stem X having the valve Y.

The outer casing A is preferably closed by the frame or casting Z which is provided with the gas inlet *a* to which the inlet pipe *b* is connected. The casting Z in this in-

stance is also provided with the outlet *c* to which the gas eduction pipe *d* is connected. The inlet pipe *b* communicates with the space between the outer and inner casings, while the outlet pipe *d* communicates with the inner casing.

A cover plate *e* is mounted on the frame or casting Z and held in place by the bolts *f*. Between the cover plate *e* and frame Z is provided the gasket *g*. The cover plate *e* is provided with the escape vent *h* having a rubber valve seat *j* held in place by the washer *k* and bolts *o*. The valve Y cooperates with the valve seat *j*. The cover plate *e*, as shown, is also provided with the escape pipe *p* entering at one side of the cap portion *q* of the plate *e*. Within the cap portion *q* and around the opening *h* is the upwardly extending flange *r* around which is seated a removable cap *s* water sealed as shown in the drawing. The upper end of the valve stem X is guided in the guide *t*. A bail *u* as shown is pivoted to the cap portion *q* of the cover plate and is adapted to hold in place the cover *v* by means of the hand screw *w*.

In the operation of the apparatus, gas or other fluid under pressure enters the inlet pipe *b* and passes downwardly in the direction of the arrows between the casings A and B. The valve P is normally open and the valve Y is normally closed by the buoyancy of the float L. The gas bubbles up through the lower valve opening and rising through the filter V passes out through the eduction pipe *d*. If for any reason there should be a back pressure through the pipe *d*, the pressure of the entering gas will overcome in the inner container B due to the back pressure and the difference in head between the water levels in the outer and inner casings, so that the float L will be depressed and the lower valve P will be closed and the upper valve Y open, so that the gas will escape through the upper valve opening and through the escape pipe *p*. When the back pressure is relieved the float will again rise and will close the upper valve Y and open the lower valve P.

By opening the cover *v*, leakage at the upper valve Y may be detected by the presence of gas bubbles rising around the cap *s*, even when too slight to readily detect at pipe *p*.

It will be seen that the two casings con-

stitute connecting chambers the connection between which is controlled by the valve and float by means of the body of liquid in the chambers.

5 I claim and desire to obtain by Letters Patent the following:

- 10 1. A hydraulic back pressure valve, comprising outer and inner casings communicating with each other, a valve for controlling said communication, an escape vent and valve for the inner casing, means for automatically opening one valve when the other is closed, and connections for passing gas through said casings in one direction.
- 15 2. A hydraulic back pressure valve, comprising an outer casing having a gas inlet, an inner container having a gas outlet and communicating with the outer casing through an opening in the bottom of the container, a cover having an escape vent, a float in said container and valves alternately controlling said opening in the bottom of the container and the escape vent and actuated by said float.
- 20 3. A hydraulic back pressure valve, comprising inner and outer casings adapted to hold water, said inner casing having a valve controlled opening in its bottom, and a valve controlled escape vent above the water level in the inner casing, a float in the inner casing adapted to normally hold the vent valve closed and the bottom valve open, and means for admitting gas to the outer casing and deducting gas from the inner casing.
- 25 30 4. A hydraulic back pressure valve comprising two chambers or casings having a connection between them and adapted to contain liquid through which the gas normally passes, a float actuated by the liquid, two gas outlets from one of the chambers or casings, and a valve for controlling one of the said outlets actuated by the said float.
- 35 40 5. A hydraulic back pressure valve com-

prising two chambers or casings having a connection between them and adapted to contain liquid through which the gas normally passes, a float actuated by the liquid, two valves actuated by the said float, one of which control the said connection between the chambers or casings and two gas outlets from one of said chambers one of which outlets is controlled by the other of said valves.

6. A hydraulic back pressure valve comprising two chambers or casings having a connection between them and adapted to contain liquid through which the gas normally passes, a float actuated by the liquid and a valve controlling the said connection and actuated by the said float.

7. A hydraulic back pressure valve comprising two chambers or casings adapted to hold liquid, a valve and valve controlled opening or connection between them through which the liquid acts and through which the gas passes, a float in one of the chambers, connections therefrom to the said valve for normally holding the said valve open, means for admitting gas to one of the chambers and deducting it from the other chamber, and a valve and valve controlled vent for the last said chamber actuated by the said float and normally closed.

8. A hydraulic back pressure valve having two chambers adapted to hold liquid an opening or connection between them, a valve therefor, a float controlling the valve, and a deflector plate R supported between the valve and the float.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses, Jan. 14, 1910.

NELSON GOODYEAR.

Witnesses:

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