A. H. PROBST.

VALVE.

APPLICATION FILED JULY 11, 1908.

1,039,068.

Patented Sept. 17, 1912.

2 SHEETS—SHEET 1.

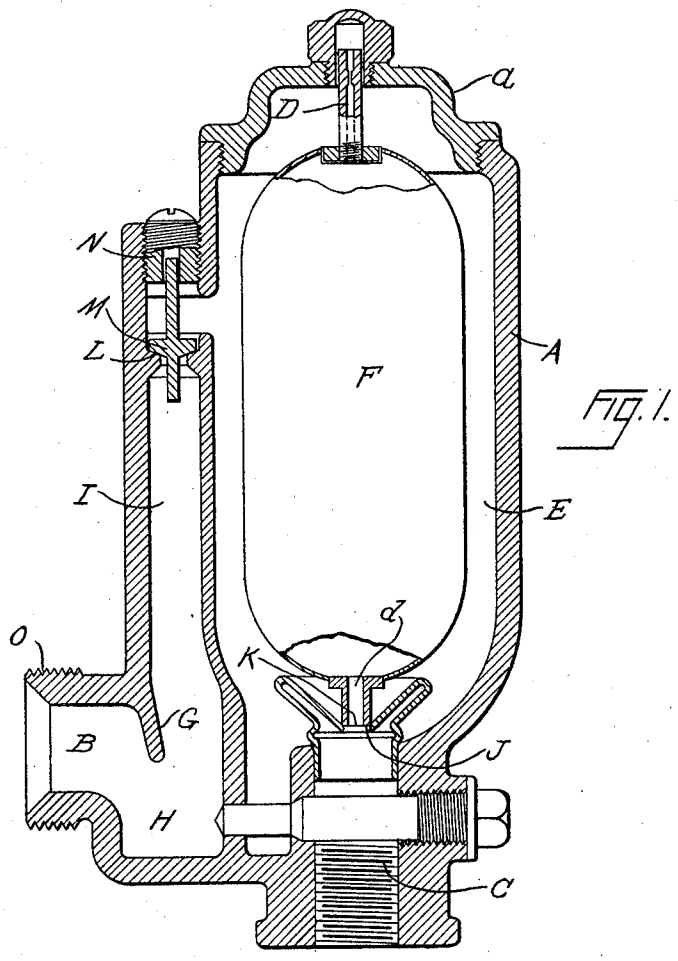

FIG. 1.

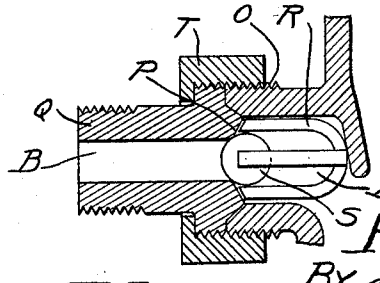

FIG. 2.

WITNESSES:

C. C. Green.

C. A. Adams.

INVENTOR

Alfred H. Probst;

BY Charles Turner Brown,

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

A. H. PROBST.

VALVE.

APPLICATION FILED JULY 11, 1908.

1,039,068.

Patented Sept. 17, 1912.

2 SHEETS—SHEET 2.

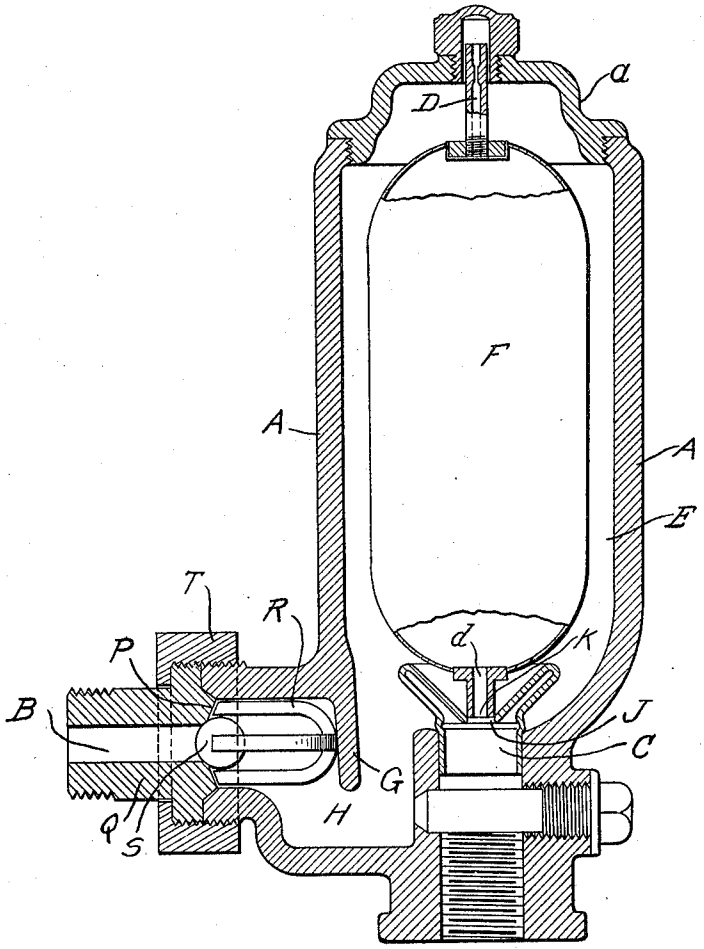

FIG. 3.

WITNESSES:

A. D. Brown.

E. A. Adams.

INVENTOR

Alfred H. Probst:

By Charles Turner Brown

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALFRED H. PROBST, OF CHICAGO, ILLINOIS, ASSIGNOR TO BYRON E. VAN AUKEN.

VALVE.

1,039,068. Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed July 11, 1908. Serial No. 443,143.

To all whom it may concern:

Be it known that I, ALFRED H. PROBST, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves, of which the following, when taken in connection with the drawing accompanying and forming a part hereof, is a full and complete description, sufficient to enable those skilled in the art to which it pertains to understand, make, and use the same.

This invention relates to valve mechanism for discharging air and water of condensation by differential pressure, from individual members of a steam heating system comprising a plurality of radiators, an exhauster and return pipes, said return pipes communicating, respectively, with the radiators and the exhauster.

One of the principal objects of this invention is to provide means whereby, when a radiator is cut out from the remainder of the heating system by closing the steam supply valve thereto less pressure in the radiator than in the remainder of the heating system will be the result thereof, (due to the condensation of the steam contained in the radiator at the time of the closing of such valve), and thereby, when such radiator is again brought into the heating system by opening its steam supply valve such radiator will be quickly filled with steam. And a further object of the invention is to obtain a device which will be efficient in operation, durable, and economical in construction.

In the drawings referred to Figure 1 is a vertical sectional view of a device embodying the invention. Fig. 2 is a vertical sectional view of a modification of the device. Fig. 3 is a vertical sectional view of an additional modification.

A reference letter applied to designate a given part is used to indicate said part throughout the several figures of the drawings, wherever the same appears.

A designates a representation of the shell or casing of the device and *a* the top thereof.

B designates the inlet; C the air and water of condensation outlet and D a passage way arranged to conduct air from the float chamber (lettered E), to interior of the float (lettered F), and *d* designates a passage way arranged to conduct air from the interior of the float to the passage way C.

G designates a hanging wall and H a well in which well, by the accumulation of water of condensation in the operation of the device, a water seal is obtained. In Fig. 3 said well communicates directly with the float chamber.

I, (Fig. 1), designates a vertical passage way from well, (H), arranged to discharge into the float chamber, (E), above the level of the water required in such float chamber to raise the float, (F).

J designates a valve seat and K a valve co-acting therewith to control the admission of the water of condensation to the passage way, (C). Said valve is mounted in float F, and the air discharge passage D, the interior of the float and the air discharge passage *d* constitute a passage way for air to pass from the float chamber E to the passage way C.

L designates a valve seat in vertical passage way I and M a valve arranged to co-act with valve seat L.

N designates a screw threaded plug arranged to close the upper end of passage way I to shut communication thereof off from the atmosphere. The valve seat L may be ground, and the valve M inserted before the plug N is put in place as described.

O, O, designate screw threads by means of which the device is attached to a radiator of a heating system by an ordinary union.

The modification illustrated in Figs. 2 and 3 consists in the making of the valve seat (lettered P), at the inner end of part Q of the union (lettered Q, T), and inserting cage (lettered R) and ball (lettered S) in the inlet B so that such ball S will constitute a valve arranged to co-act with the valve seat P. This construction is substituted (when used) for the valve seat L and valve M co-acting therewith. T designates the internal screw threaded collar of the union Q T.

In assembling this device the float F is placed in the float chamber E and the top *a* is secured in place on the shell or casing A. The valve M is put in position and the plug N inserted, (or cage R is inserted in inlet B and ball S is placed in such cage when the part Q is attached in place by collar T).

The operation of the device is:—When the pressure in the inlet B is enough greater than the pressure in the float chamber E to actuate the device, air, water of condensa-

tion or steam in the inlet passage way B will flow through such passage way and from thence underneath the hanging wall G through well H and into the float chamber E (via vertical passage way I in Fig. 1 and directly into the float chamber in Fig. 3). Such air, water of condensation or steam so flowing into the float chamber in sufficient quantity will unseat the valve obstructing the passage thereof, from the float chamber. When the pressure in the radiator to which the device is attached, or in inlet B, is less than or the same as the pressure in the float chamber, valve M (in the construction illustrated in Fig. 1), or ball S (in the construction illustrated in Figs. 2 and 3), will seat to prevent the back flow of steam, air or water of condensation from the float chamber through the inlet B to the radiator. When steam is shut off from a radiator to which this device is attached the pressure in such radiator will, by the condensation of the steam therein at the time of such shut off, become less than the pressure in the remainder of the heating system, and less than the pressure in the float chamber E and thereby seating of the valves M and S will be effected. The seating of said valves controls the action of the float controlled outlet valve K and prevents the float from rising and falling, under the influence of back pressure. When steam is again admitted to such radiators the radiators will quickly fill because of the low pressure therein. Said low pressure in a given radiator is caused by the condensation, after the closing of the steam inlet valve thereto, of the steam contained therein. This condensation of steam and consequent reduction of pressure in a radiator is effected slowly, and the closing of the check valves M and S is correspondingly slow; but the seating of said valve, however slowly effected, prevents water flowing from the float chamber of the device into the radiator and hence when steam is again admitted to the radiator, there is but little water therein and said steam flows thereinto quietly. For the above reasons this device prevents movement of the float operated valve, to cause chattering thereof, either from water flowing into the radiator from the float valve chamber thereof or from being forced by the incoming steam to flow from the radiator into said float chamber.

I claim:—

Valve mechanism for the discharge of air and water of condensation from steam heating systems by differential pressure, comprising a float chamber, a liquid discharge passage communicating therewith, a float for governing said discharge passage, a conduit adapted to provide a steam, air and water inlet to said float chamber, a liquid seal positioned between the inlet of the casing and the float chamber, said seal arranged to be sealed by the accumulation of water of condensation, and means to prevent the flow of liquid in said seal back to said radiator, whereby when the pressure is sufficiently lower on the float chamber side of said seal a portion of the water of condensation in said conduit is forced into said float chamber and when the pressure on the inlet side of said seal is less than the pressure in the float chamber water of condensation is not permitted to flow from said conduit into said radiator to break said seal, and an air discharge passage arranged to discharge the air after it has passed said liquid seal.

ALFRED H. PROBST.

In the presence of—
CHARLES TURNER BROWN,
CORA A. ADAMS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."