No. 798,360. PATENTED AUG. 29, 1905.

D. F. MORGAN.

COMBINED VENT AND CHECK VALVE.

APPLICATION FILED APR. 27, 1905.

Fig. 2.

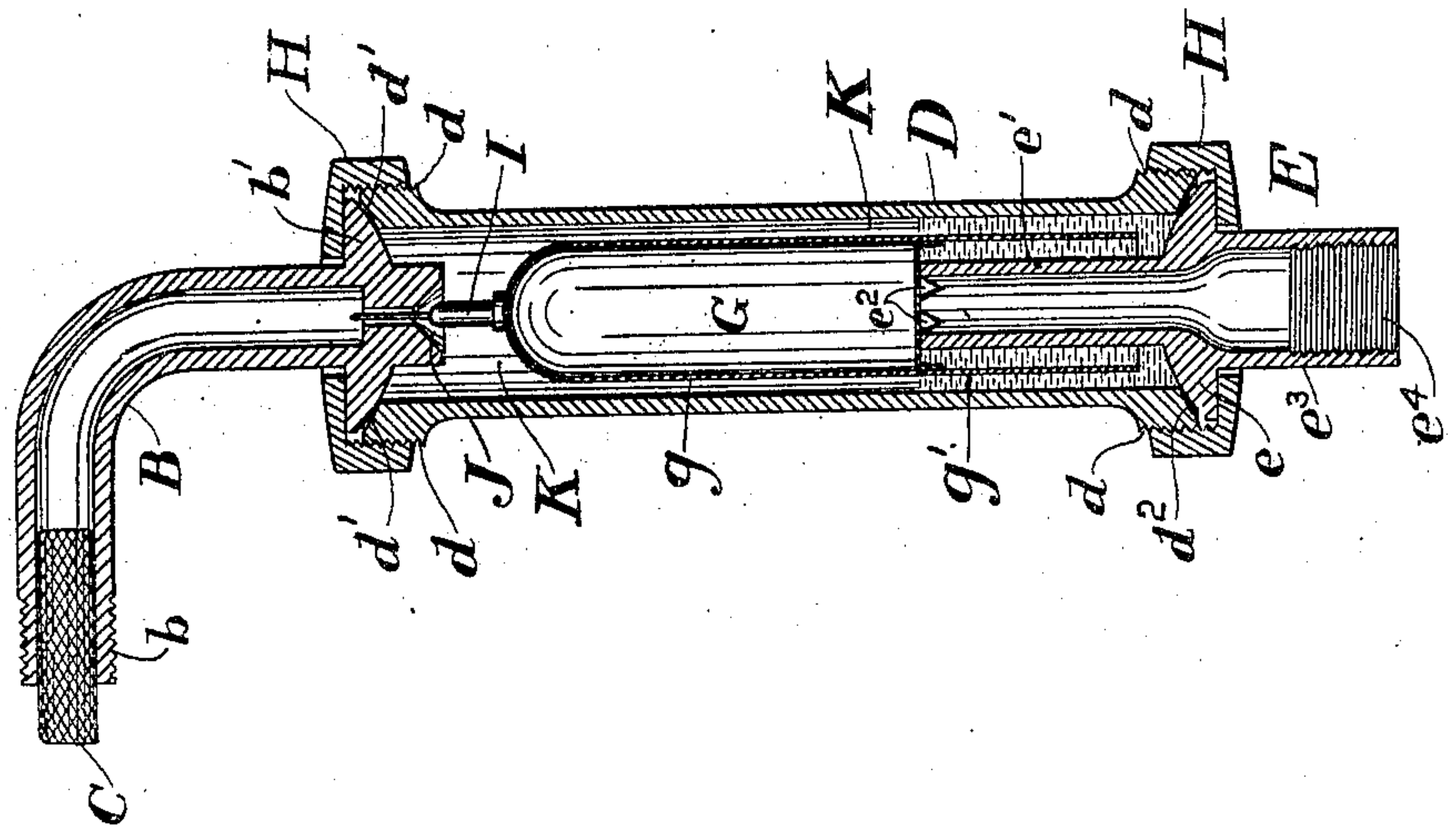
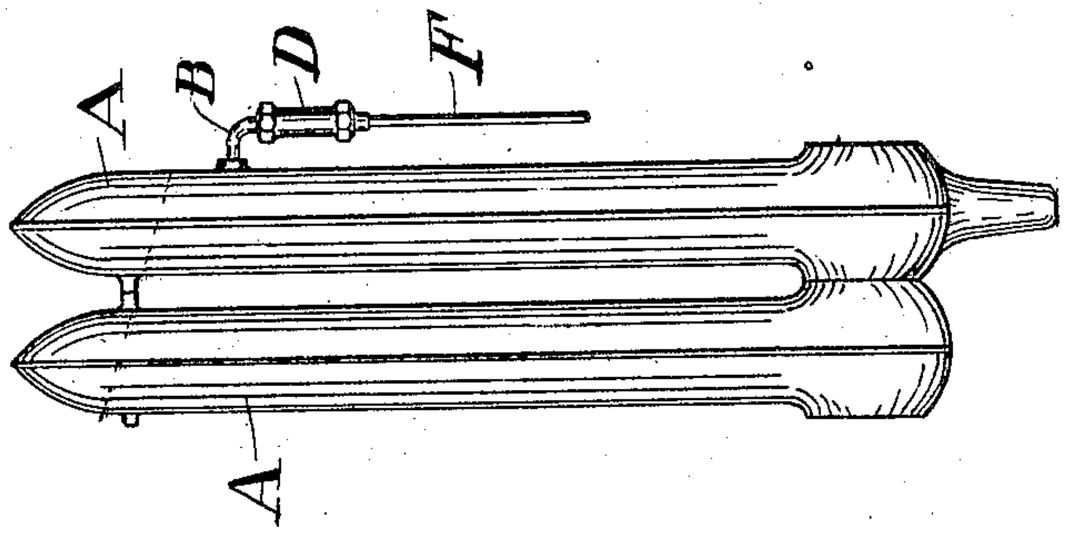


Fig. 1.



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UNITED STATES PATENT OFFICE.

DOCTOR FRANKLIN MORGAN, OF CHICAGO, ILLINOIS.

COMBINED VENT AND CHECK-VALVE.

No. 798,360. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed April 27, 1905. Serial No. 257,751.

To all whom it may concern:

Be it known that I, DOCTOR FRANKLIN MORGAN, 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 a Combined Vent and Check-Valve, of which the following, when taken in connection with the drawings 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 valves used in and about steam-heating systems in which the pressure in certain parts is at times below atmospheric pressure; and the object of this invention is to obtain a valve which will permit air and water of condensation to flow in one direction freely therethrough, which will greatly retard the flow of steam in the same direction therethrough, and which will not permit air, steam, or water of condensation to flow in the other direction therethrough; and the object of this invention is to obtain an apparatus whereby when steam is first turned onto a radiator no resistance to the escape of air therefrom will be offered, and when a radiator has become filled with steam or vapor resistance to the escape of steam or water of condensation therefrom will be presented for the purpose of directing steam into all the radiators of the heating system.

A further object of the invention is to obtain an apparatus which can be used at any point in a steam-heating system where it is desired to have air and water of condensation flow in one direction and to prevent the flow thereof in the opposite direction.

A further object of the invention is to obtain an apparatus of the kind named which can be readily taken apart and any desired part taken therefrom and other like part substituted therefor.

In the drawings referred to, Figure 1 is an elevation of the discharge end of a radiator with an apparatus embodying this invention attached thereto, and Fig. 2 is a vertical sectional view of an apparatus embodying this invention.

A reference character applied to designate a given part is used to indicate such part throughout both figures of the drawings wherever the same appears.

A A are radiator-coils.

B is a tube provided with beveled disk b' (preferably ground) at one end thereof and with screw-threads b at the other end thereof. Tube B is shown with a right-angle bend therein; but such bend is not an essential feature and is not placed therein when the apparatus is placed in a vertical pipe to prevent air traveling up the pipe.

C is a roll of fine wire-cloth placed in pipe B to restrict the passage-way therethrough.

D is a cylinder provided with screw-threads d d at its ends and also provided at one end with seat d' for beveled disk b' and at the other end with a like seat (lettered d^2) for beveled disk e on stem E. Stem E extends above beveled disk e, as at e', Fig. 2, and may be provided with notches e^2 e^2 at its upper end. It also extends below the disk e, as at e^3, and is provided with internal screw-threads e^4, by means of which pipe F (see Fig. 1) may be attached thereto.

G is a float in part D of the apparatus. Float G consists of the closed part g, the bottom whereof may rest on the top of part e' of stem E, and the open part g', which extends below part g and is substantially concentric with such part e'. Part g' of float G is shorter than part e' of stem E, so that water of condensation precipitated in or flowing into the tube D over or around the float may flow under such part e', and through notches e^2, part of the device.

H H are screw-threaded collars fitting onto the screw-threads d d at the respective ends of part D of the device, and making, in combination with the beveled disks b' and e, respectively, and seats d' d^2, union-joints. The device is thus readily secured in place and as readily removed.

I is a valve mounted on float G, and J is a valve-seat at the end of tube B.

K is the chamber of the device, in which chamber the float G is placed.

The inlet to this apparatus (that is, to chamber K) is through tube B and the valve-seat J, and the outlet is underneath the float G and through notches e^2. When a current of air or steam flows through notches e^2, the level of the liquid (water of condensation) within part g' of the float is depressed, such liquid being forced thereby underneath the bottom of the float and into the chamber K around or on the outside of the float G. The float G is thus raised, and valve I is closed on seat J. At any time after the closing of valve I on seat J when the pressure in stem E and pipe F is less than the pressure in chamber K the liquid in such chamber is forced therefrom

to underneath the float and such float falls, thereby permitting the flow of air, steam, or water of condensation through tube B. The flow of steam and water through tube B is very much retarded by the wire-cloth C. Air may, however, flow freely through the wire-cloth and the pressure thereof may force the liquid down in chamber K, causing a flow thereof through the notches e^2, lowering the level of such liquid until air may flow underneath the bottom of float G and escape from the apparatus.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a combined vent and vacuum check-valve provided with a chamber having an inlet and an outlet, and a valve-seat to the inlet, the combination of a float in the chamber, a valve on the float to coact with the valve-seat, and means to retain water of condensation in the chamber in position to be moved by a backflow of fluid through the outlet, to raise the float and seat the valve.

2. In a combined vent and vacuum check-valve provided with a chamber having an inlet and an outlet and a valve-seat to the inlet, the combination of a float in the chamber, such float consisting of a closed part and a cylindrical part extending below the bottom of the closed part, and a valve on the float to coact with the valve-seat, the outlet consisting of a cylinder extending above the bottom of the chamber and inclosed by the cylindrical part of the float.

3. In a valve for a vacuum steam-heating system the combination of a valve-casing provided with a chamber therein and a float in such chamber, such chamber and float arranged to contain a body of water movable from within the float to without the same to permit the flow of fluid through such casing in one direction and to prevent the flow of fluid therethrough in the opposite direction.

DOCTOR FRANKLIN MORGAN.

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