

F. A. SIMONDS.  
RADIATOR VALVE.

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932,589.

Patented Aug. 31, 1909.

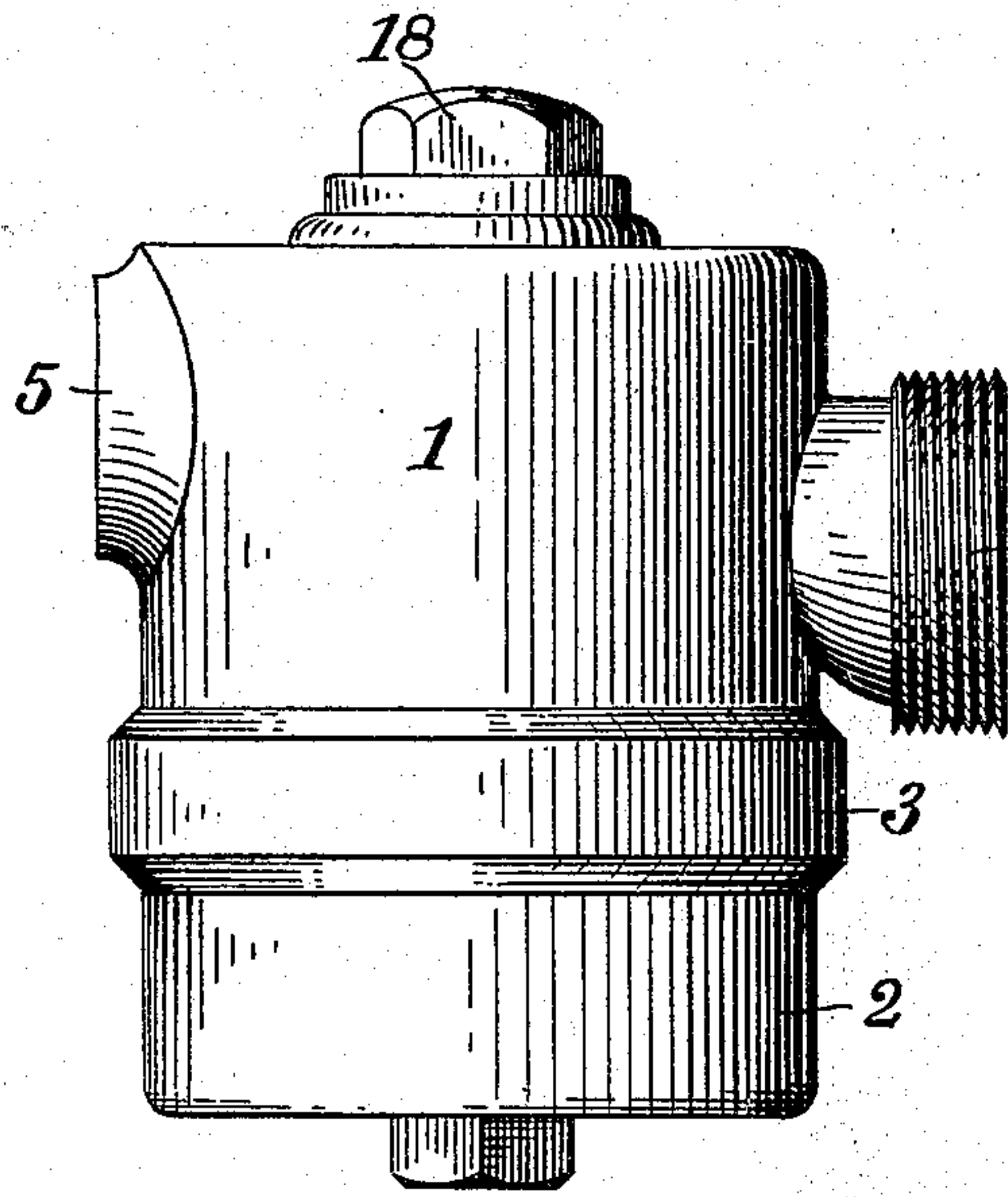


Fig. 1.

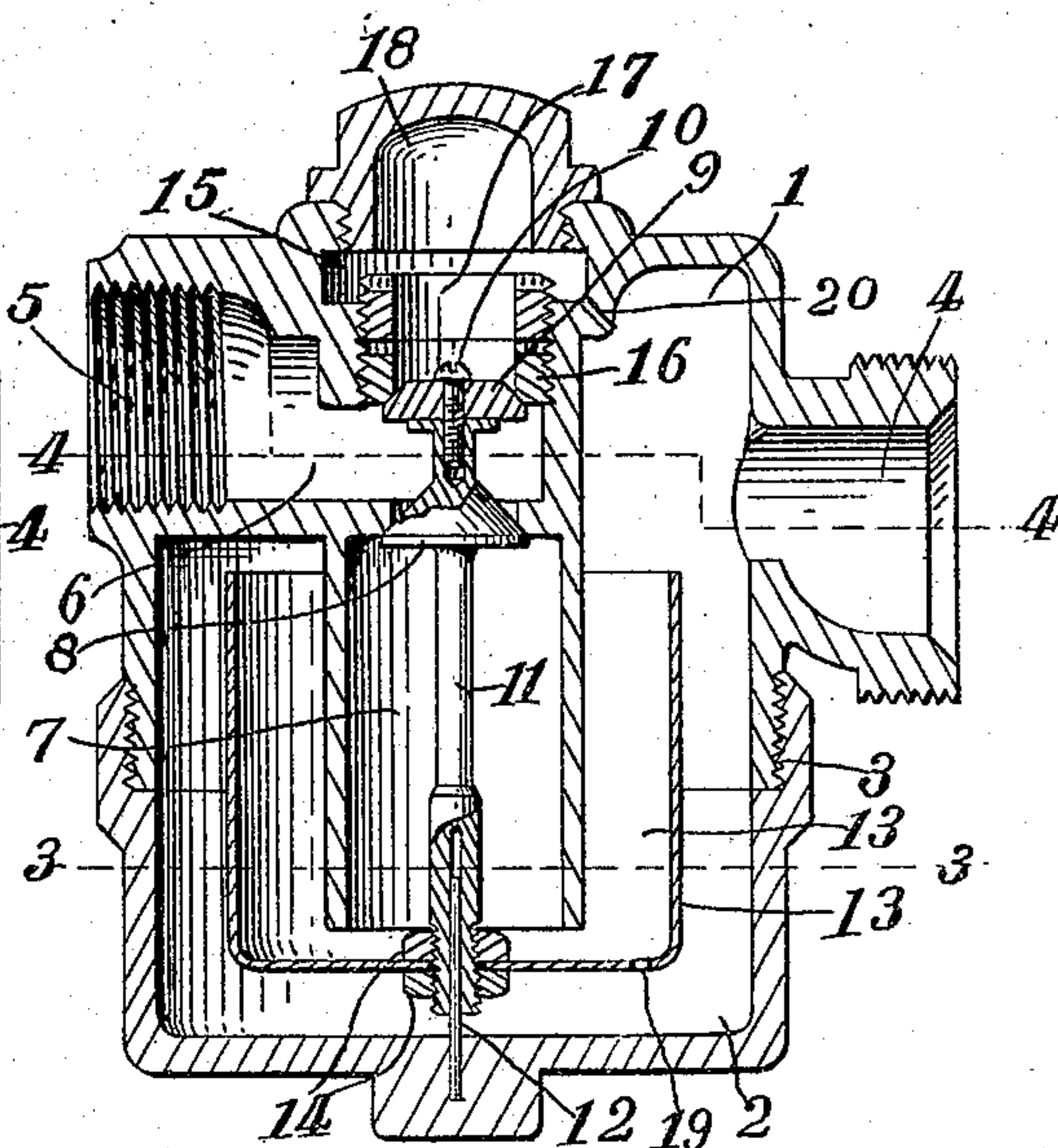


Fig. 2.

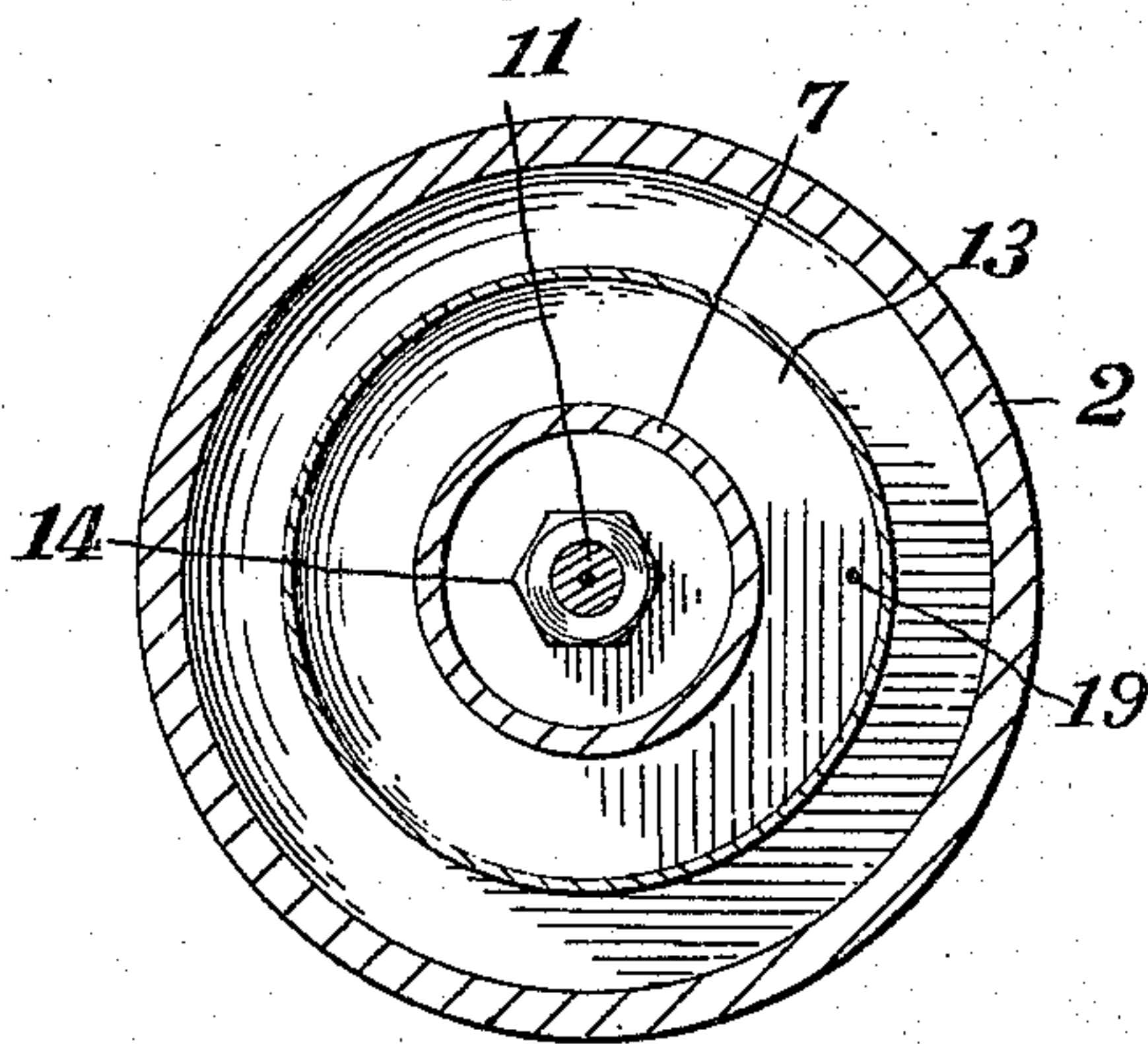


Fig. 3.

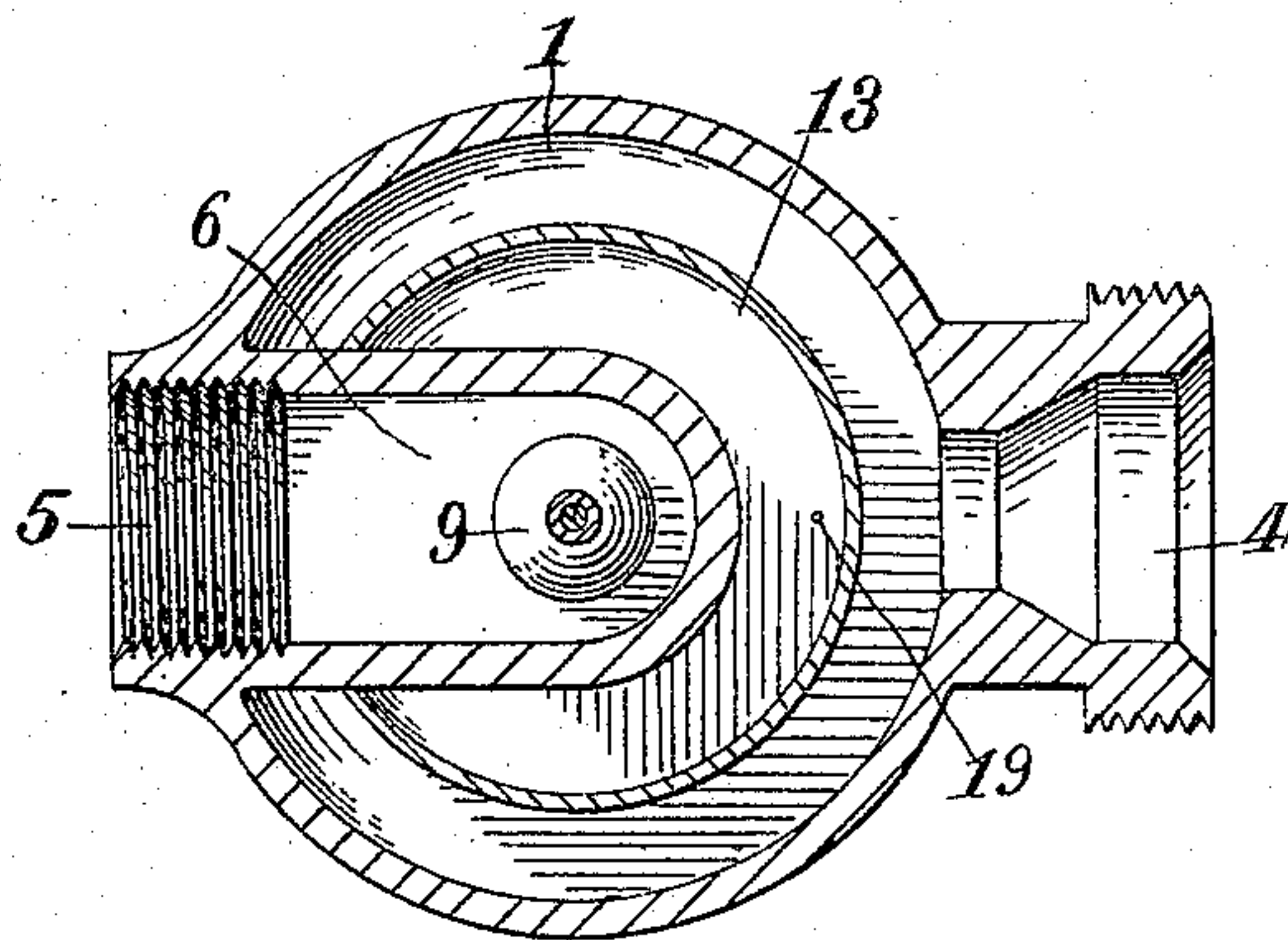


Fig. 4.

Witnesses  
H. O. Van Antwerp  
Georgiana Chace

Inventor  
Frank A. Simonds  
By  
Luther V. Moulton  
Attorney



# UNITED STATES PATENT OFFICE.

FRANK A. SIMONDS, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO SIMONDS HEATING & SPECIALTY COMPANY, OF FREMONT, MICHIGAN, A CORPORATION OF MICHIGAN.

## RADIATOR-VALVE.

932,589.

Specification of Letters Patent. Patented Aug. 31, 1909.

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*To all whom it may concern:*

Be it known that I, FRANK A. SIMONDS, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Radiator-Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in radiator valves, and more particularly to valves in the nature of steam traps for removing air and water of condensation from radiators, and its object is to provide the same with certain new and useful features hereinafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings, in which:

Figure 1. is a side elevation of a device embodying my invention; Fig. 2. a central vertical section of the same; Fig. 3. a horizontal section on the line 3—3 of Fig. 2; and Fig. 4. the same on the line 4—4 of Fig. 2.

Like numbers refer to like parts in all of the figures.

1 represents the main body of the case provided with a removable lower part 2 preferably connected to the main body portion by a screw thread 3.

4 is a pipe connection by which the device communicates with the radiator.

5 is a similar pipe connection by which the device communicates with the return pipe of the heating system when the device is installed for use. A valve chamber 6 extends inward within the upper part of the case and communicates with the connection 5. In the axis of this chamber, and also in the axis of the case, is a balanced valve. The lower member 8 of this valve engages a seat in the lower side of the chamber 6, and closes an opening between this chamber and the interior of a downwardly extended tube 7 in the axis of the case and extending to near the bottom of the same. The valve 9 is detachably secured to the valve 8 and is spaced apart therefrom, and also engages a tubular valve seat 16 which is vertically adjustable in the upper wall of the chamber 6 and locked by an annular nut 17 above the same.

15 is an air chamber above the valve 9 which communicates through a small open-

ing 20 with the interior of the case. This chamber is closed at the top by a removable plug 18 inserted in an opening large enough to permit the valve 9, valve seat 16, and lock nut 17 to pass therethrough.

The valve 9 is secured in place by a screw 10. The valve 8 has a downwardly extended stem 11 in the axis of the case and having an axial opening in its lower end slidable in which is a guide pin 12 fixed in the lower part of the case. On the lower end of this stem 11, by means of lock nuts 14, is secured a pot float 13, whereby the balanced valve is opened and closed. In the bottom of this float is a small opening 19 through which the water will slowly pass, but not in sufficient quantity to materially affect the operation of the device when in use, and sufficient to slowly bring the water inside and outside of the float to an equilibrium and thus open the valve when the device is out of use, to remove the water therefrom to such an extent as to avoid danger of freezing, and also to leave only a small quantity in the lower part of the case when the latter is detached and the valve will always be open when there is no steam in the radiator.

In operation the water of condensation accumulating in the case outside of the float will raise the same, and close the valve, the pressure upon opposite sides of the same being equalized by means of a small opening 20, which permits the pressure in the case to be communicated through the chamber 15, valve seat 16, and nut 17 to the valve 9. When the water overflows into the float 15 sufficiently, the float and valve will drop, thus opening a passage through both the upper and lower walls to the chamber 6, and the pipe inserted at 5. When this occurs, the water will be drawn out from the interior of the float, through the lower opening and at the same time air will escape by way of the upper opening. As soon as the float is relieved of the water therein, it will again rise and close the valve until another overflow takes place. When no further water of condensation comes into the device, the water therein will slowly pass through the small opening 19 and thus permit the float to drop and open the valve and drain the water therefrom, until the water is nearly all out of the device and the valve remains open. When the steam is again admitted to the radiators, the air therefrom will then



escape freely through the device until followed by sufficient water to again close the valve, when the operation will be resumed. By adjusting the seat 16, the valve may be made to simultaneously and completely close both openings in the chamber 6.

What I claim is:

1. A radiator valve, comprising a case having an inlet opening, an inwardly projecting chamber in the case having an outlet opening and also having a top opening communicating with the air space of the case, and a bottom opening communicating with the water space of the case, a balanced valve adapted to simultaneously close or open the top and bottom openings of the chamber, a float to open and close the valve, and a tube communicating with the bottom opening and extending downward within the float.

2. A radiator valve, comprising a case separable horizontally near the middle and having an inlet opening in the upper part thereof, an inwardly projecting chamber in the upper part of the case having an outlet opening, and also having a top opening communicating with the air space of the case, and a bottom opening communicating with the water space of the case, a valve to simultaneously close or open both of said top and bottom openings, a pot float attached to the valve, and a tube communicating with the bottom opening and extending downward within the float.

3. A radiator valve comprising a case, an air chamber in the case and communicating with the upper part of the same, a tube in the case and extending into the lower part of the same, a discharge chamber in the case and between the air chamber and tube, and separated therefrom by upper and lower walls having openings therethrough respectively communicating with the air chamber and tube, a valve to simultaneously open or close said openings, and a pot float attached to the valve to open and close the same and surrounding the lower end of the tube.

4. A radiator valve of the class described, comprising a casing having inlet and outlet openings communicating with the interior

thereof near the top, a valve to control said outlet opening and adapted to periodically discharge water from said casing, a pot float in said casing to open the valve when containing water and to close the valve when water is discharged therefrom, said float having a small opening near the bottom thereof to slowly admit water thereto, whereby the valve will be always opened when the device goes out of operation.

5. A radiator valve, comprising a case having a detachable lower portion, and also having a top opening and inlet and outlet openings near the top, a plug to close said top opening, an air chamber beneath the plug and communicating by a restricted opening with the interior of the case, an inwardly projecting chamber beneath the first named chamber and communicating with the outlet opening, said last named chamber also having an upper opening communicating with the air chamber and a lower opening communicating with the tube, a balanced valve to close said openings and having a detachable upper member, an adjustable valve seat in the upper opening, a downwardly projecting stem on the valve, a tube extending downward from the chamber and surrounding said stem, and a pot float attached to said stem and surrounding the tube.

6. A radiator valve comprising, a case having an inlet opening and an outlet opening, an inwardly projecting chamber in the case communicating with the outlet opening and having openings in its respective upper and lower walls, a downwardly projecting tube surrounding the opening in the lower wall, a balanced valve having an upper and lower member closing said openings, the upper member being detachable, an adjustable seat in the upper opening, and a float to operate the valve and surrounding said tube.

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

FRANK A. SIMONDS.

Witnesses:

E. M. BARRICK,  
E. A. VOIGT.