

No. 666,549.

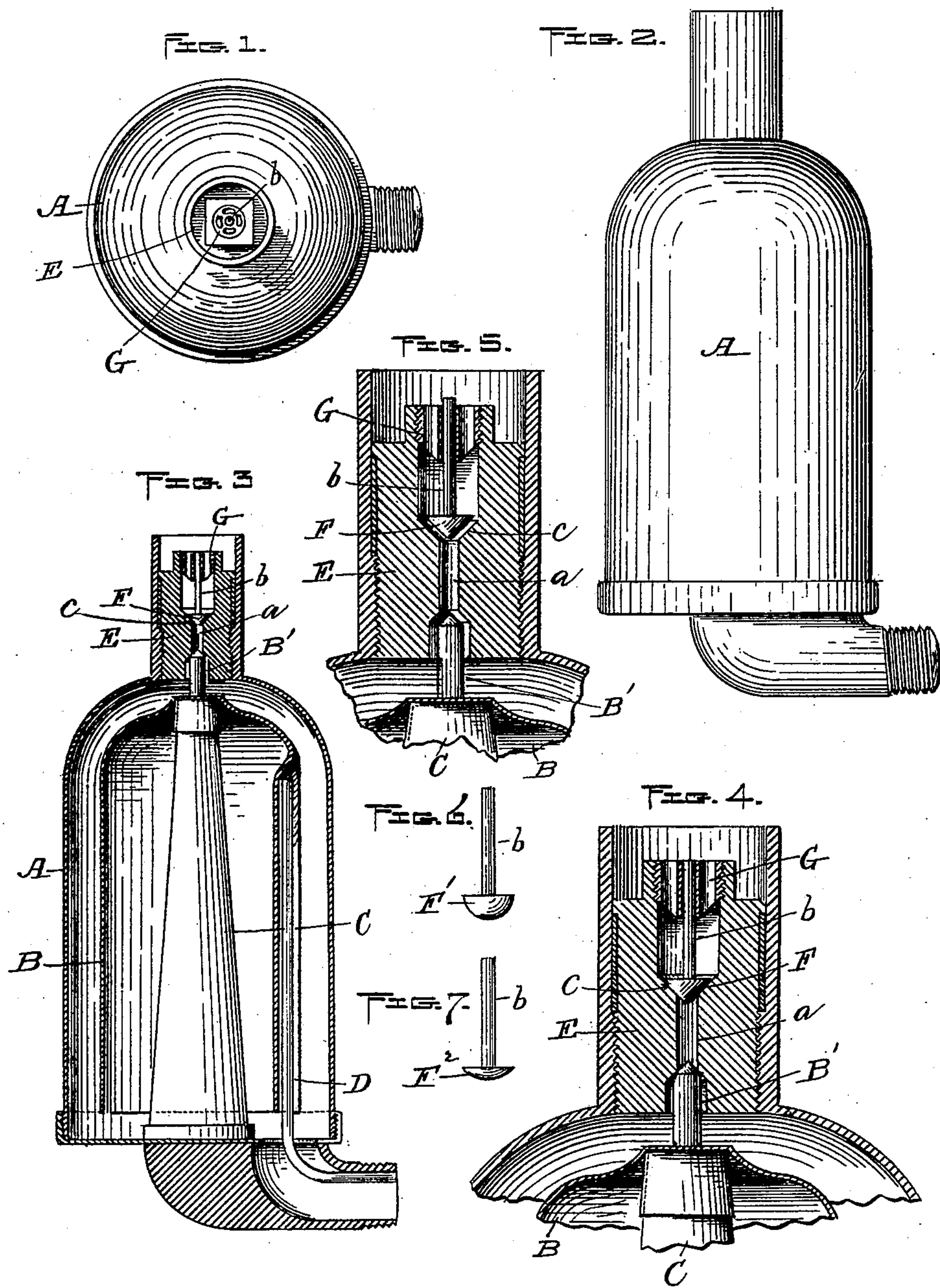
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R. S. PARKS.

AUTOMATIC COMBINED STEAM AND AIR VALVE FOR RADIATORS.

(Application filed Apr. 3, 1900.)

(No Model.)



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ROBERT S. PARKS, OF FITCHBURG, MASSACHUSETTS.

AUTOMATIC COMBINED STEAM AND AIR VALVE FOR RADIATORS.

SPECIFICATION forming part of Letters Patent No. 666,549, dated January 22, 1901.

Application filed April 3, 1900. Serial No. 11,347. (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. PARKS, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in an Automatic Combined Steam and Air Valve for Radiators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figures 1 and 2 represent a plan and side view, respectively, of my said improved valve. Fig. 3 is a central vertical section thereof. Fig. 4 represents, upon an enlarged scale, the upper part of the sectional view of the valve shown in Fig. 3 to more fully illustrate my improvement. Fig. 5 is a similar view to Fig. 4, showing the operating parts of the valve in different positions from those shown in said Fig. 4; and Figs. 6 and 7 represent modifications in the shape of the air-valve, which will be hereinafter described.

My invention relates to what are commonly known as "float air-valves," and is applicable to any float-valve of said class.

The object thereof is to provide a simple and effective automatic valve for steam-radiators for permitting the escape of air from said radiators and also for preventing the admission of as little air as possible thereto; and it consists of the usual outer case, vertical expansion-plug, and float, the latter having a vertical stem whose upper end is adapted to close the bottom opening in the screw-plug, in combination with said screw-plug having a central vertical opening and an annular bevel seat at the upper end of said opening, a vertical perforated nut adapted to be screwed into the top of the aforesaid screw-plug and having a central vertical opening to receive and guide the stem of the valve, and said valve arranged in the chamber of the screw-plug above its vertical opening and adapted to fit and rest by force of gravity upon the seat of said screw-plug to close the upper end of said vertical opening, said valve also being provided with an upward-extending stem, as and for the purpose hereinafter more fully set forth.

To enable others skilled in the art to which my invention appertains to better understand

the nature and purpose thereof, I will now proceed to describe it more in detail.

In the drawings, A represents the outer case or jacket of the valve, B the float, and C the vertical expansion-plug common to valves of this class.

D is a small vertical tube, also used in many valves of this class, for equalizing the steam-pressure in the valve.

To the upper end of the float B is attached the central upwardly-extending stem B' for closing the bottom of the usual central vertical opening *a* in the removable screw-plug E by the expansion of the vertical plug C. As these parts are all of common well-known construction and operation, it will be unnecessary to describe the same in detail.

My invention relates only to the means employed for preventing the admission of air to the valve and radiators when the usual valve is not closed by the steam-pressure and expansion-tube. Said means consist, as previously stated, in combining with the screw-plug E a substantially conical-shaped head F and provided with an upwardly-extending central stem *b*, which fits and slides longitudinally in a vertically-perforated nut G, which is fitted in the upper end of said removable screw-plug E. The vertical opening *a* is made larger in cross-diameter at the top to receive the head F than at the central portion thereof, not only to receive said head, but also to form a substantially conical-shaped annular shoulder or seat *c*, corresponding in shape to the bottom of head F for said head to fit against, as is shown in Figs. 3 and 4 of the drawings. By thus forming said head at its seat it is obvious that a very close tight-fitting joint and seal are effected between the two parts on account of the large amount of contact-surface between them, the whole bottom surface of the head, as will be observed, resting on the seat *c*, formed on the screw-plug.

While I prefer a conical-shaped head F, it is obvious that it is not essential to the carrying out of my invention, and I therefore do not limit myself thereto, as, for instance, if desired, the bottom of said head may be made hemispherical in shape, as is shown at F' in Fig. 6, in the form of a segment, as is shown at F² in Fig. 7, or of any other desired shape.

By the use of my improved automatic air-valve in connection with an ordinary steam-valve it is obvious that the air is permitted to escape freely when forced forward by the influx of steam in first starting up the heating apparatus, and it also effectually prevents the admission of air when the temperature and consequent pressure of the steam in said apparatus diminish. It will also be apparent that by the employment of such a valve whose action is automatic, positive, and perfect in shutting off the admission of air a radiator will not cool off as rapidly as if such an air-valve were not provided.

The head or valve *c* being free to move vertically rests of its own weight on its seat, and being guided in its vertical movements, as previously described, forms a perfect tight-fitting joint on said seat, as aforesaid, while at the same time it may be easily raised by the air-pressure to allow the free escape thereof when the apparatus is first started up, as hereinbefore described.

I find in practice that by providing all the radiators in a building with my improved device it is possible to obtain substantially the results and advantages of both steam and hot-water heating, for when a temperature is required such as would be necessary in cold winter weather the apparatus can be forced a little and that temperature obtained, while in spring and fall, a less temperature being required, the water can be vaporized at a temperature less than that required for winter weather, with a temperature in the radiators corresponding to the number of inches of vacuum in the system. I have also found

in practice that by the use of my device I have been able to obtain a vacuum of about twenty inches, and at the end of five hours, without replenishing the apparatus, still had a vacuum of five inches, which is of course due to preventing the air entering and cooling off the system, as is common in the old style of radiator-valves.

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

In a valve, the outer case *A*, vertical expansion-plug *C* and float *B*, the latter having the vertical stem *B'*, whose upper end is adapted to close the bottom of the central, vertical opening *a* in the screw-plug *E*; in combination with said screw-plug *E*, having said central, vertical opening *a* and the annular, bevel seat *c* at the upper end of said opening; the vertically-perforated nut *G*, adapted to be screwed into the top of screw-plug *E* and having a central, vertical opening to receive and guide the stem *b* of valve *F* and said valve *F* arranged in the chamber of screw-plug *E* above vertical opening *a*, and adapted to fit and rest by force of gravity upon the seat *c* of said screw-plug to close the upper end of vertical opening *a*, said valve also having a vertical, upwardly-extending stem fitting as aforesaid in the central, vertical opening in nut *G*, substantially as and for the purpose set forth.

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