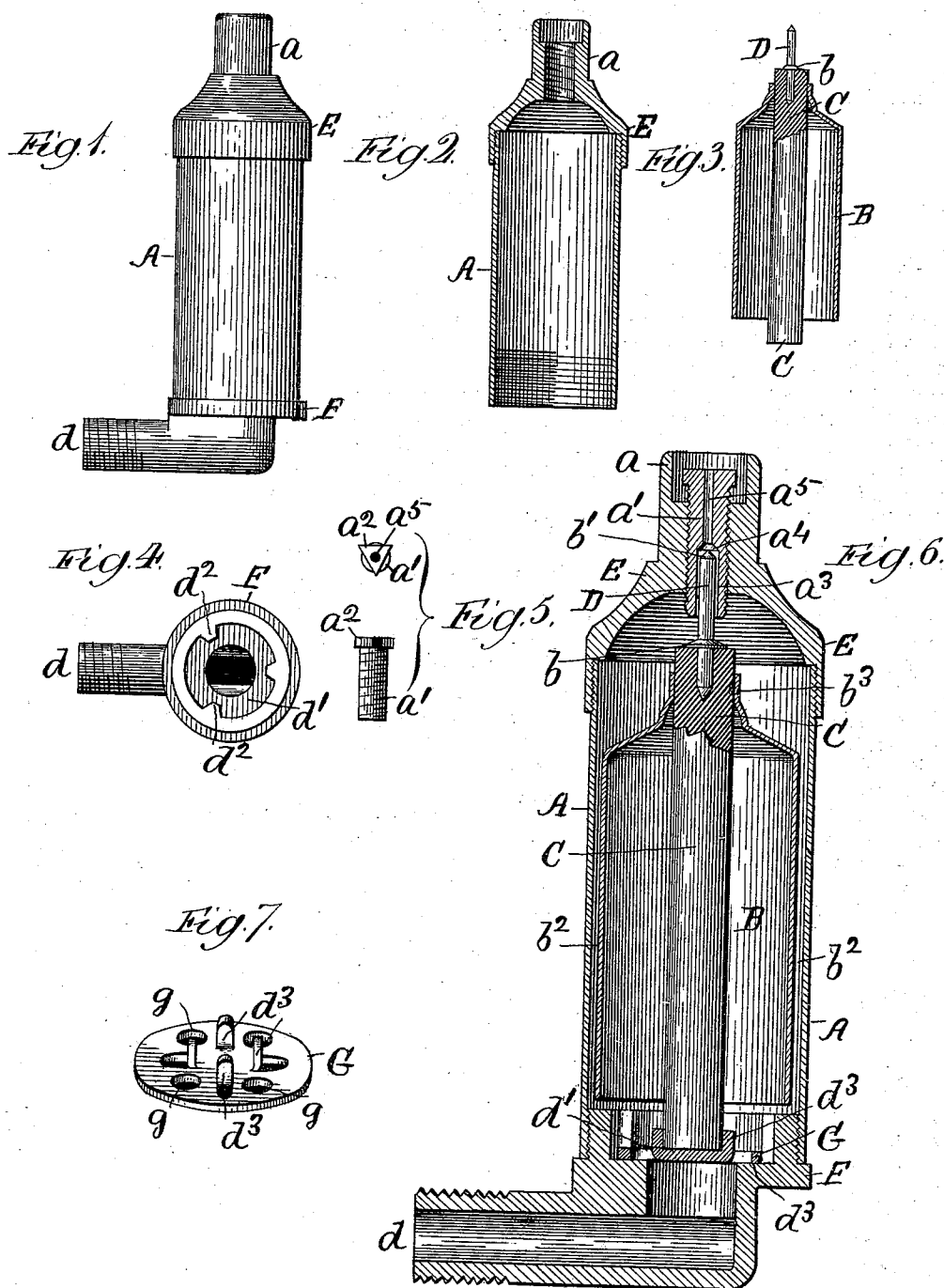


(No Model.)

G. M. DAVIS.
AIR VALVE.

No. 507,650.

Patented Oct. 31, 1893.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE M. DAVIS, OF CHICAGO, ILLINOIS.

AIR-VALVE.

SPECIFICATION forming part of Letters Patent No. 507,650, dated October 31, 1893.

Application filed October 8, 1892. Serial No. 448,212. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. DAVIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Air-Valves, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in the class of automatically operating air-valves used on steam-radiators.

In the drawings:—Figure 1 is a side elevation; Fig. 2, a longitudinal section of the cylindrical inclosing case, and contracted neck; Fig. 3, a longitudinal section of the shell-float, with the expansion stem and valve in place; Fig. 4, a plan of the base part closing the lower end of the exterior case; Fig. 5, a plan and elevation of the adjusting-screw; Fig. 6, an enlarged longitudinal section with the different parts in position; and Fig. 7, a perspective of a spring-plate seated in the base, and supporting the lower end of the expansion stem.

A is the inclosing case, B the float, C the expansion-stem, and D the spindle-valve.

The exterior case is preferably of the cylindrical form shown, and is closed at the upper end by cap, E, terminating in the contracted neck-extension a , in which is inserted the adjusting-screw a' , having a triangular shaped head a^2 . This screw is provided with the valve-chamber a^3 , starting inwardly from the lower end to the valve-seat a^4 . The air-escape orifice, a^5 , is a continuation, outwardly, through the upper end of this screw. The triangular head of the adjusting-screw, (Fig. 5,) in practice, is placed just far enough below the mouth opening of the neck a (Fig. 6) to prevent it from being turned except by means of a suitable key-wrench. Where the adjusting-screw is simply grooved in the upper end, to be manipulated with the ordinary screw-driver, the screw is so often tampered with after being once properly set as to cause great annoyance. This is obviated by the use of some peculiar shaped head for the screw; the triangular form being preferred.

The spindle-valve, D, is provided, near its longitudinal center, with the stop-shoulder b .

The lower part of this valve, up to the shoulder, is permanently fixed in the upper end of the expansion-stem C. The upper part of the valve extends up into the valve-chamber in the adjusting-screw; the conical end, b' , being adapted to fit the valve-seat a^4 in closing the air-escape passage. Sufficient space is left between the shoulder on the valve and the lower end of the adjusting-screw for the endwise movement of the expansion-stem and valve fixed therein.

The metallic float, B, consists of a cylindrical shell of a less diameter than the inclosing case, so as to provide the annular space, b^2 , between the adjacent surfaces for the passage of the escaping air forced out of the radiator. This float is open at the lower end; the upper end terminating in the contracted neck, b^3 , tightly embracing the expansion-stem, so as to secure the float rigidly to said stem at a point below its upper end. This feature of securing the float and stem rigidly together, provides for a simultaneous movement and positive action of these parts, and thus rendering them less liable to be affected by corrosion and other causes incident to devices of this character.

The chambered base, F, closing the lower end of the exterior case, is provided with the screw-threaded tubular extension, d , which is inserted in the radiator in attaching the device. This chambered base is provided, interiorly, with the seat, d' , and a number of ribs d^2 , arranged at intervals. A spring-disk-plate, G, (Figs. 6 and 7,) is loosely inserted in the chambered base and rests on the seat d' . This plate is punched through, in a number of places, from the under side; the punched-out parts adhering at one end and being turned upwardly and inwardly in the direction of each other to provide the vertical lugs, d^3 , which loosely embrace the lower end of the expansion-stem, resting on the disk-plate. This arrangement permits of a free endwise expansion of the stem C, but prevents a lateral play or movement, thus always retaining the stem and float in a central position with reference to the inclosing case and insuring a free and sensitive action of the stem, float, and valve parts. The upper end of the spindle-valve, extending into the adjusting-screw, also serves as a guide to retain the float and

stem in a true central position and entirely out of contact with the case. The spring-plate also allows the stem to expand in the opposite direction so as not to force the valve so tightly against its seat as to stick. This disk-plate is provided with a number of apertures, *g*, in addition to those formed by punching out the metal to provide the lugs, *d*³, so that the escaping air has a free upward passage. These apertures also form drip passages.

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

1. In an air valve, the inclosing casing, the cylindrical float within the same having the spindle valve at its upper end, the cap in the casing forming a guide for said spindle valve, and the disk plate resting on the base of the casing and having upward projections which embrace and guide the float, all combined substantially as described.

2. The inclosing casing having a cap in which the threaded adjusting screw has its seat, the cylindrical float valve having a spindle which enters a seat in said screw, and the perforated spring plate within the casing hav-

ing upwardly projecting guides which embrace the float, and having drip passages, all combined substantially as described.

3. The outer casing having the adjustable screw with valve seat therein, the cylindrical float valve consisting of a hollow shell open at the bottom and having a central spindle, and the spring plate having guides which embrace said spindle and having drip passages, the parts constructed and relatively arranged substantially as described.

4. In an air-valve, the combination of the exterior case, the chambered base, the perforated spring-plate, seated in said base and provided with upturned lugs, as described, the expansion-stem, the shell-float rigidly secured thereto, the adjusting-screw, having an air-passage therethrough and a valve-seat therein, and a spindle-valve, one end of which is fixed in the expansion-stem, and the other extending up into the adjusting-screw, substantially as set forth.

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Witnesses:

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