

D. F. MORGAN.
VALVE FOR RADIATORS.
APPLICATION FILED APR. 27, 1905.

Fig. 1.

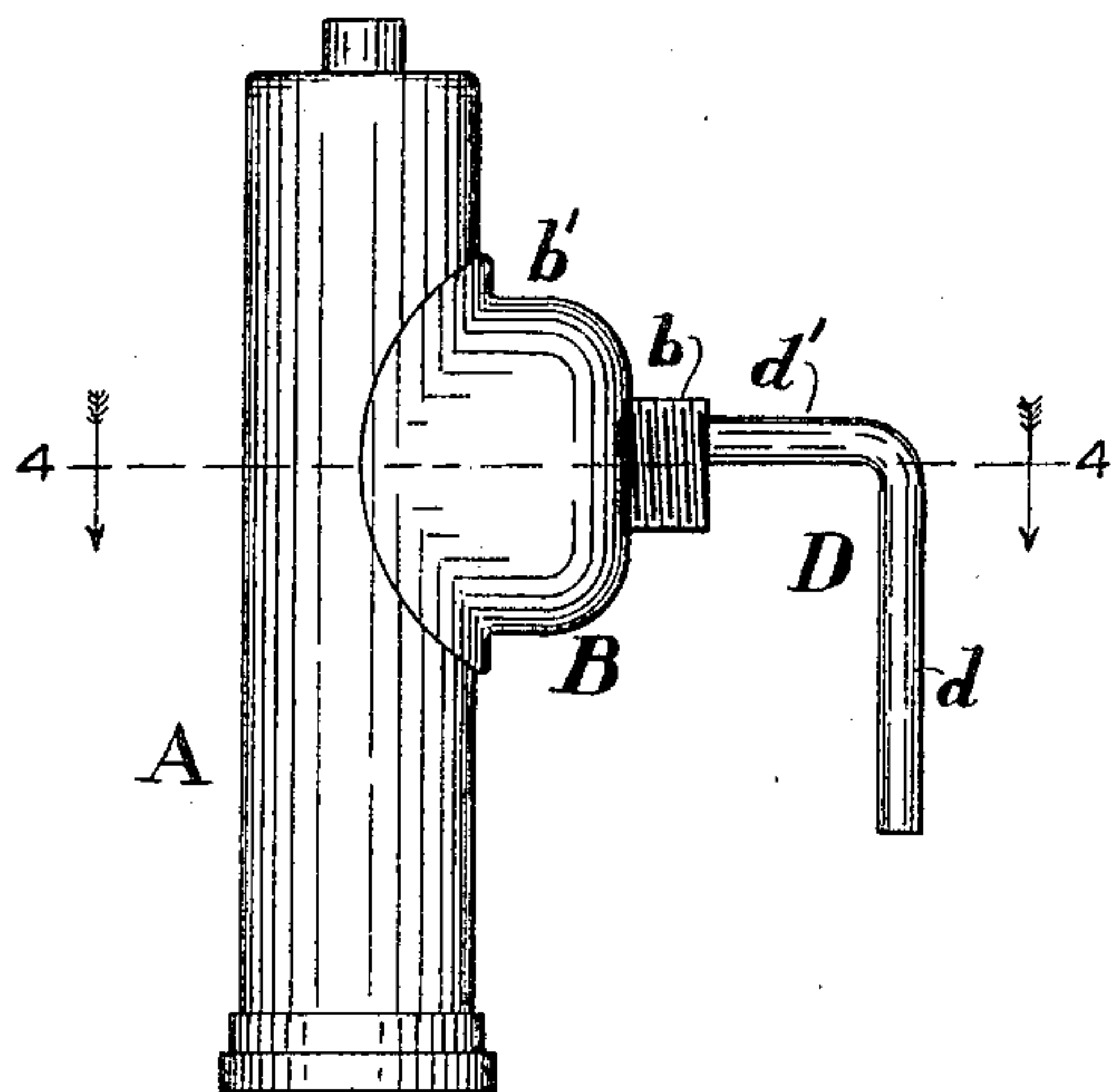


Fig. 2.

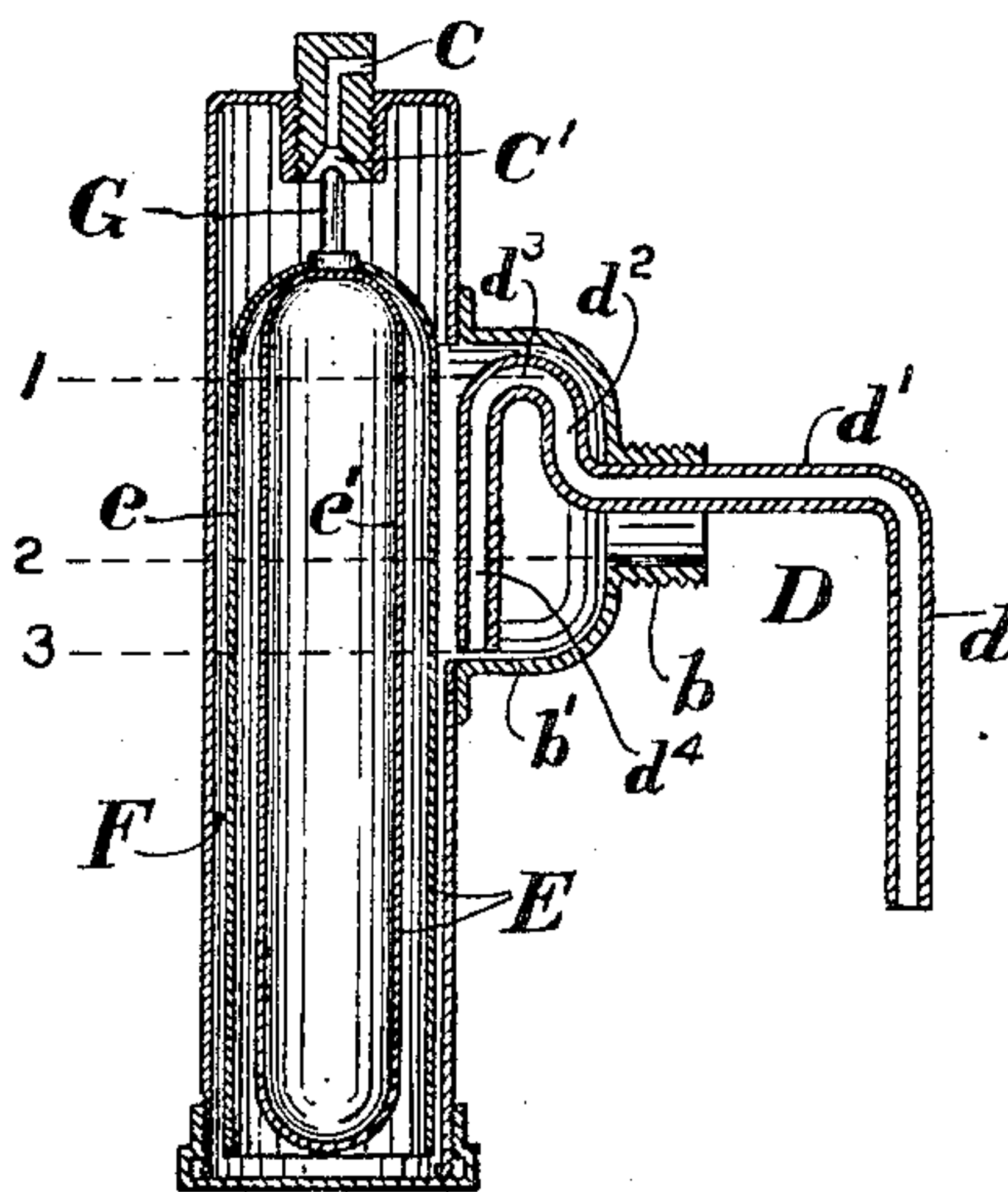


Fig. 3.

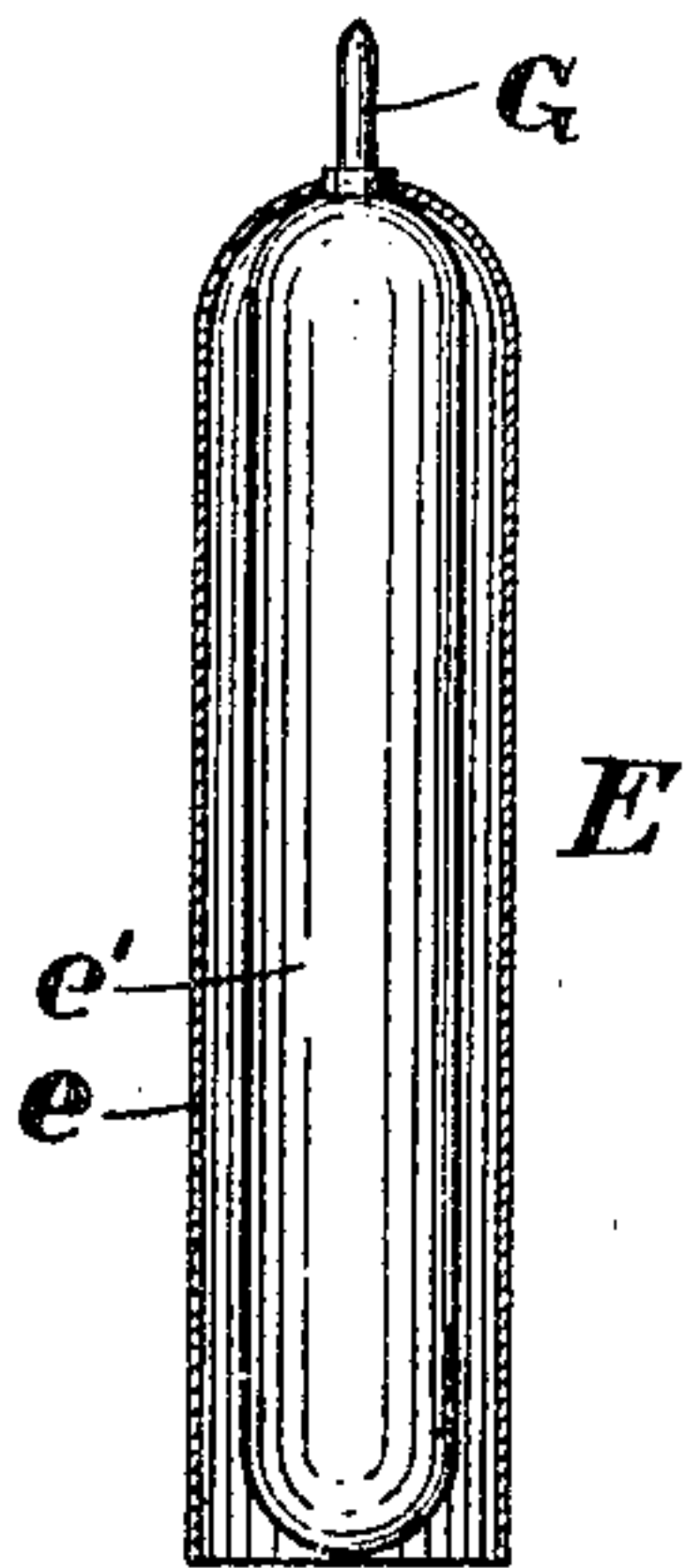
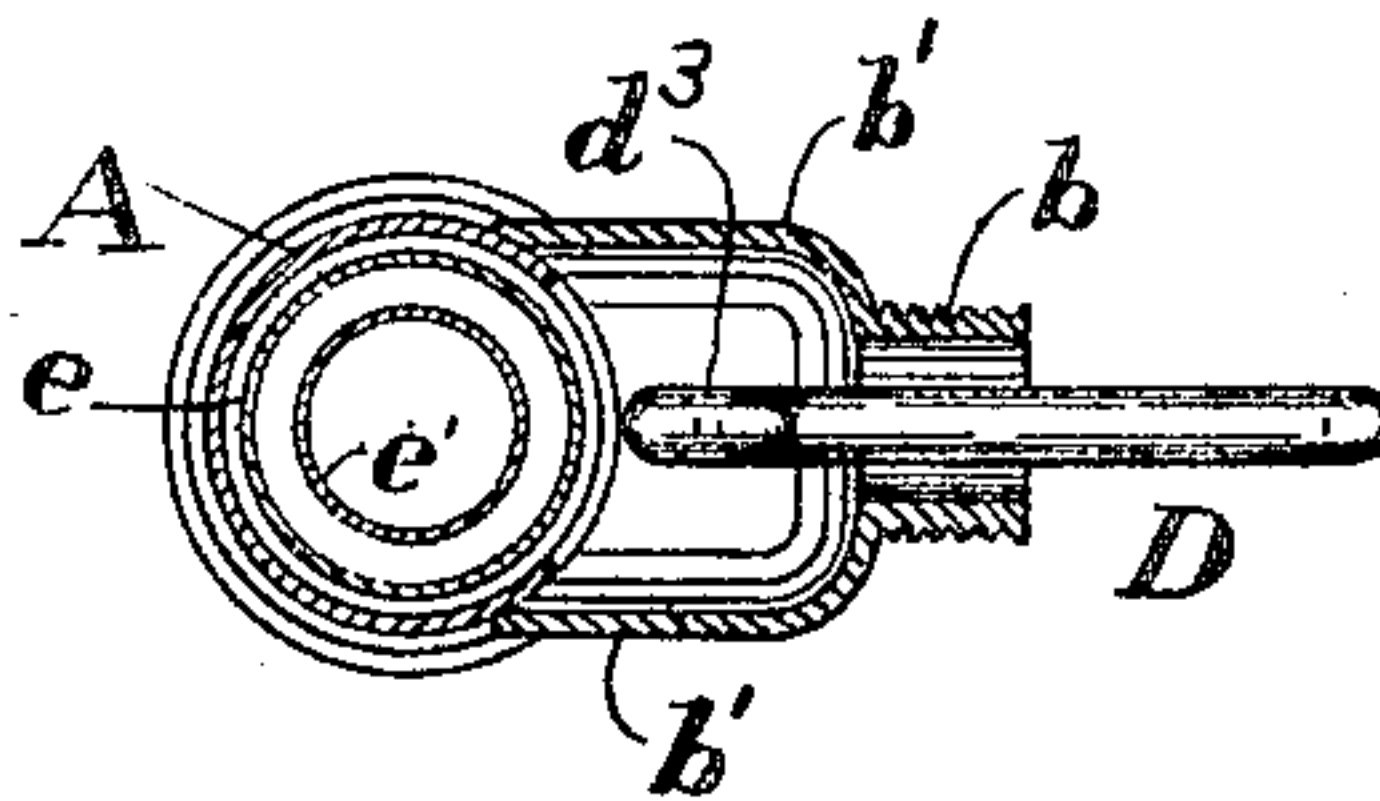


Fig. 4.



Witnesses.

J. H. Muller
C. A. Adams.

Inventor.

Doctor Franklin Morgan,
By Charles Turner Brown,
Atty.

UNITED STATES PATENT OFFICE.

DOCTOR FRANKLIN MORGAN, OF CHICAGO, ILLINOIS.

VALVE FOR RADIATORS.

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Specification of Letters Patent.

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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 Valves for Radiators, 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 make and use the same.

This invention relates to valves placed on radiator and other fluid heating devices to automatically vent the same of air and to prevent the escape of steam and water therefrom; and the object of this invention is to obtain an air-valve for radiators which will require no adjustment, which will be operative in the same manner when placed on an ordinary heating device, on one which is "extra dry," as it is termed because of its location, or on an extra wet radiator or other heating device.

A further object of the invention is to obtain an air-valve which is simple in construction, easily placed in operative position, not liable to get out of order, and slightly in appearance.

To those skilled in the art of steam-heating it is well known that some radiators in a steam-heating system are liable to become "water-logged," as it is termed—that is, that because of the position of a radiator in the system it is peculiarly liable to become filled with water of condensation—and it is also well known that water of condensation does not contain therein the quantity of air which is usually to be found in water and that when such water of condensation is in contact with air for any considerable time, particularly when under pressure, as in the ordinary steam-heating system, such air becomes absorbed by the water, and it is also well known to those skilled in the art that where air is used as an expansible member in air-valves for radiators such air in a wet or water-logged radiator becomes wholly or partially absorbed by the water of condensation in the float-chamber of the valve and that perfect working of the valve under all the conditions which occur is thereby prevented.

In the drawings referred to, Figure 1 is a side elevation of an air-valve for radiators embodying this invention. Fig. 2 is a vertical sectional view of the device illustrated

in elevation in Fig. 1. Fig. 3 is a vertical sectional view of the float forming an element in an air-valve embodying this invention, and Fig. 4 is a sectional view on line 4 4 of Fig. 1 viewed in the direction indicated by the arrows.

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

A is the casing of the device. B is the stem thereof. Stem B is of two diameters, as indicated by the letters b b' . Part b of the stem is screw-threaded to fit corresponding screw-threads in a hole in the wall of the radiator to which the device is attached.

C is the outlet of the casing, A and such outlet is provided with valve-seat C' .

D is a siphon provided with leg d , which extends into the radiator or other heating apparatus to which the device is attached.

d' is the horizontal part of the siphon D.

d^2 is an upward bend to siphon D within part b' of stem B.

d^3 is the turn, and d^4 is the downwardly-extending short leg, of the siphon, also contained in part b' of stem B.

E is a float and comprises the closed inner part e' , which is floatable, and the outer part e , which is open at its bottom.

F is a float-chamber.

G is a valve attached to float E, so that the rising of the float raises the valve to its seat C' . The valve G is secured to part e of the float E. Part e' may be attached to part e or detached therefrom, as preferred. The closed part e' of the float is of sufficient size so that when water of condensation is contained in the float-chamber F to about the level of broken line 2, Fig. 2, such closed part will have sufficient buoyancy to raise part e and seat valve G, even if the space between parts e and e' of the float is filled with water and no air whatever therein. The specific gravity of float E is such that when water of condensation is contained in float-chamber G to about the level indicated by broken line 2 2, Fig. 2, and steam is contained in the valve-casing above such level and steam or air is contained in the float between parts e e' the float will rise and seat valve G. The specific gravity of float E is such that when water of condensation is contained in float-chamber F to about the level of the broken line 3 3 in Fig. 2 such float will not rise and valve G will be unseated.

The operation of this valve is substantially as follows: When the valve-chamber F and the space between part *e* and part *e'* of valve E contain air, the admission of steam to the radiator to which the device is attached forces air (if any is contained therein) from the radiator into and through the casing of the valve. When the radiator is emptied of the air therein, or partially so, steam or water is forced into the valve-casing, and if water is forced therein to, say, the level of lines 1 or 2 the float will rise and seat the valve G. When water in the casing of the valve rises to the level of line 1, the float remains up and valve G remains seated until the water in the radiator falls below the short leg of the siphon, at which time the siphon D will commence to flow and will continue to flow until the level of the water in the float-chamber F is lowered to about the level of line 3, when the valve will be down and valve G will be unseated. If additional water of condensation is forced into the float-chamber F, float E will be raised and the valve G again seated, and if steam enter the valve-casing the air (or water) in the space between part *e* and part *e'* of the float E will be expanded (some of the water in the upper part of such space will be converted into steam) and sufficient water of condensation will be driven from such space into the well F around the float E to raise the level thereof to about line 2, and the float will rise and seat valve G. The float will remain seated so long as steam is in the valve-casing, and some of the contents of the space between parts *e e'* of float E are expanded by the heat thereof, with the level of the water surrounding the float at about the line 2. Any rush of water into the valve-casing raising the level thereof to near the line 1 will, upon the fall of the same to below the short leg thereof start the siphon to flowing and lower the level of the water in the float-chamber to near the line 3, and thereupon the float will fall, and thereafter any air in the radiator may flow into the valve and out through the outlet C. When such air is followed by steam, the action hereinbefore described will be repeated.

The upward bend *d*² in siphon D is there placed to obtain such a difference in height between the levels indicated by lines 1 and 2 as will prevent the starting of the siphon by the slow rise of the level above line 2 from the constant precipitation of water of conden-

sation from the steam contained in the valve-casing after the air and water of condensation in the radiator have been expelled therefrom. Intermittent action of the air-valve embodying this invention is thereby prevented.

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

1. In an air-valve for radiators, the combination of a casing provided with a well, an inlet and an outlet, with a valve-seat to the outlet, of a two-part float, and a valve on the float coacting with the valve-seat, such two-part float comprising a closed floatable part and a part thereover of larger diameter and open at the bottom; substantially as described.

2. In an air-valve for radiators the combination of a casing provided with a well, a screw-threaded stem to the casing, such stem provided with a passage of more than one diameter therethrough, such passage constituting the inlet to the casing, and such casing provided with an outlet having a valve-seat thereto, a two-part float comprising an inner closed part and an outer part open at the bottom in the casing, a valve on the float coacting with the valve-seat, and a siphon in the stem, such siphon provided with an upward bend and a short leg in the part of the stem of larger diameter, a horizontal part in the part of the leg of smaller diameter and a longer leg arranged to come within the coil of the radiator to which the air-valve is attached.

3. In an air-valve for radiators the combination of a casing provided with a well, a screw-threaded stem to the casing, such stem provided with a passage of more than one diameter therethrough, such passage constituting the inlet to the casing, and such casing provided with an outlet having a valve-seat thereto, a float in the casing, a valve on the float coacting with the valve-seat, and a siphon in the stem, such siphon provided with an upward bend and a short leg in the part of the stem of larger diameter, a horizontal part in the part of the leg of smaller diameter and a longer leg arranged to come within the coil of the radiator to which the air-valve is attached.

DOCTOR FRANKLIN MORGAN

In presence of—

GUY F. MORGAN,
JOS. D. MULLEN.