

(No Model.)

J. P. MARSH.

AIR VALVE FOR RADIATORS.

No. 390,244.

Patented Oct. 2, 1888.

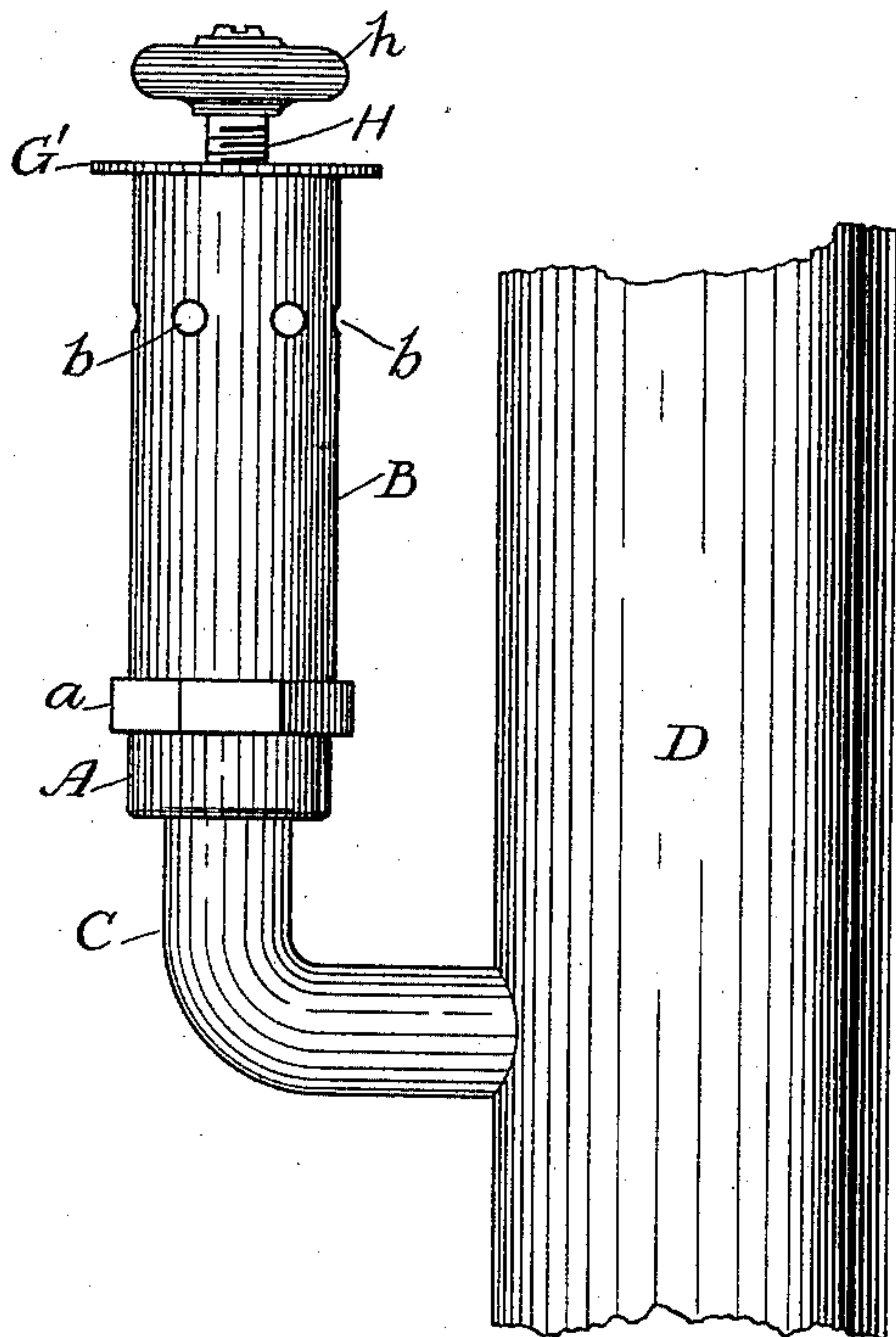


Fig. 1.

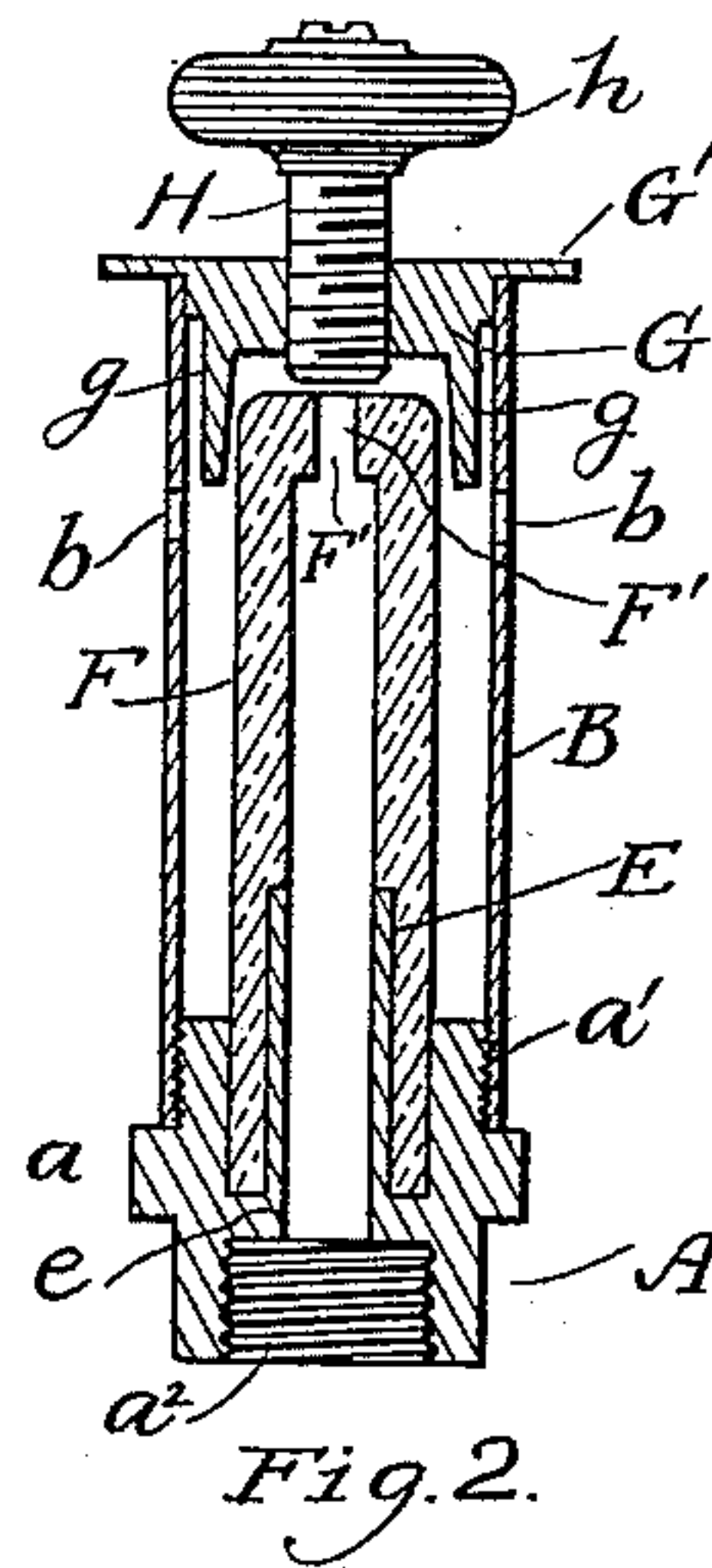


Fig. 2.

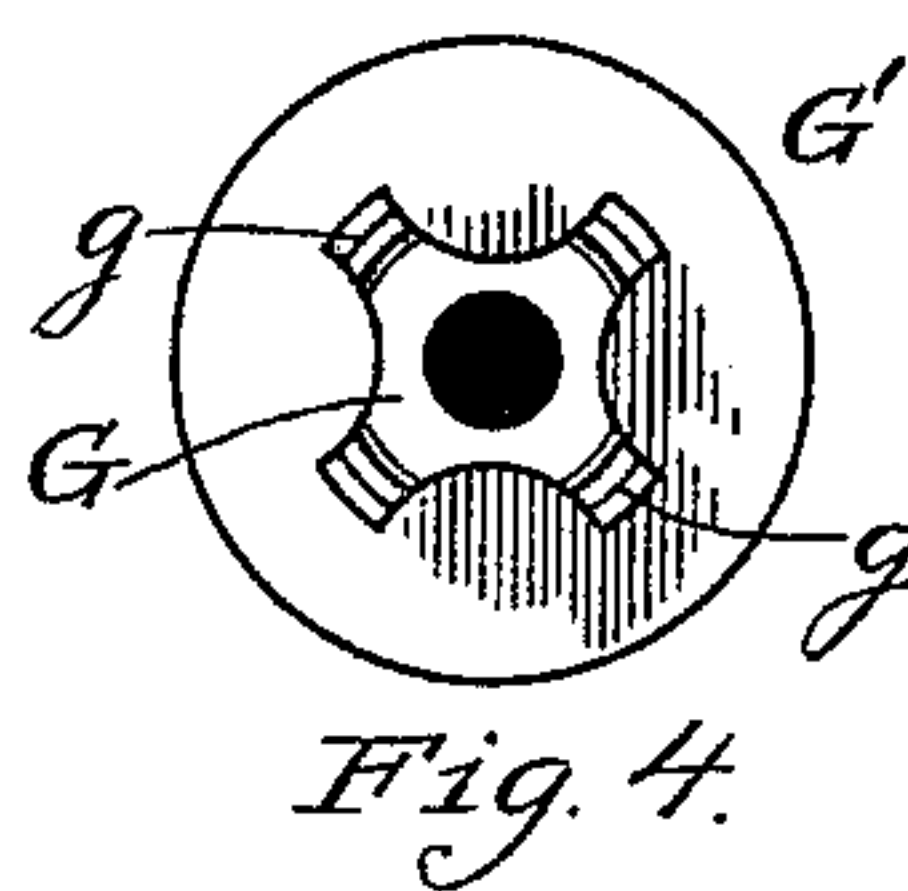


Fig. 4.

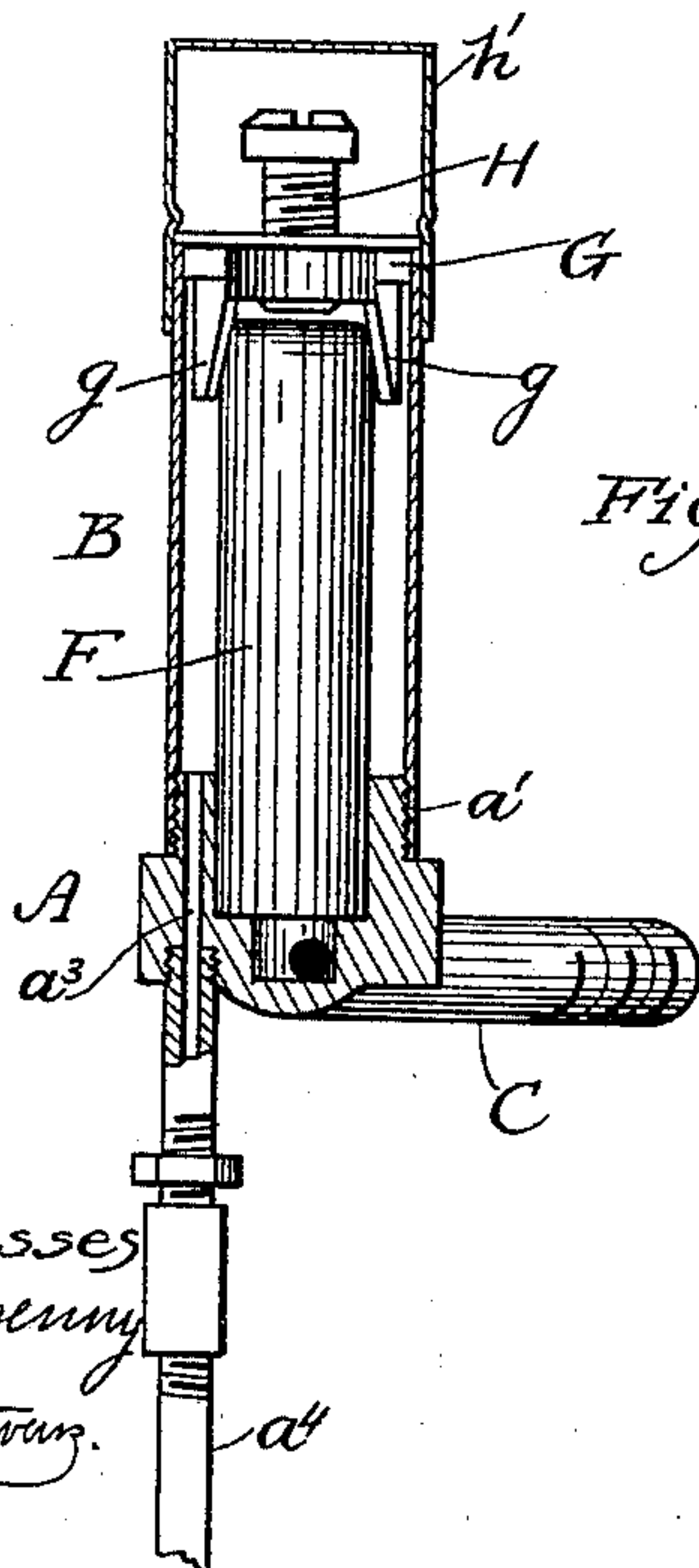


Fig. 3.

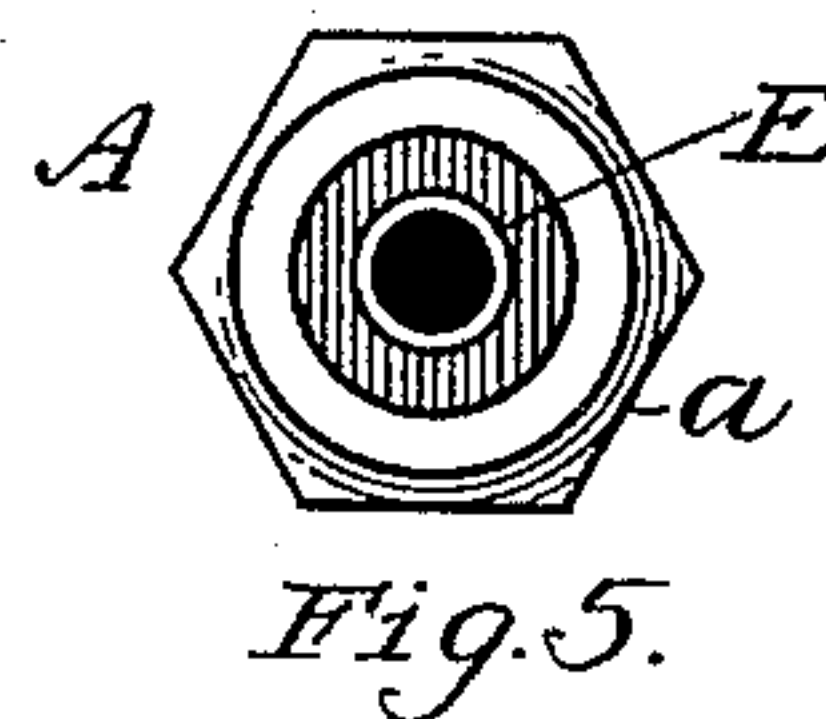


Fig. 5.

Witnesses  
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# UNITED STATES PATENT OFFICE.

JAMES P. MARSH, OF CHICAGO, ILLINOIS.

## AIR-VALVE FOR RADIATORS.

SPECIFICATION forming part of Letters Patent No. 390,244, dated October 2, 1888.

Application filed March 6, 1888. Serial No. 266,369. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES P. MARSH, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful

5 Improvements in Air-Valves for Radiators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which—

10 Figure 1 is a side view of my improved valve as applied to one of the pipes of a radiator. Fig. 2 is a central vertical sectional view of said valve. Fig. 3 is a like sectional view showing a modification thereof. Fig. 4 is a

15 bottom view of the top plate or plug, showing the guiding-prongs thereon; and Fig. 5 is a top view of the base, showing the annular socket in which the expanding material is placed.

20 Like letters of reference indicate like parts in the different figures.

The object of my invention is to provide an air-valve for radiators which shall be cheap, simple, and compact in its construction, and

25 reliable, durable, and effective in its operation.

To this end said invention consists in certain details of construction, as hereinafter more particularly described, and definitely pointed out in the claims.

30 Referring to the drawings, A represents a short cylindrical piece of metal, a portion, *a*, of which is polygonal in form, as shown in Figs. 1 and 5. Said portion forms the base of my improved valve, and the exterior is screw-

35 threaded, as shown at *a'* in Figs. 2 and 3, to receive a correspondingly-threaded cylindrical shell, B, which is intended to resist the pressure of the expanding material, as well as to form an evaporating-chamber, as hereinafter

40 stated. Said base A is preferably interiorly threaded at its lower end, as shown at *a''*, Fig. 2, to receive an induction-pipe, C, Fig. 1, which is bent in the form of an elbow and tapped into one of the pipes D of a radiator.

45 Within the shell A, and concentric therewith, is cast or otherwise formed a tube, E, Figs. 2 and 5, extending upwardly from a part, *e*, which is integrant with the base A. Thus an annular space is formed between the tube

50 E and the body of the shell A. Within said annular space is inserted, preferably by com-

pression, a short tube, F, of vulcanite or other analogous composition or material adapted to be expanded by heat. The bore of the tube F is made large enough to receive the tube E 55 throughout the length of the latter, and is then preferably reduced, as shown in Fig. 2, to correspond to the interior of the tube E to a point near its top, when it is again reduced to form a vent, F', Fig. 2. 60

Soldered or brazed within the cylindrical shell B is a metal plug, G, to the top of which is secured a plate, G', which, by preference, extends laterally beyond the circumference of the shell. The plug G is bored and screw- 65 threaded to receive a screw-valve, H, which is by preference provided with a thumb-piece, *h*. The top of the expanding tube F forms a valve-seat for said valve, the latter being opposite to and so adjusted as to cover and nor- 70 mally close the vent F'. To insure the centering of the top of said tube and preserve its axis in alignment with that of the valve, I form depending spurs *g* upon the plug G, so as to surround the upper end of said tube. 75

The shell B, when a drip-tube is not employed, is provided with a series of perforations, *b*, near its top, and the annular chamber between said shell and the tube F forms an evaporating-cup for any water which may 80 escape through the vent, the vapor from which passes off through the perforations *b*.

By constructing the base in the manner set forth, with the tube E and the annular space surrounding it, I am enabled to employ a vul- 85 canite or other composition or non-metallic expanding tube the capacity for expansion of which is much greater than that of metal, thus enabling me to make said valve more compact, it being only about one-third the length 90 of a valve made wholly of metal.

The materials which I prefer to employ in making said tube in order to obtain the most satisfactory results are as follows: india-rub- 95 ber or caoutchouc, (about fifty per cent.,) the usual amount of sulphur to vulcanize the same, and plumbago in a sufficient quantity to impart solidity and wearing qualities thereto. The material described is not only adapted to expand laterally to an indefinite degree, but, 100 by reason of such lateral expansion and the qualities of the material so combined, the valve-



seat is not liable to be injured by the pressure of the valve thereon in case it is screwed up too tightly, as would be the case were the tube made of metal. Said tube F, being compressed  
5 within the annular space around the tube E, when heated fills said space by lateral expansion, so as to insure at all times a steam-tight joint, which overcomes what would otherwise prove an important objection to the use of a  
10 non-metallic expansion material. Moreover, in the construction shown I am enabled to utilize the shell B not only as an evaporating-chamber, but as a means for resisting the expansion of the tube F. The guides *g* serve to  
15 insure a perfect seating of the valve, while they permit the free escape of air.

In Fig. 3 I have shown a modification of said invention. Instead of connecting the induction-pipe C, as shown in Fig. 1, it is tapped  
20 into the side of the base A, and a duct, *a*<sup>3</sup>, is formed to communicate with the annular space around the tube F and connect it with a drip-tube, *a*<sup>4</sup>. The valve H may have a screw-top, and a cap, *h*', may be provided to protect it.

25 Having thus described my invention, I claim—

1. In an air-valve, the combination of the base A, having an interior upwardly-projecting tube, E, integrant and concentric there-  
30 with, an expansion-tube of vulcanite or analogous composition, having its base located within the annular space surrounding said interior tube, a cylindrical shell detachably secured to said base and inclosing said expan-

sion-tube, a top plate or plug, G, secured 35 within said shell, and a screw-valve tapped through said plug in operative proximity to the outlet of said expansion-tube, whereby said screw-valve may compress the composition tube into its annular seat when said tube is 40 expanded, and the lateral expansion of the tube may fill said annular space and insure a tight joint, substantially as shown and described.

2. In an air-valve, the combination of the 45 base A, having an interior upwardly-projecting tube, E, integrant and concentric therewith, an expansion tube of vulcanite or other analogous composition, having its base secured within the annular space surrounding said in- 50 terior tube, a cylindrical shell detachably secured to said base and inclosing said expansion-tube, a top plate or plug, G, secured within said shell, a screw-valve, H, tapped through said plug in operative proximity to the out- 55 let of said expansion-tube, and the guide-prongs *g*, whereby the tube may be guided and sediment may be expelled therefrom between the guide-prongs, substantially as shown and described. 60

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 2d day of March, 1888.

JAMES P. MARSH.

Witnesses:

D. H. FLETCHER,  
J. B. HALPENNY.