

(No Model.)

2 Sheets—Sheet 1.

J. P. MARSH.
AIR VALVE FOR RADIATORS.

No. 353,639.

Patented Nov. 30 1886.

Fig. 2.

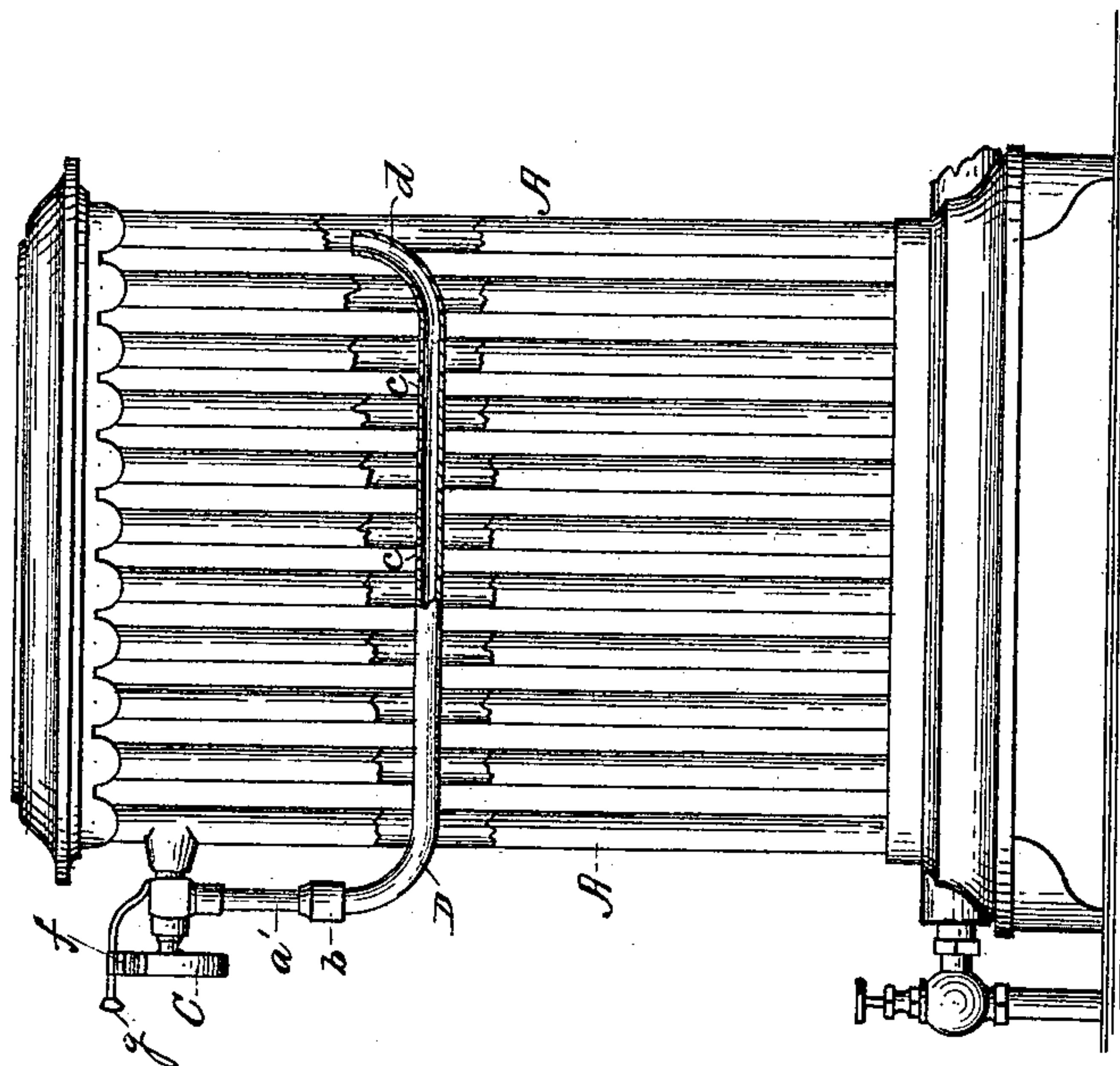
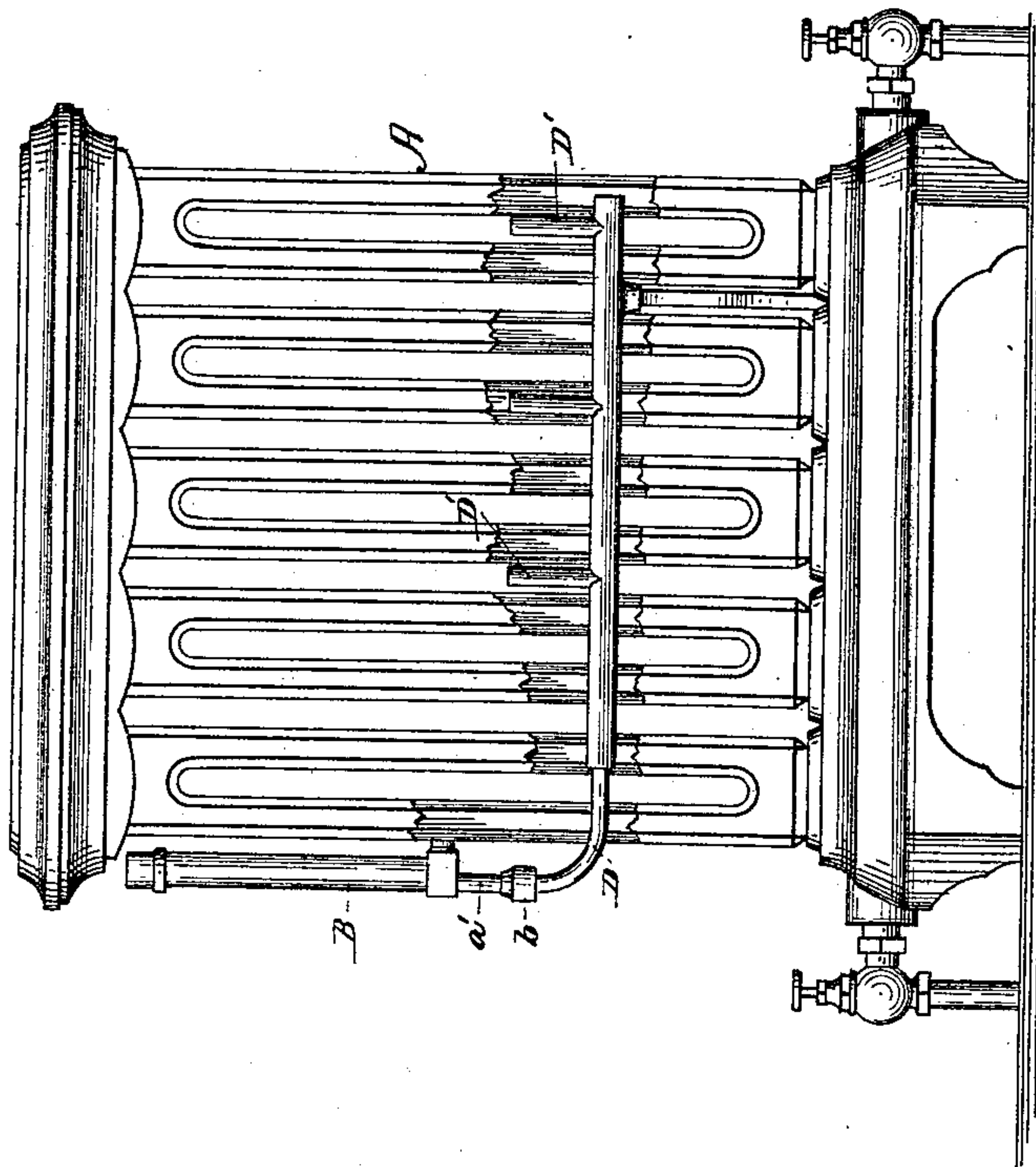


Fig. 1.



Witnesses.

*Henry Frankfurter
Adolf Wiszogh.*

Inventor.

James P. Marsh

per. *F. F. Warner*
his Attorney.

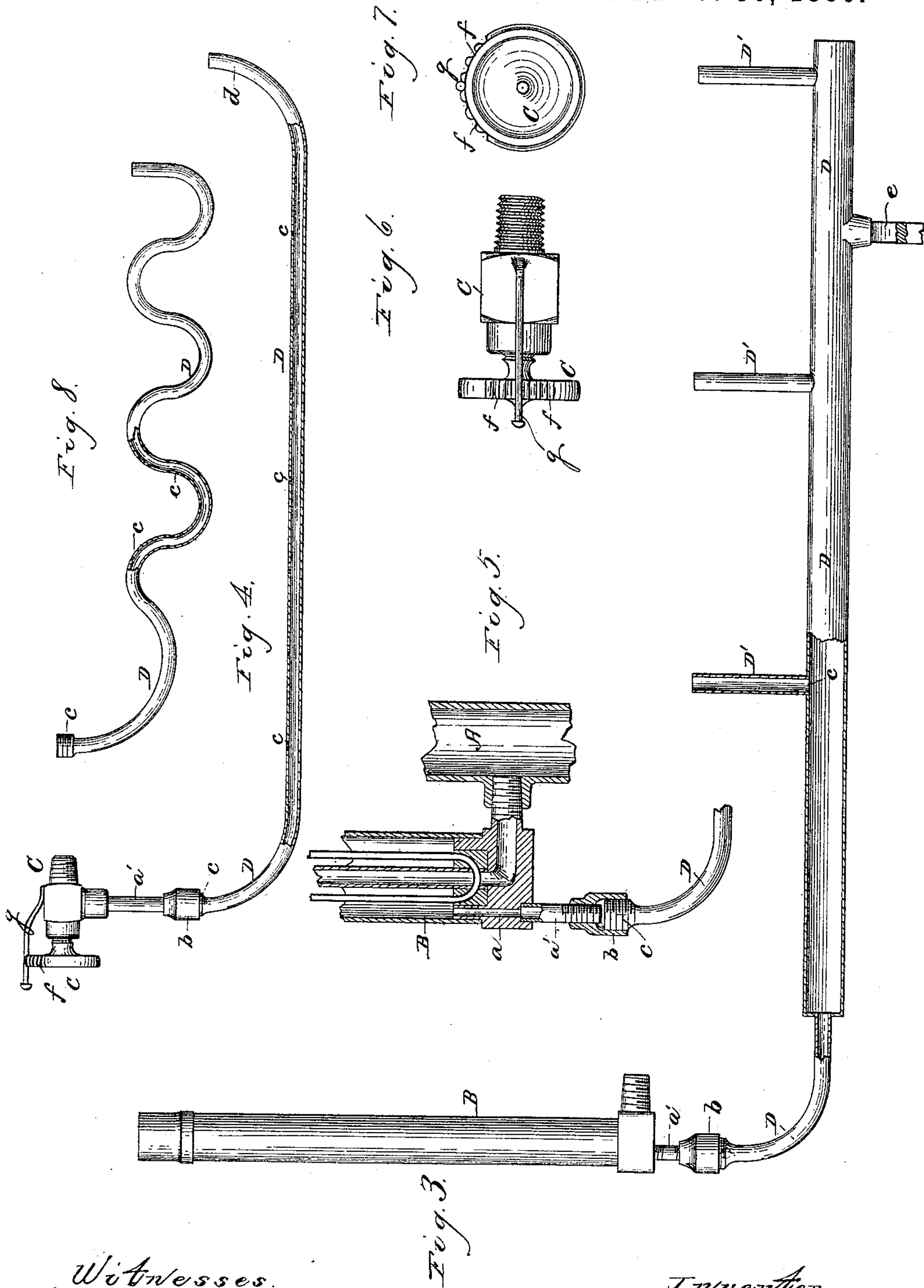
(No Model.)

2 Sheets—Sheet 2.

J. P. MARSH.
AIR VALVE FOR RADIATORS.

No. 353,639.

Patented Nov. 30, 1886.



Witnesses.
Henry Frankfurter.
Adolf Haezler.

Inventor.
James P. Marsh
per *F. F. Warner*
his Attorney.

UNITED STATES PATENT OFFICE.

JAMES P. MARSH, OF CHICAGO, ILLINOIS.

AIR-VALVE FOR RADIATORS.

SPECIFICATION forming part of Letters Patent No. 353,639, dated November 30, 1886.

Application filed February 23, 1886. Serial No. 193,089. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. MARSH, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Air-Valves for Radiators, of which the following, in connection with the accompanying drawings, is a specification.

My invention relates to air-valves of the class usually employed in connection with steam-radiators.

My purpose is to provide improved means for disposing of the surplus water which may pass through the valve.

My invention consists in combining with valves of this class, whether the same are automatic or not, a tube made, preferably, of flexible metal and having perforations or ports therein for the escape of the surplus water or of the vapor arising therefrom; and in arranging the said tube (which is in connection with the valve) between the rows or series of the tubes or loops of the radiator or steam-coil, all of which will be hereinafter more fully explained.

In the drawings, Figure 1 is a side elevation of a steam radiator or coil of a well-known class, the same being provided with my improvements and being broken away for the purpose of more clearly illustrating the same. Fig. 2 is a like representation showing a slight modification of construction. Fig. 3 is a detail, the same being an enlarged view of my improved evaporator and so much of a valve as is necessary to show the relation of my improvements thereto. Fig. 4 is a detail, the same being a side view of a plain or non-automatic valve combined with my improved evaporator. Fig. 5 is a detail, the same being an enlarged vertical central sectional view through the lower portion of an automatic valve of the class referred to, and showing the means employed for connecting my improvements thereto. Fig. 6 is a detail, the same being a top or plan view of the valve shown in Fig. 4. Fig. 7 is an end view of the outer end of the said valve, and Fig. 8 represents a modification in the form of the evaporator.

Like letters of reference indicate like parts. A represents a steam radiator or coil.

B represents an automatic valve or steam-trap. This valve or trap may be constructed substantially as shown and described either in Letters Patent No. 317,818, dated May 12, 1885, or in Letters Patent No. 319,593, dated June 9, 1885, and granted to me by the United States of America for improvements therein set forth; and I have not, therefore, here particularly described the construction and operation of the said valves. I may say, briefly, however, that the valve B opens and closes automatically by reason of the contraction and expansion of some of its parts, and that the steam escapes through the open valve, is condensed, and finds its way to a vent, *a*, through which it passes into a pipe, *a'*, the lower end of which is screw-threaded to receive a nut or coupler, *b*, which is internally screw-threaded in opposite directions at its ends, respectively. It is not absolutely essential, however, but merely preferable, that the said coupler be screw-threaded in different directions or have right and left screw-threads therein. The valve or trap is attached to the radiator in any well-known or usual way.

C is a non-automatic valve or trap, which may, with the exceptions hereinafter described, be made in any well-known way.

The essential features of my invention I will now proceed to describe.

D is a comparatively slender pipe or tube, made of flexible metal, by preference such as copper or brass.

c c are perforations in the pipe D. I make one end of the pipe D screw-threaded, as indicated at *c*, to adapt it to be attached with facility to the coupler *b*. I deem it preferable to either close the other end of the said pipe or turn it up, as shown at *d*, Figs. 2 and 4.

In the example shown in Figs. 1 and 3 I make the main portion of the pipe D somewhat larger than that part which is in connection with the coupler *b*, and into the openings or perforations *c c*, I insert short vertical tubes *D'*; also, with this construction of pipe I deem it best to apply thereto a depending rod, bar, or rest, *e*, for the purpose hereinafter referred to.

In using this evaporator in connection with a non-automatic valve the valve must be left more or less open; and in order to gage the extent to which it shall be open I make in the

perimeter of the thumb-wheel of the valve small notches *ff*, and to the stationary part or shell of the valve I apply a light spring, *g*, the outer end of which rests yieldingly in one or the other of the said notches, thereby retaining the said wheel adjustably in its position after it has once been set. By this means I am enabled to judge quite accurately as to the extent to which the valve is open, and I turn the said wheel accordingly, and after it is so set the spring *g* prevents it from being accidentally displaced, but permits it to be differently set, if necessary or desirable. The purpose of the rest *e* is to support the comparatively heavy portion of the tube *D*, (shown in Figs. 1 and 4,) as will hereinafter more fully appear.

By making the tube *D* or that portion of it which enters the coupler *b* flexible or pliable I am enabled to arrange the tube with facility, as I may desire, when applying my invention to use.

To apply my invention to use, I proceed as follows: I screw the screw-threaded end of the tube *D* into the lower end of the coupler *b*, and arrange the main part of the tube *D* between the row of tubes or loops of the radiator *A*, (if there be more than one row of such tubes,) bending, if need be, that part of the tube which is in proximity to the said coupler, so as to have the main part of the tube arranged horizontally between the radiator coils or tubes. The tube *D*, by being made of flexible or pliable metal, can easily be bent so that it may be arranged as may be desired; and the inner end of the said tube may also be bent up with facility, as shown in Figs. 2 and 4, when the said tube is not entered by the smaller tubes *D'* *D'*.

The operation is as follows: The vapor or condensed steam in the valves or traps *B* and *C* enters the tube or pipe *D*, and, if not before evaporated, becomes there evaporated and escapes either through ports *cc* or through the smaller tubes *D'* *D'*. The pipe *D*, either by being bent up, as shown at *d*, Fig. 4, or by having its end closed when in the form shown in Fig. 3, retains the condensed steam or water therein in proximity to the coils or loops of the radiator. The water in the pipe or tube *D*, therefore, is sufficiently exposed to the influence of the heat radiated by the radiator, and this water is again either generated into vapor and escapes through the ports *cc* or tubes *D'* *D'*, or else flows out through the said ports or tubes and falls upon the base of the radiator, which is sufficiently hot to change or generate the water so falling upon it into vapor or steam, which escapes into the room where the radiator is located. This second vaporization of the water has the effect of rendering the atmosphere of the room comparatively moist, and thus much more healthful than dry heated air

would be. The atmosphere of the room also gives a greater degree of comfort, although the temperature is lowered somewhat by the process of evaporation. A further advantage of disposing of the surplus water in this manner is that this air-valve, by being left partially open, creates a better circulation of steam, hence a greater generation of the heat in proportion to the amount of steam passing through the radiator. The necessity of the hitherto common drip-pipe, which is not always practicable, is avoided, and yet all of the advantages of a drip-pipe are attained without its disadvantages, and the air-valve is rendered more perfect in operation.

No connection with drains or sewers, as has heretofore been usual, is necessary, and hence there will be no possibility of the air in the house becoming contaminated by the leaking of foul gases through the pipes and valve.

Heretofore when non-automatic valves were employed the accumulated vapor or water would be liable to run down upon the outside of the radiator whenever the valves were opened, thus soon marring the appearance of the radiator, if not producing some substantial injury. This objection I also aim to overcome by arranging the drip-pipe as described. It will now be perceived that what has heretofore been a source of great annoyance—viz., the condensing steam or water—is utilized by me in such a manner as to lead to the beneficial results now set forth.

In the modification shown in Fig. 8 the evaporator-tube is made waving, to present a comparatively great length of tube in a comparatively short or narrow radiator.

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

1. The combination, with the air-valve and flues of a steam-radiator, of a tube having ports or openings therein and in operative connection with the said valve, and arranged horizontally in juxtaposition with the said flues, substantially as and for the purposes specified.

2. The combination, with the air-valve and flues of a steam-radiator, of a flexible evaporator-tube arranged horizontally between the flues, substantially as and for the purposes specified.

3. The combination, with the air-valve of a steam-radiator, of a flexible evaporator-tube having ports or openings therein, substantially as and for the purposes specified.

In testimony that I claim the foregoing as my own I hereunto affix my signature in presence of two witnesses.

JAMES P. MARSH.

Witnesses:

F. F. WARNER,
WM. D. EWART.