

# J.L. Peake, Steam Heating Apps.

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PATENTED AUG 1 1871

Fig. 1.

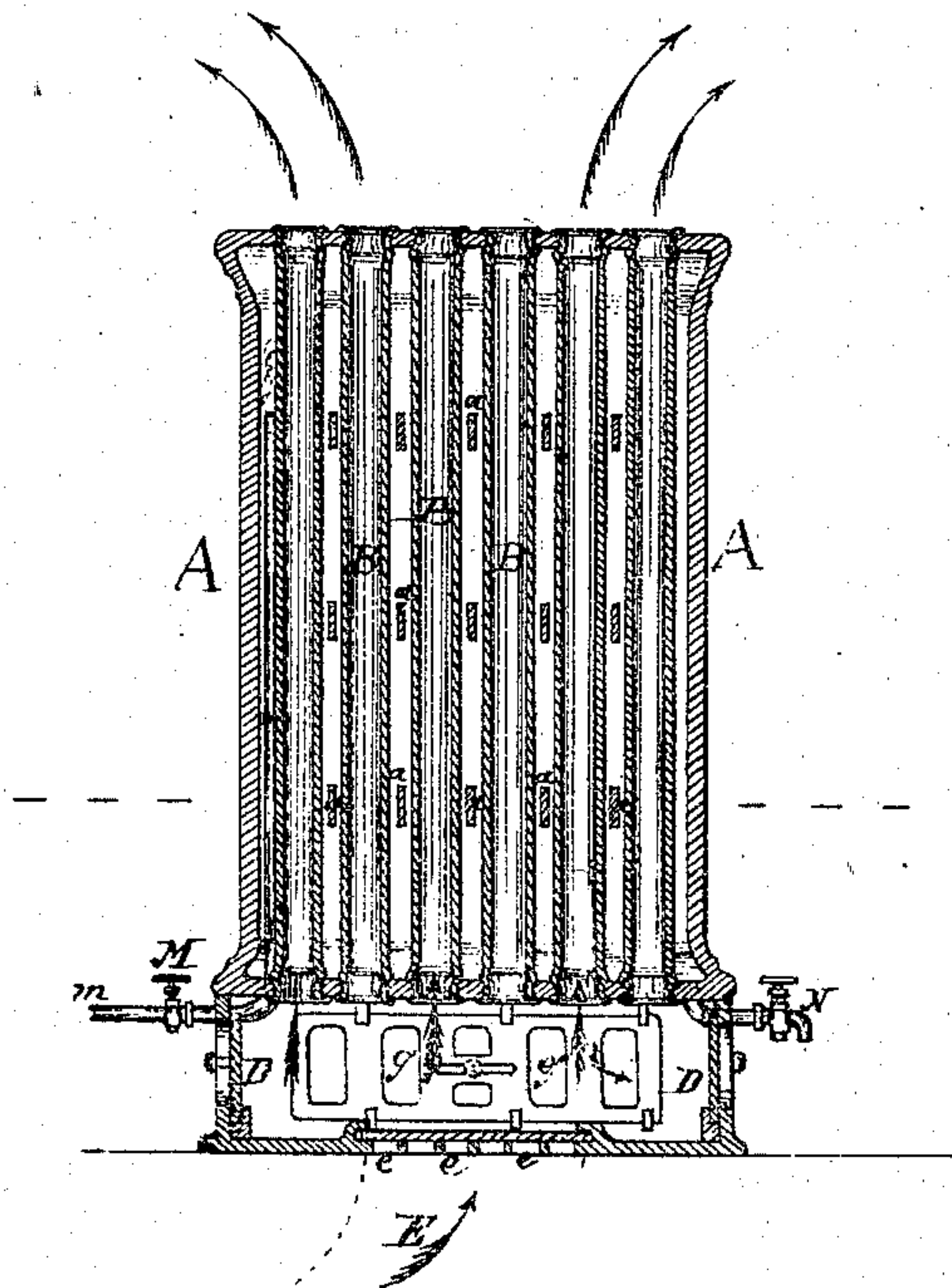


Fig. 3

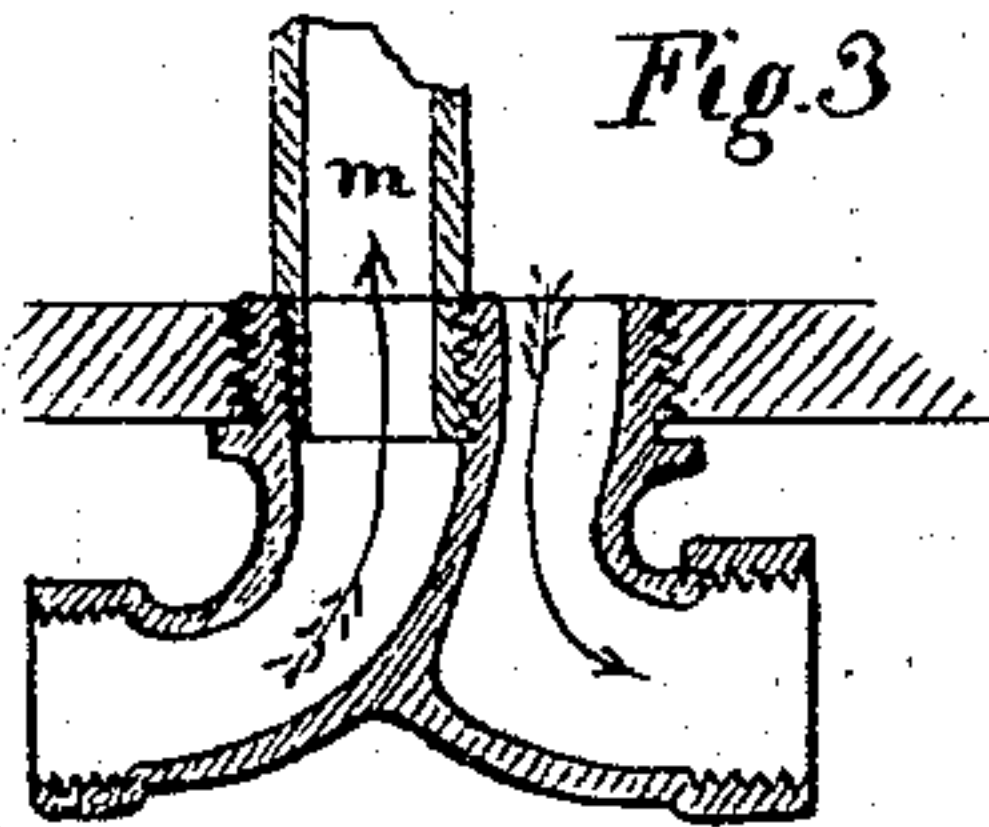


Fig. 4

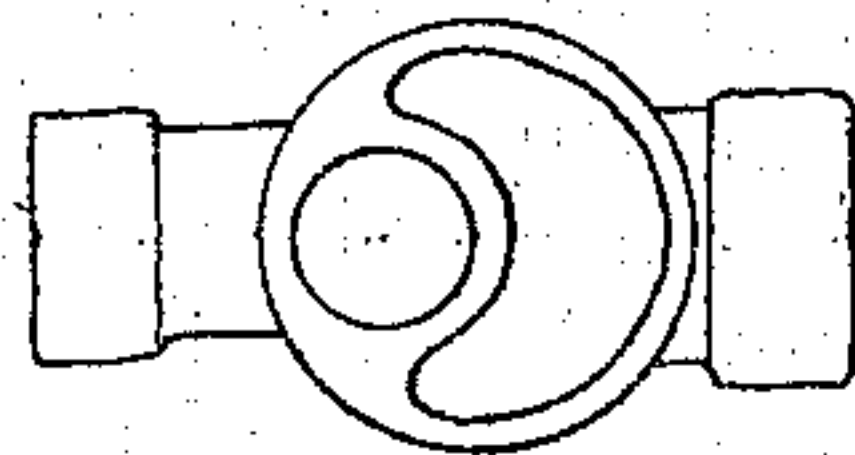
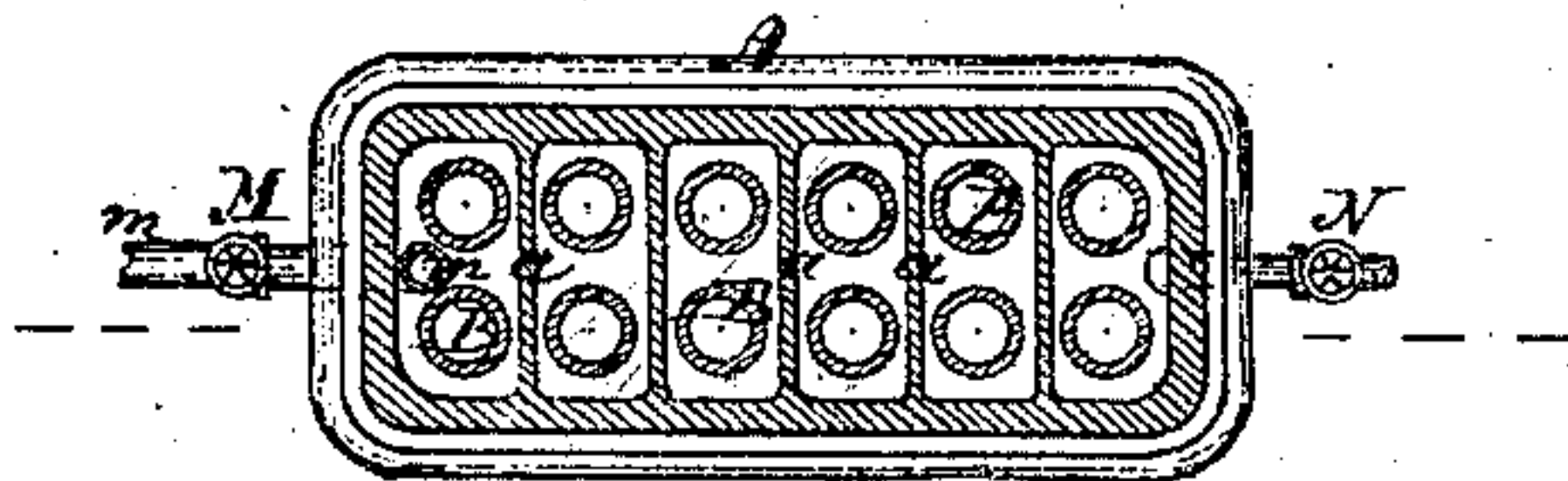


Fig. 2



Witnesses:

C. Rastig  
Morris O'Keefe

Inventor:

John L. Peake  
by his attorney  
J. D. Sutton



# UNITED STATES PATENT OFFICE.

JOHN L. PEAKE, OF NEW YORK, N. Y.

## IMPROVEMENT IN STEAM-HEATERS.

Specification forming part of Letters Patent No. 117,675, dated August 1, 1871.

*To all whom it may concern:*

Be it known that I, JOHN L. PEAKE, of New York city, in the State of New York, have invented certain new and useful Improvements in Steam-Heating Apparatus. It is applicable to the warming of buildings or apartments therein, and for general warming and ventilating purposes.

I produce the apparatus in the form of a tasty and compact case, the entire exterior of which is of cast-iron in a single piece. There are upright tubes therein, through which air rises, becoming heated on the way, and the exterior faces warm the air in contact therewith and radiate heat in the obvious manner. Provisions are made for ventilating and controlling the ventilation in combination therewith.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawing forms a part of this specification. Figure 1 is a vertical section, and Fig. 2 a horizontal section. Figs. 3 and 4 represent enlarged views of certain parts. Fig. 3 is a central vertical section of the junction of the steam-pipe to the heater, the drain-pipe junction being in one therewith; and Fig. 4 is a plan view of the same parts and on the same scale as Fig. 3.

Similar letters of reference indicate like parts in all the figures.

A is a casting, formed in a single piece by the means known as coring. Holes are cored in the top and bottom to receive tubes B. The holes are rapidly and cheaply smoothed by suitable boring apparatus, and the tubes are rapidly and efficiently set therein by the same operation which has long been practiced in setting the tubes of steam-boilers. The extent to which the tubes are forced out in this process above and below the casting is somewhat exaggerated in the drawing. The core is produced with a number of holes, through which the metal flows and forms stays *a* to support the extended flat sides, as indicated in Figs. 1 and 2. The stays may be deeper than they are shown, but it is important not to let them form tight partitions. It is important to the fullest usefulness of the apparatus that the water of condensation be allowed to flow freely across to be drawn out, when required, by the cock N. The steam is admitted through a pipe, *m*, controlled by a cock, M. This steam-pipe enters the casing A at the bottom, and rises therein to

a point near the top. This provision avoids the disagreeable gurgling sound which is frequently experienced with steam heating apparatus; and also accomplishes several other points of great importance: First, it provides for the exclusion of the air, driving it out before the steam, and for the retention of a quantity of water in a tolerably hot condition ready to be drawn out, as desired, for culinary or other purposes. Next, it allows the whole surface of the apparatus to be made fully efficient by keeping the water well drawn out, and allowing the whole interior to be filled with steam. This condition is necessary in the coldest weather, and may be attained either by frequently drawing out the water by hand, setting the cock N a little open so that it will dribble all the water with a very little steam, which steam may be useful in moistening the air in the room, or, by means of a small self-acting device, forming a cheap steam-trap, not represented, which will automatically discharge the water as soon as a pint or any other small quantity has gathered; and finally, it allows the apparatus to work very certainly and efficiently in receiving the water of condensation back again into the boiler through the same pipe *m* by which the steam is received.

To fully appreciate the importance of this latter condition it will be understood that the pipe *m* is necessarily of limited size, and, in a large building, its connections must extend along nearly horizontally for considerable distances. Under these conditions the water will not flow back through the same pipe which brings the steam when the steam is condensing rapidly. This condition is a well-known evil of steam-heating, and it frequently renders the apparatus partially or entirely inoperative at the period when it is most needed, to wit, when the temperature of the atmosphere is the lowest, because the steam under those conditions is more rapidly condensed in the heater, and a larger quantity of condensed water is thrown into the pipe at the same time that a stronger current of steam than usual is moving in the opposite direction.

My improved apparatus providing by other means, as above described, for discharging the condensed water in the coldest weather, serves automatically as a self-returning apparatus in moderate weather, because the surface of the steam-heater is then very much reduced. The



fact that the steam-pipe rises up through the water of condensation and imparts heat thereto through itself from the live steam within, maintains the temperature of the condensed water in the bottom of the vessel at a sufficiently high degree to serve efficiently as hot water for washing hands or the like; but it is not maintained at nearly as high a temperature as the steam.

When no provision is made for drawing away the condensed water, and the apparatus works as a self-returning apparatus, the water fills up to the level of the top of the pipe *m*. This reduces the efficiency of the heating-surface, and reduces the amount of the water condensed in a corresponding degree. The small quantity of water condensed in the upper part of the apparatus trickles down and adds to the amount below, flowing over into the open top of the pipe *m*, and flowing moderately back to the boiler.

A portion of the benefits of the invention may be realized by introducing the steam through a nearly horizontal pipe connected near the top of the apparatus; but I greatly prefer the arrangement represented.

The form of the casting *A* is swelled near the top and bottom, to give an elastic character to the casing which it would not otherwise possess. This allows the casing to expand or contract without any severe strain, and thus allows for any difference in the expansion of the cast-iron casing and of the wrought-iron tubes therein.

*D* is a pedestal casting, open at the top and receiving the bottom of the casting *A* directly thereon, but provided with registers or equivalent adjustable openings in the bottom and at the sides. The register *e* in the bottom controls the communication with a passage, *E*, leading in fresh air from the external atmosphere, while registers *g* communicate with the air in the base of the apartment which is to be warmed. By partially or entirely closing the registers *g* a strong suction is made by the heating apparatus drawing air inward through the passage *E* from out

of doors. This is the desirable condition for moderate weather. In the coldest weather the register *e* is partially or entirely closed, and the influx of cold air is proportionately excluded, while the register *g* should, under those conditions, be wide open and allow the air of the apartment to have free access and become rewarmed, passing around in a circuit in the apartment as long as these conditions are maintained.

The same apparatus can be placed in chambers or in cellars, or any convenient localities apart from the space to be heated, and used as means of indirect warming, the warmed air being brought to the rooms by pipes.

I claim as my invention—

1. The casting *A*, made in a single piece with tubes *B* set therein, adapted to serve in the manner and for the purposes herein specified.

2. In a hollow casing, formed in a single casting with vertical tubes, as specified, the swells or large hollow beads at the top and bottom to allow for expansion and contraction, in combination with the stays *a* cast therewith and connecting across the space between the tubes, as specified.

3. The casting *A*, tubes *B*, drain-cock *N*, and pipe *m*, the latter opening into the steam-space near the top, as specified, the whole adapted to serve as a steam-heater and hot-water reservoir with the advantages herein specified.

4. In combination with a heater-casting, *A*, and tubes *B* constructed and adapted to serve as specified, the sub-casting or pedestal *D* having registers *e g* controlling the communication with the external air and with the air of the apartment, as specified.

In testimony whereof I have hereunto set my name in presence of two subscribing witnesses.

JOHN L. PEAKE.

Witnesses:

THOS. D. STETSON,  
C. C. LIVINGS.