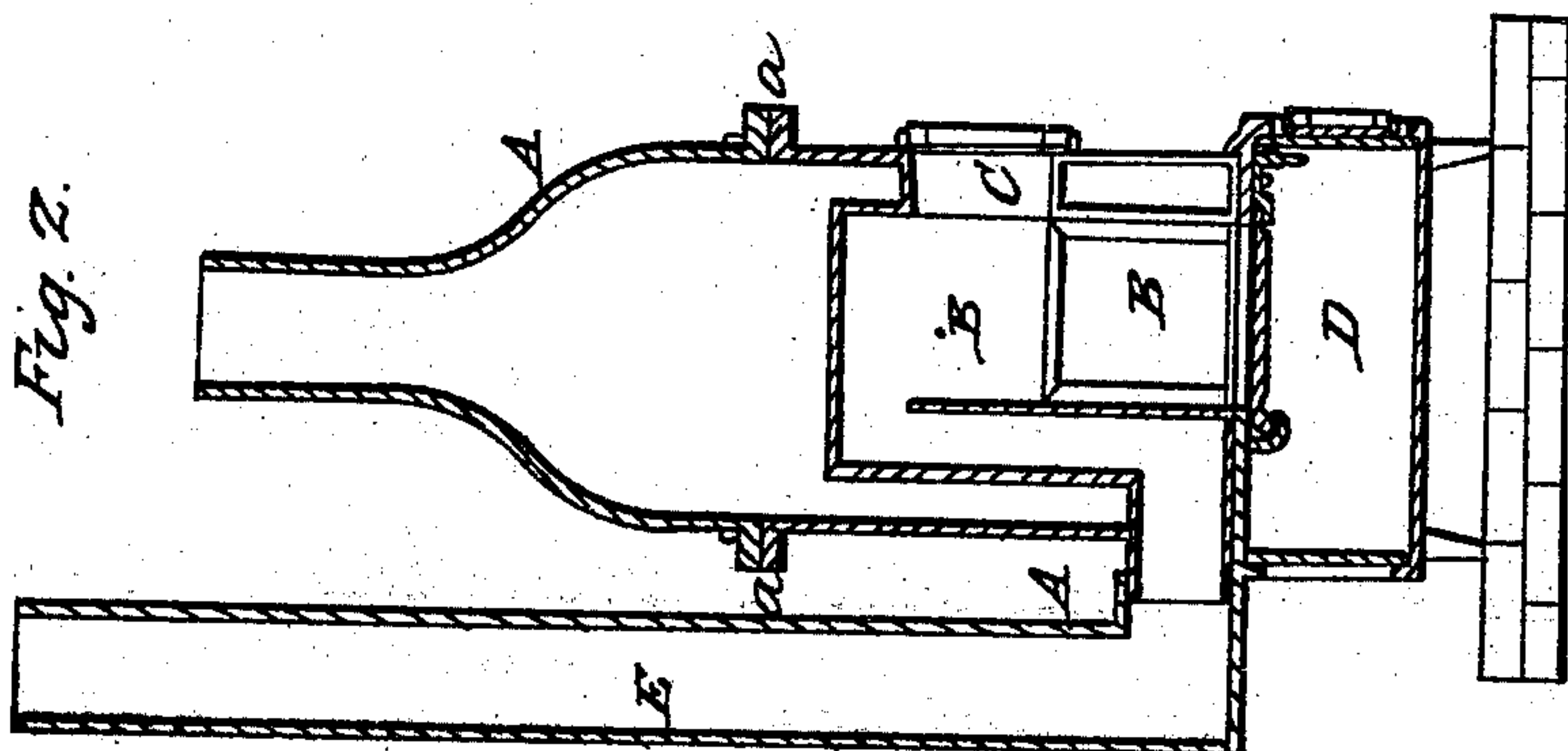
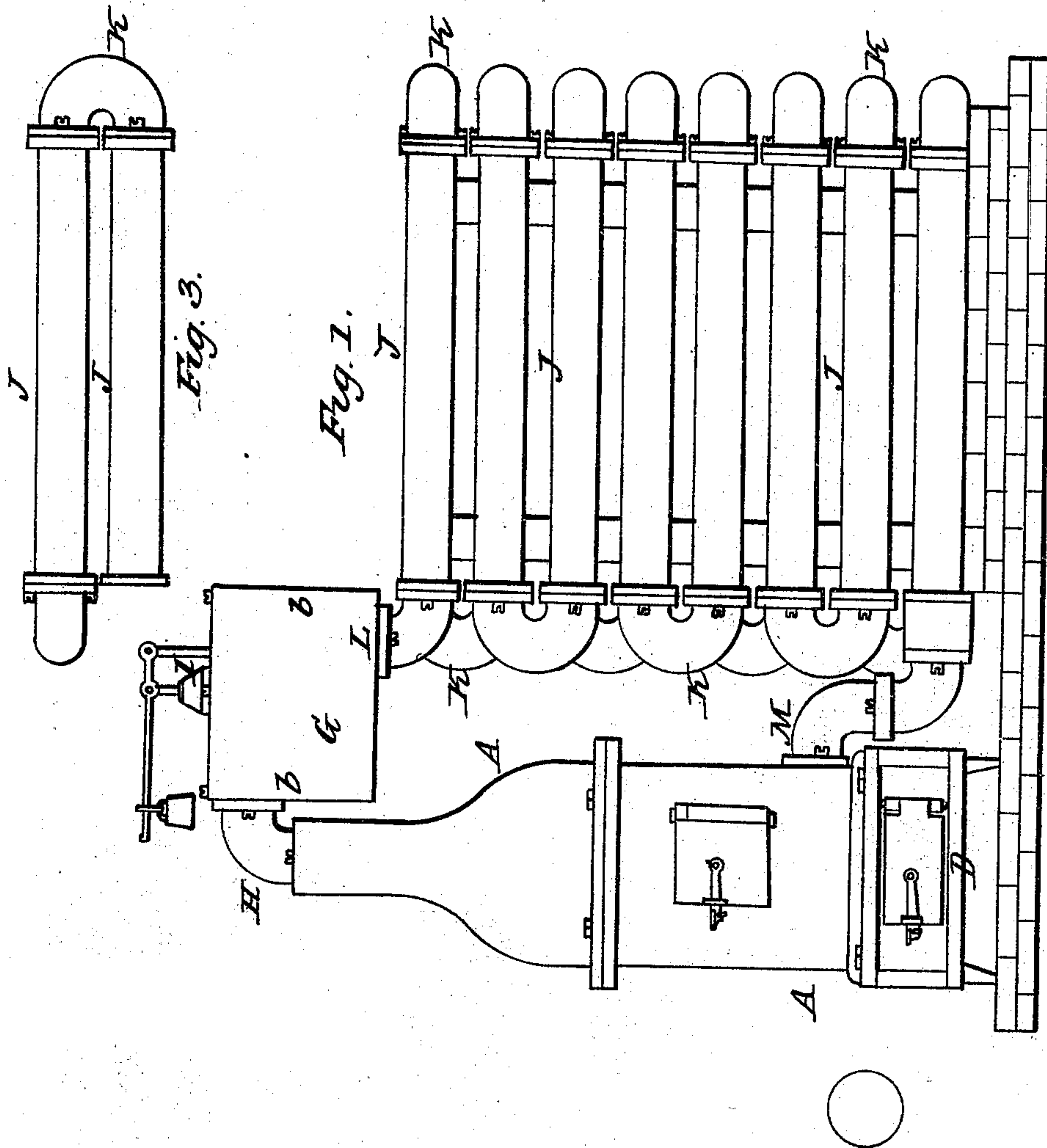


B. BLANEY.  
Steam Heater.

No 3,730.

Patented Sept. 7, 1844.



# UNITED STATES PATENT OFFICE.

BENJAMIN BLANEY, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN APPARATUS FOR WARMING BUILDINGS.

Specification forming part of Letters Patent No. 3,730, dated September 7, 1844.

*To all whom it may concern:*

Be it known that I, BENJAMIN BLANEY, of the city of Boston, in the State of Massachusetts, have invented certain new and useful Improvements in the Manner of Constructing an Apparatus for the Warming of Buildings by the Agency of Heated Water, and which apparatus may also be used for supplying a portion of steam to be commingled with the heated air, or to be otherwise applied to such purposes as may be desired; and I do hereby declare that the following is a full and exact description thereof.

My apparatus consists, in part, of a furnace and a vertical boiler, constructed in a manner to be presently described. To the upper part of this boiler is attached a box, which I denominate a "water-trap," said water-trap being intended to receive the water which by its ebullition is caused to flow into it from the boiler. From the bottom of the water-trap the heated water passes along and descends through a series of recurved pipes contained in an air-heating chamber, and from the lower part of these it again passes into the lower end of the boiler, and is thus kept constantly circulating while ever a fire is maintained in the furnace.

The whole apparatus is to be contained within a suitable chamber made perfectly close excepting where provision is made for giving access to the furnace, and the opening or openings made for the admission of the air from without which is to be heated and those which allow it to escape after being heated, for the purpose of being conveyed through tubes into the apartments to be warmed.

In the accompanying drawings, Figure 1 is an elevation of my apparatus, the walls of the chamber within which it is to be contained not being represented, as said chamber does not differ from any others erected for a like purpose. Figure 2 is a vertical section through the boiler from front to back; and Fig. 3 is a top view of two of the tubes through which the heated water is to circulate.

The boiler, the water-trap, and the circulating-tubes I make of cast-iron, this material being preferred on account of the facility with which it parts with its heat by radiation, while it is more economical in construction

and possesses other advantages over copper or any other metal.

A A is the boiler, which is upright and cylindrical. Its lower portion up to the flange *a*, by which it is connected to the upper portion, is cast in one entire piece. By this means all danger of leakage is prevented.

B is the fire-chamber, which is surrounded by water excepting at its bottom and at the aperture C for the admission of fuel. The fire-chamber may be about two feet high, and for about one-half its height or to the lower edge of the fire-door I line it with soapstone or fire-clay to prevent the too rapid absorption of heat at the time of kindling the fire.

D is the ash-pit, constructed as usual.

E is the pipe or chimney for the escape of smoke.

To the smoke and gaseous products of combustion I give a descending draft in passing from the fire-chamber to the flue. For this purpose I place an iron partition-plate F across the rear of the fire-chamber, said plate extending up to within about five inches of its top. The passage into the exit-pipe is thereby brought on a level, or nearly so, with the bottom of the boiler.

G is the water-trap, which is connected with the boiler by the curved tube H, and is provided with a safety-valve at I. I have constructed this part square and measuring twenty-two inches on its sides and eighteen inches in height. It may, however, be made cylindrical or oval and varied in size, if preferred.

J J is a series of pipes which I have made four inches in diameter in the interior. Of these I have used forty, of four feet in length, connecting their ends by curved tubes K K, making a tier of eight tubes in height and five in depth. The upper end of this continued series of tubes is connected to the bottom of the water-trap, as at L, and the other end to the lower part of the boiler, as at M. The number and extent of tubes may be varied; but I believe that the amount of about two hundred feet in length and about three hundred feet of radiating-surface which is thus obtained will be found sufficient for most purposes.

When this apparatus is to be used, it is to be filled with water to about the level of the



dotted line *b b* of the water-trap, or to such height as that when heated the water in the trap shall still be below the level of the entrance of the tube *H* into it. When so situated on heating the water to the point of ebullition a portion of it will boil over and pass into the water-trap, and a corresponding portion will consequently pass from the pipes *J* into the lower end of the boiler. This operation will continue while the water is kept boiling, a portion of it passing over in an interrupted stream or by pulsations from the boiler into the trap and from the recurved tube into the boiler. A large portion of heat will thereby be given off by the radiating-surfaces to the air passing through the chamber within which the apparatus is contained. This air is to be conveyed through tubes leading from the upper part of the chamber to the apartments to be heated, such tubes being governed by valves or dampers and otherwise arranged in the ordinary way.

When it is desired to impregnate the heated air with watery vapor, a portion of steam may be admitted from the steam-chamber or upper portion of the water-trap into the air-heating chamber, there being a tube and damper arranged for that purpose. Should a more copious supply of steam be desired for any purpose, a steam-pipe may be used to conduct steam from the steam-chamber into any apartment conveniently situated, and if steam only is wanted this may be obtained copiously by drawing off a few gallons of water from the apparatus so as to prevent its boiling over into the water-trap.

Should there be an apartment immediately above the air-chamber into which from its size

or from any other cause it may be desirable to convey a larger portion of heat than elsewhere, the water-trap may be elevated into such apartment, the tubes leading into it being lengthened so as to accommodate them thereto.

As the form of this apparatus may be changed in various ways while its principle of action will remain the same, it is to be distinctly understood that I do not intend to limit myself to the particular form and arrangement of the respective parts herein described and represented, but to vary these as I may find expedient, while I attain the same end by means substantially the same.

Having thus fully described the manner in which I construct and arrange my apparatus for warming apartments and also shown the operation thereof, what I claim therein as new, and desire to secure by Letters Patent, is—

The manner in which I have connected the boiler with the series of tubes or pipes through which heated water is to circulate by combining therewith a box or vessel, such as that which I have denominated a "water-trap," into which the boiling water is to pass in consequence of its ebullition, and through which, as well as through the tubes *J J* connected therewith, and through the boiler, said water is to circulate, for the purpose and substantially in the manner above set forth.

BENJ. BLANEY.

Witnesses:

S. FLETCHER,

D. S. GILCHRIST.