(No Model.) 2 Sheets—Sheet 1.

O. M. SHANNON.

APPARATUS FOR HEATING APARTMENTS BY GAS.

No. 428,963. Patented May 27, 1890.

Fig 1.

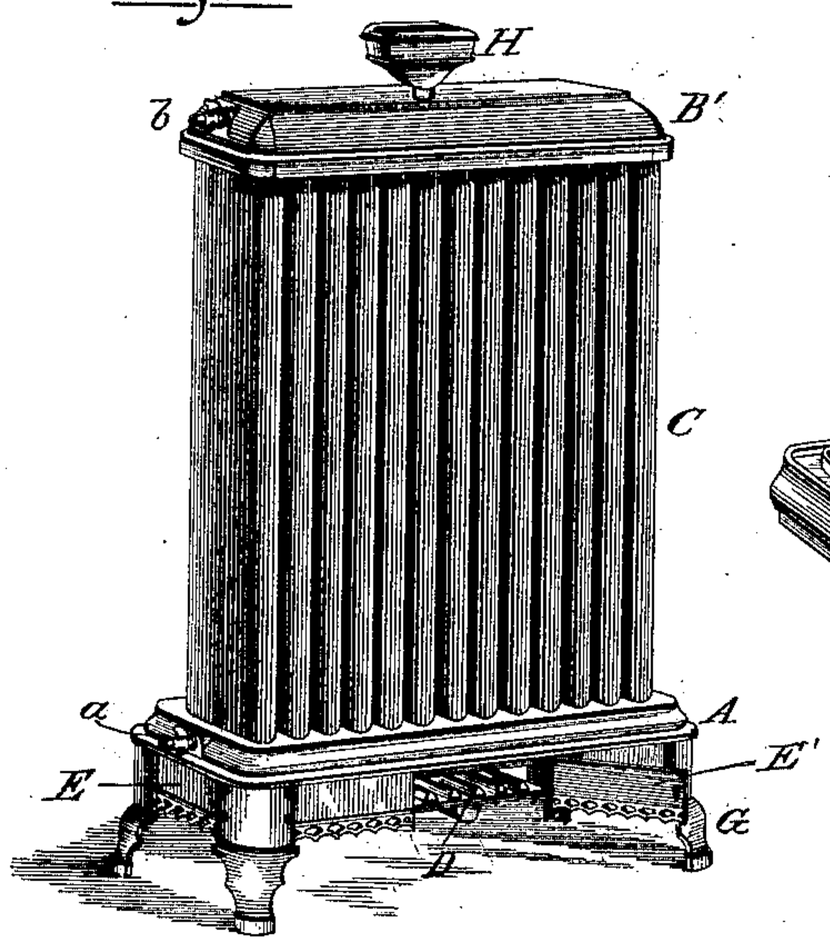


Fig 4.

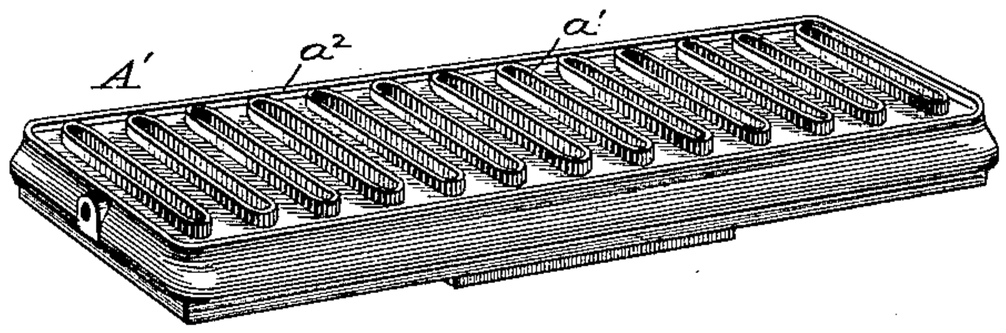


Fig 2.

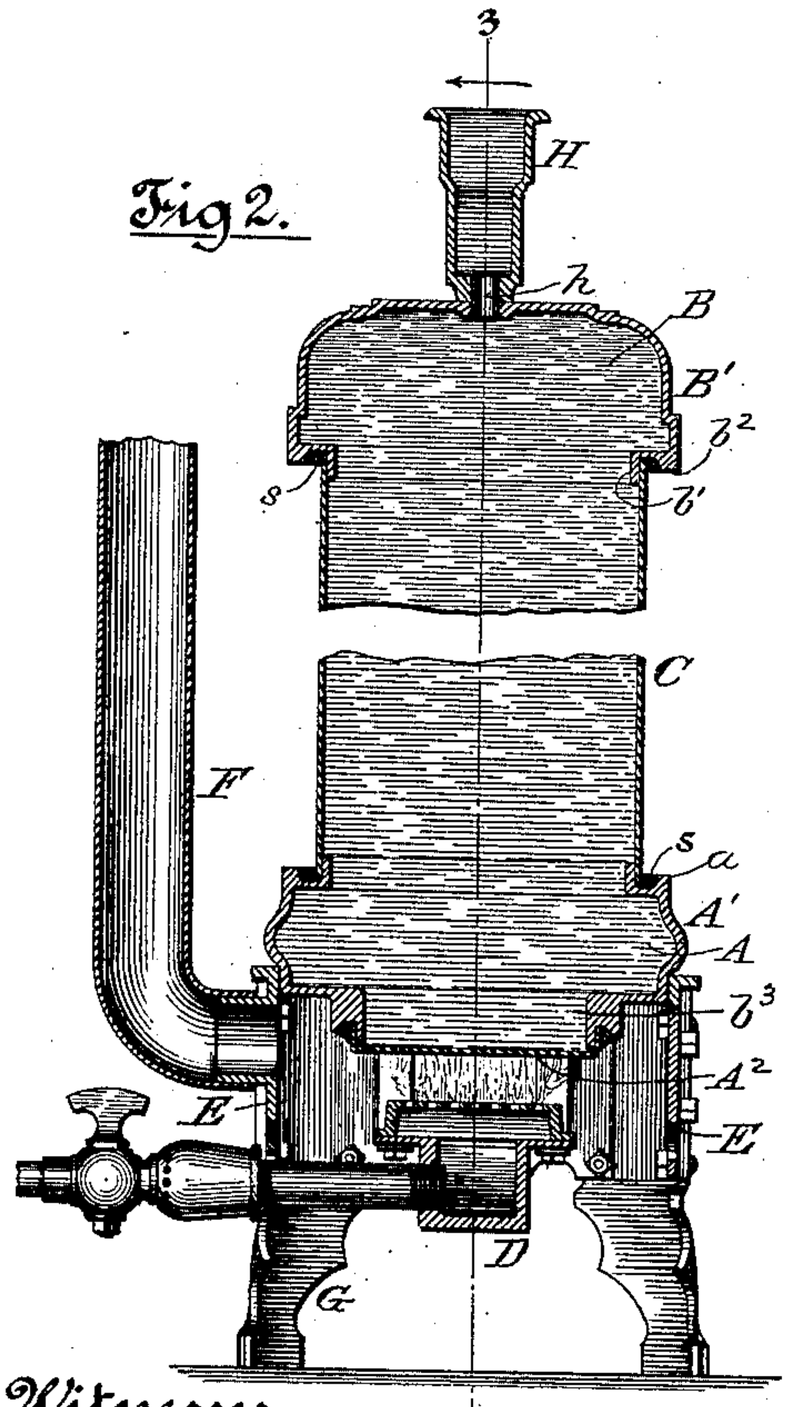
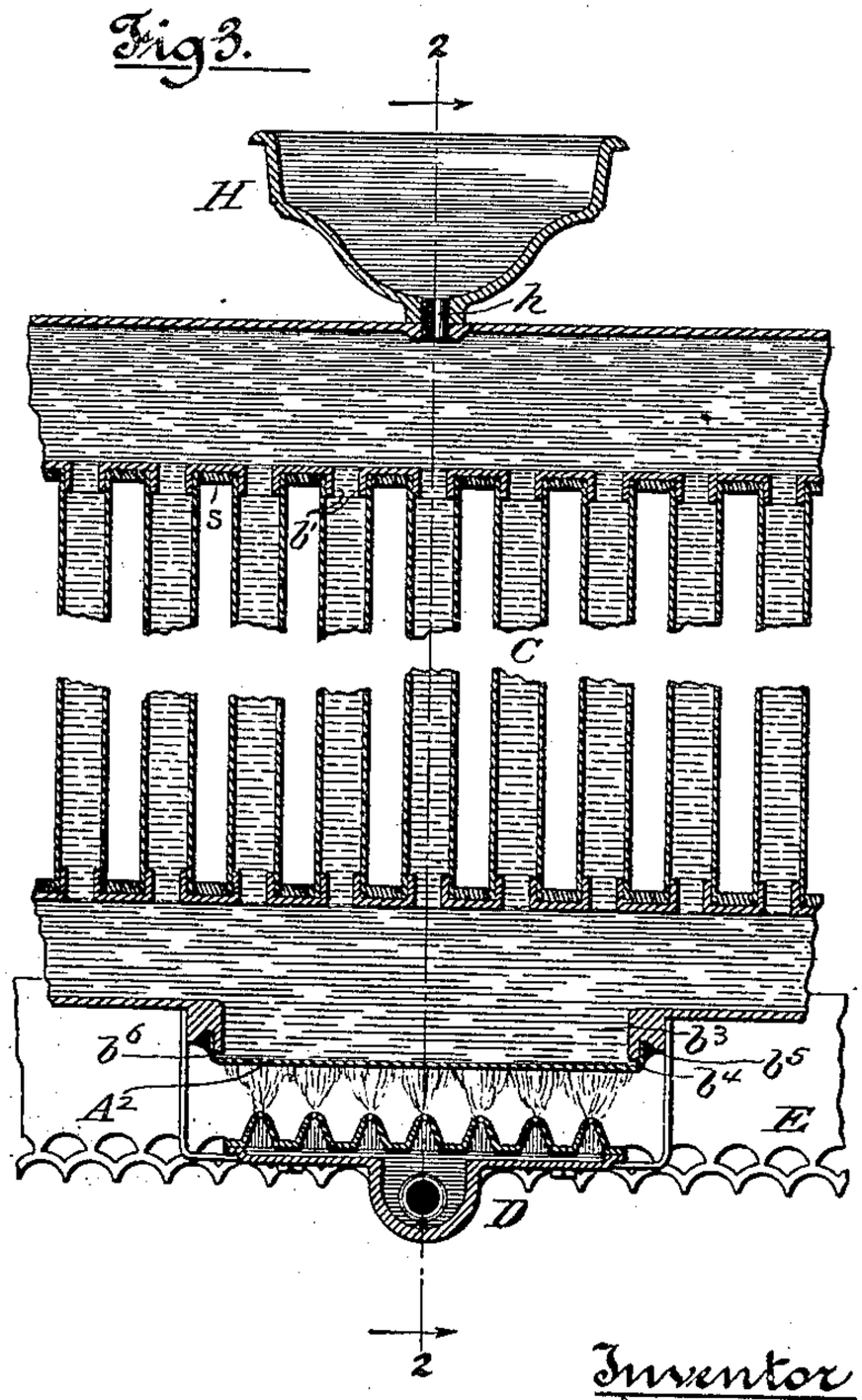


Fig 3.



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(No Model.) 2 Sheets—Sheet 2.

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APPARATUS FOR HEATING APARTMENTS BY GAS.

No. 428,963. Patented May 27, 1890.

Fig 5.

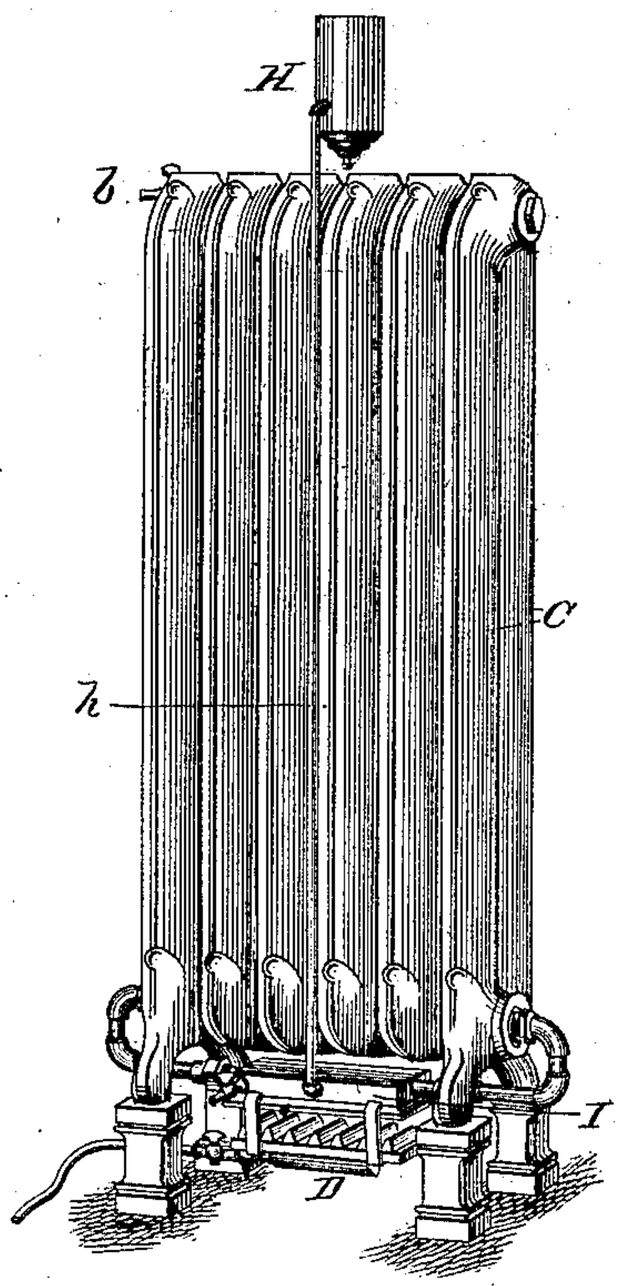


Fig 6.

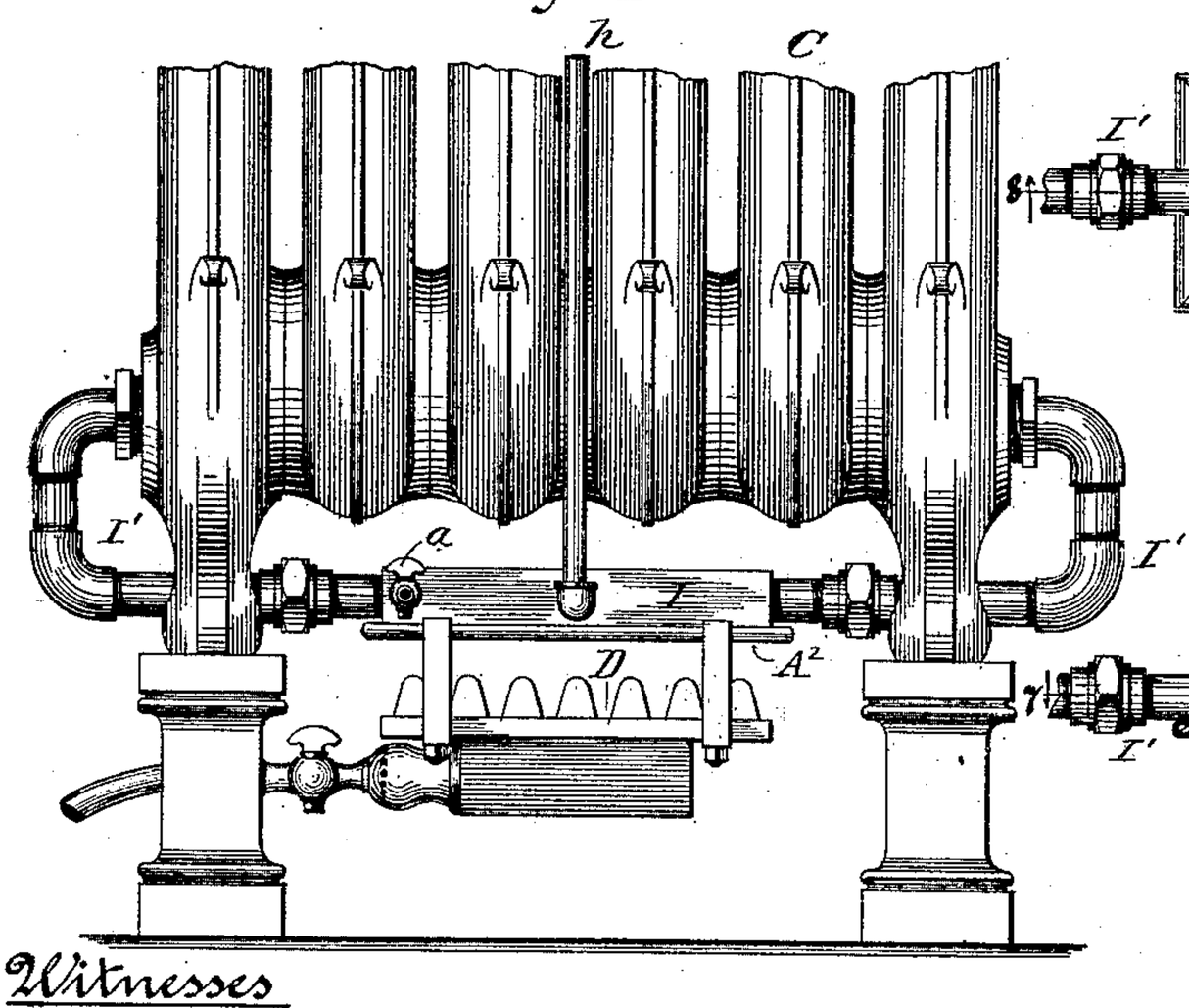


Fig 7.

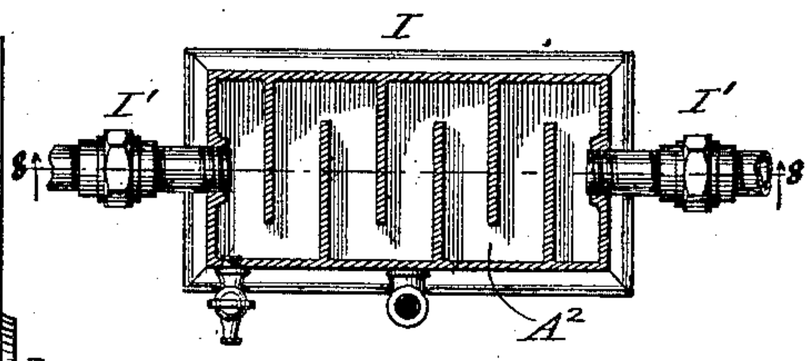
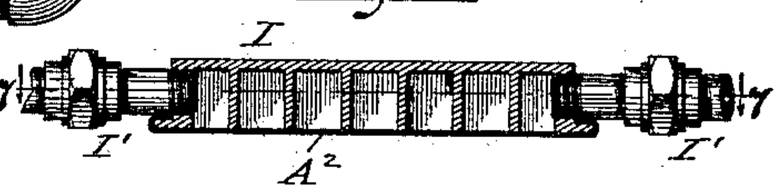


Fig 8.



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UNITED STATES PATENT OFFICE.

OSCAR M. SHANNON, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CHICAGO LAUNDRY DRYER COMPANY, OF SAME PLACE.

APPARATUS FOR HEATING APARTMENTS BY GAS.

SPECIFICATION forming part of Letters Patent No. 428,963, dated May 27, 1890.

Application filed November 4, 1889. Serial No. 329,131. (No model.)

To all whom it may concern:

Be it known that I, OSCAR M. SHANNON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Heating Apartments by Gas; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention has for its object to provide an improved device for heating an apartment by the combustion of gas fuel.

The burning of sufficient gas in a grate or otherwise to heat an apartment by direct radiation having been found too wasteful and costly, it has been the more common practice heretofore to apply the gas-flames to the heating of metallic and other solids and to rely upon the radiation of these solids for heating the room, though in some cases a bright metallic surface has been arranged in position with respect to the flames to reflect the heat of the latter into the apartment. Neither of these methods having proven entirely satisfactory, I have provided a construction by which water is made the medium for transmitting heat of gas-flames to the air of an apartment.

In the accompanying drawings, which illustrate my invention, Figure 1 is a perspective view of a hot-water radiating device containing my said invention in the form now most approved, the radiator of said device having sheet-metal tubes and a cast-iron base provided with a sheet-metal bottom, combined with a gas-burner placed beneath said bottom. Fig. 2 is a transverse vertical section of the radiator through one of the vertical tubes and through the sheet-metal bottom plate and subjacent burner. Fig. 3 is a fragmentary vertical longitudinal section, also cutting the sheet-metal bottom plate and the burner. Fig. 4 is a perspective view of the cast-iron base of the radiator, showing the nipples which enter the tubes and the marginal raised flange which affords a dam by which the solder is retained when poured about the bottom of the tubes in constructing the radiator. Fig. 5 is a perspective of a cast-iron tubular radiator of a well-known pattern employed in my invention. Fig. 6 is an enlarged side elevation of the lower part of the structure shown in Fig. 5. Fig. 7 is a horizontal section of the separate water-heating device employed in the construction shown in Figs. 5 and 6 on the line 7 7 of Fig. 8. Fig. 8 is a vertical section of the said water-heating device on the line 8 8 of Fig. 7.

First describing the construction shown in Figs. 1 to 4, inclusive, A is a continuous horizontal chamber, represented as formed in a cast-iron base A′, having a sheet-metal bottom plate A^2; B, a similarly-continuous horizontal top chamber, shown as formed in a casting B′.

C C are vertical sheet-metal tubes fastened to the base and top castings referred to and connecting the chambers A and B through suitable passages in the castings.

D is a burner for gas or gas and air, located beneath the sheet-metal bottom plate A^2 of the base-chamber A.

E is a metal hood depending all around from the margins of the base A′.

F is a pipe leading from the upper interior of the hood for the conduct of the products of combustion from the room occupied by the radiator.

G G are legs supporting the radiator from the floor.

H is a funnel communicating with the interior of the radiator, and *b a* are cocks inserted in the upper and lower chambers of the radiator, respectively.

It is the purpose to fill or nearly fill the space comprising the chambers A and B and the connecting-tubes C with water and to heat the same from the subjacent burner D. It is therefore necessary that the radiator be water-tight, and to this end when said water-chamber is composed of the separate parts A′, B′, and C the joints uniting said parts are soldered. To make the joints strong, the tubes C are first fitted tightly over the nipples or flanges *a′ b′*, formed around the openings of the several chambers, and then soldered.

For the purpose of facilitating the application of solder to the joints which unite the tubes C with the base and top castings, each of said castings is provided with a marginal

flange a^2 b^2, by means of which is formed a continuous trough surrounding all the tubes and permitting a body of solder (seen at *s* in Figs. 2 and 3) to be poured around all of the tubes at once—that is to say, the tubes are all applied to the castings by being forced over the nipples or flanges a' b' thereof, and while the radiator is standing in an upright position the solder is poured around the lower joints in the trough embraced by the tubes and marginal flange. The radiator is then inverted and the joints at the opposite ends of the tubes are soldered in the same way.

When the base or lower chamber B′ is of cast-iron, it is provided with a sheet-metal bottom plate A^2, which is secured over an opening of any desired extent in the casting by soldering or otherwise, so as to make a water-tight joint. As illustrated in Figs. 2 and 3, the opening b^3 in the base is surrounded by a flange b^4, externally to which is provided a solder-groove b^5, similar to those already described, for the reception of solder about the ends of the tubes C C, and the sheet-metal bottom plate A^2 has its edges upturned to fit closely around said flange b^4, the solder being poured into the groove after such application of the bottom plate in the manner described in connection with the tubes.

The burner D is preferably of the form and construction shown in the drawings, which consists, essentially, of a chamber to which the gas is admitted, and having a top plate with numerous apertures through it, at which the gas is emitted for ignition; but for the general purposes of this invention any form of burner may be employed. The flames proximate or impinge upon the sheet-metal bottom plate A^2, and by reason of the thinness of said plate the more readily communicate their heat to the water within the radiator. The tubes C, of sheet metal, also, by reason of their thinness, the more readily transmit the heat of the water to the surrounding air of the room.

To provide for the expansion and contraction of the water within the radiator, due to changes in its temperature, the interior of the radiator is in communication with the external air. In the present case such communication is afforded through the filling-funnel H at the orifice *h*. The upper cock *b* allows the water to be drawn off to a proper level after filling the radiator to excess, and the lower cock *a* enables the radiator to be emptied when desired. The hood E, if present, desirably depends below the burner, in order both to protect the flames from air-currents and to form a suitably-deep chamber for the retention of hot air beneath the entire base, or, if the escape-flue F be employed, to insure the conduct through said tube of all of the products of combustion.

Next describing the construction shown in Figs. 5 to 8, inclusive, the radiator there shown is composed of sections joined to each other at their upper and lower ends in a familiar manner and constituting upper and lower horizontal chambers communicating with each other by means of the vertical tubes or passages, of which each section contains two. In this case a separate water-heating chamber I is provided, having its opposite ends connected with opposite ends of the lower horizontal chamber of the radiator by means of pipes I′ I′. The interior of the heating-chamber I is thus continuous with the interior of the radiator proper. The upper part of the heater I is of cast-iron; but its bottom plate A^2 is of sheet metal and answers to the sheet-metal bottom plate A^2 of the apparatus illustrated in Figs. 1 to 4. The burner D is placed beneath this sheet-metal bottom A^2 in substantially the same relation as described of the other construction, so that the apparatus, including the heater I, contains a single water-space or radiating-chamber, the contents of which are directly heated by the burner, the same as in the form of apparatus shown in Figs. 1 to 4, inclusive.

The application of the heat to the bottom of the water-space or radiating-chamber and the exposure of the extended surface of the latter to the surrounding air produce an active circulation of the water within said radiating-chamber, whereby the heat imparted to the water by the burner is promptly transmitted to the atmosphere of the room in which the apparatus is placed. The connection of the vertical tubes at top and bottom by the horizontal chambers or passages facilitates the circulation throughout the entire apparatus, notwithstanding the heat is applied to only a restricted portion of the bottom.

The heater I as a special device is not in itself made the subject of claims herein.

The funnel H is shown in Figs. 5 and 6 to be connected with the water-space of the apparatus by means of the tube or pipe *h*, connected into the heater I. This, however, is not necessary, but rather a matter of convenience when the separate heater I is employed, since the heater may be originally constructed to receive such pipe, while otherwise it would be necessary to make an opening for the pipe in one of the sections of the radiator proper.

I denominate the apparatus described and comprising the radiating-chamber and the gas-burner a "water-stove" or a "gas-water stove," said apparatus being distinguished from an ordinary hot-water house-heating system in having the primary heating agency applied directly to the water-filled radiating-chamber and constituting as a whole a complete and unitary structure or system in itself especially adapted for the combustion of gas in a room for heating purposes.

The gas-burner may be fed through a flexible tube, which may be disconnected at pleasure, and the apparatus is readily portable from one to another part of the room or from one room to another. To facilitate its portability, its legs may be provided with casters in a familiar manner.

I claim as my invention—

1. The gas-heated water-stove described, comprising a radiating-chamber having a hollow base portion of cast-iron provided with a sheet-metal bottom and a gas-burner arranged beneath said sheet-metal bottom.

2. The combination, in a water-stove, of a radiator having a hollow cast-metal base portion provided with a sheet-metal bottom plate, an upper chamber, vertical sheet-metal tubes connecting the upper and lower chambers, and a gas-burner arranged beneath the sheet-metal bottom plate.

3. The cast-metal chamber A′, provided with openings in its upper surface surrounded by flanges or nipples a', and provided with a marginal flange a^2, in combination with sheet-metal tubes C, embracing the nipples, and a body of solder surrounding the bottoms of the tubes within the flange a^2.

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

OSCAR M. SHANNON.

Witnesses:
M. E. DAYTON,
C. CLARENCE POOLE.