No. 822,607. PATENTED JUNE 5, 1906.

A. P. HOPLER.

HEATER.

APPLICATION FILED OCT. 27, 1905.

2 SHEETS—SHEET 1.

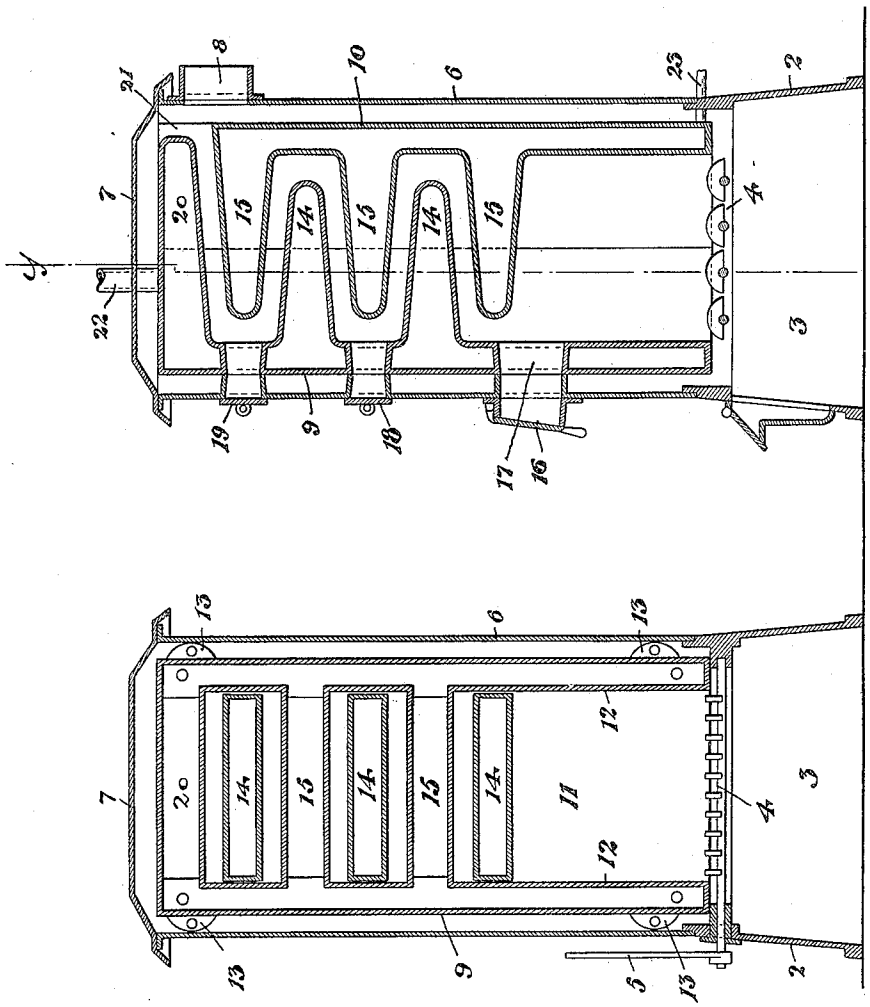


Fig. 1.

Fig. 2.

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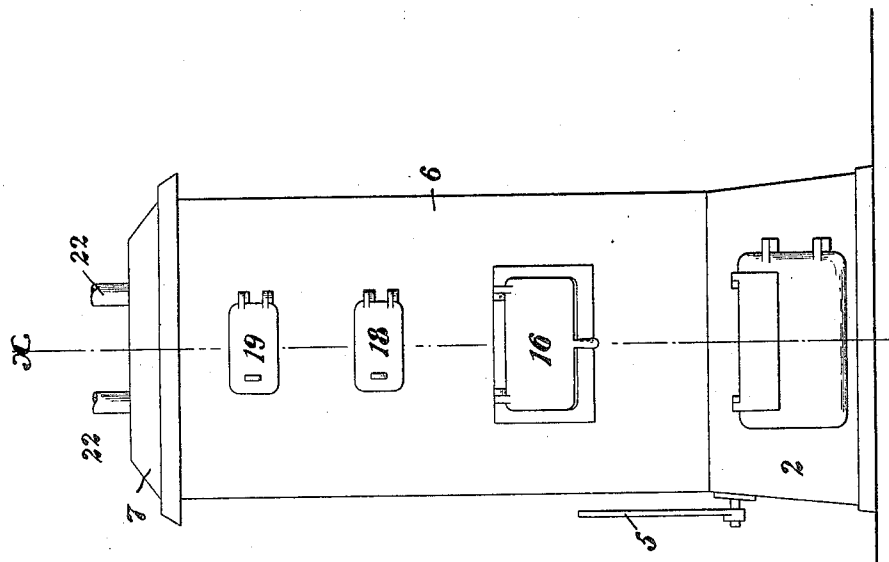


Fig. 3.

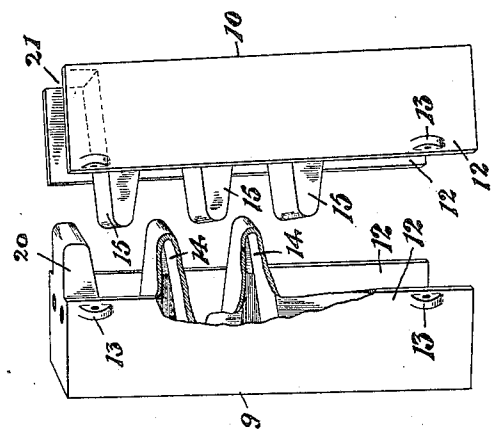


Fig. 4.

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UNITED STATES PATENT OFFICE.

AMOS P. HOPLER, OF BARTLEY, NEW JERSEY.

HEATER.

No. 822,607. Specification of Letters Patent. Patented June 5, 1906.

Application filed October 27, 1905. Serial No. 284,593.

To all whom it may concern:

Be it known that I, AMOS P. HOPLER, a citizen of the United States, residing at Bartley, in the county of Morris and State of New Jersey, have invented certain new and useful Improvements in Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to numerals of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in that class of water-heaters and steam-generators which are used for warming houses, and more particularly to those in which the flames and heat from the fire take a tortuous course upward between overlapping hollow protuberances or projections formed upon the boiler of the furnace and containing the water to be heated.

The objects of the present improvements are to utilize to the fullest extent in the boiler the heat from the furnace; to prevent such heat from being radiated to warm the cellar or basement; to thus secure a satisfactory, economical, and efficient heater, and to obtain other advantages and results, some of which may be hereinafter referred to in connection with the description of the working parts.

The invention consists in the improved heater and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like numerals of reference indicate corresponding parts in each of the several figures, Figure 1 is a central vertical section of the heater, taken from front to rear, as upon line *x*, Fig. 3, and Fig. 2 is another vertical section at right angles to that shown in Fig. 1 and taken upon line *y* of said figure. Fig. 3 is a front elevation of the heater; and Fig. 4 is a perspective view of the boiler proper, showing the sections thereof separated or moved apart out of their normal relation to more clearly illustrate the construction.

In said drawings, 2 indicates the base of the furnace or heater, providing an ash-pit 3 and bearings for a grate 4, adapted to be manipulated by a lever 5 in any ordinary manner. The outer casing 6 of said heater extends upward from said base and is at its top provided with a hood or dome 7. At the back of said casing 6 in the side thereof and near its top is an opening 8 for the passage of smoke and other products of combustion to the chimney.

Within the casing 6 is the boiler proper, which comprises two hollow sections 9 10 of cast metal, standing at their lower ends upon the base 2. Each of said sections has a back 11 and sides 12 12, projecting from said back, preferably at right angles thereto, all said parts being hollow and forming a single interior chamber. When the two sections are brought together, the forward edges of the sides 12 12 of one section abut against those of the other section, suitable ears 13 being provided upon the sections by means of which they can be firmly bolted together. The meeting walls of the sections have registering perforations at suitable points, and push-nipples are inserted in said perforations to provide communication between the two sections of the boiler. The inner faces of the said boiler-sections 9 10 are each provided with a vertical series of hollow heating-tongues 14 and 15, respectively, which project horizontally and extend each across its boiler-section between the sides 12 12 thereof. These tongues are each formed with oppositely-inclined or outwardly-converging upper and lower surfaces, and the tongues of one section alternate in vertical position with those of the other, so that a tongue of one section extends between the tongues next above and on the other section.

The lower ends of the boiler-sections 9 and 10 are for a suitable distance upward devoid of the hollow heating-tongues 14 and 15, so as to form directly above the grate 4 a fire-chamber. I have shown the lowest heating-tongue 15 as being upon the rear boiler-section 10; but obviously this could be otherwise. A door 16 and passage 17 therefor opens into the said fire-chamber, and similar passages 18 19 open at higher points into the tortuous draft-flue for cleaning the same.

Coming now more particularly to the novel features of my present invention, the topmost heating-tongue 20 of the boiler is located

upon the front section 9, and the back wall 11 of the rear section is above its topmost tongue 15 cut away, as at 21. The opening thus formed is located directly in front of the draft-flue 8, so that the smoke and heated gases upon leaving the tortuous passage of the boiler pass directly to the chimney. In other words, the heat is protected from reaching the dome or hood 7 of the boiler by the tongue 20, which lies between and is filled with water. The effect of this construction is not only to more greatly conserve the heat energy and utilize it for the warming of the water, but to also prevent the escape of the heat into the room or basement where the boiler is located and which it is usually desirable to keep cool. The said uppermost tongue 20 is thus considerably longer than any of the others, so as to overlie the entire length of the next lower or adjacent tongue, since there is no occasion for a flue-passage upwardly around the end of the tongue, and it is, in fact, designed to cut off upward passage of heat. Indeed I prefer to form said tongue, as shown, so long that its extremity projects into the top of the cut-away space 21 of the back of the rear section. A lateral draft outlet or escape is thus provided for the heater by my improved construction, and there is no material heat lost through the dome, for while the air-space thereunder is preferably in communication with the entire air-space around the boiler within the casing 6 it is a dead-space and there is no tendency for the draft from the fire to be diverted thereinto.

Flow-pipes 22 lead from the top of the boiler, and a return-pipe 23 enters at the bottom, as is common.

Having thus described this invention, what I claim as new is—

1. In a heater, the combination of opposite boiler-sections each having a back and side portions projecting therefrom, said sections being placed with their side portions abutting at the front edges and in communication, hollow interior tongues upon the said oppositely-arranged sections projecting alternately past the plane of joining of the sections and forming a tortuous flue, the uppermost tongue being on the front section and the back of the other or rear section being apertured or cut away opposite the passage between said uppermost tongue and the next lower tongue on the rear section, and a casing inclosing said sections and having a draft-outlet opposite the said aperture in the rear section.

2. In a heater, the combination of opposite hollow boiler-sections each having a back and side portions projecting therefrom, said sections being secured together with the front edges of their side portions abutting, means establishing communication between said sections, hollow interior tongues projecting from the facing sections, those of one section alternating in height with those of the other and being adapted to lie therebetween, the uppermost of said tongues being upon the front section, and the back of the rear section being cut away from its upper end down to the top of its first tongue, and a casing inclosing the boiler and providing a lateral draft-outlet opposite the said cut-away portion of the rear section.

3. In a heater, the combination of opposite hollow boiler-sections each having a back and side portions projecting therefrom, said sections being secured together with the front edges of their side portions abutting, means establishing communication between said sections, hollow interior tongues projecting from the facing sections, those of one section alternating in height with those of the other and being adapted to lie therebetween, the uppermost of said tongues being upon the front section and the rear section having its back apertured or cut away opposite the passage between said uppermost tongue and the next adjacent tongue on the rear section and its sides extending upward past said passage to overlap the said uppermost tongue, and a casing providing a lateral draft-outlet adjacent to the extremity of said uppermost tongue.

4. In a heater, the combination of opposite hollow boiler-sections each having a back and side portions projecting therefrom, said sections being placed with their side portions abutting at the front edges and in communication, hollow interior tongues upon the said oppositely-arranged sections projecting alternately past the plane of joining of the sections and forming a tortuous flue, the uppermost tongue being on the front section and the back of the other or rear section being apertured or cut away opposite the passage between said uppermost tongue and next adjacent tongue on the rear section, said uppermost tongue being longer than any of the others and adapted to overlie the entire length of the said next lower tongue, and a casing inclosing said sections and having a draft-outlet opposite the said aperture in the rear section.

5. In a heater, the combination of opposite hollow boiler-sections each having a back and side portions projecting therefrom, said sections being secured together with the front edges of their side portions abutting, means establishing communication between said sections, hollow interior tongues projecting from the facing sections, those of one section alternating in height with those of the other and being adapted to lie therebetween, the uppermost of said tongues being upon the front section and the back of the rear section being cut away from its upper end down, to

the top of its first tongue, said uppermost tongue being longer than any of the others and projecting into the upper part of said cut-away space, and a casing inclosing the boiler and providing a lateral draft-outlet opposite the said cut-away portion of the rear section.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of October, 1905.

AMOS P. HOPLER.

Witnesses:
CHARLES H. PELL,
RUSSELL M. EVERETT.