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HEAT EQUIPMENT

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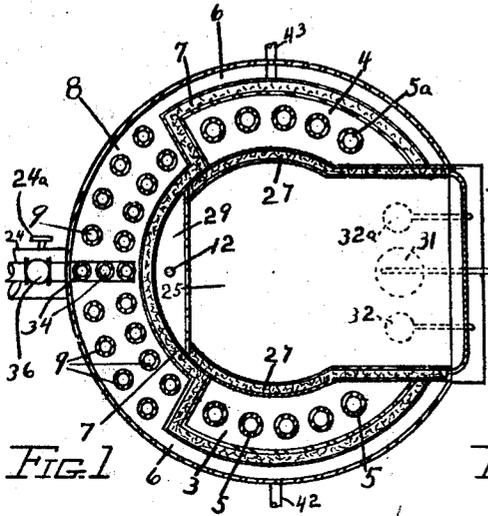


FIG. 1

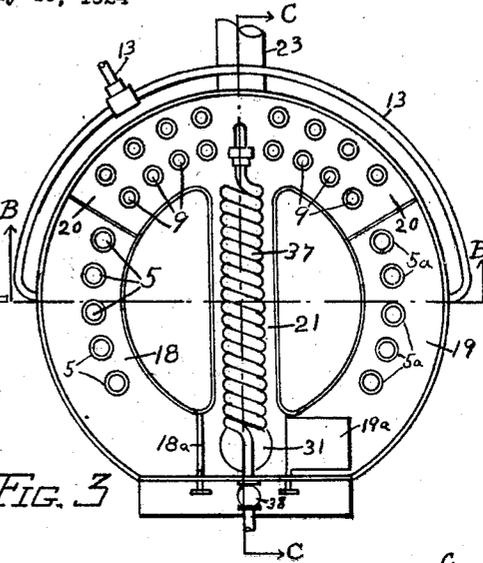


FIG. 3

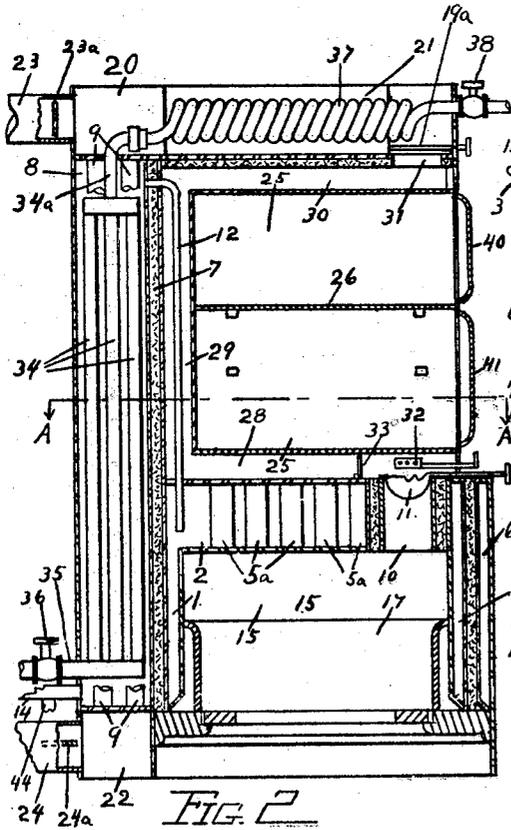


FIG. 2

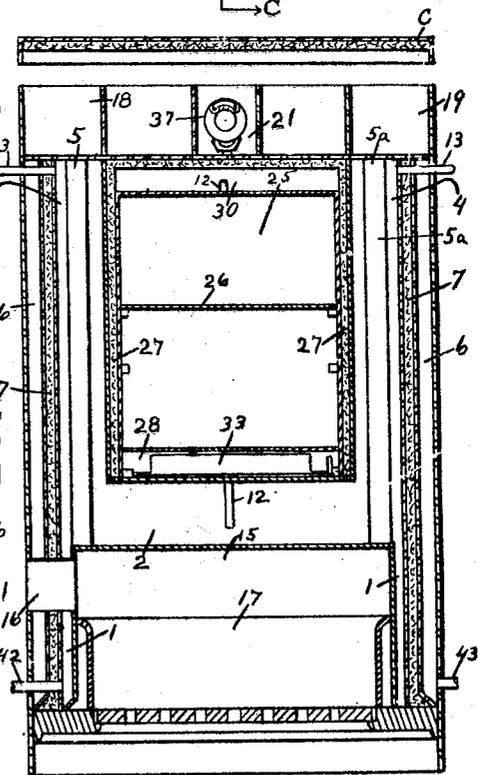


FIG. 4

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# UNITED STATES PATENT OFFICE.

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## HEAT EQUIPMENT.

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*To all whom it may concern:*

Be it known that I, OLIVER S. BOWMAN, a citizen of the United States, and a resident of Colorado Springs, in the county of El Paso and State of Colorado, have invented a new and useful Heat Equipment, of which the following is a specification.

My invention relates to hot water heat equipments and my object is to provide a device which will require but one fire to provide hot water heat, to cook, and to heat water for domestic use. Other objects will appear as the description progresses.

Although I show the preferred embodiment of my invention, I do not confine myself to the precise form herein shown but wish it understood that various changes in the details of construction may be made within the scope of what is hereinafter claimed.

Figure 1 represents a sectional plan view of the invention taken on the line A—A in Fig. 2; Fig. 2, an elevation of a section on the line C—C in Fig. 3; Fig. 3, a plan view of the invention, the cap C being removed; and Fig. 4, an elevation of a cross section on the line B—B in Fig. 3.

The means for heating water for the radiator system consists of a primary water-heating chamber, comprising an annular lower section 1, a cylindrical intermediate section 2 and two segmental upper sections 3 and 4, with up-draft tubes 5 and 5<sup>a</sup> through said cylindrical and segmental sections; and a secondary water-heating chamber 6 enclosing said primary water-heating chamber and having an inner insulating wall 7 and a segment 8 with down-draft tubes 9 therethrough; said cylindrical intermediate section 2 having therethrough an insulated conduit 10 with damper 11 therein. Drain pipe 12 opens above into segment 8 of the secondary water-heating chamber and below into intermediate section 2 of the primary water-heating chamber. 13 is a pipe connecting upper segmental sections 3 and 4 of the primary water-heating chamber to the radiator system, and 14 is the return pipe from the radiator system and enters segmental section 8 of secondary water-heating chamber 6.

Combustion chamber 15, having a fire door 16 and containing fire pot 17, is enclosed by the annular section 1 of the primary water-heating chamber and is in com-

munication with up-draft tubes 5 and 5<sup>a</sup> and with insulated conduit 10 having damper 11 therein.

The two upper side smoke channels 18 and 19 communicate with the upper ends of tubes 5 and 5<sup>a</sup>; a rear upper smoke channel 20 communicates with the upper ends of down-draft tubes 9; a central smoke channel 21 is in open communication with smoke channel 20 and in damper-controlled communication with side smoke channels 18 and 19 having therein dampers 18<sup>a</sup> and 19<sup>a</sup>. A lower smoke chamber 22 communicates with the lower ends of down-draft tubes 9. Smoke conduit 23 in communication with smoke channel 20 and smoke conduit 24 in communication with smoke chamber 22, are adapted to communicate with a chimney flue and are controlled by dampers 23<sup>a</sup> and 24<sup>a</sup> respectively.

The cooking means comprise chamber 25, having movable partition 26, insulating wall 27 and doors 40-41, disposed above cylindrical section 2 and between segmental sections 3 and 4 and positioned to form a smoke channel, having sections 28, 29, and 30, in communication below with conduit 10 and above (via opening 31) with central smoke chamber 21.

Gas burners 32 and 32<sup>a</sup> and hinged baffle 33 are disposed in section 28 under cooking chamber 25.

The means for heating water for domestic purposes comprise a series of connected pipes 34, having an inlet 35 controlled by valve 36, vertically disposed in rear segment 8, and a coil 37, having an outlet controlled by valve 38, horizontally disposed in central smoke channel 21 and joined to said connected pipes 34 by pipe 34<sup>a</sup>.

The gases of combustion pass upward through up-draft tubes 5 and 5<sup>a</sup> into smoke channels 18 and 19, thence through central smoke channel (assuming that both dampers 18<sup>a</sup> and 19<sup>a</sup> are open and that damper 11 is closed) into rear smoke channel 20, down through tubes 9 into lower smoke chamber 22 and through conduit 24 into the flue.

The hot water for heating purposes flows from segmental sections 3 and 4, of the primary water-heating chamber, through pipe 13 into the radiator system, and returns therefrom through pipe 14 into the secondary water-heating chamber 6, where it is partly heated, as it rises therein, and flows

through drain pipe 12 again into the intermediate section 2 of the primary water-heating chamber, where its reheating is completed.

5 The temperature prevailing in cooking chamber 25 is regulated by the manipulation of dampers 11, 18<sup>a</sup> and 19<sup>a</sup>. When damper 11 is open and dampers 18<sup>a</sup> and 19<sup>a</sup> are closed, practically all the gases of combustion pass through conduit 10, smoke channel sections 28, 29, and 30 and opening 31 into central smoke channel 21. The object of baffle 33 is to retard the movement of the gases of combustion whilst passing under chamber 25.

15 If a direct draft is desired when starting a fire, damper 24<sup>a</sup> is closed and damper 23<sup>a</sup> opened.

20 When hot water heat is not required, gas burners 32 and 32<sup>a</sup> may be used to heat cooking chamber 25 and to heat water in coil 37.

Water is heated for domestic purposes in pipes 34 and coil 37, pipe 35 being the inlet and valve 38 the outlet.

25 Water is taken into the system through pipe 44 and may be drained from the primary water-heating chamber through pipe 42 and from the secondary water-heating chamber through pipe 43.

30 The removal of cap C permits access to tubes 5, 5<sup>a</sup> and 9.

I claim:

1. In an equipment of the class described, 35 the combination of a primary water-heating chamber, comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; and a drain pipe extending through the insulating wall of the rear segment of said secondary water-heating chamber and into the intermediate section of said primary water-heating chamber and for the purposes set forth.

50 2. In an equipment of the class described, the combination of a primary water-heating chamber, comprising an annular lower section, a cylindrical intermediate section and two segmental sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in 65

damper-controlled communication with said side smoke channels; for the purposes set forth.

3. In an equipment of the class described, the combination of a water-heating chamber comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a combustion chamber in communication with said up-draft tubes; upper side smoke channels in communication with said up-draft tubes, a central smoke channel in communication with said side smoke channels, a rear smoke channel in communication with said central smoke channel; and a horizontal conduit in communication with said rear smoke channel and adapted to communicate with a chimney flue; for the purposes set forth. 85

4. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; and a combustion chamber in communication with said up-draft tubes; for the purposes set forth. 105

5. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; and a drain pipe extending through the insulated wall of the rear segment of said secondary water-heating chamber and into the intermediate section of said primary water-heating chambers; for the purposes set forth. 125

6. In an equipment of the class described, the combination of a primary water-heating 130

chamber comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; and a combustion chamber enclosed by the annular section of said primary water-heating chamber; for the purposes set forth.

7. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; a combustion chamber enclosed by the annular section of said primary water-heating chamber; a lower smoke chamber in communication with said down-draft tubes and with the exhaust conduit; and a drain pipe extending through the insulated wall of the rear segment of said secondary water-heating chamber and extending into the intermediate section of said primary water-heating chamber; for the purposes set forth.

8. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; a drain pipe extending through the insulating wall of the rear segment of said secondary water-heating chamber and extending into the intermediate section of said primary water-heating chamber; a combustion chamber enclosed by the annular section of said primary water-heating chamber; upper side smoke channels in

communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; a horizontal conduit, having a damper therein, in communication with said rear smoke channel and adapted to communicate with a chimney flue; a lower smoke chamber in communication with said down-draft tubes; and a horizontal conduit in communication with said lower smoke chamber and adapted to communicate with a chimney flue; for the purposes set forth.

9. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section having a damper-controlled insulated conduit therethrough, and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a combustion chamber enclosed by the annular section of said primary water-heating chamber, and a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said inner water chamber; for the purposes set forth.

10. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section having a damper-controlled insulated conduit therethrough, and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water heating chamber with an inner insulated wall, having a rear segment with down-draft tubes therethrough enclosing said primary water-heating chamber; a drain pipe extending through the insulated wall of said rear section of said secondary water-heating chamber and into the cylindrical section of said primary water-heating chamber; a combustion chamber enclosed by the annular section of said primary water-heating chamber; for the purposes set forth.

11. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section with an insulated conduit therethrough, the two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; a combustion chamber enclosed by the annular section of said primary water-heating chamber; upper side smoke channels in communication with said

up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; for the purposes set forth.

12. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section with a damper-controlled insulated conduit therethrough, and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; a drain pipe extending through the insulated wall of the rear segment of said secondary water-heating chamber and into the intermediate section of said primary water-heating chamber; a combustion chamber enclosed by the annular section of said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; for the purposes set forth.

13. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section, and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a secondary water-heating chamber with an inner insulated wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, a rear upper smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; and a series of connected pipes, having a valve-controlled inlet, vertically disposed in the rear segment of said secondary water-heating chamber, and a coil, having a valve-controlled outlet, horizontally disposed in said central smoke channel, and in communication with said series of connected pipes; for the purposes set forth.

14. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section, and two segmental upper sections;

up-draft tubes through said cylindrical and intermediate sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; a drain pipe extending through the insulating wall of said rear section of said secondary water-heating chamber and into the cylindrical section of said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said up-draft tubes, and a central smoke channel in open communication with said upper rear smoke channel and in damper-controlled communication with said side smoke channels; a series of connected pipes, having a valve-controlled inlet, vertically disposed in the rear segment of said secondary water-heating chamber, and a coil, having a valve-controlled outlet, horizontally disposed in said central smoke channel and in communication with said series of connected pipes; for the purposes set forth.

15. In an equipment of the class described, the combination of a water-heating chamber having an annular lower section, a cylindrical intermediate section and two segmental upper sections; and a cooking chamber disposed above the intermediate section and between the segmental sections; for the purposes set forth.

16. In an equipment of the class described, the combination of a water-heating chamber having an annular lower section, a cylindrical intermediate section with an insulated conduit therethrough, and two segmental upper sections; a combustion chamber enclosed by the annular section of said water-heating chamber; an upper smoke channel; a cooking chamber disposed above the cylindrical and between the segmental sections of said water-heating chamber; a smoke channel in communication with said combustion chamber via said insulated conduit, extending under, behind and over said cooking chamber and into said upper smoke channel; for the purposes set forth.

17. In an equipment of the class described, the combination of a water-heating chamber having an annular lower section, a cylindrical intermediate section with an insulated conduit therethrough, and two segmental upper sections with up-draft tubes therethrough; upper smoke channels in communication with said up-draft tubes; a cooking chamber disposed above said cylindrical and between said segmental sections; a smoke channel in communication with said insulated conduit and extending under and over said cooking chamber and into said upper smoke channels; for the purposes set forth.

18. In an equipment of the class described,

the combination of a water-heating chamber having an annular lower section enclosing a combustion chamber, a cylindrical intermediate section with a conduit there-through, and two upper sections; up-draft tubes through said upper sections; a cooking chamber disposed above said cylindrical section and between said upper sections; upper smoke channels; a smoke channel in communication with said conduit, extending under and over said cooking chamber and into said upper smoke channels; and burners disposed under said cooking compartment; for the purposes set forth.

19. In an equipment of the class described, the combination of a primary water-heating chamber having segmental upper sections with up-draft tubes therethrough; a cooking compartment disposed between said segmental sections; upper smoke channels in communication with said up-draft tubes; a smoke channel extending under and over said cooking chamber and into communication with said upper smoke channels; a secondary water-heating chamber surrounding said primary water-heating chamber and having an insulating inner wall; down-draft tubes through said secondary water chamber, in communication with said upper smoke channels; and a combustion chamber enclosed by said primary water-heating chamber and in communication with said up-draft tubes; for the purposes set forth.

20. In an equipment of the class described, the combination of a primary water-heating chamber having segmental upper sections with up-draft tubes therethrough; a cooking compartment disposed between said segmental sections; upper smoke channels in communication with said up-draft tubes; a smoke channel extending under and over said cooking compartment and into communication with said upper smoke channels; a secondary water-heating chamber having an inner insulating wall and enclosing said primary water-heating chamber; a series of connected pipes vertically disposed in said secondary water-heating chamber, and a coil disposed in one of said upper smoke channels and in communication with said series of connected pipes; and down-draft tubes through said secondary water-heating chamber in communication with one of said upper smoke channels; for the purposes set forth.

21. In an equipment of the class described, the combination of a primary water-heating chamber having a lower annular section, an intermediate section with a conduit there-through, and two segmental sections with up-draft tubes therethrough; upper smoke channels in communication with said up-draft tubes; a combustion chamber enclosed by the annular section of said primary water-heating chamber; a cooking chamber

disposed between the segmental sections of said water-heating chamber; a smoke channel extending under and over said cooking chamber and into communication with said upper smoke channels; a secondary water-heating chamber having an inner insulating wall, enclosing said primary water-heating chamber; down-draft tubes through said secondary water-heating chamber; a series of connected pipes vertically disposed in said secondary water-heating chamber, and a coil disposed in one of said upper smoke channels and in communication with said series of connected pipes; and a lower smoke chamber in communication with said down-draft tubes; for the purposes set forth.

22. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; up-draft tubes through said cylindrical and segmental sections; a damper-controlled insulated conduit through said cylindrical section of said water chamber; a secondary water-heating chamber having an inner insulating wall, comprising a segment with down-draft tubes, and a segment having an upper side opening therethrough, enclosing said primary water-heating chamber; a combustion chamber enclosed by the annular section of said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; a cooking chamber disposed above the intermediate section and between the segmental sections of said primary water-heating chamber; a smoke channel in communication with said combustion chamber, via said insulated conduit, extending under and over said cooking chamber and opening into said central smoke chamber; and a lower smoke chamber in communication with said down-draft tubes; for the purposes set forth.

23. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section having an insulated conduit therethrough, and two upper sections; a secondary water-heating chamber with an inner insulating wall, comprising a segment with down-draft tubes and a segment having an upper side opening therethrough, enclosing said primary water-heating chamber; a drain pipe extending through the insulating wall of said secondary water-heating chamber and into the intermediate section of said primary water-

- heating chamber; a combustion chamber enclosed by the annular section of said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, an upper rear smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; a cooking chamber disposed above said intermediate section and between said upper sections of said primary water-heating chamber; a hinged baffle disposed under said cooking chamber; a smoke channel in communication with said combustion chamber via said conduit, extending under and over said cooking chamber and into said central smoke chamber; a lower smoke chamber in communication with said down-draft tubes; a horizontal conduit having a damper therein, in communication with said rear upper smoke channel and adapted to communicate with a chimney flue, and a horizontal conduit, having a damper therein, in communication with said lower smoke chamber and adapted to communicate with a chimney flue; for the purposes set forth.
24. In an equipment of the class described, the combination of a primary water-heating chamber comprising an annular lower section, a cylindrical intermediate section with an insulated conduit therethrough, and two upper sections; up-draft tubes through said intermediate and upper sections; a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; a combustion chamber enclosed by the annular section of said primary water-heating chamber; upper side smoke channels in communication with said up-draft tubes, a rear upper smoke channel in communication with said down-draft tubes, and a central smoke channel in open communication with said rear smoke channel and in damper-controlled communication with said side smoke channels; a series of connected pipes, having a valve-controlled inlet, vertically disposed in the rear segment of said secondary water-heating chamber, and a coil, having a valve-controlled outlet, horizontally disposed in said central smoke channel and in communication with said series of connected pipes; a cooking chamber disposed above the intermediate section and between the segmental sections of said primary water-heating chamber; a smoke channel in communication with said combustion chamber, via said conduit, extending under and over said cooking chamber and into said central smoke channel; a lower smoke channel in communication with said down-draft tubes; a horizontal conduit in communication with said rear upper smoke channel and adapted to communicate with a chimney flue; a horizontal conduit in communication with said lower smoke chamber and adapted to communicate with a chimney flue; a drain pipe extending through the insulating wall of the rear segment of said secondary water-heating chamber and into the intermediate section of said primary water-heating chamber; and burners disposed under said cooking chamber and adapted to be connected to a fuel supply pipe; for the purposes set forth.
25. An element in an equipment of the class described, comprising a water-heating chamber, having an annular lower section, a cylindrical intermediate section and two segmental upper sections; for the purposes set forth.
26. An element in an equipment of the class described, comprising a water-heating chamber, having an annular lower section, a cylindrical intermediate section, two segmental upper sections, and a damper-controlled insulated conduit through said intermediate section; for the purposes set forth.
27. An element in an equipment of the class described, comprising a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, adapted to enclose a primary water-heating chamber; for the purposes set forth.
28. In an equipment of the class described, the combination of a primary water-heating chamber, comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; and a secondary water-heating chamber with an inner insulating wall, having a rear segment with down-draft tubes therethrough, enclosing said primary water-heating chamber; for the purposes set forth.
29. In an equipment of the class described, the combination of a primary water-heating chamber, comprising an annular lower section, a cylindrical intermediate section and two segmental upper sections; and up-draft tubes through said cylindrical and segmental sections; for the purposes set forth.

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