

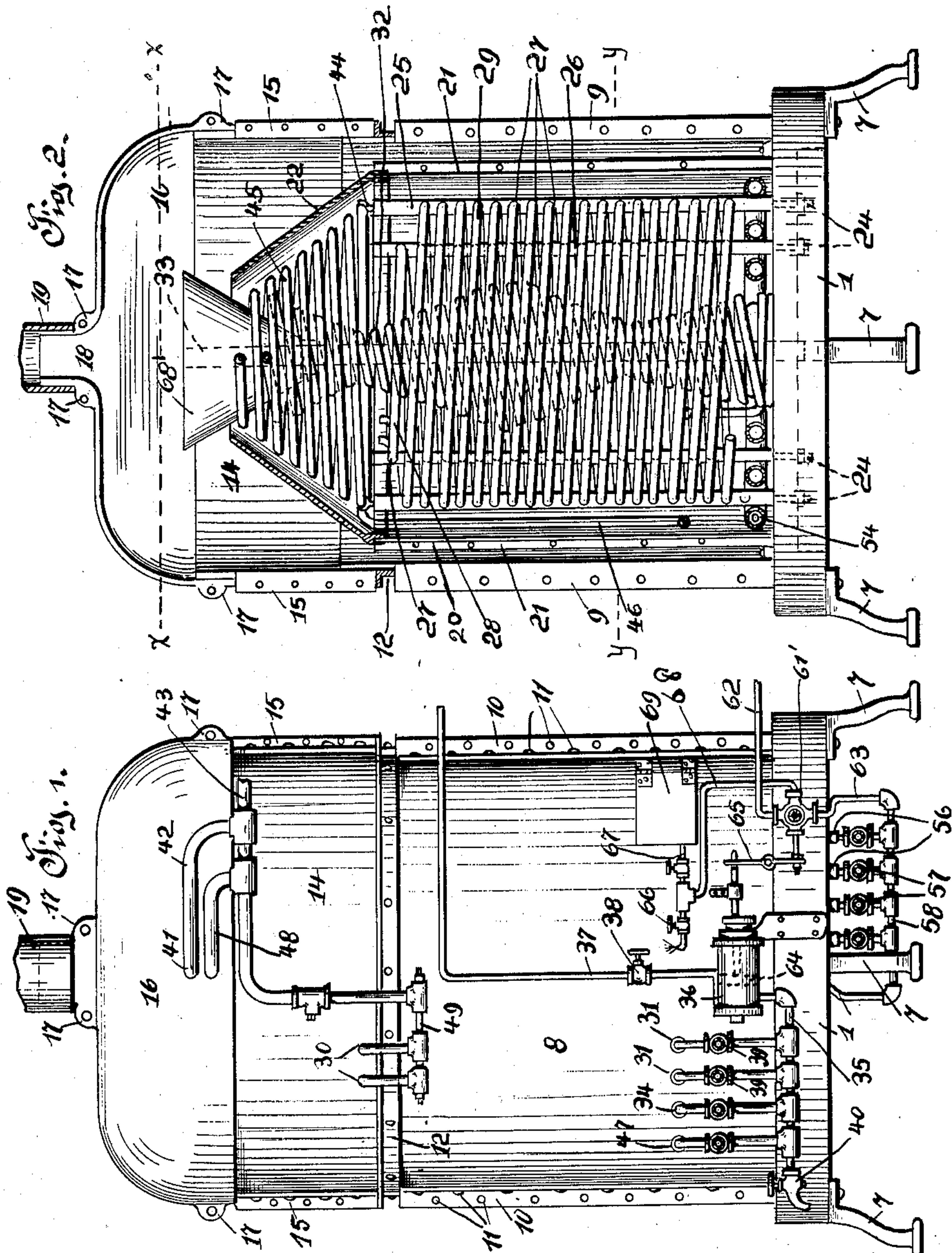
No. 850,620.

PATENTED APR. 16, 1907.

T. H. CAMPBELL.
HOT WATER HEATER.

APPLICATION FILED DEC. 8, 1905.

2 SHEETS—SHEET 1.



Witnesses:
C. Klostermann.

W. H. Butler.

Inventor.
Thomas H. Campbell.

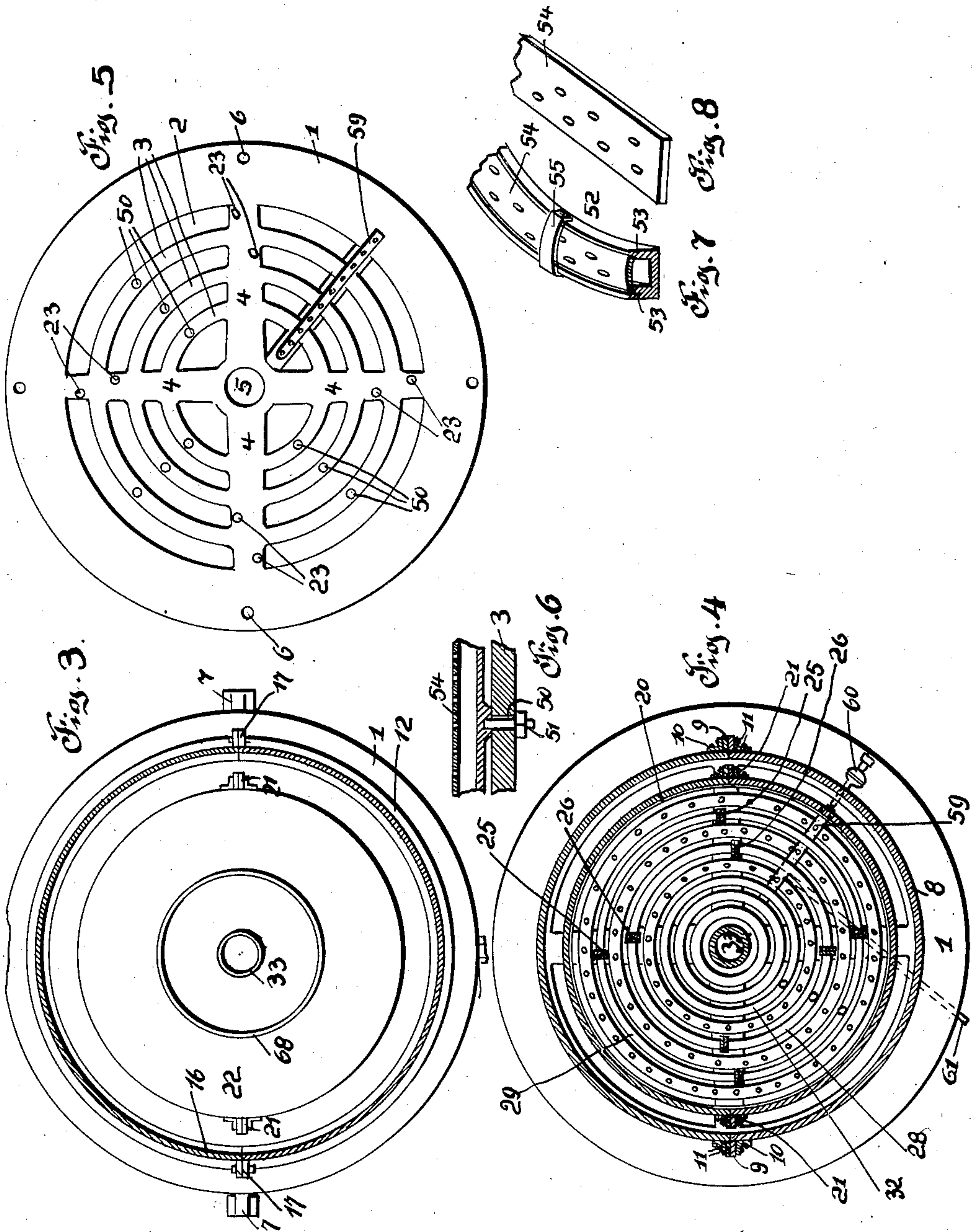
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UNITED STATES PATENT OFFICE.

THOMAS H. CAMPBELL, OF PITTSBURG, PENNSYLVANIA.

HOT-WATER HEATER.

No. 850,620.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed December 8, 1905. Serial No. 290,913.

To all whom it may concern:

Be it known that I, THOMAS H. CAMPBELL, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in hot-water heaters; and the primary object of the invention is to provide a novel form of heater for instantaneously heating water.

15 Another object of this invention is the provision of novel means for increasing and decreasing the capacity of the heater, according to the use to which the heater is applied.

20 A further object of this invention is to utilize and house the products of combustion, whereby the greatest amount of heat units will be derived from the least expenditure of fuel.

25 A still further object of this invention is to provide a simple and inexpensive construction in connection with the heater that can be easily and quickly assembled and disassembled when it is desired to cleanse the same.

30 With the above and other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts, to be hereinafter more fully described and then specifically pointed out in the claims, and, referring to the drawings accompanying this application, like numerals of reference designate corresponding parts throughout the several views, in which—

35 Figure 1 is a front elevation of my improved hot-water heater. Fig. 2 is a vertical sectional view of the same, partly in side elevation. Fig. 3 is a cross-sectional view taken on the line *x x* of Fig. 2. Fig. 4 is a similar view taken on the line *y y* of Fig. 2. Fig. 5 is a plan of a base-plate used in connection with the heater. Fig. 6 is a fragmentary sectional view of the same, illustrating a burner 45 mounted thereon. Fig. 7 is a perspective view of a portion of the burner, and Fig. 8 is a perspective view of a portion of one of the perforated plates of the burner.

50 To put my invention into practice, I construct my improved hot-water heater of a base-plate 1, which is cut away, as at 2, to

form a plurality of circumferentially-arranged ribs 3 and radially-disposed ribs 4. At the intersection of the radially-disposed ribs 4 the base-plate is provided with a central opening 5, while the edge of the base-plate opposite each radially-disposed rib is provided with an opening 6. Legs 7 are secured in the opening 6 of the base-plate to support said base-plate a suitable distance 65 above a floor or the like foundation.

Resting upon the base-plate 1 is a two-part outer shell 8, the parts of said shell being flanged, as at 9, and secured together by angle-irons 10 and bolts or rivets 11. Adjacent 70 to the upper edge of the outer shell 8 is secured a ring or annulus 12, and adapted to fit over the upper end of the outer shell 8 and resting upon the annulus or ring is an upper shell 14, said shell being formed of two parts 75 which are flanged and secured together, as at 15 15, similar to the two-part outer and lower shell 8. Fitting upon the upper shell 14 is a two-part dome or cap 16, the parts of said dome or cap being secured together, as at 17 80 17. The dome 16 is formed with a central opening 18, over which an exhaust-flue 19 is mounted to convey the products of combustion from within the heater to a suitable flue or chimney. (Not shown.) 85

Mounted within the outer shell 8 and resting upon the base-plate is a cylindrical two-part casing 20, the parts of said casing being flanged and secured together, as at 21, similar to the outer shell 8. The casing 20 is substantially the same height as the lower outer shell 8, and mounted upon its top edges is a frustro-conical-shaped hood 22. 90

The radially-disposed ribs 4 of the base-plate 1 are provided with openings 23 23, 95 and secured in said opening, as at 24, are upwardly-extending two-piece standards or strips 25 and 26, each standard or strip having a plurality of openings 27 formed therein. Arranged within the openings of the standards 26 is a coil of tubing 28, while arranged 100 within the opening of the standards 25 is a coil of tubing 29. The upper ends of the coils of tubing 28 and 29 pass out of the casing 20 and the outer shell 8, as at 30 30, 105 while the lower ends of the coils of tubing pass out of the casing and outer shell, as at 31 31. Within the coil of tubing 28 is mounted a sinuous coil of tubing 32, said coil of tubing surrounding a central cold-air-draft pipe 33, which is mounted over the opening 5 of the base-plate 1. The lower 110

end of the sinuous coil of tubing 32 passes out of the casing and outer shell 8, as at 34, and, together with the ends of the coils of tubing 28 and 29, are connected to a pipe 35, which supplies water to said coils of tubing from a cylinder 36, which receives water from a main supply-pipe 37, valves 38 and 39 controlling the passage of water into the coils of tubing. The pipe 35 is provided with a drain-cock 40 in order to cleanse the cylinder 36 and its appurtenant parts.

The upper end of the sinuous coil of tubing 32 passes out of the dome 16, as at 41, and is connected by a pipe 42 with a pipe 43.

The upper ends of the standards 25 are provided with brackets 44, which support a coil of tubing 45 within the hood 22, said coil of tubing communicating with the pipe 35 by a pipe 46, which passes downwardly within the casing 20 and extends through the casing and the outer shell 8, as at 47. The upper end of the coil of tubing 45 passes through the dome 16 and is connected by a pipe 48 with the pipe 43. The pipe 43 connects with a pipe 49, with which the ends of the coils of tubing 28 and 29 connect. In this manner the water which passes through the coils 28 and 29, also the coils 32 and 45, will pass into a common pipe 43, which may lead to the place or compartment where the heated water is to be used.

The circumferentially-formed ribs 3 are provided with openings 50, and secured upon said ribs by screw-bolts 51, which pass through the openings 50 of said ribs, are circular burner-casings 52, said casings being arranged between the coils of tubing 28 29 32 and the casing 20, whereby both sides of the coils of tubing will be exposed to the heat given off by the burner-casing. Each burner-casing is substantially channel-shaped in cross-section and has its upper inner sides recessed, as at 53 53, to receive the edges of a perforated plate or strip 54. The strip or plate 54, of a greater width than the casing 52, is used, whereby to secure the plates upon the casings it will be necessary to slightly curve the same, thereby giving it a convex burner or upper surface, the resiliency of the strips or plates tending to hold the plates upon the casings; but to further insure their engagement with the casings I employ strips 55, which are secured to the sides of each casing, as clearly illustrated in Fig. 7 of the drawings. The burner-casings 52 are provided with depending pipes 56, each of which carries a regulating-valve 57, and said pipes are adapted to communicate with a pipe 58, mounted beneath the base-plate 1. Arranged transversely of the burner-casing is a pilot-light tubing 59, a portion of which extends through the casing 20 and the shell 8 to provide an exterior pilot-light 60. The pilot-light tubing 59 is connected by a pipe 61 with the pipe 58, beneath the base-plate.

Upon one side of the base-plate 1, adjacent to the pipe 58, I mount a valve 61', which controls the main gas-supply pipe 62. The valve 61' is in communication with the pipe 58 by a piece of tubing 63. In the cylinder 36 is mounted a piston 64, which is adapted to actuate a pivoted lever 65 to open and close the valve 61'. A pilot-light 66 is connected with the valve 61' or may be connected by a pipe 68 with the pilot-light tubing 59, within the heater.

The upper end of the cold-air-draft pipe 33 is provided with an inverted-cone-shaped deflector-head 68', which is adapted to deflect the products of combustion toward the hood 22 and when they have been ejected from said hood to deflect the products outwardly to the sides of the outer shell or dome of the heater.

The outer shell 8, together with the casing 20, may be provided with suitable doors 69 in order that easy access may be had to the burner-casing of the heater or any of the parts thereof.

By the construction of my improved heater it will be observed that each coil of tubing within the heater can be used independently of the others. Consequently the capacity for heating water can be increased or decreased, according to the quantities of hot water desired. It is a well-known fact that certain residences require a greater quantity of hot water on certain days than other days. Therefore I have constructed my improved heater whereby one coil of tubing will only be operated, together with one burner-casing, when a small quantity of heated water is desired.

In the accompanying drawings I have illustrated a novel form of thermostat for controlling the burners of the heater; but this thermostat will be the subject-matter of another application, and therefore I desire it to be understood that a conventional form of thermostat can be readily used, besides the independent valves for controlling the operation of the heater.

I preferably construct my improved heater of sheet metal and drop-forge castings where necessary, and the construction and simplicity of the parts of the heater permit of the same being easily and quickly assembled and operated to produce any desired quantity of hot water.

Such changes in the construction and operation of my improved heater as are permissible by the appended claims may be resorted to without departing from the spirit and scope of the invention.

What I claim, and desire to secure by Letters Patent, is—

1. A heater embodying a base, shells supported by said base, coils of tubing arranged within said shells and surrounding one another, burners located between said coils of

tubing, means to support said coils of tubing, and means to support said burners, substantially as described.

2. A heater embodying a base, shells supported by said base, coils of tubing arranged within said shells, said coils of tubing being arranged one within the other, and having a common outlet, burners located between said coils of tubing, means to support said coils and tubing and means to support said burners.

3. A heater having a central opening passing vertically therethrough, said heater embodying the base, shells supported by said base, coils of tubing arranged within said shells, said coils being arranged one within the other, the innermost of said coils surrounding said central opening, burners located

between said coils of tubing, means to support said coils of tubing, and means to support said burners substantially as described.

4. A heater embodying the base and having a central opening passing therethrough, a plurality of shells arranged one within the other, coils of tubing supported by said shells, burners arranged between said shells and coils of tubing, and means for supporting said burners substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

THOMAS H. CAMPBELL.

Witnesses:

K. H. BUTLER,
E. E. POTTER.