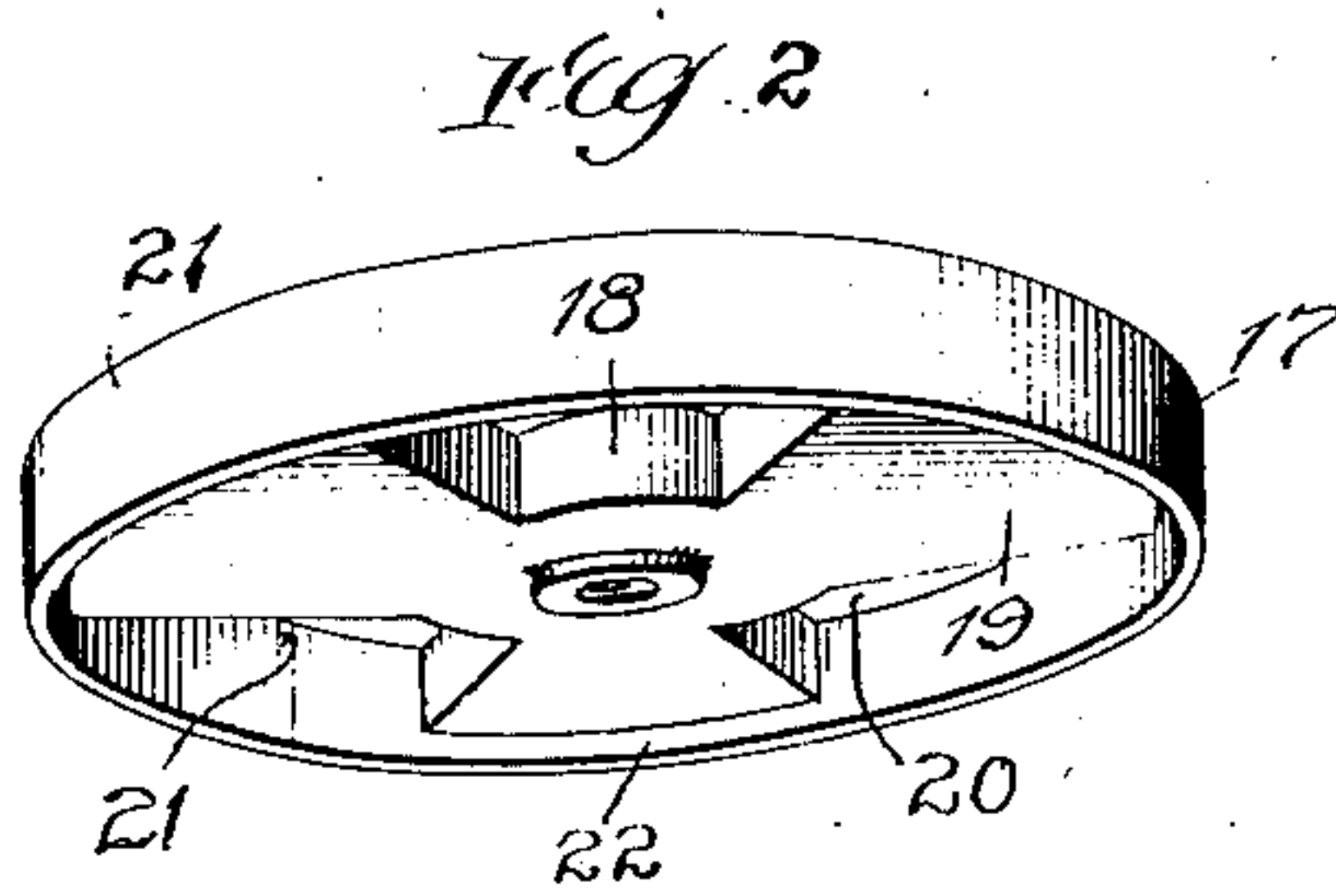
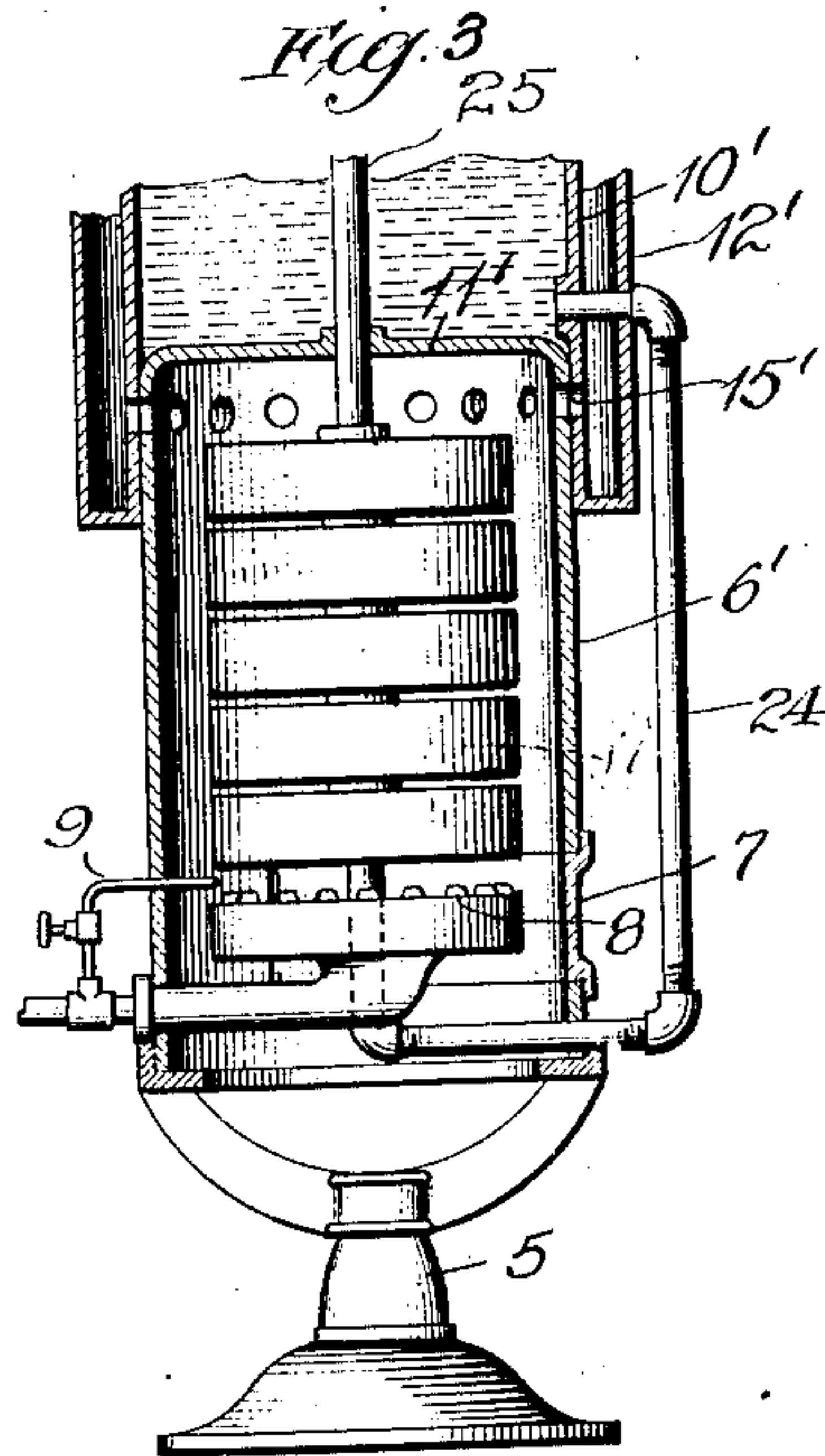
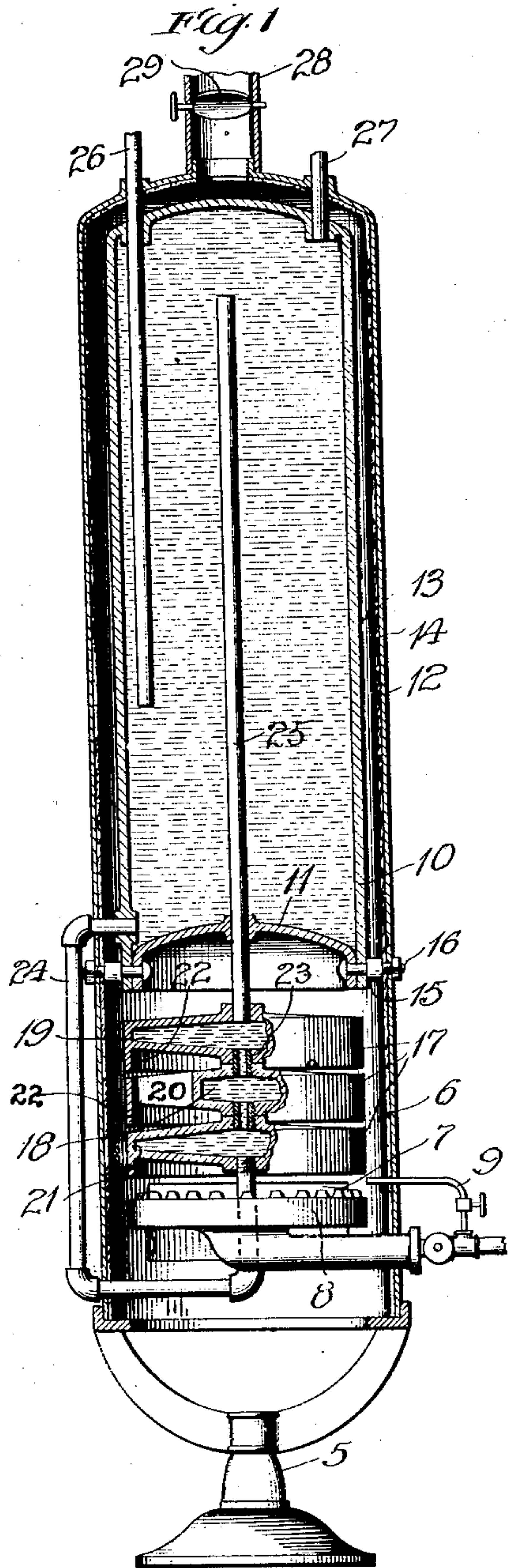


W. HAWKS.
HOT WATER HEATER.
APPLICATION FILED MAR. 29, 1907.

924,779.

Patented June 15, 1909.



Witnesses
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UNITED STATES PATENT OFFICE.

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HOT-WATER HEATER.

No. 924,779.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed March 29, 1907. Serial No. 365,263.

To all whom it may concern:

Be it known that I, WILLIAM HAWKS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification.

My invention relates to improvements in hot water heaters, and more particularly to heaters of the kitchen boiler type.

One of the objects of my invention is to provide a heater wherein the direct heat from the burner acts upon a built-up structure involving a series of heating disk units arranged to cause the heat to pass through a tortuous passage.

A further object of my invention is to provide a construction in which the hot water receptacle is jacketed by the escape flue for the heat.

Another object of my invention is to provide improved heating disk units. And further my invention has for its object to provide a generally improved, simple and efficient heating construction.

In the drawing; Figure 1 is a vertical cross section of a structure embodying my invention; Fig. 2 is a perspective view of one of the heating disk units, and; Fig. 3 is a modified structure embodying features of my invention.

Throughout the drawing like numerals of reference refer always to like parts.

In said drawing 5 indicates a base of ordinary construction supporting a vertical, open-bottomed combustion chamber 6, provided, preferably, with a side door 7, and having arranged therein the burner 8, of any suitable construction and adapted for the burning of any suitable fluid.

In the construction shown burner 8 is a gas burner, and 9 is a pilot for lighting the same.

Vertically above the combustion chamber 6 is arranged a hot water reservoir or boiler 10, the bottom of such boiler 11, forming the crown sheet of the combustion chamber 6.

Surrounding the boiler 10 is a jacket 12, spaced apart from the boiler proper to form an annular flue 13, completely surrounding the top and sides of the boiler, and in open communication with the combustion chamber, such jacket 12 having preferably a heat insulating lining 14 of suitable material such as asbestos.

In the construction shown in Fig. 1 the shell of the combustion chamber is a continuation of the jacket shell 12, the opening between the flue 13 and the chamber 6 being the annular space 15. The boiler 10 is positioned within the casing partly by its piping connections, to be described, and partly by the bolts 16 having thereon appropriate spacing sleeves.

In the construction shown in Fig. 3 the combustion chamber casing 6' is connected to the boiler 10', and the jacket 12' closed at its lower end a little below the level of crown sheet 11', opening to the combustion chamber through registering apertures 15' and 15'' made through the wall of the combustion chamber and the boiler 10' respectively.

Obviously the construction shown in Fig. 1 gives the greater amount of space within the combustion chamber so that large burners and heating disks may be used, and I, therefore, show it as a preferred form.

In the space between the bottom 11 of the boiler and the burner 8, are arranged the primary heating drums or disks, the construction shown comprising a series of disks 17 superposed one upon another and connected together for water circulation. Each disk is preferably a circular structure having a hollow hub 18 and several hollow water arms 19 radiating therefrom and communicating therewith, such arms being separated by heat passages 20 extending through the disk.

21 indicates a continuous band or rim forming the periphery of the disk, to constitute the peripheral wall of the water arms 19 and to peripherally close the heat passages 20. These peripheral rims 21 I prefer shall be of such height that when the disks are stacked one upon the other the rims form substantially a vertically continuous peripheral stack, as indicated in Fig. 1. To this end I prefer that the bands or rims 21 shall project downward a considerable distance below the under surfaces of their disks proper, to form lower flanges, as indicated at 22 in Fig. 1. In cross sectional area the water arms 19 of the disks preferably taper somewhat from the hub to the periphery, and in plan they taper from rim to hub. The hub portions of the several disks of the stack are all interconnected by hollow bushings 23 and preferably the disks are stacked one upon the other in such relation that the

heat passages 20 are staggering, so that the path of heat circulation through the opening 20 is tortuous.

24 indicates the supply pipe for the stack, at its upper end connected to the boiler 10 adjacent its bottom, and thence passing downward into the combustion chamber and up through the center of burner 8 into the hub of the lowermost disk 17.

25 indicates the outlet water pipe of the stack passing up through the center of boiler 10 to a point adjacent its top.

26 and 27 indicate the usual main supply and discharge pipes for the boiler 10, and 28 indicates the heat outlet flue from the top of jacket 12, controlled by a hand damper 29.

Now it will be apparent that when the burner 8 is lighted the hot gases of combustion therefrom pass upward through the tortuous passage afforded by the heat openings 20 through the superposed heating disks 17, peripheral escape of the gases being prevented by the wall 21, so that heat is not wasted by radiation to and through the casing wall 6. In consequence the maximum proportion of the heat is absorbed by, and communicated to the water within, the hollow disk 17 so that the temperature of such water is quickly raised. As a result the hot water, seeking to escape through the circulation pipe 25, from the arms 19, belches, in sudden impulses, from such arms through the communicating bushings 23 and the pipe 25, into the boiler, fresh water being supplied to the bottommost heater disk through the circulation feed pipe 24. This belching action occasioned by this construction I have found very efficacious in keeping the disks free from deposits, which tend to clog them up and destroy their usefulness, as the agitation accompanying the delivery of volumes of water from arms 19 is quite violent.

The heat escaping through the uppermost disk passes into the annular flue 13 surrounding the boiler proper, imparting additional heat or tending to conserve the heat of the boiler, according to its temperature, and eventually finds its way out through the flue 28. When the water in the boiler has been properly heated it will be apparent that the burner 8 may be turned out and then by closing the damper 29 hot air may be pocketed in the annular flue 13 to effectively aid in insulating the boiler against radiation of

the heat from the water therein. This arrangement I have found to be very effective, and a boiler full of hot water may be caused to retain its heat for considerable periods of time.

While I have herein described in some detail a specific embodiment of my invention, which I deem to be new, it will be apparent that many changes may be made in the construction without departure from the spirit and scope of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent, of the United States, is:

1. In a water heater, a boiler, a series of like superposed hollow disks each having a smooth top and heat passages therethrough connected with said boiler and provided with a continuous band or rim forming the periphery of the disk, whereby a vertically, substantially inclosed continuous stack is provided within which the heat is confined, and a source of heat below the disks.

2. In a water heater, a boiler, a hot-water inlet pipe extending through the bottom to a point near the top of the boiler, a series of superposed smooth top disks or drums, each comprising a hollow hub and a plurality of hollow water arms radiating therefrom and communicating therewith, said arms being separated by heat passages extending through the disk, and a continuous peripheral rim extending around the outer surfaces of the water arms, said disks being arranged to provide tortuous heat passages therethrough, and a heating means below said disk.

3. In a water heater, the combination of a boiler, a jacket surrounding and supporting said boiler and extending therebelow to form the combustion chamber, a series of perforated, peripherally - flanged, superposed smooth top hollow disks arranged with said perforations out of register whereby there is formed within said disks an inclosed stack, provided with tortuous heat passages therethrough within which the heat is substantially confined, and a source of heat within said combustion chamber.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

WILLIAM HAWKS.

In the presence of—

GEO. T. MAY, Jr.,
FORÉE BAIN.