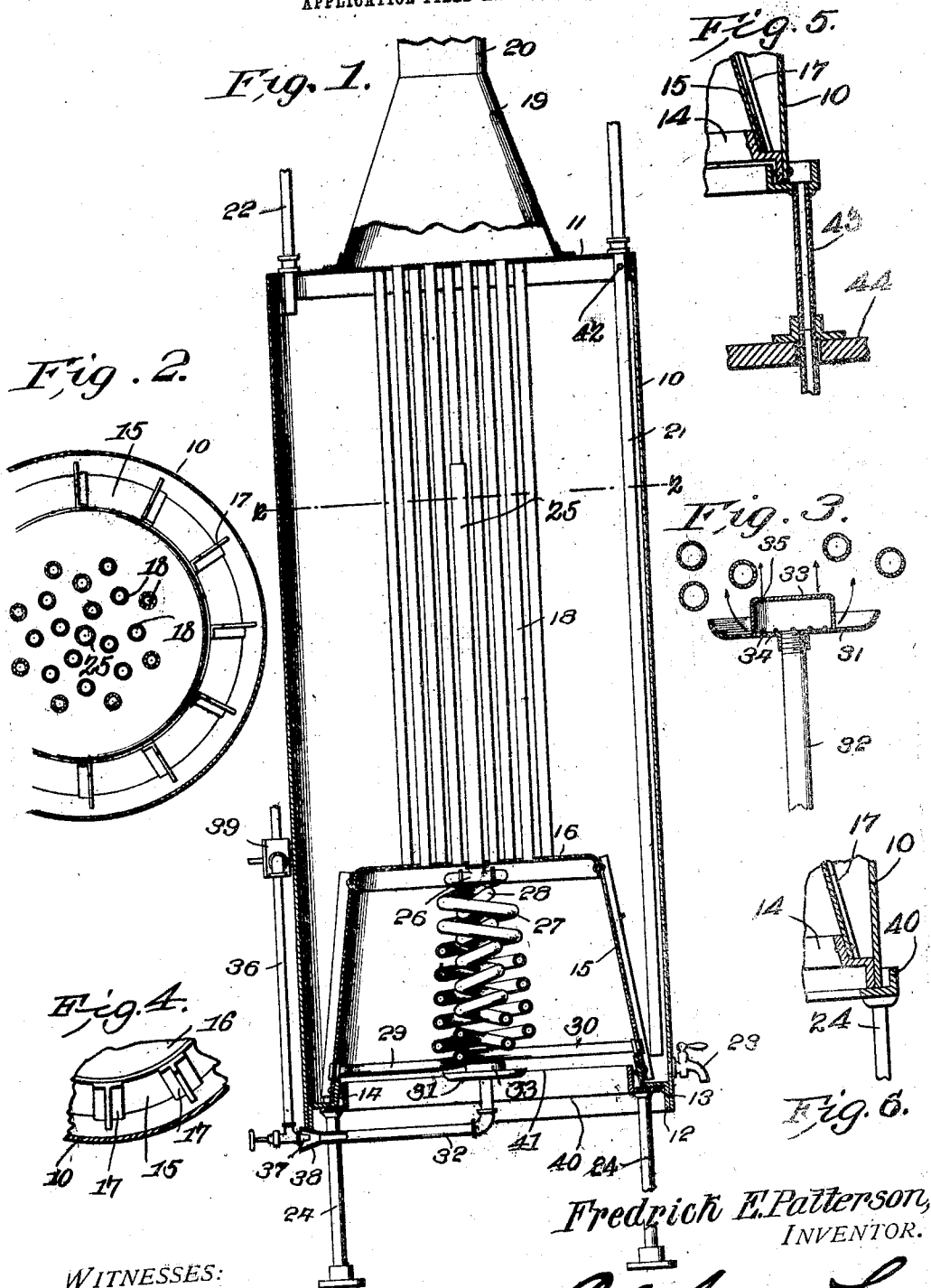


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PATENTED JAN. 21, 1908.

No. 877,115.

F. E. PATTERSON.
WATER HEATER.
APPLICATION FILED MAY 8, 1906.



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UNITED STATES PATENT OFFICE.

FREDRICK E. PATTERSON, OF BUCYRUS, OHIO.

WATER-HEATER.

No. 877,115.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed May 8, 1906. Serial No. 315,807.

To all whom it may concern:

Be it known that I, FREDRICK E. PATTERSON, a citizen of the United States, residing at Bucyrus, in the county of Crawford and State of Ohio, have invented a new and useful Water-Heater, of which the following is a specification.

This invention relates to devices for rapidly heating water for various purposes, more particularly for heating water in dwelling houses for use in bath-rooms, for the laundry and similar purposes, and has for its object to simplify and improve the construction, and increase the utility and efficiency of devices of this character.

With these and other objects in view which will appear as the nature of the invention is better understood, the invention consists in certain novel features of construction as hereinafter fully described and claimed.

In the accompanying drawings forming a part of this specification and in which corresponding parts are denoted by like designating characters, is illustrated the preferred form of the embodiment of the invention capable of carrying the same into practical operation.

In the drawings:—Figure 1 is a sectional elevation of the improved device. Fig. 2 is a transverse section on the line 2—2 of Fig. 1. Fig. 3 is an enlarged sectional detail of the burner. Fig. 4 is a detail of a portion of the inner shell, illustrating a slight modification in the construction. Figs. 5 and 6 are sectional details illustrating modifications in the construction of the supporting stand.

The improved device comprises a shell 10, preferably cylindrical, with a head 11 at one end and an annular frame 12 within the other end, the frame having an inwardly extending horizontal flange 13 spaced above its lower edge, and with an upwardly and inwardly inclined annular flange 14 extending from the horizontal flange, as shown in Fig. 1.

Riveted or otherwise secured to the flange 14 is an inner shell 15, converging inwardly and upwardly and provided with a head 16, the shell 15 and its head 16 forming an inwardly and upwardly tapering chamber within the outer shell 10, and opening downwardly therefrom, as shown.

The tapering shell 15 is reinforced by a plurality of bars or ribs 17 attached to its outer face, as shown.

Extending between the head 11 of the outer shell and the head 16 of the inner shell are a plurality of flues 18, providing means for the passage of the heated air rising from the burner which is located within the inner shell 15, as hereinafter described.

Disposed upon the head 11 of the outer shell 10 is a hood 19 from which a flue 20 leads to a chimney or other point of discharge, the hood extending over all the flues 18.

A feed pipe 21 leads into the shell 10, preferably through the head 11, and terminates near the lower end of the shell 10, while a discharge pipe 22 leads from the shell 10, and also preferably through the head 11.

A draw-off valve 23 is also provided, to enable the contents of the shell 10 to be withdrawn.

The shell 10 is supported upon a stand constructed of an annular frame 40 and spaced legs 24, the annular frame bearing beneath the horizontal flange 13 of the frame 12, and provided with a vertical flange 41 extending within the annular flange 14 of the frame 12.

Extending through the head 16 of the inner shell 15 is a pipe 25, projecting upwardly into the shell 10 for a considerable distance, and provided with a T 26 below the head 16.

Connected to one end of the T 26 is the upper whirl of a relatively large coil 27, the latter increasing in diameter downwardly, and connected to the other end of the T 26 is the upper whirl of another and smaller coil 28 likewise extending downwardly and within the larger coil 27, and also increasing in diameter toward the lower end.

The lower whirl of the outer and larger coil extends laterally as at 29 and is connected with the interior of the shell 10 through the inclined inner shell 15, while the lower whirl of the smaller inner coil is also extended laterally as at 30 and connected with the interior of the shell 10 through the wall of the inner shell 15.

The burner is located beneath the coils 27—28, and consists of a saucer-like plate 31, or a plate having an upturned edge, and through which the supply pipe 32 for the gas is conducted.

Bearing upon the plate 31 is a cap 33 having relatively minute recesses 34 in its lower rim, and with a plurality of minute orifices 35 in its upper face, the orifices being preferably arranged in a circle.

The supply pipe for the liquid fuel is represented at 36, and is provided with a needle valve 37 discharging into a funnel-like terminal 38 of the pipe 32. A suitable regulating device may be disposed in the supply pipe and adapted to be actuated automatically by the temperature of the water within the shell 10, but as the construction of these regulating devices is so well known and as it forms no part of the present invention, it is not specifically illustrated but a conventional outline of such a regulator is indicated at 39.

The relative sizes of the base plate 31 of the burner and the cap member 33 of the coils 27 and 28, that the flames from the orifices 35 extend into the space within the inner coil 28, while the flames escaping by the recesses 34 are turned upwardly by the curved edge of the base 31 between the two coils, as represented in Fig. 3, so that the greatest possible benefit will be secured from the flames of the burner.

The inner shell 15 converging inwardly and upwardly, causes the heated air produced by the action of the burner to be deflected inwardly as it rises and is thus accelerated, and its beneficial effects thereby materially increased.

By arranging the pipe 25 with its discharge end in the upper portion of the space within the shell 10, and lower ends of the coils connected to the space within the shell 10 near its lower end, a very rapid and free circulation of the water within the outer shell is maintained.

The tubes 18 are so distributed over the surfaces of the "heads" 11 and 16 as to form bracing supports thereto.

The bars 17 may be of any suitable form transversely but will preferably be in L shape as in Fig. 2, or T shaped as in Fig. 4.

A small vent orifice is formed in the inflow pipe as at 42, to prevent the formation of a vacuum and thereby obviate all danger of the "siphoning" of the contents of the shell back through the intake pipe.

The annular frame 40 may be arranged with its vertical flange outside the shell 10, as in Fig. 6, or in channel form as in Fig. 5.

When in channel form the frame is utilized as a receptacle for any moisture which may be precipitated from the shell and thus prevent it from falling upon the floor shown at 43. When thus employed one of the standards 24 will be replaced by a tubular member 44 and leading through the floor, to any suitable receiver.

The device may be constructed of any required size, or capacity, and of any suitable material.

Having thus described the invention, what is claimed as new is:—

1. A water heating apparatus including an outer shell provided with an interior liquid chamber, a hood secured to the top of the shell, an inner shell extending within the outer shell and having its lower end open, a plurality of flues connecting the inner and outer shells and extending through the liquid chamber and communicating with the interior of the hood, a pipe disposed within the liquid chamber and having its lower end provided with an enlarged head having oppositely disposed coupling members, a pipe secured to one of the coupling members and bent to form a vertically disposed coil the free end of which is extended laterally through one side of the inner shell for communication with the interior of the liquid chamber, a pipe secured to the opposite coupling member and bent to form a second coil surrounding the first coil and having its free end extending laterally through the opposite side of the inner receptacle for communication with the liquid chamber, and a burner arranged beneath the coils.

2. A water heating apparatus including an outer shell having an interior chamber, a hood secured to the top of the casing, an annular frame secured to the bottom of the shell, an inner shell resting on the annular frame and extending within the outer shell, said inner shell having its lower end open and its exterior walls reinforced by a plurality of spaced vertically disposed ribs, flues connecting the inner and outer shells and extended through the liquid chamber for communication with the hood, a pipe disposed within the liquid chamber and having its lower end provided with a T head and having oppositely disposed coupling members, coils disposed one within the other and connected with the coupling members of the head, said coils having their free ends extending laterally in opposite directions through the adjacent walls of the inner shell for communication with the liquid chamber, and a burner disposed beneath the coils.

3. A water heating apparatus including an outer shell, a hood secured to the top of the outer shell, an annular frame secured to the lower end of the shell, an inner shell resting on the annular frame and extending within the liquid chamber, said inner shell having its lower end open and its interior walls provided with a plurality of spaced reinforcing ribs, flues connecting the inner and outer shells and extending through the liquid chamber for communication with the hood, a pipe extending within the liquid chamber and terminating short of the upper end thereof, said pipe being provided at its lower end with an enlarged head having oppositely disposed coupling members, coils disposed one within the other and connected

with the coupling members of the head, the
free ends of said coils being extended in
opposite directions through the adjacent
walls of the inner shell for communication
5 with the liquid chamber, a supporting frame
engaging the annular frame, standards de-
pending from the supporting frame, and a
heater disposed beneath the coils.

In testimony that I claim the foregoing
as my own, I have hereto affixed my signa- 10
ture in the presence of two witnesses.

FRED. E. PATTERSON.

Witnesses:

HEARMON PATTERSON;
G. F. BIEBER.