

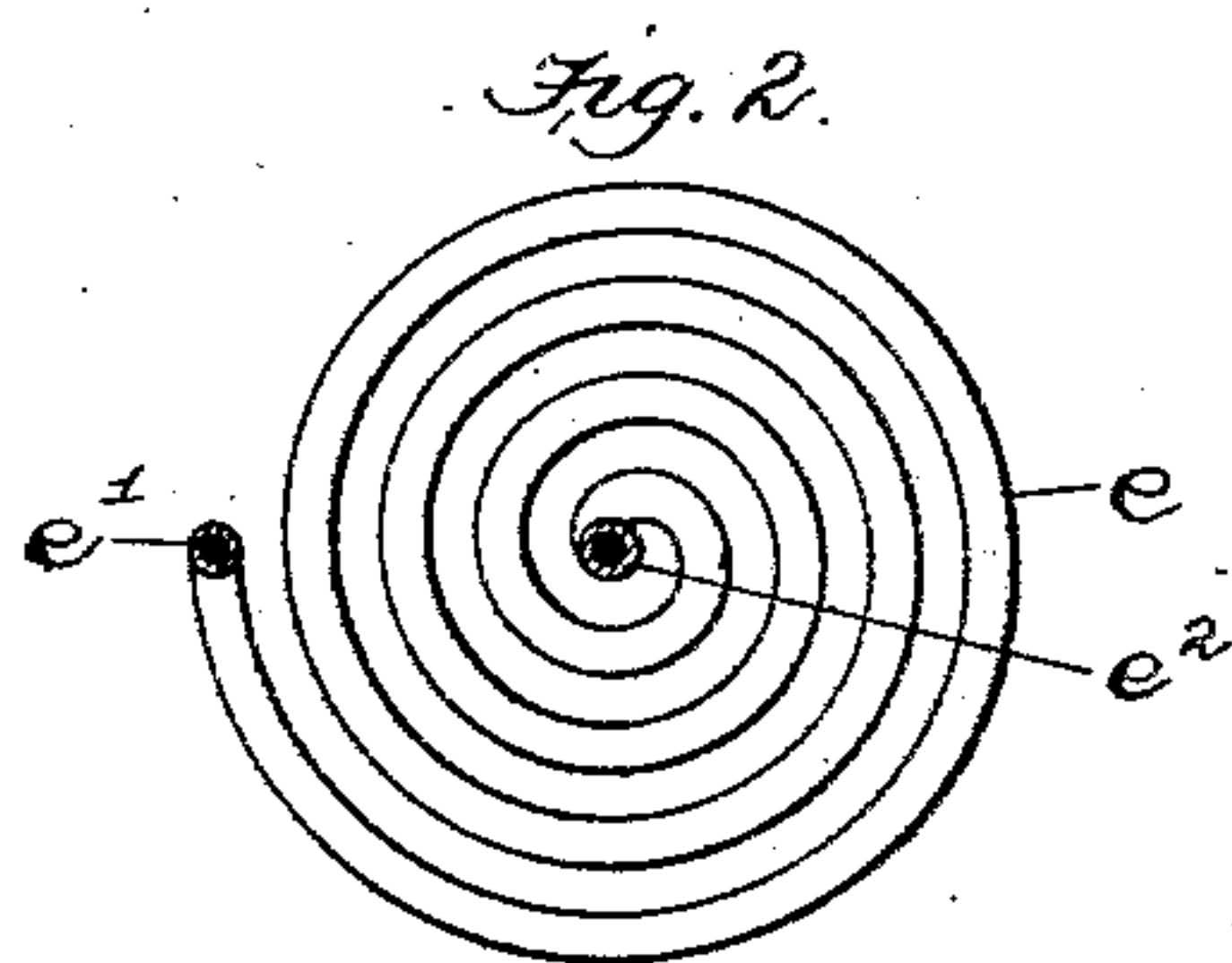
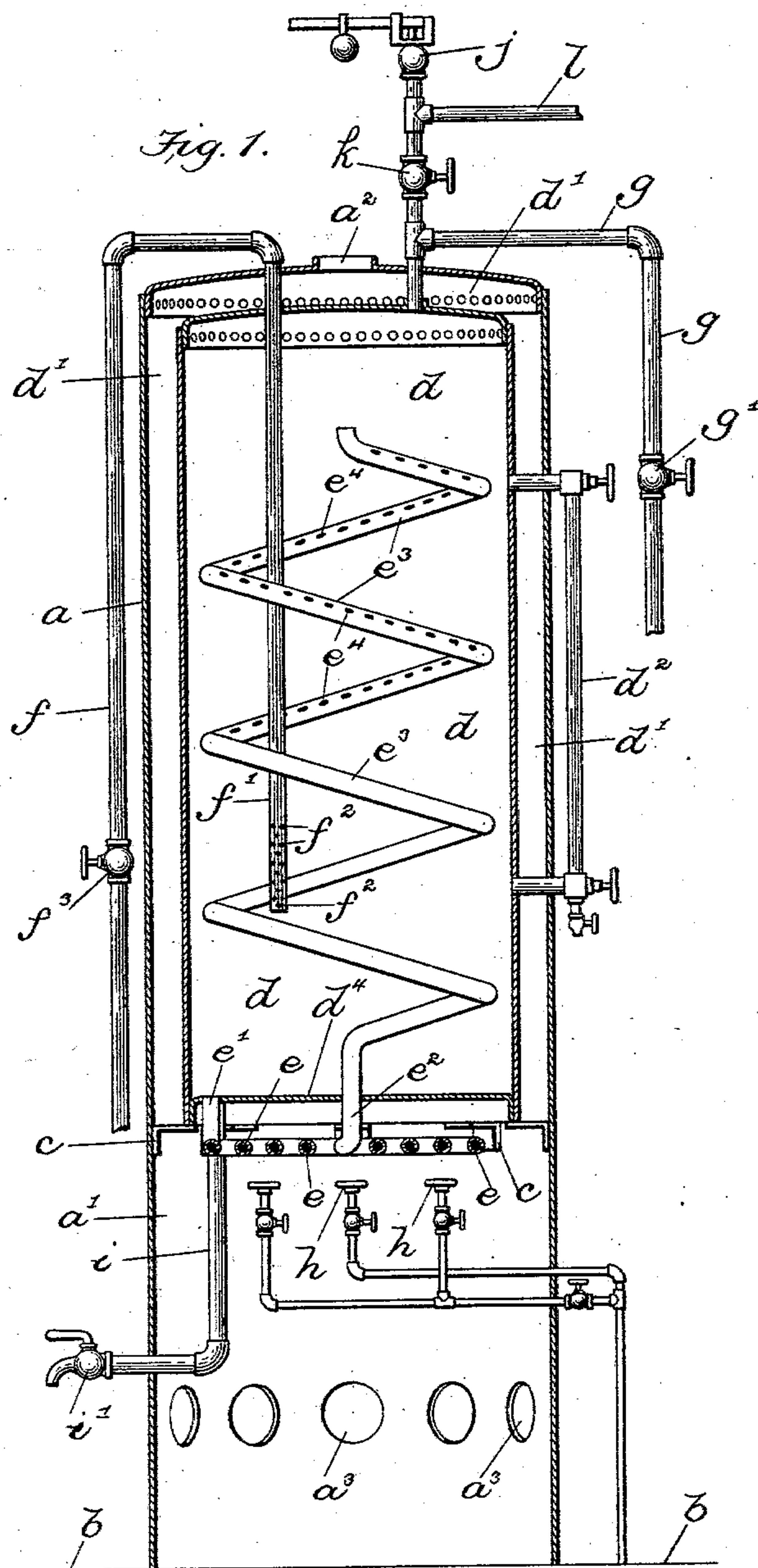
No. 743,719.

PATENTED NOV. 10, 1903.

M. HENKLE.
WATER HEATER.

APPLICATION FILED MAR. 11, 1903.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

MILTON HENKLE, OF BALTIMORE, MARYLAND.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 743,719, dated November 10, 1903.

Application filed March 11, 1903. Serial No. 147,224. (No model.)

To all whom it may concern:

Be it known that I, MILTON HENKLE, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

My invention relates to improvements in water-heaters.

One object of the invention is to provide a device of such construction as will permit it being utilized either as a water-heater or as a low-pressure steam-generator.

Another object of the invention is to provide a device of such construction that the heating-surface may be greatly increased and which will utilize the greater portion of heat, which at present usually passes off into the chimney or stack; and another object is to provide improved means for maintaining a complete circulation.

With these and other objects in view the invention is illustrated in the accompanying drawings, in which—

Figure 1 illustrates a vertical longitudinal section through my improved heater, and Fig. 2 illustrates a plan view of the heating-coils.

In the drawings, *a* designates a cylindrical casing, the lower end of which in the present instance serves as a stand and as a burner-chamber *a'* and rests on the floor *b*. This casing, however, may be sustained on legs or on a suitable wall-bracket. At the top the casing *a* is provided with a vent or opening *a²*, and at the bottom and around said burner-chamber the casing is provided with a plurality of openings *a³* for the admission of air into the burner-chamber.

In the present instance the casing *a* is provided on its interior with a plurality of brackets *c*, which are secured in any suitable manner and arranged in a horizontal plane around said casing, and these brackets *c* serve to support an inner tank *d* within said casing. The tank *d* is smaller in diameter than the casing *a*, and this difference in diameter is enough to form a suitable annular space *d'* between said tank and casing, and said annular space is in communication at its lower end with the

burner-chamber *a'*. The tank *d* is also provided with a water-gage *d²*, having an ordinary glass tube on the exterior casing *a*.

A coil-pipe *e* has position in the burner-chamber *a'* and beneath the tank *d*, and one end, *e'*, of said coil is tapped into the bottom *d⁴* of said tank, while the other end, *e²*, of said coiled pipe passes vertically through the bottom of said tank, and into the latter and on the interior of the tank the pipe from said coil is formed into a second coil *e³*, and this latter coil extends nearly to the top of said tank. The upper end of this coil *e³* is provided with a plurality of perforations *e⁴*, from which the water will be distributed through the tank in a manner to be hereinafter described.

In the present instance a water-supply pipe *f* from any suitable water-supply passes up along the outside of the casing, over the top of the latter, and then down through the casing and into the tank *d*, and the lower end *f'* of said supply-pipe is provided with a plurality of perforations *f²*, which serve to distribute the water-feed into said tank. In the present instance the supply-pipe projects down into the tank and has position within the coiled pipe *e³*, and the lower end *f'* has position near the bottom of the tank, where the latter is hottest. This arrangement is of advantage, as the comparatively cold water is fed into the tank in jets from the perforations *f²* and at the point where the heat is greatest and also at a point where it is immediately drawn from the tank and passed through the coil *e*, heated, and again returned to the tank. A valve *f³* serves to cut off the supply of water to the tank.

A distributing-pipe *g*, having a valve *g'*, extends from the upper end of the tank *d* and conveys the heated water to any suitable or convenient place for use.

Suitable burners *h* have position in the chamber *a'* and beneath the coil *e*, and the flames therefrom are directed against said coil and also against the bottom *d⁴* of the tank, and the heat from said flames passes from beneath said tank and passes up into the annular space *d'* and heats the tank on the exterior. By this arrangement it will be seen

that the heat is utilized so as to act on all sides of the tank before it escapes from the vent a^2 at the top.

A suitable drain or flush pipe i , having a faucet i' , extends from the bottom of the tank through the burner-chamber a' and out through the casing a .

A blow-off valve or governor j is provided in the distributing-pipe and serves the usual functions of said valves. A valve k also has position in the distributing-pipe between the governor and the tank d , for a purpose to be presently described.

The operation of the device as a water-heater is simple and as follows: Water is supplied or fed into the tank through the pipe f and discharged in jets through the perforations f^2 . The circulation then takes place by the water passing from the tank through the pipe e' , the coil e , where it is heated, and up again into the tank by passing through the pipe e^2 , the coil e^3 , and out through the perforations e^4 . For the purpose of merely heating water the valve k would be closed and the hot water drawn off from the pipe g .

It is often necessary, both for domestic and other purposes, that steam, as well as hot water, be supplied, and I have designed the present device in order that the one apparatus will meet this demand, and thereby avoid the necessity of putting in a separate steam apparatus. To quickly convert the apparatus from a hot-water heater to a steam-generator is accomplished as follows: The valve f^3 is closed to cut off the supply of water to the tank, and the faucet i' is then opened to draw off the water from the tank until the water-level in said tank can be seen through the gage d^2 . The faucet i' is then closed and the valve k is opened. The water in the tank d and coils e and e^3 then receives the heat from the burners h , and steam is then quickly generated. The governor j then being in communication with the tank acts as a safety-valve, and the steam from the tank may be carried off to any suitable place by means of the pipe l . If desired, steam may also be al-

lowed to pass through the distributing-pipe g . By this arrangement it will be seen that the apparatus may readily be converted from a water-heater to a steam-generator, or vice versa.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a tank; a coiled tube within said tank; a casing surrounding the top and sides of said tank and forming an annular space between said tank and casing; a burner-chamber beneath said tank, said chamber being in communication with said annular space, and a tube in communication with the tank and also communicating with the coil within said tank.

2. The combination with a tank; a coiled tube within said tank; a casing surrounding the top and sides of said tank and forming an annular space between said tank and casing; a coiled tube on the exterior of said tank and communicating with the coil in the tank, and a burner beneath said exterior coil.

3. The combination with a tank having a feed-water pipe provided with a plurality of perforations; a tube within said tank and also having a plurality of perforations; a coiled tube beneath the tank and being in communication with the tank and also with the tube in the latter; a casing surrounding the sides and top of said tank, and a burner beneath said coiled tube.

4. The combination with a tank; a feed-water pipe for supplying water to said tank near the bottom of the latter; a circulating-tube within said tank and discharging above the point where the feed-water enters, and a tube beneath said tank and in communication with the latter and also communicating with the circulating-tube within said tank.

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

MILTON HENKLE.

Witnesses:

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