

Oct. 25, 1927.

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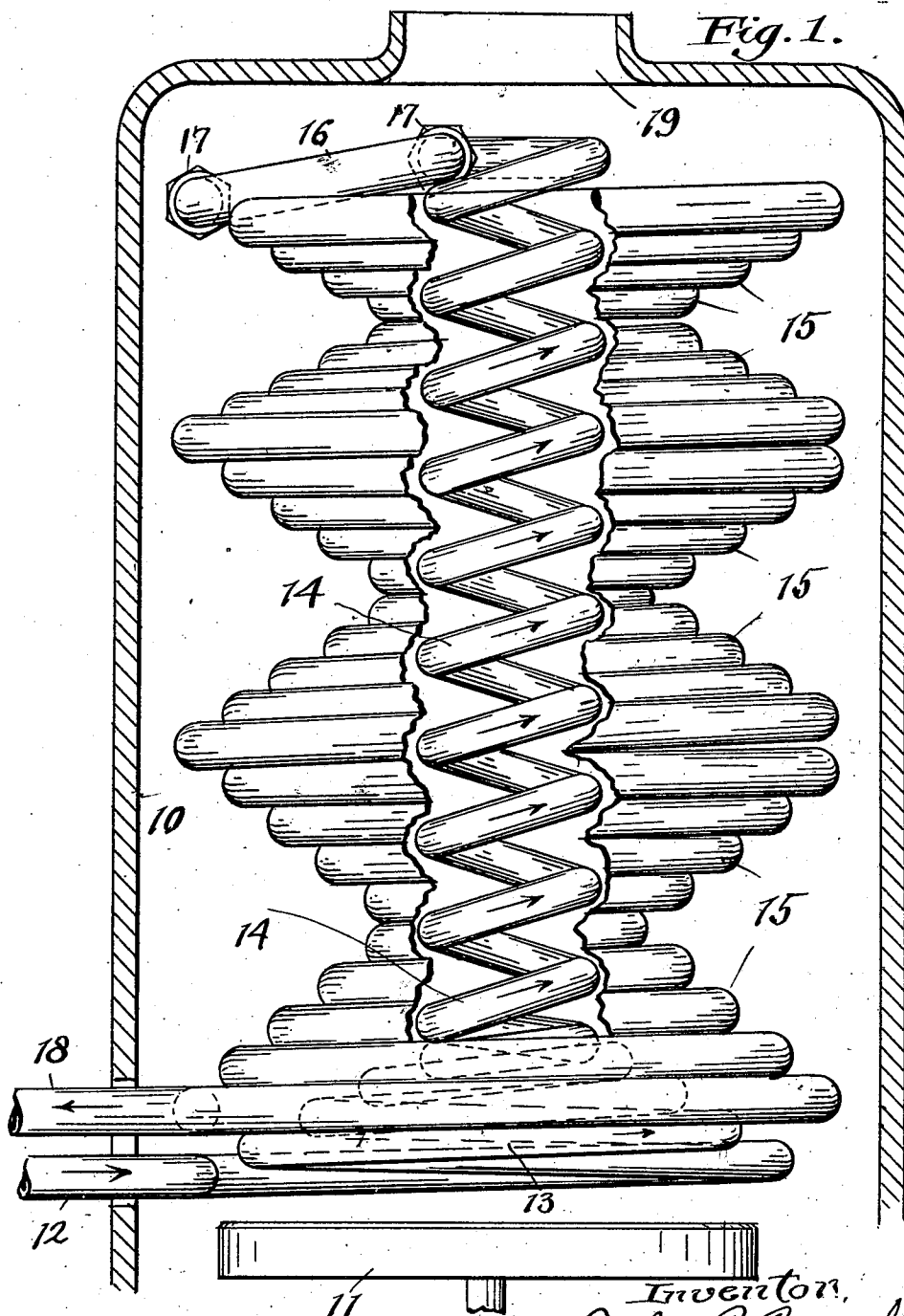
J. P. REINECKE

WATER HEATING COIL

Filed Nov. 21, 1925

2 Sheets-Sheet 1

Fig. 1.



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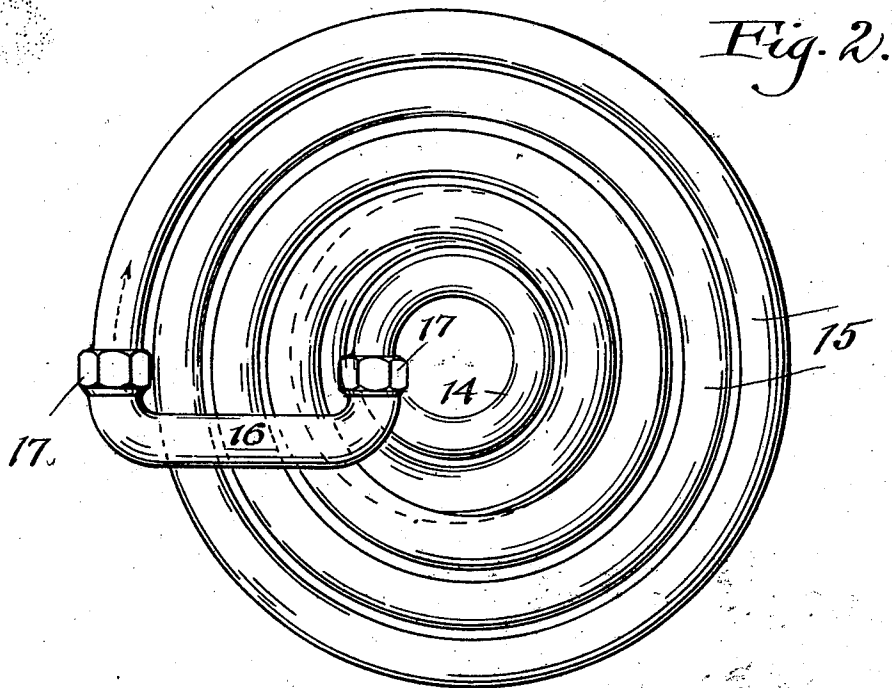
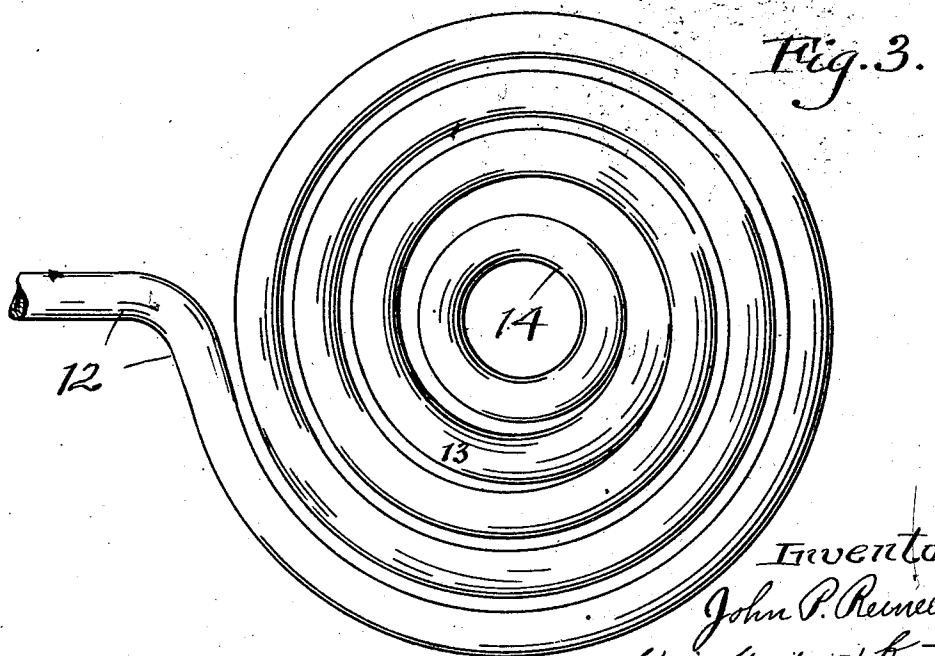
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UNITED STATES PATENT OFFICE.

JOHN P. REINECKE, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO THE HOFFMAN HEATER COMPANY, OF LOUISVILLE, KENTUCKY, A CORPORATION OF OHIO.

WATER-HEATING COIL.

Application filed November 21, 1925. Serial No. 70,442.

This invention relates to water-heating devices and more particularly to the tubular coil-type of device in which the water passes through the coil and is heated by the hot gases which are caused to circulate around the coil.

In the coil-type of heaters heretofore used, considerable difficulty has been encountered as a result of the condensation of the water vapor, contained in the hot gases, by contact with the relatively cool surfaces of the coil and it is one of the objects of the invention to provide a construction that will largely overcome this difficulty and also have the water circulated through the coil in such a way as to maintain the maximum difference of temperature between the water in the various portions of the coil and the surrounding gases.

Other objects of the invention and the features of novelty will be apparent from the following description taken in connection with the accompanying drawings, of which:

Fig. 1 is an elevation of a heating device embodying my invention, the enclosing shell being shown more or less diagrammatically in section and certain parts being broken away to show parts of the coil that would, otherwise, be concealed;

Fig. 2 is a plan view of the upper end of the heating coils; and

Fig. 3 is a bottom plan view of the inner coil.

Referring to the drawings, 10 indicates a shell or casing having a burner 11 in its lower part, this burner being diagrammatically shown and, for the purposes of the present invention, may be of any preferred type such as any of the commercial forms of gas burners now commonly used. In accordance with my invention, I provide an inner or pre-heating coil having an inlet at 12, the lower end of this coil being in the form of a conical spiral 13 above which there is a helical coil 14 extending to the upper end of the heater. Surrounding the inner coil there is an outer coil that is formed in a series of reversely arranged conical spirals 15, the upper ends of the inner and outer coils being connected by a U-shaped bend 16 which is connected to the upper ends

of the coils 14 and 15 by means of couplings 17. The lower end of the coil 15 is indicated at 18 and constitutes the discharge end, the inlet 12 and the discharge 18 being located adjacent to each other and in the region of the hottest gases directly above the burner 11.

By having the cold water enter at the point 12 and first circulate through the spiral portion 13 of the inner coil, the water is preliminarily heated but the hot gases are not sufficiently reduced in temperature to cause an objectionable amount of condensation of the water vapor. The course of the water is upwardly through the inner coil 14, thence through the connection 16 to the upper end of the outer coil whence it flows downwardly through this coil to the discharge 18 so that the hottest water is contained in the lower convolutions of the outer coil and in the region of the hottest gases, thereby avoiding condensation on the outer coil. The arrangement of the coils and the method of circulating the water there-through insures high heating efficiency and a relatively large difference of temperature between all portions of the coils and the surrounding gases so that by the time the gases reach the outlet 19, they will be so reduced in temperature that only a very small amount of the available heat will be wasted.

The provision of the connection 16 affords a design that lends itself readily to efficient manufacturing and also makes it convenient to remove either of the coils whenever necessary.

Having thus described my invention, what I claim is:

In water-heating devices, a vertically arranged coil having an enlarged spiral portion at the bottom, an outer coil surrounding said inner coil and detachably connected therewith at the top, said inner coil having an inlet at the periphery of said spiral portion and said outer coil having an outlet at its lower end whereby the course of the water is upwardly through said inner coil and then downwardly through said outer coil, and a burner arranged below said coils.

In testimony whereof, I hereunto affix my signature.

JOHN P. REINECKE.