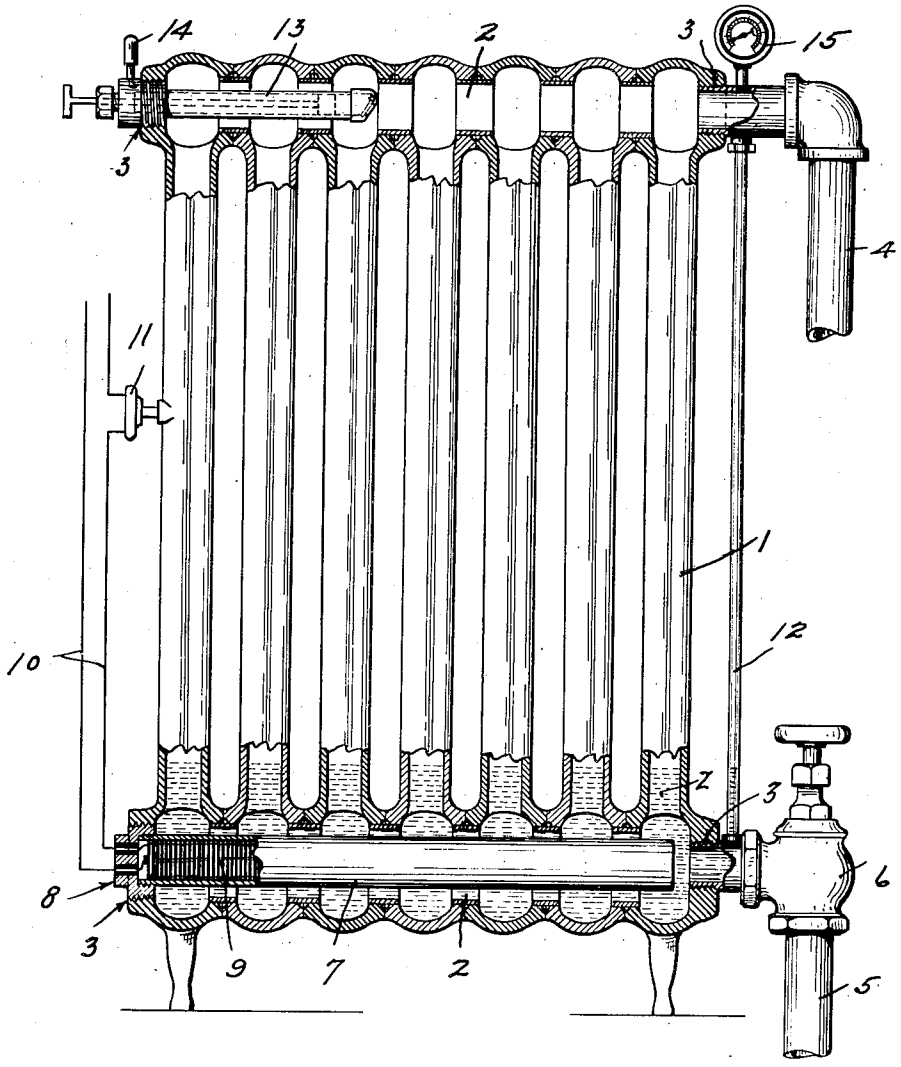
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ELECTRICALLY HEATED WATER CONTAINING RADIATOR.

APPLICATION FILED MAR. 9, 1917.

**1,241,244.** Patented Sept. 25, 1917.




Witnesses
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# UNITED STATES PATENT OFFICE.

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## ELECTRICALLY-HEATED WATER-CONTAINING RADIATOR.

1,241,244. Specification of Letters Patent. **Patented Sept. 25, 1917.**

Application filed March 9, 1917. Serial No. 153,541.

*To all whom it may concern:*

Be it known that I, OTTO A. PALMER, a citizen of the United States, residing at Wayzata, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Electrically-Heated Water-Containing Radiators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electrically heated water-containing radiators; and, to this end, it consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The invention is illustrated in the single view of the accompanying drawing.

The numeral 1 indicates a hot water radiator of standard construction and comprises a plurality of radiator sections having therein upper and lower axially alined communicating openings 2. In the end sections of the radiator, are internally threaded bossed openings 3 axially alined with the respective openings 2. The delivery end of a hot water feed pipe 4 is screwed into the upper right hand opening 3 and the receiving end of a cold water return pipe 5 is screwed into the lower right hand opening 3. A hand valve 6 is provided for opening and closing the cold water return pipe 6.

A tubular casing 7 is inserted through the lower left hand opening 3 and into the lower communicating openings 2. On the outer end of the casing 7, is a plug 8, which is screwed into the respective opening 2 and from which plug the casing 7 is entirely supported with its inner end terminating short of the adjacent opening 3. Within the casing 7, is a heating element 9 and the feed wires 10 therefor are extended through suitably insulated openings in the plug 8. An automatic control, diagrammatically illustrated and indicated as an entirety by the numeral 11, is provided for automatically turning on and off the current to the heating element 9. A sight tube 12 connects the horizontal sections of the pipes 4 and 5. When the heating element is used for heating the radiator 1, the water Z is partly drained from said radiator to substantially the level, as the same appears in the sight tube 12. After the water Z is drawn down to the proper level, the valve 6 is closed. By supporting the casing 7 at one end only, the water Z is free to circulate completely therearound.

Inserted through the upper left hand opening 3 and into the alined communicating openings 2, is a vacuum pump, indicated as an entirety by the numeral 13. This vacuum pump 13 has screw-threaded engagement with the respective bossed opening 3 and is entirely supported therefrom. On the outer projecting end of the vacuum pump 13, is a combined relief and signal valve 14. Supported on the horizontal section of the pipe 4, is a combined vacuum and presser gage, indicated as an entirety by the numeral 15, and having communication with the interior of said pipe.

It is, of course, understood that my present invention can also be used in connection with the radiators of steam or vapor systems. One of the objects of the invention is to so construct the same that it can be readily and easily applied to standard radiators. By manipulating the pump 13, a partial vacuum may be produced in the radiator to reduce the pressure on the water Z, so that the same will vaporize at a low temperature.

The above described invention, while simple and of comparatively small cost to install in radiators of standard construction, has, in actual usage, proven highly efficient for the purpose had in view.

What I claim is:—

1. An electric radiator having a supply of liquid therein, a heating element in said liquid, and means for producing a partial vacuum in the radiator.

2. An electric radiator comprising a plurality of radiator sections having alined top and bottom communicating openings and a supply of liquid therein, a heating element mounted in said bottom openings and in the liquid, and a vacuum pump mounted in said top openings for producing a partial vacuum in the radiator.

3. An electric radiator comprising a plurality of radiator sections having alined communicating openings at the bottoms thereof and a supply of liquid therein, an external opening in the radiator alined with said communicating openings, and a heating element inserted through said alined openings into the liquid, said heating element

having at its outer end a plug secured in said external opening and from which plug the heating element is supported.

4. An electric radiator comprising a plurality of radiator sections having top and bottom alined openings extending completely therethrough and a supply of liquid therein, the intermediate of said openings affording communication between the radiator sections and the others thereof being external openings, a heating element secured in one of the external openings and extending into the bottom communicating openings and liquid, a vacuum pump secured in one of the external openings and extending into the top communicating openings, and intake and return pipes secured in the other of said external openings.

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

OTTO A. PALMER.

Witnesses:
CLARA DEMAREST,
HARRY D. KILGORE.