

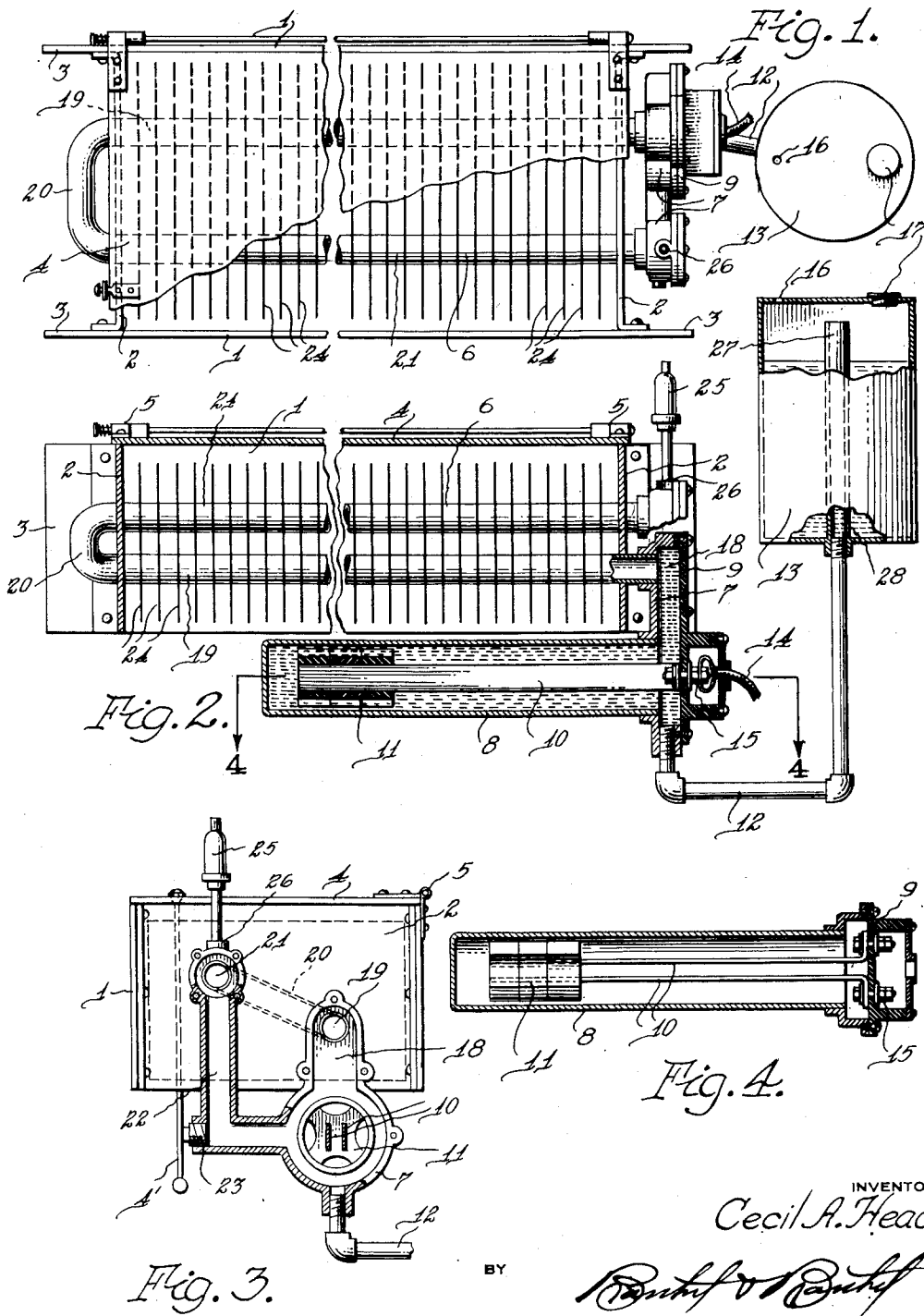
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RADIATOR

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INVENTOR

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BY

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UNITED STATES PATENT OFFICE

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RADIATOR

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The present invention pertains to a novel radiator particularly referring to radiators of the type which employ electricity as a source for generating heat.

5 The primary object of the present invention is to devise a light, portable, inexpensively manufactured electrically heated radiator which may be located at any convenient place in a room or which may be sunk
10 into an opening in a wall and lathed and plastered over, leaving an opening in the baseboard for the heat to enter the room. The radiator is equipped with a shutter or damper which when moved to an open or
15 closed position automatically controls the electrical fuel consummation and regulates the heating of the room.

A further object of the present invention is to construct a radiator through which circulates water which is heated by electrodes that are so constructed and arranged that an excess amount of heat automatically cuts off the electrical fuel. The amount of heat generated by the radiator is governed by the
25 amount of water between the electrodes and when a high temperature is reached the water becomes vaporized and the amount of water between the electrodes is thereby reduced, the current flowing between the electrodes is thereby reduced and the amount of
30 heat generated automatically lowered. If the temperature is high enough to vaporize a greater amount of the water the latter is forced away from the electrodes which are
35 left bare and thereby entirely cuts off the electrical fuel until the water has lowered in temperature.

With the above and other ends in view, the invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which

Figure 1 is a top plan view of the heating attachment which is adapted to be inserted
45 in a casing or in a wall opening, part of the cover being broken away;

Figure 2 is a longitudinal cross sectional elevation through the heating attachment;

Figure 3 is an end elevation, partly in
50 cross section and

Figure 4 is a cross sectional view on the line 4—4 of Figure 3.

Like characters are employed throughout to designate the corresponding parts.

The heating attachment which is adapted
55 for insertion into any suitably shaped casing is formed of the side members 1 and the end members 2 which form a parallelogram with the ends of the members 1 projecting outwardly as at 3 for the purpose of providing
60 means by which the attachment may be fastened within a casing. The bottom is uncovered and at the top is provided a cover 4 having friction hinges 5 which are adapted to hold the cover at any angle at which it may
65 be placed by means of the adjusting member 4'.

Mounted in the end members 2 is a water circulation tube 6 which has both ends mounted in the casting 7 which also supports a
70 cylinder 8. The casting 7 is provided with an insulated cover plate 9 which supports a pair of electrodes 10 so that they project into the cylinder 8. The projecting ends of the electrodes are supported and partially covered
75 by insulating members 11.

Connected into the lower portion of the casting 7 is a line 12 which opens into an expansion chamber 13 which is supported at
80 a higher level than the rest of the described parts. The tube 12 extends upwardly within the expansion chamber 13 as indicated by the numeral 27, and is perforated as at 28 near the bottom of the expansion chamber for
85 a purpose which will later become apparent. An electrical supply line 14 is connected to the ends of the electrodes as at 15, the connection being enclosed in a chamber which is formed on the insulating plate 9.

The expansion chamber 13 is provided with
90 a vent 16 and a plug 17, which may be removed to permit water to be poured into the chamber. The water passes through the line 12 into the casting 7, into the circulation tube 6 and into the cylinder 8 and completely surrounds the electrodes 10. The electric current is then supplied through the line 14
95 and in passing from one electrode to the other through the water the resistance causes considerable heat. When the water becomes
100

heated it begins to circulate as follows; from the cylinder 8 the water passes up the portion 18 of the casting 7 and into the lower portion 19 of the circulation tube 6, it then passes up the inclined portion 20 and back through the higher portion 21 where the temperature becomes lowered and it then passes down the portion 22 of the casting 7 and back to the heating cylinder 8. A drain plug 23 is provided in the lower extremity of the portion 22.

The amount of the electrodes which is exposed to the water governs the amount of resistance and the amount of heat and the insulators 11 are provided to cover part of the electrodes and thereby make the heating more gradual if it is desired. When steam is generated in the cylinder 8 by the current passing from one electrode to the other in the water, the latter is forced from the tube 6 and the cylinder 8 back into the expansion chamber 13 and thereby lessens the amount of the electrodes which is in contact with the water. If sufficient steam is generated the water will be forced out to such an extent that the electrodes will be left bare and no current will flow and the heat is thereby lowered.

The portion 27 of the tube 12 has an open mouth as well as the perforation 28 and these two openings permit the water to pass rapidly from the line 12 into the expansion chamber 13. When the system begins to cool again and the water starts to return to the cylinder 8 from the expansion chamber, it is desirable that it should not be returned too rapidly. For this purpose is provided the perforation 28 which is of a determined area and when the water in the chamber 13 drops lower than the top of the portion 27 it can only go back to the system through the perforation 28. In this manner the water may be forced into the expansion chamber quite rapidly and is returned to the heating parts at a slower rate of speed which is governed by the size of the opening 28.

A series of copper pins 24 are mounted on the tube 6 and serve to radiate the heat outwardly therefrom. When the cover 4 is closed the heat is maintained within the attachment and causes steam to be generated quite rapidly and the current to be cut off quite quickly. If the cover 4 is opened to supply an additional amount of heat to the room it takes a greater length of time to generate steam and the current flows continuously. To prevent any air from being trapped in the upper part of the circular portion a valve mechanism 25 is connected as at 26 to the casting 7.

Although a specific embodiment of the present invention has been illustrated and described, it will be understood that changes may be made within the scope of the appended claims without departing from the

spirit of the invention and such changes are contemplated.

What I claim is:

1. A radiator comprising side and end members, a circulation tube mounted in said end members, heat radiating fins mounted on said tube, a water containing cylinder in connection with said circulation tube, a removable cover plate on said water containing cylinder, an expansion chamber in connection with said cylinder, a pair of electrodes mounted on said removable cover plate to extend into said water containing cylinder, and a plurality of insulating members adapted to be slipped on said electrodes to partly cover the same and thereby reduce the flow of current between said electrodes when said electrodes are removed from said cylinder by removal of said cover plate.

2. A radiator comprising side and end members, a circulation tube mounted in said end members, heat radiating fins mounted on said tube, a water containing cylinder in connection with said circulation tube, a removable cover plate on said cylinder, an expansion chamber in connection with said cylinder, a pair of electrodes mounted on said removable cover plate to extend into said water containing cylinder, the amount of heat generated by said electrodes being governed by the amount of electrode surface exposed to the water, and insulating blocks having slots to receive said electrodes in a manner permitting the blocks to be slipped onto said electrodes to partly cover the same when said electrodes are removed from said cylinder by removal of said cover plate.

3. In a radiator, a cylinder adapted to contain a quantity of water, a circulation tube connected to said cylinder and provided with a plurality of heat radiating fins, a pair of electrodes mounted in said cylinder whereby electric current flows from one electrode to the other through said water and causes the latter to become heated and circulate through said circulation tube, and an expansion chamber connected with said cylinder whereby vaporization of said water caused by said heat through said electric current forces the water to back from said circulation tube and said cylinder into said expansion chamber and to force the water away from said electrodes to prevent the flow of current, means permitting the rapid entrance of said water into said expansion chamber, and means for governing the return of said water from said expansion chamber to the heating elements.

In testimony whereof I affix my signature.

CECIL A. HEAD.