

Feb. 21, 1933.

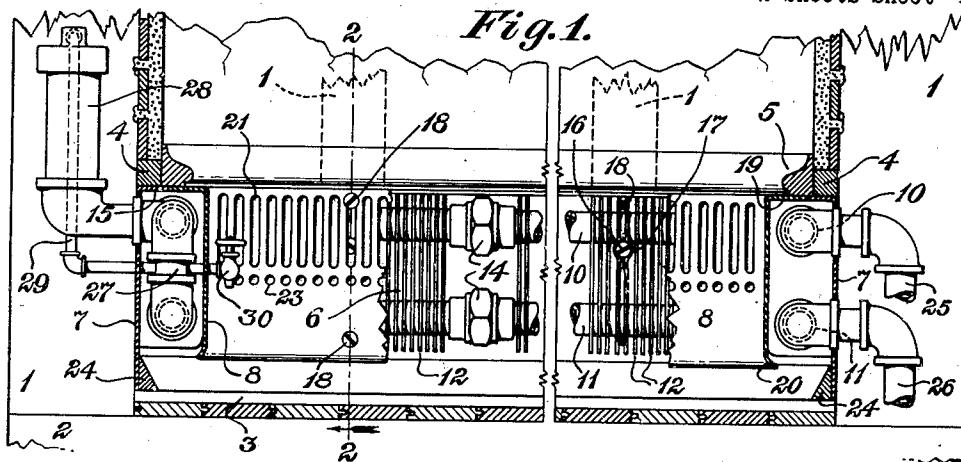
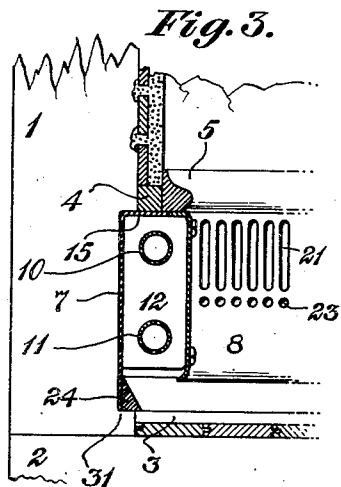
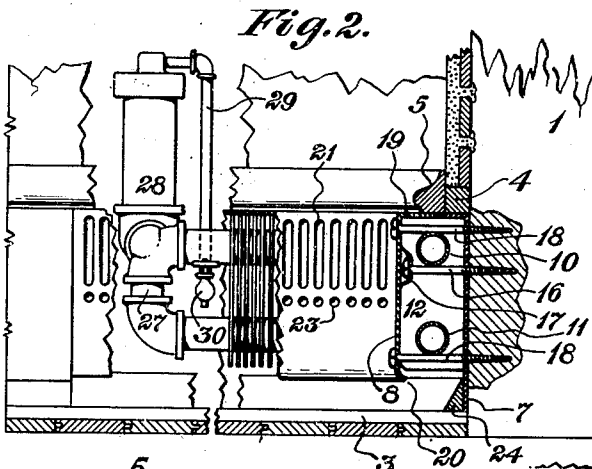
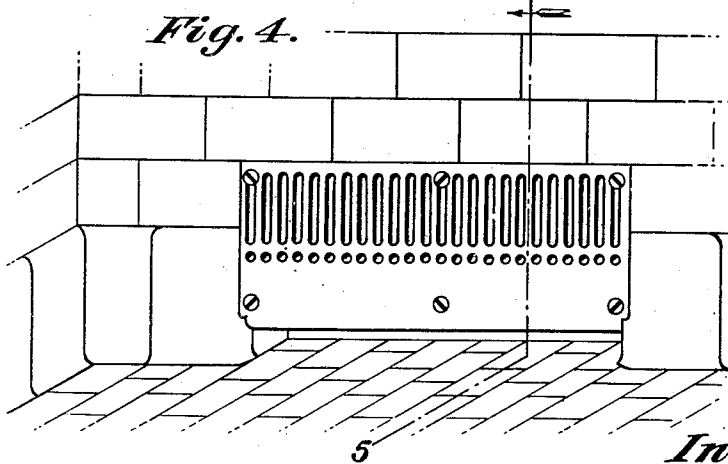
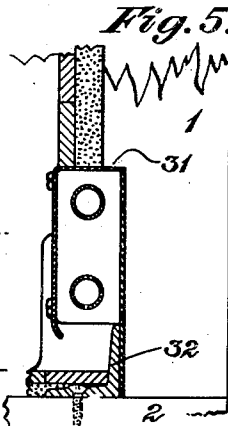
E. E. WAYLES

1,898,327

RADIATOR

Filed March 24, 1930

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 6.

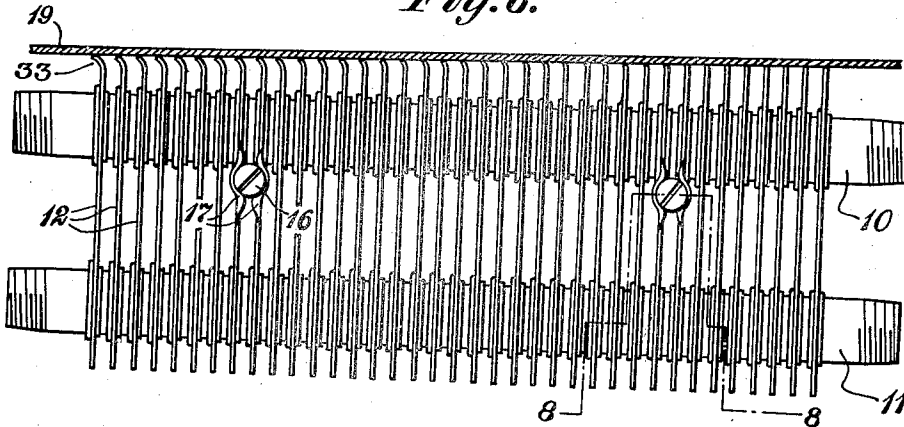
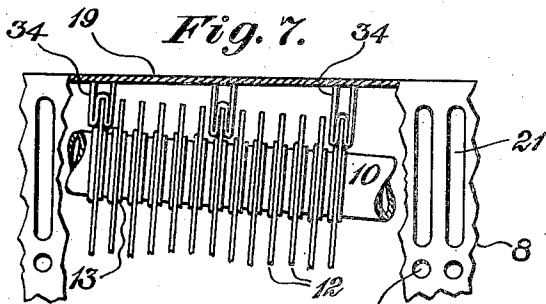


Fig. 8.

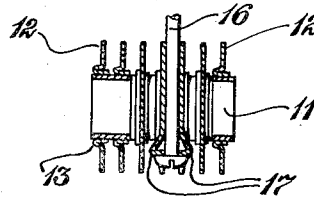


Fig. 9.

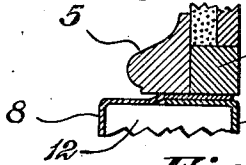


Fig. 10.

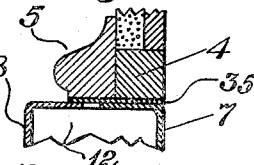


Fig. 11.

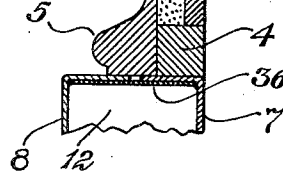


Fig. 12.

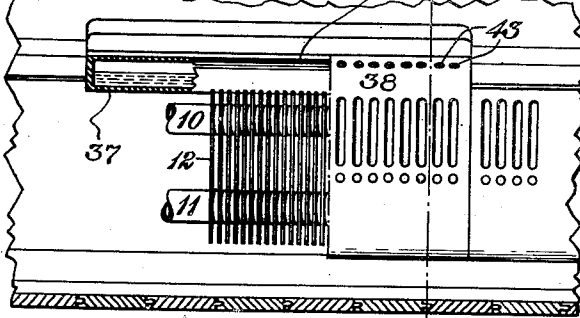
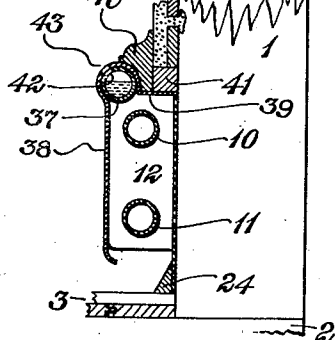


Fig. 13.



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UNITED STATES PATENT OFFICE

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RADIATOR

Application filed March 24, 1930. Serial No. 438,416.

This invention relates to radiators, more particularly of the type constructed largely of sheet metal and adapted for installation in an inconspicuous arrangement as in association with a wall, as for example, in a wall panel or in place of and simulating the usual base board adjacent the floor level. Primarily the object of the invention is the provision of an efficient compact heating element associated with a sheet metal casing in a manner to form a rigid faced radiator structure of the type mentioned. A further object of the invention is provision of novel means for supporting the heating element, and of means for associating the front plate or grille, of the casing, with said element and a support, whereby an unobstructed air passage below the grille, may be extended throughout the length of the heating element. Other objects of the invention will be apparent from the disclosure of the accompanying drawings or will appear from the following detailed description, while the novelty of the invention is defined in the appended claims.

In the accompanying drawings,—

Figure 1 is a view in elevation and section indicating three sides of a room equipped with radiator structure embodying a preferred form of my invention.

Figure 2 is a sectional view on line 2—2 of Fig. 1.

Figure 3 is a sectional view of a form of construction slightly different from that shown in Fig. 2.

Figure 4 is an isometric view of my improved radiator as installed in a tiled bath room.

Figure 5 is a sectional view on line 5—5 of Fig. 4.

Figure 6 is a detail view of component parts of my invention and illustrates one means of securing a certain correlation therebetween.

Figure 7 is a fragmentary detail view illustrating another means of securing the correlation of parts shown in Fig. 6.

Figure 8 is a sectional view on line 8—8 of Fig. 6.

Figures 9, 10 and 11 are fragmentary de-

tail views hereinafter more fully described.

Figure 12 is a view in elevation and section of humidifying means associated with a radiator embodying my invention, and,—

Figure 13 is a sectional view on line 13—13 of Fig. 12.

Similar characters of reference indicate corresponding parts in the several views.

Inasmuch as desirably heated air in dwelling rooms may in most cases be directed or introduced from near or at the level of the floor, a preferred form of the present invention comprises a base board structure. My invention, however, is not limited to such an arrangement, as, in its broader aspects the radiator may be useful when otherwise installed. In any suitable location the manner of supporting and securing together component parts of the structure may be substantially the same. As a base board structure the means employed for its support are arranged for leaving a space at the floor level extending throughout the length of the radiator thereby enhancing its general appearance and providing for free access to the heating element of air from that strata adjacent the floor level which needs most to be heated. Furthermore this opening, being continuous and unobstructed from end to end of the radiator, facilitates removal of dust and litter that is so prone to gather at the juncture of floor and wall.

Referring to Fig. 1 of the drawings, the wall structure here indicated, includes the wall studs 1, rising from joists as 2, which receive flooring 3. Spaced above the flooring at the usual height of a base board are the ground strip 4 and crown molding 5, and within this space is introduced a radiator structure including the heating element 6, back plate 7, and front plate or grille 8. The heating element per se is not my invention, its character however, is useful in the particularly effective provision it affords in a sustaining backing for an encasing plate or grille of thin sheet metal as will hereinafter fully appear. This heating element consists of piping or a core forming equivalent, having closely spaced heat radiating fins of thin sheet metal secured transversely thereto and

in thermal contact therewith. Such piping, as 10 and 11, may be suitable for circulating a heat transferring medium as water, steam, or electricity. In some cases a single pipe or elongated core is suitable for effecting the desired function. The fins 12, are preferably of copper, which may be effectively swaged upon the piping, as in the manner indicated at 13, (see Fig. 8). To meet various requirements suitable lengths of the heating element may be provided with unions, as 14, and joined together.

As intimated the casing for the heating element is formed of thin sheet metal, which, more essentially in the front plate, is dependent for rigidity upon contact with fins of the heating element extending in edgewise relation thereto. The back plate 7, preferably terminating in an outwardly directed flange 15, at its upper edge, may be secured to the wall studs in any desirable manner, with its lower edge at the floor level and the flange 15 adjacent the ground strip. The heating element is supported by screws 16, extending between certain of the fins, beneath the piping or core, through the back plate and into the wall studs. The heads of these screws engage inwardly bent portions 17, of adjacent fins which form shoulders whereby the heating element may, by action of the screws, be drawn toward the back plate to firmly seat thereupon edges of the fins opposed thereto, said element being located vertically to bring the upper edges of the fins adjacent or contiguous to the under side of the flange 15, the latter having directly above it, the ground strip 4. With the heating element thus supported the bottom edges of the fins are spaced from the floor an appropriate distance to insure an adequate supply of air for circulation between the fins. To enclose the fins and form air passages therebetween, the front plate 8, is secured by screws 18, or their equivalents passing between certain of the fins and into the wall studs, thus serving to seat said plate into firm contact with edges of the fins opposed thereto. The upper part of this plate preferably terminates in an inwardly directed flange 19, passing beneath the crown molding and it will be observed that such part of this flange as may be exposed, outwardly from said molding, is supported either directly upon underlying edges of fins or in some cases indirectly by said edges as will in due course be further explained. The lower edge of the front plate terminates just below the fins, preferably in an inwardly turned or curved lip 20, which serves to stiffen the edge as well as to improve appearance thereof and to provide an approved form of intake for air therebeneath. The upper portion of the front plate is suitably perforated, as at 21, to permit outward flow of air that has been heated by passage between the fins. These openings 21 are opposed to the closely

spaced edges of the fins and the spaces between them, and as the purpose of the openings is to permit free outlet of air from respective spaces, their form is best adapted to suit the purpose by making them long, narrow, closely spaced and with their side edges in substantial parallelism with the fins so that the latter as seen, in so far as they are visible back of the resulting grille, will be in harmony with the grille and therefore inconspicuous. This arrangement of elongated slots may be supplemented with various small openings, as the "dots" 23, to make the design of the grille more ornate. At the base of the back plate, a strip 24, is provided, corresponding to the so called shoe molding of a base board, which strip may be so shaped and so harmonized in color with that of the front plate as to make the outward appearance of the structure closely simulate a base board of generally accepted design. From the foregoing it will be apparent that the closely spaced fins of the heating element form, when the latter is encased between the back and front plates in the manner set forth, a rigid structure and one in which front plate, although of thin sheet metal, is insured by the backing of the fins, against the effect of such blows from the outside as would otherwise buckle the surface and mar its appearance.

In Fig. 1, feed and return pipes for a heating element adapted for fluid circulation, are indicated by 25 and 26, respectively, and are shown as they may be conveniently installed between wall studs. A return bend 27, at the opposite end of said element, may be provided with an enlarged air chamber 28, extended from the bend to within a space between wall studs. This arrangement conveniently permits of attachment to the top of the air chamber of a pipe 29, directed downwardly and outwardly to a suitable point, as in front of the grille, where an air cock 30, is attached to permit of the release of such excess air as may become trapped in the system.

While the face of the structure shown in Fig. 1, is in a plane somewhat to the fore of that usually occupied by a base board, it will be observed that the exact position of the latter may be duplicated by the expedient illustrated in Fig. 3, wherein the wall studs are shown as recessed at 31, to secure the desired result. Similarly in Figs. 4 and 5, the wall studs are recessed and abutted at their base by an angle iron 32, such as commonly employed in bath-room and like construction. The upright leg of the angle iron, herein takes the place of the shoe molding or strip 24, shown in other views. In Fig. 4, the radiator structure is represented as of comparatively short extent. It clearly shows, however, the accessibility of the floor area overhung by the radiator and from this

it will be readily understood that the advantage indicated prevails throughout with whatever length of radiator may be installed.

In Fig. 6, the heating element illustrated 5 is shown inclined to the horizontal top flange of the front plate, such inclination being effected in practice in cases where it is desirable to overcome air trapping and to impart gravity flow to the heating fluid employed 10 as when it becomes condensed. As manufactured at the present time, the heating element sections comprise associated piping and fins, with the surface defined by the outer 15 edges of the fins in parallelism with the longitudinal axis of the piping. It becomes desirable then, when a heating element is installed in inclination to the horizontal, to adopt an expedient to maintain a supporting effect by the fins similar to that secured 20 by their edges when the latter are brought into a plane corresponding with or contiguous to that of an overlying member. This may be accomplished by bending the flange opposed edges of the fins in graduated degree from one end of the series to the other 25 as indicated at 33. A similar result may be effected by placing upon certain of the fins at suitable intervals, clips 34, as of folded metal, graduated in width to bridge the 30 tapered space between the surface defined by the upper edges of the fins and the opposed surface of an overlying member, as of the flange 19. Other similar expedients will be readily suggested to those skilled in the art to which this matter appertains. 35

In Figs. 9, 10 and 11, different ways are illustrated of forming a joint between the fin overlying flanges of the front and back plates. The joint shown in Fig. 9, is formed 40 by extending the flange of the front plate over that of the back plate. Fig. 10, shows a joint formed by placing a strip 35, of suitable material on top of the front and back plate flanges to bridge their adjacent edges. 45 Fig. 11, shows a similar strip 36, placed beneath the flanges.

In Figs. 12 and 13, there is illustrated in association with radiator construction substantially like that already described, a water 50 container which provides for humidifying air issuing from the heating area. Such a container may comprise a pipe 37, with closed ends. The piping is extended along fins of the heater in contact therewith, and may 55 be secured in place in various ways. As shown it is enclosed by a front plate 38, formed to closely fit the pipe and terminating in a flange 39, passing under a crown molding 40 and ground strip 41. A slot 42, 60 is formed in the wall of the pipe, and perforations, as 43, in plate 38, register with said slot to provide vapor exits. Any desirable means may be provided for introducing and maintaining a supply of water in the con- 65 tainer 37. While the pipe shown is circular

in cross section, it will be understood that it may be otherwise, or a container may be suitably incorporated in a crown molding.

It is to be noted in particular that in my improved radiator structure the highly efficient form of heating element employed is 70 of such character that its size in cross section may be reduced to occupy merely the upper portion of space usually taken up by a base board and that capacity of the system may be regulated to all reasonable 75 requirements by extending the structure about a room wherever base board space is available. Thus the extended narrow unobstructed openings at the floor level provide for 80 draft upon adjacent air, which draft is imperceptible because widely diffused. Furthermore the air drawn to the fins of the heating element, passes therebetween and directly 85 into the room again so that heat is diffusedly imparted to the room without objectionable air currents.

Preferred and modified forms of the structure illustrated in the drawings and described in the foregoing specification will 80 suggest other variations to those skilled in the art. These may be made in many respects without departure from the scope of the invention as defined by the following claims.

Having thus described my invention, what I claim is,— 85

1. The combination with a floor and wall adjacent their juncture and with a ground strip and crown molding, of a radiator structure simulating a base board and which 100 includes a heating element and a front and back plate forming a casing for said element, said back plate being secured to the wall and extending from the floor to the ground strip with an outwardly directed 105 flange underlying the latter, said heating element having an elongated core from which are transversely extended closely spaced sheet metal fins, means extending between the fins for securing the heating element to 110 the wall with rear edges of the fins against the back plate, upper edges of the fins adjacent the flange of the back plate, and lower edges of the fins spaced from the floor, means 115 extending between the fins for securing the front plate to the wall and drawing it into contact with the front edges of the fins, said front plate at its upper edge terminating in a flange extending under the crown molding and supported by the fins, and terminating 120 at its lower edge in an intumed lip or flange adjacent the lower edges of the fins, means for closing the space between adjacent flanges of the front and back plates where they overlie the fins, and a shoe molding at the base 125 of the back plate.

2. The combination with a floor and wall adjacent their juncture and with a ground strip and crown molding, of a radiator structure which includes a heating element and a 130

front and back plate forming a casing therefor, said back plate being secured to the wall and extending from the floor to the ground strip, said heating element having an elongated core from which are transversely extended closely spaced sheet metal fins, means extending between the fins for securing the heating element to the wall with rear edges of the fins against the back plate, upper edges of the fins adjacent the ground strip and crown molding, and lower edges of the fins spaced from the floor, means extending between the fins for supporting the front plate and drawing it into contact with the front edges of the fins, and means for covering the upper edges of the fins extending from front to back plate, said front plate terminating at its lower edge in an intumed lip or flange adjacent the lower edges of the fins and having in its upper portion closely spaced openings opposed to outer edges of the fins and spaces therebetween.

3. The combination with a floor and wall adjacent their juncture and with a ground strip and crown molding, of a radiator structure which includes a heating element and a front plate or grille, said heating element having an elongated core from which are transversely extended closely spaced sheet metal fins, front edges of which extend substantially perpendicular and define the front surface of the heating element, means for securing the heating element to the wall with upper edges of the fins adjacent the ground strip and crown molding, and lower edges of the fins spaced from the floor, and means extending between the fins for supporting the front plate and holding it in contact with the front surface of the heating element, said front plate at its upper edge terminating in a flange extending under the crown molding and supported by the fins, terminating at its lower edge in an intumed lip or flange adjacent the lower edges of the fins, and having elongated grille forming openings substantially in parallelism with front edges of the fins.

4. In a radiator structure in combination, a heating element having an elongated core from which are transversely extended closely spaced sheet metal fins, front edges of which extend in parallelism and define the front surface of the heating element, a plate or grille for covering the front of the heating element, means extending between the fins for securing the heating element to a wall, and means extending between the fins for supporting the plate and holding it in contact with the front surface of the heating element, said plate having elongated grille forming openings substantially in parallelism with the parallel edges of the fins.

5. In a radiator structure in combination, a heating element having an elongated core from which are transversely extended closely

spaced sheet metal fins, a housing for the heating element including a back plate and a perforated front plate or grille, means for securing the back plate upon a wall adjacent the floor level, supporting members extending between and engaging in bent portions of adjacent fins for supporting the heating element and securing it against the back plate with the lower side thereof spaced from the floor, and means extending between said fins for securing said front plate against the fins of the heating element.

6. A radiator structure including in combination, a back plate, a front plate of sheet metal having numerous openings therein to form a grille, a heating element having an outer surface defined by the edges of closely spaced sheet metal fins, and means extending between the fins for securing the plates and heating element in assembled relation whereby the closely spaced fins in underlying contact with the grille are effective to resist inward bending of the latter.

7. A radiator structure including in combination, a back plate, a front plate, a heating element having an elongated core from which are transversely extended closely spaced sheet metal fins, means for securing the plates and heating element in assembled relation with the fins of the heating element serving as spacers for the plates, and covering means for the fins extending from one plate to the other.

8. A radiator structure including in combination, a support, a sheet metal casing folded to form adjoining sides, a heating element having an elongated core from which are transversely extended closely spaced sheet metal fins, outer edges of which define surfaces corresponding to those of the casing, means for securing the casing and heating element to the support with one surface defined by outer edges of the fins contiguous to a side of the casing and another of said fin defined surfaces inclined to an opposed side of the casing, and spacing means interposed between the fin defined surface and the opposed side of the casing.

9. A radiator structure including in combination, a support, a sheet metal casing folded to form adjoining sides, a heating element having an elongated core from which are transversely extended closely spaced sheet metal fins, outer edges of which define surfaces corresponding to those of the casing, and means for securing the casing and heating element to the support with the sides of the casing engaged by the fins.

10. A radiator structure including in combination, a support, a heating element having an elongated core from which are transversely extended closely spaced sheet metal fins, outer edges of which define a surface of substantial extent, certain of said fins being in bent to form screw head engaging shoulders

beneath said surface and at suitable points lengthwise of the core, and screws passing between the fins, beneath the core, into the support, with the heads of said screws beneath said surface and engaging respective shoulders, whereby the surface defined by the fins is left unbroken to receive an overlying cover plate conformable to said surface.

10 11. A radiator structure including in combination, a support, a heating element having an elongated core from which are extended transversely to its longitudinal axis, closely spaced sheet metal fins, certain of which are
15 inbent to form screw head engaging shoulders at suitable points lengthwise of the core, and screws passing between the fins, beneath the core and into the support with the heads of said screws engaging respective shoulders.

20 12. A radiator heating element comprising an elongated core from which are extended transversely to its longitudinal axis closely spaced sheet metal fins, portions of certain adjacent fins being inbent to form shoulders
25 at spaced points lengthwise of the core.

13. A radiator structure including in combination, a back plate, a front plate, a heating element having an elongated core from which are transversely extended closely spaced sheet
30 metal fins, means for securing the plates and heating element in assembled relation with the fins of the heating element serving as spacers for the plates, and covering means juxtaposed over the fins and extending from
35 one plate to the other.

14. A radiator structure including in combination, a support, a sheet metal casing folded to form adjoining sides, a heating element having an elongated core from which are
40 transversely extended closely spaced sheet metal fins, outer edges of which define surfaces corresponding to those of the casing, a water container contiguous to the fins of the heating element within the casing, said container and casing having vapor outlets, and
45 means for securing the casing and heating element to the support with sides of the casing engaged by the fins.

15. A radiator structure including in combination, a back plate, a front plate, a heating element having an elongated core from which are transversely extended closely spaced sheet
50 metal fins, means for securing the plates and heating element in assembled relation with fins of the heating element serving as spacers for the plates, an open water container contiguous to the fins of the heating element, and perforated covering means enclosing the
55 water container and extending over the fins from one plate to the other.

In testimony whereof I affix my signature.

EDGAR E. WAYLES.