Dec. 16, 1941. R. R. FISHER 2,266,016

STEAM RADIATOR

Filed June 19, 1939 2 Sheets-Sheet 1

Fig. 1

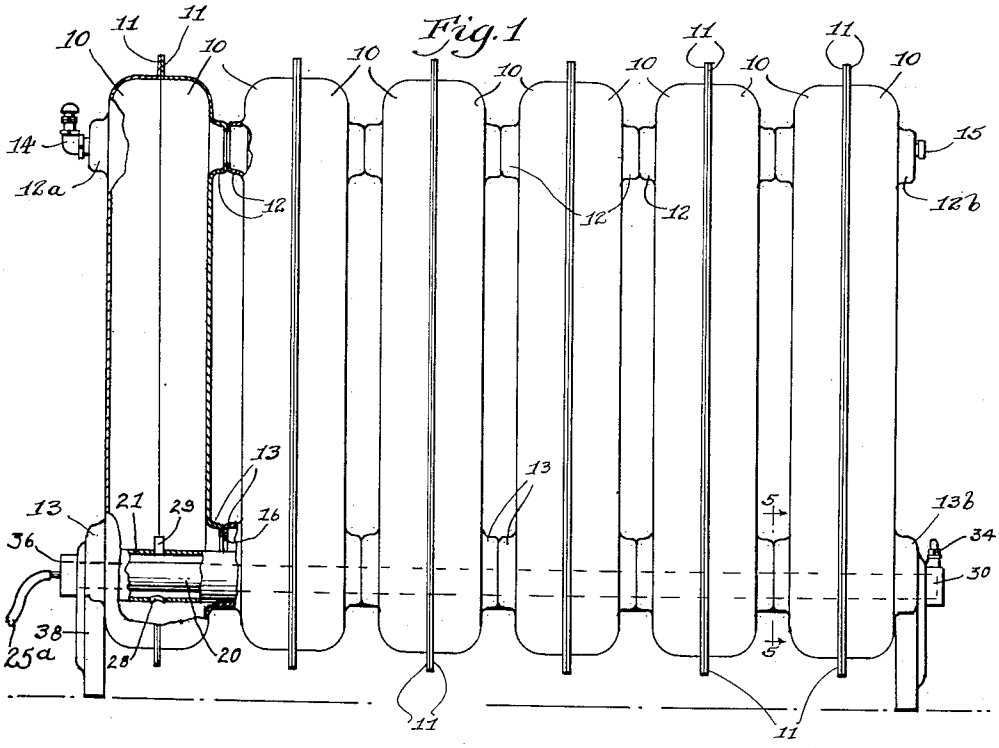


Fig. 2

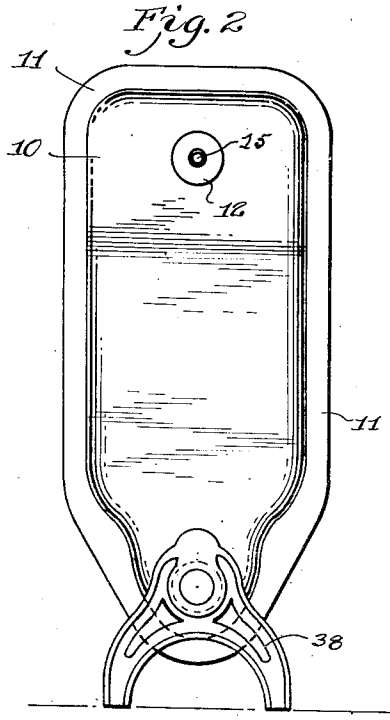
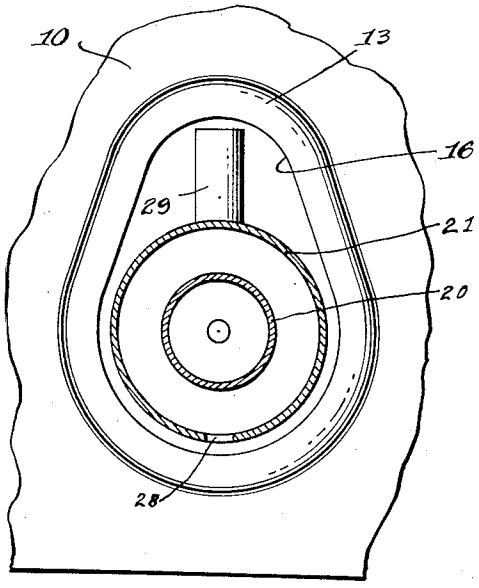


Fig. 5



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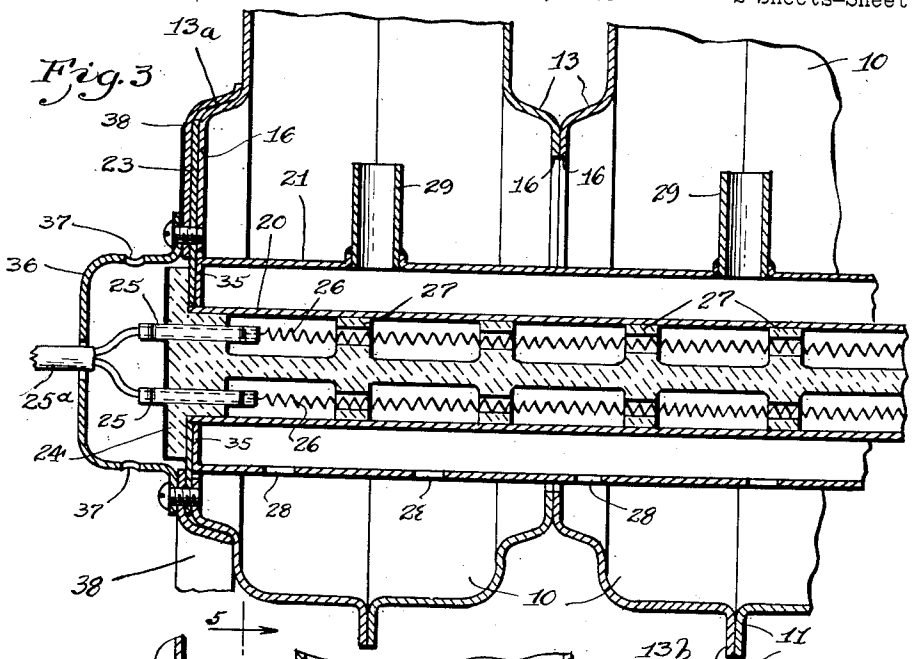
By Barnes, Kisselle, Laughlin & Raisch
ATTORNEYS

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Fig. 3



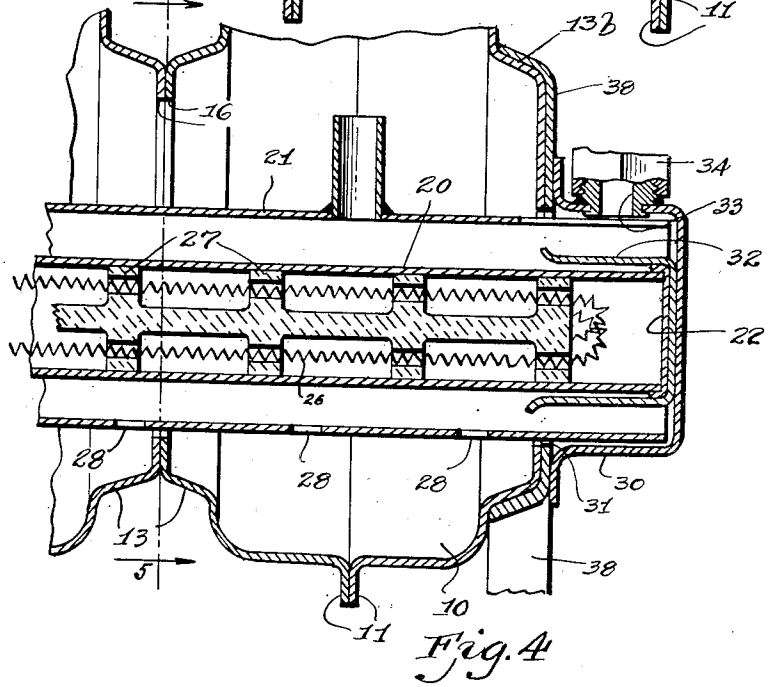


Fig. 4

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Patented Dec. 16, 1941

2,266,016

UNITED STATES PATENT OFFICE

2,266,016

STEAM RADIATOR

Roy R. Fisher, Detroit, Mich., assignor to Electric Steam Radiator Corporation, Detroit, Mich., a corporation of Michigan

Application June 19, 1939, Serial No. 279,775

9 Claims. (Cl. 219—38)

This invention relates to steam radiators and has particularly to do with a portable radiator electrically heated wherein a small quantity of water is provided in the radiator to form steam for giving off heat to the radiator and the surrounding atmosphere.

An example of this type of radiator is found in Patent No. 1,852,252 dated April 5, 1932, wherein the operation and the uses of the radiator are clearly set forth.

It is an object of the present invention to provide an improved steam radiator design which may be manufactured at a lower cost and assembled with less difficulty than previously designed radiators. The result is a radiator which is just as serviceable as the old type and which is lighter and easier to handle. Another object of the invention is to provide a construction in which the radiator unit and the heating unit may each be constructed separately and later assembled into one unit. In order to accomplish this result it has been necessary to make considerable changes in the heating unit and what is called the boiler unit which consists of the tube surrounding the heating unit.

The design of the radiator has also been changed so that it may be constructed from a number of identical stampings and a passageway provided therein to receive the complete heating unit.

Other objects and features of the improved design will be brought out in the following description and claims.

In the drawings:

Fig. 1 is a side elevation of the radiator showing one section cut away.

Fig. 2 is an end view of the radiator.

Fig. 3 is an enlarged partial vertical section through one end of the radiator and combined heating unit.

Fig. 4 is an enlarged partial vertical section through the other end of the radiator and heating unit.

Fig. 5 is a section taken on the lines 5—5 of Figs. 1 and 4.

Referring to the drawings, the radiator portion of the steam radiator is composed of a series of identical stampings indicated at 10. These stampings are each formed with a flange 11 and each of them has a protrusion 12 and a protrusion 13, as shown. A complete section of the radiator which is formed of a plurality of sections is composed of two stampings 10 placed together face to face and having the flanges 11 sealed together by a welding operation. The radiator is then formed by uniting complete sections at the protrusions 12 and 13, this being also done by welding or brazing or other similar metal joining operations. Each of the protrusions 12 are provided with openings so that there is a continuous passageway through the top portion of the radiator. At each end the protrusions 12a and 12b are provided with an air valve 14 and a safety popoff valve 15 respectively. The joining protrusions 13 at the lower portion of the sections are each to be provided with an elongated aperture 16 having substantially the shape shown in Fig. 5. This aperture need not be provided in the end protrusion 13b to the right of the radiator, as shown in Fig. 1.

The heating unit of the radiator is to consist mainly of two concentric tubes 20 and 21. The inner tube 20 is to extend substantially the length of the radiator and is adapted to house an electric heating unit. This tube 20 is sealed at one end as shown in Fig. 4, by a cap 22. At the other end of the tube 20 is a plate 23 which forms a seal with the tube 20 and which has a shape substantially the same as, but larger than, the apertures 16. The hole at the left end of the tube 20 is closed by an insulator 24 in which are located conducting tubes 25 leading to heating elements 26 stretched through the tube and spaced therefrom by insulators 27. Lead wires 25a and heating elements 26 are fastened to the tubes 25 by being inserted into the tubes which are thereafter crushed on the wires.

Concentric with tube 20 is tube 21 which may be designed as a boiler tube. This tube 21 is provided at its lower portion with spaced holes 28 which permit water to pass from the lower portion of the radiator up to the heating unit. In the top portion of the boiler tube 21 are provided short vertical outlet tubes 29 which are so spaced on the boiler tube that each one falls about the center portion of a radiator section. These short tubes 29 may be termed feed or steam tubes since they direct steam or feed steam from the feeding tube 21 up into the sections of the radiator.

Referring for a moment to the dimensions of the various elements, the diameter of tube 21 plus the length of tubes 29 must be substantially equal to the length of aperture 16. It is preferable that the aperture 16 have a length slightly greater than the length of the tubes 29 plus the diameter of the tube 21.

In the assembly of the heating unit within the radiator section, a spacing cap 30 is first welded over a round aperture 31 in the protrusion 13b.

This cap 30 is provided with an inner concentric spacing means 32 which is adapted to receive the tube 20 as shown particularly in Fig. 4. This cap 30 serves to seal the end section 10 but is provided with an opening 33 which is normally closed by a cap 34. This opening permits replenishment of the water which is contained in the closed radiator and also allows for draining in case such is desired. After the cap 30 is welded to the radiator section, the tubes 20 and 21 may pass into the horizontal passageway which is provided in the lower portion of the radiator by reason of the apertures 16 and the joining protrusions 13. Since the apertures 16 are elongated the boiler tube 21 will pass into the radiator and after the tube 20 is located within the spaced member 32 and the end of the tube 21 is positioned within the cap 30, the plate 23, wihch is sealed to the tube 20, will close the aperture 16 in the protrusion 13*a*. This plate may be sealed over this aperture by welding or other metal joining process and with this operation the entire radiator will be sealed. Suitable means 35 may be provided at the left end of tube 21 (see Fig. 3) to space the tube from the heating unit tube 20. After the sealing of the plate 23 a second end cap 36 may be placed over the insulator 24 to protect the same. This cap 36 is preferably provided with apertures such as 37 to permit ventilation and the cap 36 is preferably screwed to the radiator so that it may be removed. The heating unit within the tube 20 is removable so that the same may be replaced if this becomes necessary.

In order that the radiator may have support, stampings 38 (Fig. 2) may be fastened to the end sections by welding or other means. For example, as shown in Figs. 3 and 4, the stamping 38 at the right end of the radiator is fastened to the cap 30 and the protrusion 13*b*. At the left end of the radiator stamping 38 is fastened the cap 36 and the protrusion 13*a*.

It will thus been seen that a complete radiator formed of similar sections may be manufactured, and the heating unit along with the boiler tube may be assembled therewith as an independent unit. This removes the necessity of forming a radiator of two sections as in the patent previously mentioned and I have found that the provision of the feed tubes 29 furnishes sufficient outlet of steam which is formed in the boiler tube 21. Steam is directed upwardly in sections and will rise of its own accord to the top of the sections. In case there is condensation at the top, the condensate will form on the sides of the sections and fall back to the lower portion of the radiator where there will again be heating. The air valve 14 is a standard type of valve as is common on most radiators of today and the popoff valve 15 is provided to relieve the radiator of abnormal pressures which might possibly be formed thereon. The valve 15 is a standard valve and may be termed a safety valve.

What I claim is:

1. In a steam radiator of the type in which an electrical unit is provided to transform water into steam, a plurality of hollow sections fastened directly together to form a complete radiator, each of said sections being provided with an aperture in each side so that a passageway is provided lengthwise of the plurality of sections, a tube in said passageway adapted to receive an electrical heating unit, said tube being sealed from the inside of said radiator sections, a second boiler tube substantially concentric with said first tube and provided with apertures spaced along the bottom thereof, and short feed tubes projecting upwardly from said boiler tube and spaced along the tube whereby water may be contained in said boiler tube and steam may be directed from the boiler tube into each of said boiler sections, said apertures in said sections being so proportioned and said feed tubes having such a length that the entire boiler tube may be inserted endwise into said passageway during assembly.

2. In a steam radiator of the type in which an electrical unit is provided to transform water into steam, a plurality of hollow vertical sections fastened directly together adjacent their top and bottom to form a complete radiator, each of said sections being provided with opposed elongated apertures so that a horizontal passageway is provided lengthwise of the plurality of sections, a tube in said passageway adapted to receive an electrical heating unit, said tube being sealed from the inside of said radiator sections, a boiler tube forming a heating chamber around said first tube and provided with apertures in the bottom portion thereof, means at each end of said tube for mounting the same within said passageway, said means serving also to seal the ends of said passageway, and a row of short steam tubes projecting upwardly from said boiler tube and spaced along said tube, whereby water may flow in said boiler tube around said heating unit tube and steam may pass upwardly to the radiator sections through said steam tubes, said steam tubes having a length such that the entire boiler tube may be inserted endwise into said passageway during assembly.

3. In a steam radiator of the type in which an electrical unit is provided to transform water into steam, a plurality of hollow vertical sections fastened directly together adjacent their top and bottom to form a complete radiator, each of said sections being provided with opposed apertures so that a horizontal passageway is provided lengthwise of the plurality of sections, a tube in said passageway adapted to receive an electrical heating unit, said tube being sealed from the inside of said radiator sections, a boiler tube forming a heating chamber around said first tube and provided with apertures in the bottom portion thereof, cap means welded to one end section arranged to space and support said tubes at one end and a plate means sealed to said heating unit tube at the other end and welded to the other end section whereby the interior of said sections is fully sealed from atmosphere, and a row of short steam tubes projecting upwardly from said boiler tube and spaced along said tube, certain of said stamping apertures being so proportioned and said steam tubes having a length such that the entire boiler tube with projecting steam tubes may be inserted endwise into said passageway during assembly.

4. In a steam radiator of the type in which an electrical unit is provided to transform water into steam, a plurality of similar stampings arranged face to face in pairs to form hollow vertical radiator sections which, in turn, are fastened directly together adjacent their top and bottom to form a complete radiator, each of said stampings being provided with an aperture at a lower end whereby a passageway is provided lengthwise of a plurality of sections, a tube in said passageway adapted to receive an electrical heating unit, said tube being sealed from the inside of said radiator sections, a boiler tube form-

ing a heating chamber around said heating unit tube and provided with apertures in the bottom portion thereof, and a row of short feed tubes projecting upwardly from said boiler tube spaced along the tube whereby water may be contained in said boiler tube and steam may be directed from the boiler tube into each of said sections, certain of said stamping apertures being so proportioned and said feed tubes having a length such that the entire boiler tube may be inserted endwise into said passageway during assembly.

5. In a steam radiator of the type in which an electrical unit is provided to transform water into steam, a plurality of similar stampings arranged face to face in pairs to form hollow vertical radiator sections which, in turn, are fastened directly together adjacent their top and bottom to form a complete radiator, each of said stampings being provided with similar apertures at a lower end whereby a passageway is provided lengthwise of a plurality of sections, a heating unit adapted to be received by said passageway comprising a continuous tube constituting a heating chamber, a row of steam tubes extending upwardly into said sections from said chamber and dimensioned such that the over-all clearance of said heating chamber and steam tubes is less than the transverse dimensions of said passageway, and a heating means in said chamber, and means for sealing said heating unit within said radiator.

6. In a steam radiator formed of a plurality of sections fastened directly together adjacent their top and bottom in which are provided openings to form a passageway extending longitudinally of said radiator, a continuous tube constituting a heating chamber disposed in said passageway and having holes to receive water, a row of feed tubes on said heating chamber tube extending upwardly into said sections and dimensioned such that the over-all clearance of said heating chamber and steam tubes is less than the transverse dimensions of said passageway, and a heating means in said chamber, said heating chamber tube and feed tubes thereon being dimensioned to be received by said passageway and sealed therein.

7. In a steam radiator of the type in which an electrical unit is provided to transform water into steam, a plurality of similar stampings arranged face to face in pairs to form hollow vertical radiator sections which, in turn, are fastened directly together adjacent their top and bottom to form a complete radiator, a heating chamber adapted to be received by said radiator comprising a main horizontal tube and steam tubes extending upwardly from said main tube, each of said stampings being provided with an aperture so shaped that said heating chamber may pass therethrough and be positioned therein, and means adapted to position said chamber within said radiator and to seal the apertures in the end sections thereof.

8. In a steam radiator of the type in which an electrical unit is provided to transform water into steam, a plurality of similar stampings arranged face to face in pairs to form hollow vertical radiator sections which, in turn, are fastened directly together to form a complete radiator, a heating chamber adapted to be received by said radiator comprising a main horizontal tube and steam tubes extending upwardly from said main tube, each of said stampings except one end stamping, being provided with an aperture so shaped that said heating chamber may pass therethrough and be positioned therein, and means adapted to position said chamber within said radiator and to seal the apertures in the end sections thereof.

9. In a steam radiator of the type in which an electrical unit is provided to transform water into steam, a plurality of similar stampings arranged face to face in pairs to form hollow vertical radiator sections which, in turn, are fastened directly together to form a complete radiator, a heating chamber adapted to be received by said radiator comprising a main horizontal tube and steam tubes extending upwardly from said main tube, each of said stampings being provided with an aperture so shaped that said main tube and vertical steam tubes may pass therethrough and be positioned in said radiator, and means adapted to seal the apertures in the end sections thereof after said heating chamber has been positioned.

ROY R. FISHER.