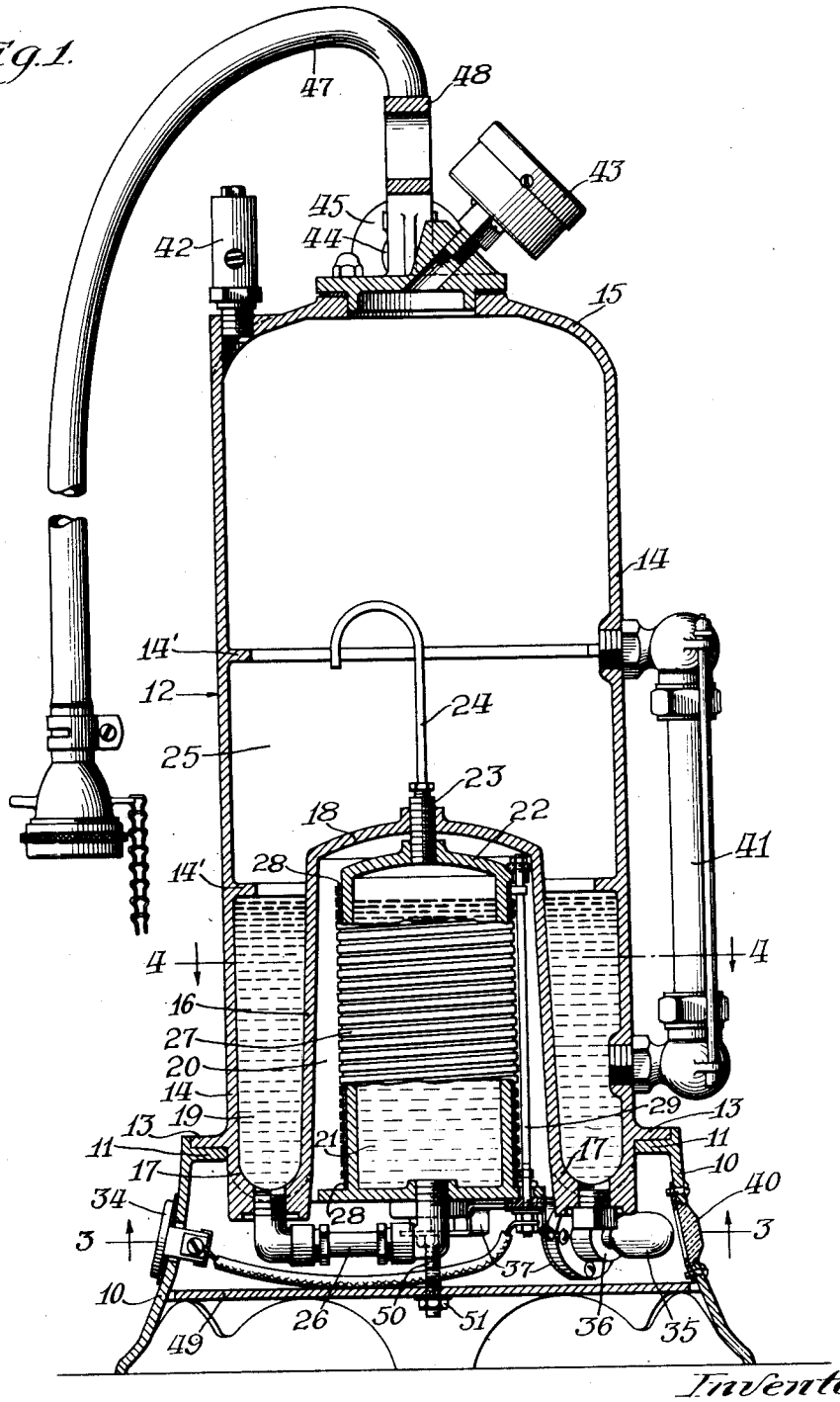
March 26, 1935. T. J. PARKER 1,995,814

STEAM BOILER

Filed Dec. 19, 1933 2 Sheets-Sheet 1

Fig. 1.



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Filed Dec. 19, 1933 2 Sheets-Sheet 2

Fig. 2.

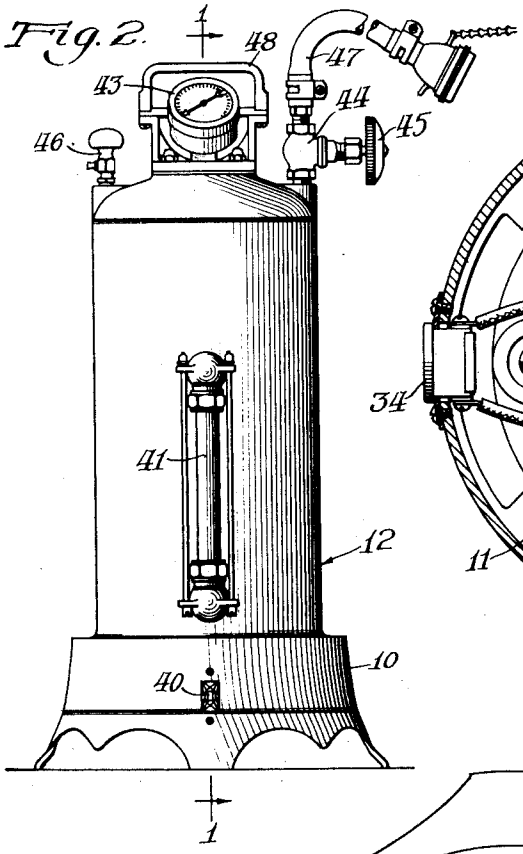


Fig. 3.

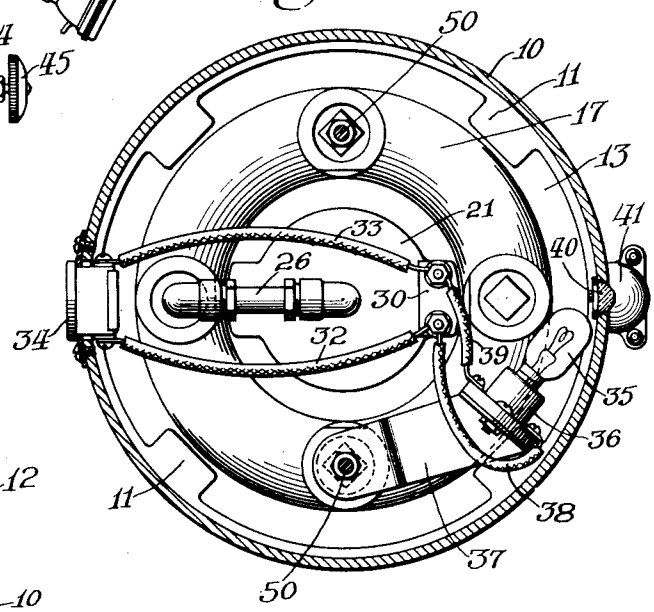
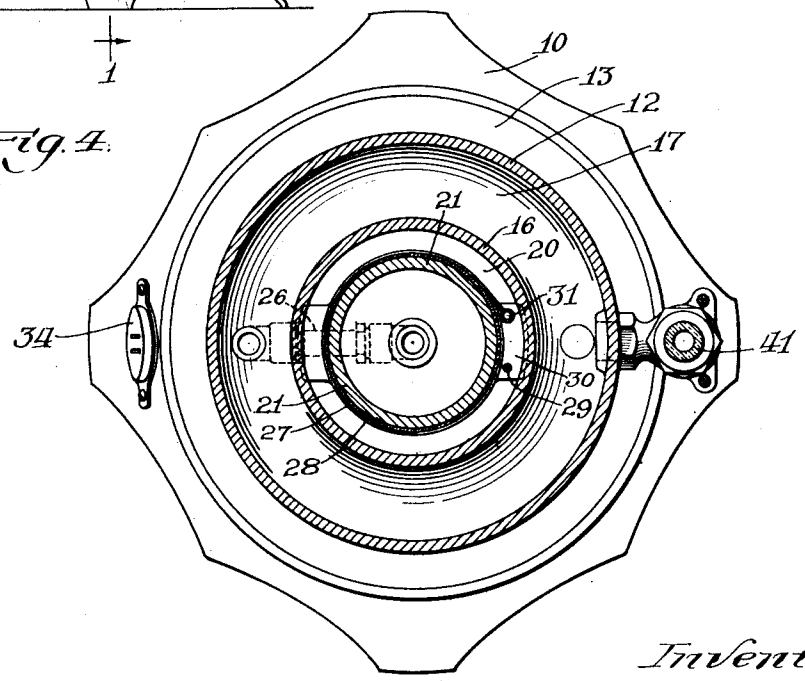


Fig. 4.



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UNITED STATES PATENT OFFICE

1,995,814

STEAM BOILER

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Application December 19, 1933, Serial No. 703,082

4 Claims. (Cl. 219—38)

This invention relates to boilers and more particularly to electrically heated boilers for generating steam. The boiler herein shown and described is a miniature boiler particularly adapted for generating steam for cleansing and sterilizing fluid conduits, such as beer coils, but obviously the invention may be applied to various uses requiring steam under pressure.

One of the objects of the invention is to provide a boiler in which steam of desired pressure may be quickly and efficiently generated. Another object is to provide for heating the water in the boiler to generate steam by means of a novel and very efficient electric heating element mounted in direct heat contact on and surrounding a generating cylinder which is part of the circulatory system of the boiler.

The boiler is so designed that its relatively thin metal walls withstand relatively high pressures. Other advantages will be apparent from the following description.

In the drawings:

Fig. 1 is a vertical sectional view of a boiler embodying my invention, the view being an enlarged section on the line 1—1 of Fig. 2.

Fig. 2 is a front elevation of the boiler.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1, looking upwardly.

Fig. 4 is a transverse section taken on the line 4—4 of Fig. 1, looking downwardly.

In that embodiment of the invention shown in the drawings, the base comprises a ring 10 having inwardly directed flanges 11 for supporting the boiler, indicated as a whole at 12. An annular flange 13 on the lower part of the boiler rests on the flanges 11.

The boiler 12 comprises an outer cylindrical vertical housing wall 14, reinforced by ribs 14', a top 15, an inner cylindrical wall 16 concentric with the wall 14, connected thereto at the bottom by a curved annular wall 17, and extending inwardly at the top to form the dished wall 18. These parts are preferably cast integrally of metal such as aluminum. The walls 14 and 16 are spaced apart radially to form a water chamber 19 in the lower part of the boiler, and the wall 16 surrounds a central space 20 which extends from the bottom of the boiler 12 upwardly about two-fifths of the height of the boiler to the wall 18.

Within the space 20 is located a cylindrical water holder 21 which forms the steam generating chamber. The holder 21 is also made of metal, preferably aluminum, and is connected at its top 22 with the wall 18 of the boiler, by means of a nipple 23. A gooseneck conduit 24 extends upwardly from the nipple 23 and then downwardly into the chamber 25, and establishes communication between the generator 21 and the steam chamber 25 of the boiler 12. The lower end of the generator 21 is connected by a conduit 26 through the wall 17 to the water chamber 19 of the boiler. The internal diameter of the conduit 26 is approximately three times as great as that of the tube 24, the arrangement of the parts being such that when the device is in operation the steam pressure in the chamber 25 will force the water in the part 19 of the boiler to pass as required into the water holder 21 in which steam is generated. This circulation of water from the chamber 19 to generator 21 is intermittent due to momentary differences in temperatures of the water in boiler and generator, and steam pressure on the water in the chamber 19.

The means for heating the water in the generator 21 comprises a nichrome ribbon 27 wound on a mica sheath 28 surrounding the cylindrical wall 21 of the generator. In the present embodiment the mica is 8/1000ths inch thick and the nichrome coil consists of twenty-one feet of 1/8th inch flat ribbon, about 4/1000ths inch thick, wound spirally and closely on the mica sheath surrounding the generator 21, providing coil capacity of approximately 1,050 watts. While nichrome has been found to be very efficient for use in the heating element of my boiler, other alloys having the characteristics of nichrome may be used. These characteristics include high melting point of the metal, and practically constant resistance regardless of temperature changes, whereby a coil of the character described has high steady heating capacity, with minimum corrosion and other deterioration.

The upper end of the nichrome ribbon 27 is attached to a connector rod 29 which extends downwardly through a bracket 30. The lower end of the ribbon is attached to a post 31 on said bracket, the ribbon ends being insulated from each other and connected by wires 32, 33, respectively, to a source of electric current through the plug 34. If desired, there may be provided a small signal light 35 mounted in a socket 36 on the bracket 37, electrically connected in the circuit by wires 38, 39 and visible through a window 40 in the base 10 to indicate that the coil is provided with electrical current.

The top wall 15 of the boiler is bored for mounting a pop valve 42, steam pressure gauge 43, steam outlet 44 provided with valve 45, and an air vent 46 on said top wall in communication

with the interior of the boiler 12. A flexible tube 47 attached to the steam outlet 44 conducts steam to a beer coil to be cleaned, or elsewhere as desired. A handle for carrying the boiler is indicated at 48. Water is supplied to the boiler, preparatory to operation, through the port 44, and during the feeding of water into the boiler, the air vent 46 is open.

The base 10 is retained in its intended position relatively to the boiler by means of a circular disc 49, apertured to permit screw bolts 50 to extend therethrough. The wall 17 is tapped and the bolts 50 are fixedly secured in and depend from said wall 17 of the boiler at opposite sides (Fig. 3). The disc 49 is held in the position shown in Fig. 1 by the nuts 51 on the bolts 50. The disc 49, bearing at its peripheral edge against the inner surface of the base 10, thus serves to hold the base in place and also to enclose and protect the mechanism located below the boiler 12.

In the present embodiment the boiler wall 14 is approximately 15 inches high, and the diameter 7 inches; the generator 21 is about 5 inches high and 3 inches in diameter. The walls are $\frac{3}{16}$ inch in thickness and reinforced as shown. While 80 pounds steam pressure is sufficient for cleaning beer coils, the boiler capacity is in excess of 1,000 pounds steam pressure. These dimensions are stated by way of example and obviously the invention is not limited to any particular size.

Changes may be made in details of construction without departing from the scope of my invention and I do not intend to be limited to the exact form shown and described, except as set forth in the appended claims.

I claim:—

1. A self-contained steam boiler comprising a pair of cylindrical housing walls forming between them an annular chamber for holding a supply of water, a cylindrical steam generator located within the inner wall of said housing but spaced from the same, a heating element surrounding the steam generator, a conduit connecting the bottom of the water holder and the bottom of the steam generator, and a conduit substantially smaller in diameter than said first mentioned conduit extending upwardly from the steam generator into the space within the boiler housing above the water supply for conveying water and steam from the generator into the boiler housing, the heating of the water in the generator producing circulation of water from the cylindrical generator to the annular chamber of the boiler housing and from said annular chamber to the cylindrical generator.

2. A self-contained steam boiler comprising a pair of cylindrical housing walls forming between them an annular chamber for holding a supply of water, a cylindrical steam generator located within the inner wall of said housing but spaced from the same, a heating element surrounding the steam generator, a conduit connecting the bottom of the water holder and the bottom of the steam generator, and a conduit approximately one-third the diameter of the first mentioned conduit extending upwardly from the steam generator into the space within the boiler housing above the water supply for conveying water and steam from the generator into the boiler housing, the heating of the water in the generator producing circulation of water from the cylindrical generator to the annular chamber of the boiler housing and from said annular chamber to the cylindrical generator.

3. A self-contained steam boiler comprising a pair of cylindrical housing walls forming between them an annular chamber for holding a supply of water, a cylindrical steam generator located within the inner wall of said housing but spaced from the same, a heating element surrounding the steam generator, a conduit connecting the bottom of the water holder and the bottom of the steam generator, and a conduit terminating in a gooseneck and substantially smaller in diameter than said first mentioned conduit extending upwardly from the steam generator into the space within the boiler housing above the water supply for conveying water and steam from the generator into the boiler housing, the heating of the water in the generator producing circulation of water from the cylindrical generator to the annular chamber of the boiler housing and from said annular chamber to the cylindrical generator.

4. A self-contained steam boiler comprising a pair of cylindrical housing walls forming between them an annular chamber for holding a supply of water, a cylindrical steam generator located within the inner wall of said housing but spaced from the same, a heating element surrounding the steam generator, a conduit connecting the bottom of the water holder and the bottom of the steam generator, and a conduit substantially smaller in diameter than said first mentioned conduit extending upwardly from the steam generator into the space within the boiler housing above the water supply for conveying water and steam from the generator into the boiler housing, the heating of the water in the generator producing circulation of water from the cylindrical generator to the annular chamber of the boiler housing and from said annular chamber to the cylindrical generator, said heating element comprising a sheath of mica surrounding the generator, a coil made of metal having high temperature capacity wound on said mica sheath and means for connecting the coil to a source of electrical current.

THOMAS J. PARKER.