

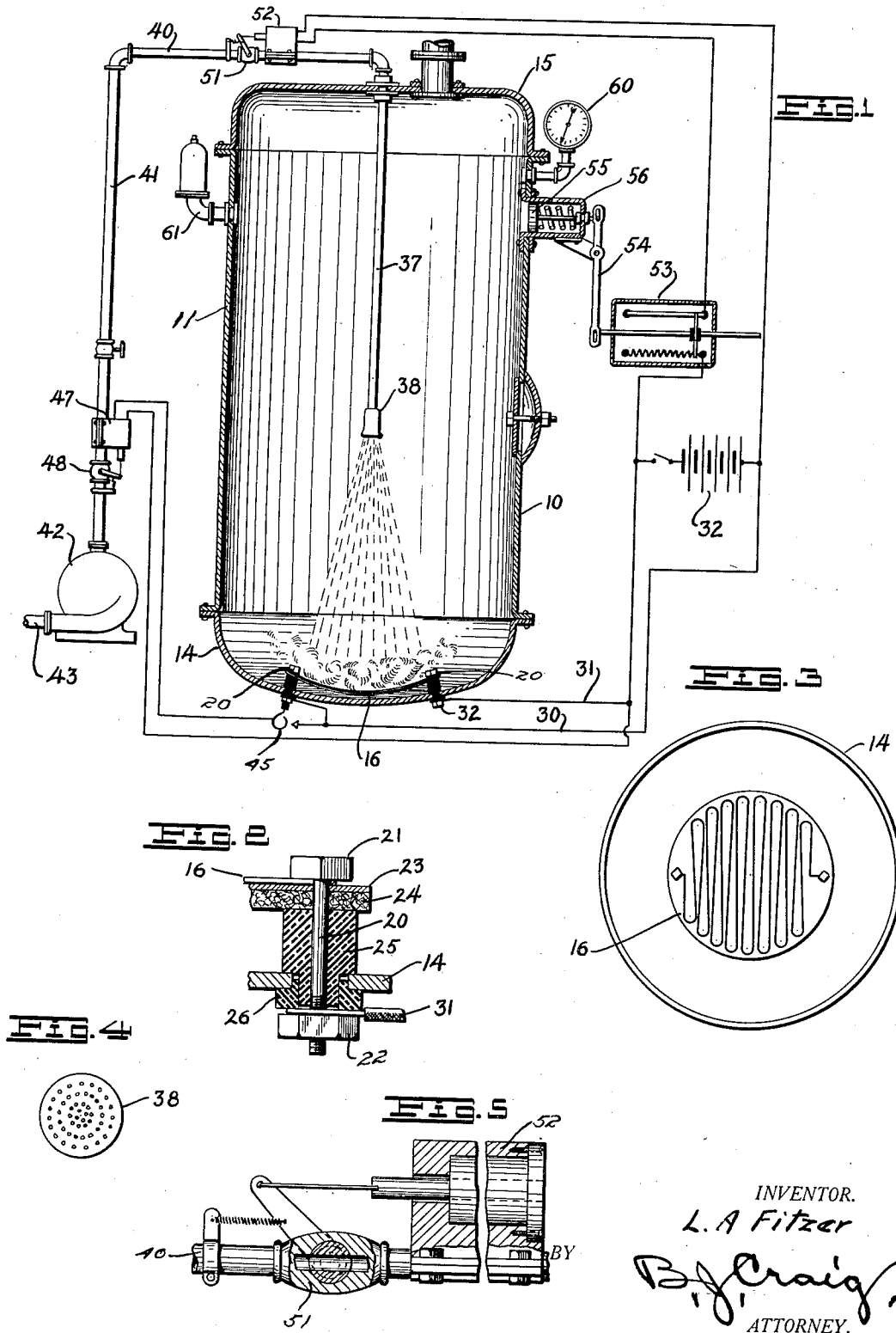
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L. A. FITZER

ELECTRICALLY OPERATED STEAM BOILER

Filed Feb. 9, 1925



INVENTOR.

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UNITED STATES PATENT OFFICE.

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ELECTRICALLY-OPERATED STEAM BOILER.

Application filed February 9, 1925. Serial No. 7,935.

To all whom it may concern:

Be it known that I, LOUIS A. FITZER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a certain new and useful Improvement in Electrically-Operated Steam Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to steam boilers.

The general object of the invention is to provide a steam boiler wherein an electric heating means is arranged to be operated to produce steam in the boiler.

A further object of the invention is to provide a steam boiler wherein a hollow drum is provided and wherein an electrically operated heating coil is disposed in the bottom of the drum for the purpose of producing steam.

Another object of the invention is to provide a boiler wherein an electrically operated coil is mounted adjacent the bottom of the boiler and wherein means is provided for evaporating condensate present in the boiler.

A further object of the invention is to provide a boiler including an outer shell and an electrically operated coil wherein means is provided for discharging water upon the heating coil to vaporize the water.

A further object of the invention is to provide a steam boiler wherein a device operated by steam pressure within the boiler serves to control the flow of water to the boiler.

A further object of the invention is to provide an electrically operated boiler wherein a thermostat which is operatively associated with the heating element controls the water supply.

Other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein Fig. 1 is a section partly in elevation showing my boiler; Fig. 2 is a sectional detail showing means for mounting the heating element in the boiler; Fig. 3 is a top plan view of the lower portion of the boiler shell showing the heating element; Fig. 4 is an end view of the nozzle; and Fig. 5 is a sectional detail partly in elevation showing the water control valve.

Referring to the drawing by reference characters, I have shown a boiler at 10. As indicated, this boiler comprises a body por-

tion 11 having end caps 14 and 15 thereon. Arranged centrally within the end cap 14, I show a heating element 16. This heating element may be of any desired material which can be efficiently heated by the passage of an electric current therethrough.

The heating element 16 is preferably made by bending a rod or bar to the shape shown in Fig. 3 with the lower portion dished or bent downwardly as shown in Fig. 1. The two terminals of the heating element are connected to fastening means such as bolts 20. One of these bolts is preferably of brass and the other of iron and these bolts are each provided with headed portions 21 and nuts 22. Immediately beneath the heating coil 16 I arrange a mica plate 23 and beneath this plate I arrange an asbestos plate 24.

Both of the plates as well as the coil are spaced above the shell 14 by an insulated block 25. This block is provided with a companion insulating member 26 as shown in Fig. 2. The bolts 20 are in circuit through leads 30 and 31 with a battery or other source of electricity 32.

The end cap 14 of the boiler is provided with an aperture through which a water supply pipe 37 extends. This supply pipe is provided with a nozzle 38 which is disposed above the heating element 16 and is adapted to direct water toward the heating element. The pipe 37 communicates with the pipe 40 which in turn, is connected with a pipe 41, the latter being connected to a pump 42 and a water supply pipe 43. The arrangement is such that when the pump is operated it will force water through the nozzle 38 causing it to be directed towards the heating unit 16 where it will be vaporized. I may here mention that in the action of my invention when the heating element is properly operating that the water will not strike this element in any quantity, but will be vaporized just before it reaches the heating element. The water will be propelled in the form of a fine mist or spray under high pressure.

In order that the water will not be accidentally supplied to the boiler before the heating unit 16 is at a proper temperature I show a thermostat 45 associated with the iron bolt 20. This thermostat is arranged to operate a solenoid 47 when the proper temperature is reached in the boiler. The solenoid 47 controls a valve 48 which allows water to enter the boiler.

In order to control the supply of water to the boiler I show the pipe 40 as provided with a valve 51. This valve is adapted to be operated by a solenoid coil 52 which is controlled by a rheostat 53. The flow of electricity through the rheostat is controlled by a lever 54 which is moved by a piston 55, the latter being exposed to the steam pressure within the boiler. The arrangement of parts is such that when the steam pressure increases in the boiler the piston 55 will be driven out against the action of a spring 56 thus rocking the lever 54 and actuating the rheostat to operate the coil 52, and thus change the amount of water fed to the boiler. As the pressure of steam in the boiler decreases due to the diminished supply of water, the spring 56 pushes the piston 55 inwardly thus again moving the rheostat 53 and increasing the supply of water.

The boiler may be provided with the usual pressure indicator 60 and pop valve 61.

From the foregoing description it will be apparent that I have provided a boiler which is of extremely simple construction, which may be economically made, and which is highly efficient in use.

Having thus described my invention, I claim:

1. In a boiler, a closed shell, a heating element in said shell, said heating element comprising electrically heated means, said means being secured to said shell and insulated therefrom, means to bring water into said shell to cause evaporation thereof and means to take steam from said shell.

2. In a boiler, a boiler shell, an electrically operated heating element in said shell, said heating element being insulated from said shell, means to inject water into said shell, wires connecting said element with a source of electricity, and means to control the flow of water to said boiler, said last mentioned means comprising a device governed by the steam pressure in the boiler.

3. In a boiler, a boiler shell, an electrically operated heating element within said shell and insulated therefrom, means to inject water into said shell, and means to prevent the flow of water to said shell unless said element is above a certain temperature.

4. In a boiler, a boiler shell, a heating element in one end of said shell, said heating element comprising an electrically operated heating coil spaced from and insulated from said shell, terminals for said coil, a nozzle adjacent said heating coil, a water supply pipe leading to said nozzle and means to prevent passage of water through said pipe

until the heating coil reaches a certain temperature.

5. In a boiler, a cylindrical boiler shell, a heating element within said shell and near one end thereof, said heating element comprising an electrically operated heating coil, said coil having some parts thereof higher than other parts thereof, a nozzle adjacent said heating coil, a water supply pipe leading to said nozzle, means for forcing water through said supply pipe, towards said coil, said coil being spaced from the adjacent portion of said shell, and insulating material between the coil and the shell.

6. In a boiler, a boiler shell, a heating element near one end of said shell, said heating element comprising an electrically operated heating coil, said coil being dished in the middle, terminals for said coil insulated from said boiler shell, a nozzle adjacent to said heating coil, a water supply pipe leading to said nozzle, a pump for forcing water through said supply pipe, said coil being spaced from the adjacent portion of said shell, and heat insulating material between the coil and the shell.

7. The method of producing steam comprising electrically heating an element which is arranged within a closed container, directing water in a finely divided spray upon said element and withdrawing the steam from the container.

8. In a boiler, a boiler shell, a heating element arranged within said shell, said heating element comprising an electrically operated heating coil, terminals for said coil, said terminals passing through said shell and being insulated therefrom, a nozzle adjacent said heating coil, a water supply pipe leading to said nozzle and a pump for forcing water through said supply pipe, said water being adapted to impinge upon said coil.

9. In a boiler, a cylindrical boiler shell, a heating element in one end of said shell, said heating element comprising an electrically operated heating coil, means to supply current to the element, a nozzle adjacent said heating coil, a water supply pipe leading to said nozzle, means for forcing water through said supply pipe, a valve in said supply pipe, means to control said valve, said last mentioned means including a rheostat and means whereby the rheostat is controlled by the steam pressure in the boiler.

In testimony whereof, I hereunto affix my signature.

LOUIS A. FITZER.