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F. CEDERGREN

ELECTRIC CONTROL FOR STERILIZERS

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Fig. 1.

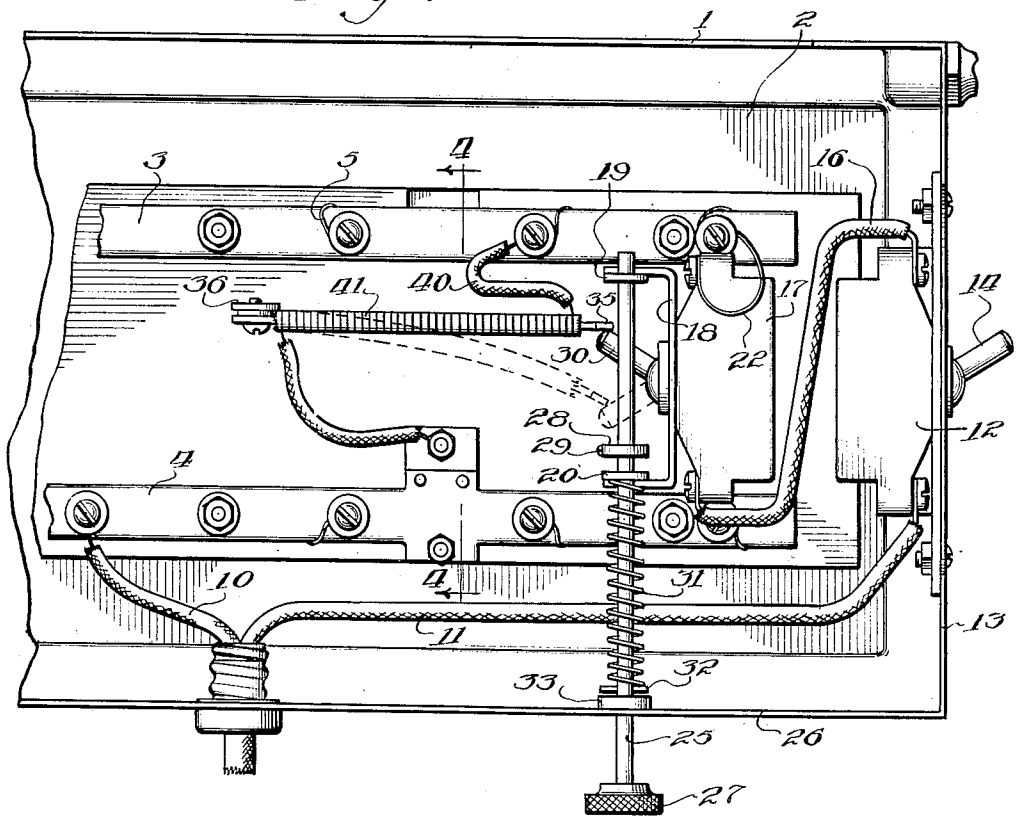


Fig. 2.

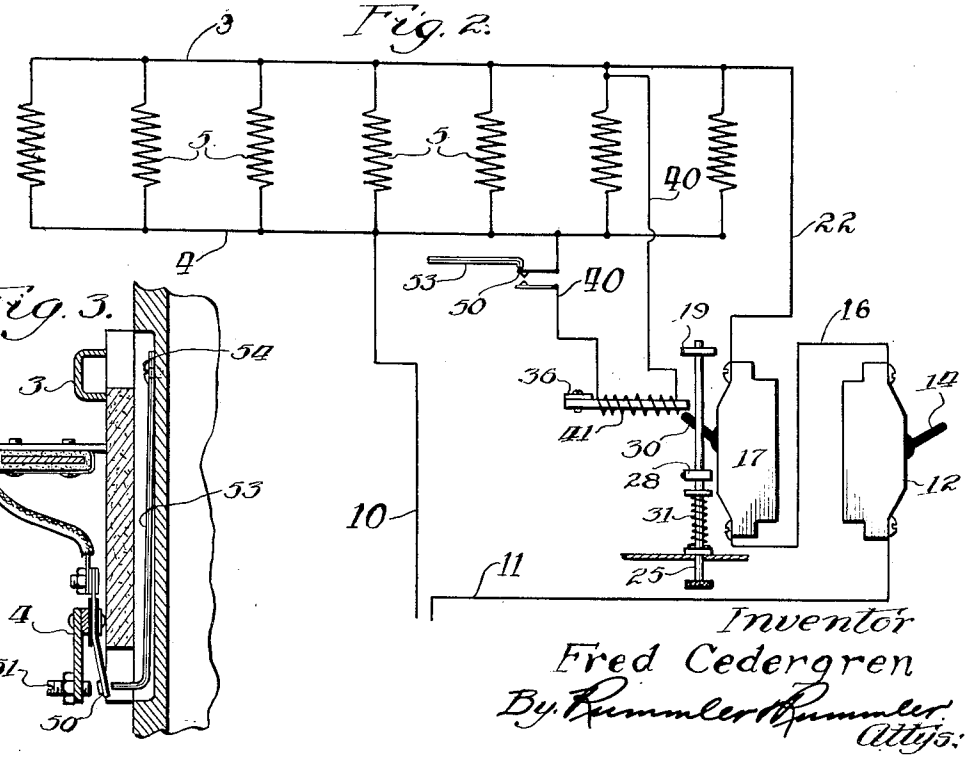


Fig. 3.

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ELECTRIC CONTROL FOR STERILIZERS.

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This invention relates to electric controls for sterilizing tanks, and the like.

The main objects of this invention are to provide an improved form of electric control having a duel switch arrangement wherein the user manually closes the circuit to the heating element and when the liquid in the sterilizing tank gets low, i. e., just before the tank goes dry, the current will be automatically cut off from the heating element.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which,—

Fig. 1 is a bottom plan view of one end of a sterilizer tank with the bottom plate removed to show the interior construction and arrangement;

Fig. 2 is a diagram of the circuit arrangement and automatic and manuel controls therefor; and

Fig. 3 is a section taken on the line 4—4 of Fig. 1.

In a sterilizer of this character it is desirable to have a machine arranged so that the operator can manually turn the current on at the time the instruments or other articles to be sterilized are placed in the sterilizing tank, and then the operator need not give any further attention to the machine unless the water or other sterilizing liquid in the tank gets low. The heating element for the sterilizing tank, after being manually connected to the electric circuit, will heat the liquid in the sterilizing tank to a point where it will sterilize the instruments placed in the tank and will continue to boil the water indefinately. However, when the water boils away, and just before the tank goes dry, the floor of the tank will get considerably hotter and this increased heat will actuate a bi-metallic thermostat strip to close a switch of a shunt circuit in which is included a heated element for a second bi-metallic element. This second thermostat element in turn operates a quick throw switch to its " off " position and thus shuts off the current to the tank heating elements.

In the construction shown in the drawing, a sterilizer tank 1 is provided on the under side of its floor 2 with a pair of longitudinally extending conductor bars 3 and 4. A series of heating coils 5 are bridged on the conductor bars 3 and 4 and are suitably insulated from the floor 2 of the tank 1.

Current is supplied to the conductor bars 3 and 4 through lead wires 10 and 11. The wire 10 is directly connected to the conductor bar 4, and the wire 11 is connected to one terminal of a standard quick throw switch 12 which is mounted on the inner face of the end 13 of tank 1. The quick throw switch 12 is provided with the usual operating handle 14 protruding through the wall 13 of the end of the tank so as to be readily accessible for manual control. The other terminal of the switch 12 is provided with a lead wire 16 which conducts the current to one terminal of a second quick throw switch 17 mounted on a bracket 18 secured to depending lugs 19 and 20 which are rigidly secured to the floor 2 of the tank. The other terminal of the switch 17 is connected by a lead wire 22 to the conductor bar 3.

Manually operable means are provided for throwing the switch 17 to its " on " position and comprise a rod 25 slidably mounted on the lugs 19 and 20 and having one end thereof protruding through the side wall 26 of the tank. A suitable head 27 is mounted on the outer end of the rod 25 for grasping by the fingers of the operator. The rod 25 carries a shoulder in the form of a disk 28 rigidly secured to the rod by a set screw 29. The disk 28 is mounted between the lugs 19 and 20 and positioned so as to abut against the switch arm 30 of the quick throw switch 17 and push the same over to its " on " position when the rod 25 is shifted axially by the operator. A coil compression spring 21 surrounds a portion of the rod 25 and one end of the spring bears against the lug 20, and the other end thereof bears against a pin 33 mounted on the rod 25. A bushing 33 is provided on the inner surface of the side wall 26 for supporting the rod and acts as a bearing therefor.

Automatic means are provided for shifting the quick throw switch 17 from its " on " position to its " off " position and comprise a bi-metallic thermostatic element 35 rigidly mounted at one end on a lug 36 secured to the floor 2 of the sterilizer. The other end

of the thermostatic element 35 is positioned closely adjacent to the switch arm 30 of switch 17 and when the thermostatic element 35 is fully flexed as shown in dotted lines in Fig. 1 of the drawings, it throws the operating handle 30 of switch 17 to an "off" position.

Means are provided for causing the bi-metallic element to flex and comprise a shunt circuit 40 bridged on the conductor bars 3 and 4. The shunt circuit 40 includes a heating element 41 which is wound around, and suitably insulated from, the bi-metallic element 35, and a normally open spring switch arm 50 that is mounted on, but insulated from, the conductor bar 4, as shown in Fig. 3.

Means are provided for closing the switch arm 50 against the inner end of an adjustable contact screw 51 threaded on the member 4, and comprises a bi-metallic thermostatic strip 53 secured at one end by screws 54 to the bottom side of the tank floor 2. The opposite end of the element 53 is bent transversely to the remainder of the strip and is positioned to bear against the spring arm 50 when the element is flexed by overheating, so as to close the shunt circuit 40 through the arm 50 and screw 51.

In the operation of the device the sterilizer is connected up to some suitable source of electric current and the switch 12 is turned to its "on" position by the switch arm 14. If the switch 17 is not already in its "on" position the rod 25 is pushed inwardly by the knurled head 27 so as to throw the switch arm 30 to its "on" position and thereby complete the circuit to the heating coils 5. The fluid in the sterilizing tank comes to a boil, thereby sterilizing the articles in the tank, and continues to boil indefinitely unless the water gets low. Just before the tank goes dry the thermostatic element 53 flexes and closes the switch arm 50 against the screw 51, thereby completing the circuit through the shunt circuit 40. The current passing through the circuit 40 causes the heating coil 41 to flex the bi-metallic thermostatic element 35, as shown in dotted outline in Fig. 1 of the drawings, thereby moving the switch arm 30 to its "off" position and thus disconnecting all of the tank heating coils 5 from the source of supply.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. A sterilizer tank for containing a liquid, an electric heating element for heating the liquid therein, a main circuit for said heating element, a switch in said circuit, manually operable means for closing said switch, a thermostatic element for opening said switch, a shunt circuit on said main circuit, a normally open switch in said shunt circuit, a second thermostatic element located adjacent the floor of said tank for closing said shunt circuit switch when said tank becomes heated to a predetermined point, and a second heating element in said shunt circuit for actuating said first mentioned thermostatic element.

2. A sterilizer tank for containing a liquid, an electric heating element for heating the liquid therein, a main circuit for said heating element, a switch in said circuit manually operable to its "on" and "off" positions a second switch in said circuit, an axially slidable rod mounted adjacent said second switch, one end of said rod being positioned for manual control, a shoulder on said rod for engaging said switch to move said switch to its closed position, a thermostatic element for opening said second switch, a shunt circuit for said main circuit, a normally open switch in said shunt circuit, a second thermostatic element located adjacent the floor of said tank for closing said shunt circuit switch when said tank becomes heated to a predetermined point, and a second heating element in said shunt circuit disposed around said first mentioned thermostatic element for actuating it to open said main circuit switch.

Signed at Chicago this 29th day of March, 1927.

FRED CEDERGREN.