

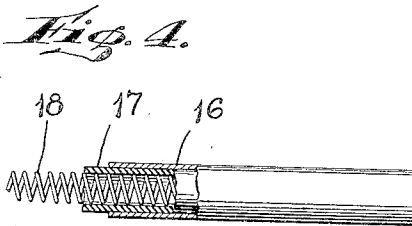
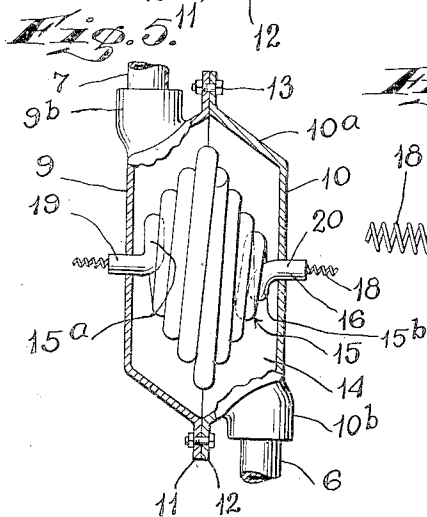
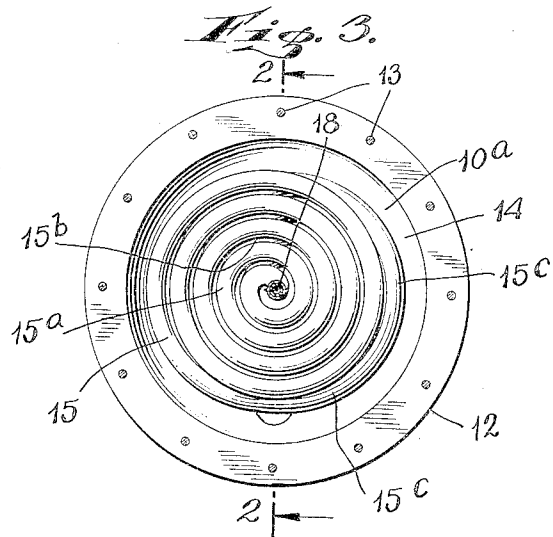
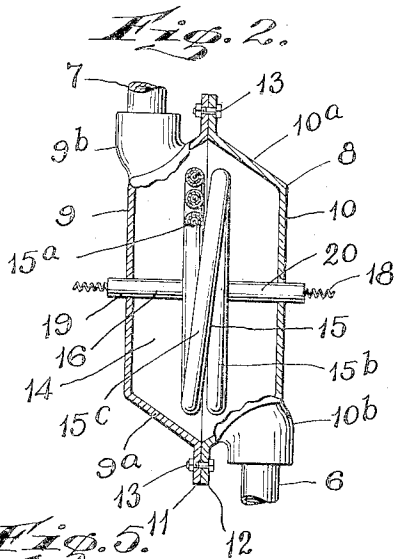
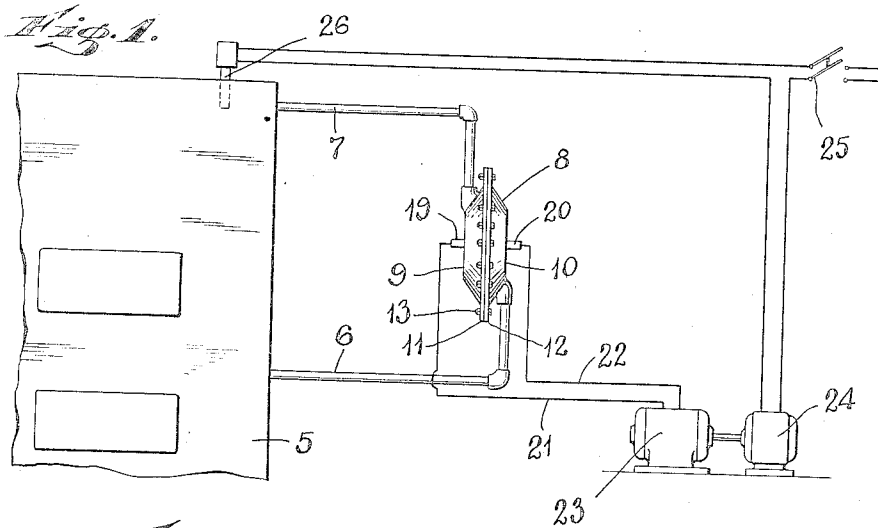
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WATER HEATING UNIT

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WATER HEATING UNIT

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8 Claims. (Cl. 219—39)

This invention relates to water heating units for boilers, furnaces and the like; and the object of the invention is to provide a unit of this class comprising a casing composed of two substantially dish-shaped parts bolted or otherwise secured together to form a water circulating chamber therethrough, and further to the arrangement of an electric heating coil in the circulating chamber of said casing, the coil being in the form of a double spiral or formed from a continuous coiled body with the ends of the coils extending outwardly through opposed sides of said casing; a further object being to provide motor driven means for supplying electric energy to the heating coil of the unit so as to supply the proper voltage and amperage to the heating coil to render the same efficient in the heating of water or other fluid circulated therethrough; and with these and other objects in view, the invention consists in a heater of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a diagrammatic view illustrating one use of the water heater.

Fig. 2 is a transverse section of the heater shown in Fig. 1 with the heater coil shown in section and in elevation, the section being on the line 2—2 of Fig. 3.

Fig. 3 is a sectional view through the center of the casing showing the heater coil in elevation.

Fig. 4 is an enlarged detail view of the tubing from which the heater coil is formed; and,

Fig. 5 is a view similar to Fig. 2 showing a modification.

For the purpose of illustrating one method of carrying my invention into effect, I have indicated in Fig. 1 of the drawing at 5 a part of a furnace, range or boiler, with which a pipe 6 is coupled to communicate with the lower portion of the water leg or jacket of the boiler; and 7 is a pipe communicating with the upper portion of the water jacket.

At one side of the furnace or range 5 is a heater casing 8 consisting of two substantially dish-shaped parts 9 and 10, adjacent surfaces of which have outwardly extending flanges 11 and 12 respectively which are bolted or otherwise secured together as indicated at 13 to form a

circulating chamber 14 within and between the parts 9 and 10. Both parts 9 and 10 have beveled walls 9a, 10a, adjacent the flanges which produce of the entire casing a substantially disc formation.

On the beveled surfaces 9a, 10a of each part 9 and 10 are outwardly projecting bosses 9b, 10b, with which the pipes 7 and 6 respectively are coupled so that water from the boiler may be circulated from the pipe 6 upwardly through the chamber 14 and out through the pipe 7 into the top of the boiler. Arranged within the chamber 14 is an electric heating coil 15 which may be constructed of any desired or suitable material, but which in the construction shown and as viewed in Fig. 4 of the drawing consists of an outer tube 16 of copper or similar material in which is an insulating tube or sheath 17 within which is a resistance wire or wire coil 18. The tube 16 forming the heater unit 15 is spiralled at each side 15a, 15b in the manner indicated in Fig. 3 of the drawing so that one end at 19 of the heater tube 16 may pass through one side wall of the casing part 9 to the center or axis of the spiral 15a and extend outwardly in spiral fashion and then across by the member 15c to the spiral 15b and the end 20 thereof will extend outwardly through the side wall of the other casing part 10. In this connection, it will be seen upon a consideration of Fig. 5 of the drawing that the structure of the heater coil 15 can be slightly modified by simply spreading the separate coils to spread the unit over a greater area of the chamber 14, and aside from this change, the structure of the device shown in Fig. 5 is similar to that shown in the other figures, and therefore, like references will indicate like parts.

Coupled with the resistance wire 18 of the heater unit where it extends through the ends 19 and 20 by any suitable source of electrical connectors, are wires 21 and 22 respectively which are coupled with a generator 23 driven by a suitable motor 24. The motor 24 in the construction shown is an electric motor in circuit with a source of electric supply controlled by a switch 25 but preferably having a thermostatic controlling element 26 therein for maintaining desired temperature of the water in the upper portion of the boiler.

It will be understood at this time, however, that the use of the element 26 is not absolutely essential, and furthermore, the illustration of use of my invention diagrammatically in Fig. 1 of the drawing is simply suggestive of one method of carrying the invention into effect, and other adaptations and uses of the heater may

be made. In other words, the heater may be used as a heater for fluids, and in the use in connection with boilers, ranges and the like, the primary purpose of the heater is to function in the manner of what might be termed a superheater to more quickly raise the water in the top of the boiler to a desired temperature in a hot water heating or supply system or in a steam supply system.

My improved heater will be used primarily when it is required to quickly increase the temperature in the boiler and may be further utilized to maintain the desired temperature in the event of any sudden drop therein. It will therefore appear that the heater will have in most cases an intermittent use except in cases where a constant drain is made upon the heating unit or system employed, in which cases, my improved heater may operate constantly for an indefinite period of time.

By employing the current supply herein described, it will be understood that the desired or required electric energy may be supplied to the heater at a relatively nominal cost, thus eliminating excessive drain on the current supply consumed in the operation of the heater.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A heater of the class described comprising a casing, means on opposed walls of the casing for introducing a fluid to be heated into the chamber of the casing and discharging the same therefrom, an electric heating element in said casing, said element comprising a tube fashioned to form opposed spiral portions, the ends of the tube terminating centrally of said spiral portions and extending outwardly through opposed side walls of the casing.

2. In a heater of the class described employing a casing having means for circulating a fluid to be heated therethrough, an electric heating unit within the casing for heating the fluid in its circulation through the casing, said unit comprising two spiral bodies disposed side by side in said casing, and the coils of each body being spread laterally, the ends thereof extending through the opposed side walls of said casing.

3. In a heater of the class described employing a casing having means for circulating a fluid to be heated therethrough, an electric heating unit within the casing for heating the fluid in its circulation through the casing, said unit comprising two spiral bodies disposed side by side in said casing, and the coils of each body being spread laterally the ends thereof extending through the opposed side walls of said casing, the coil of one body being continuous with that of the adjacent body, said coils comprising a metallic tube and resistance wire within said tube, and means for insulating the wire from said tube.

4. A superheater for boilers and the like comprising a heater casing, means for placing the lower end of the heater casing in communication with the lower portions of the water-jacket of the boiler, means for placing the upper end of the casing in communication with the upper end of the water-jacket of the boiler, an electric heating coil disposed in said casing for heating water circulated upwardly therethrough for supply to the upper end of the water-jacket of the boiler, and means including a motor driven generator for supplying electric heat energy to the

electric heating coil of said casing, the heating coil of said casing being formed of a spiral body disposed vertically in said casing.

5. A superheater for boilers and the like comprising a heater casing, means for placing the lower end of the heater casing in communication with the lower portions of the water-jacket of the boiler, means for placing the upper end of the casing in communication with the upper end of the water-jacket of the boiler, an electric heating coil disposed in said casing for heating water circulated upwardly therethrough for supply to the upper end of the water-jacket of the boiler, means including a motor driven generator for supplying electric heat energy to the electric heating coil of said casing, the heating coil of said casing being formed of a spiral body disposed vertically in said casing, and means including a temperature registering device exposed to the upper end of the water-jacket of said boiler for controlling the supply of electric energy to said heating coil.

6. A superheater for boilers and the like comprising a heater casing, means for placing the lower end of the heater casing in communication with the lower portion of the water-jacket of the boiler, means for placing the upper end of the casing in communication with the upper end of the water-jacket of the boiler, an electric heating coil disposed in said casing for heating water circulated upwardly therethrough for supply to the upper end of the water-jacket of the boiler, means including a motor driven generator for supplying electric heat energy to the electric heating coil of said casing, the heating coil of said casing being formed of a spiral body disposed vertically in said casing, and said spiral body comprising two spiral coils disposed one at each side of the casing, the ends of said coils extending outwardly through the opposed side walls of the casing centrally thereof.

7. A heater of the class described comprising a casing consisting of two substantially similar dish-shaped parts secured together to form a relatively large circulating chamber therebetween, opposed side walls of said parts having projecting bosses by means of which intake and discharge circulating pipes may be coupled therewith to communicate with the chamber of said casing, the separate casing parts being provided centrally with apertures, and an electric heating element having its end portions projecting through the central apertures of said casing parts, said element comprising a double spiral body arranged centrally within the chamber of said casing parts.

8. A heater of the class described comprising a casing consisting of two substantially similar dish-shaped parts secured together to form a relatively large circulating chamber therebetween, opposed side walls of said parts having projecting bosses by means of which intake and discharge circulating pipes may be coupled therewith to communicate with the chamber of said casing, the separate casing parts being provided centrally with apertures, an electric heating element having its end portions projecting through the central apertures of said casing parts, said element comprising a double spiral body arranged centrally within the chamber of said casing parts, and the coils of the separate spirals of said unit being spread laterally in the direction of opposed walls of said casing parts.

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