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ELECTRIC HEATER OF ADJUSTABLE TEMPERATURE

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FIG. 2.

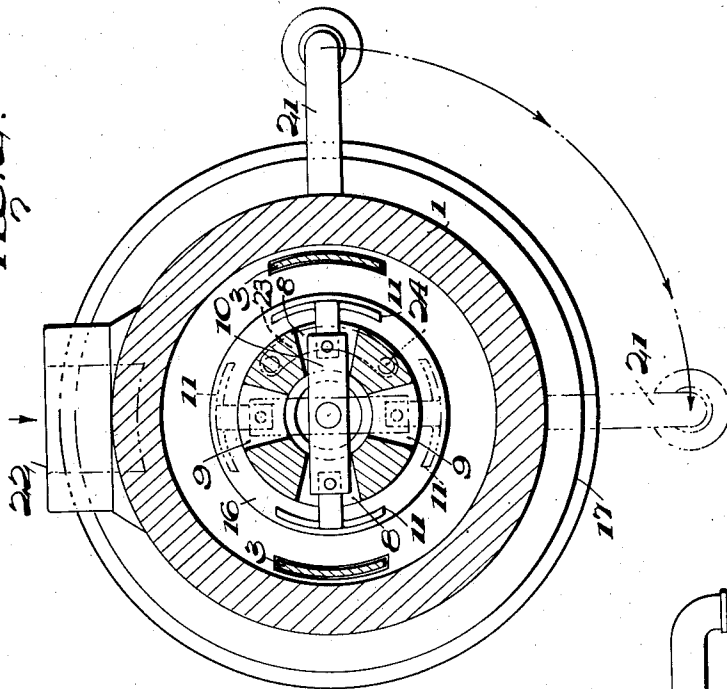
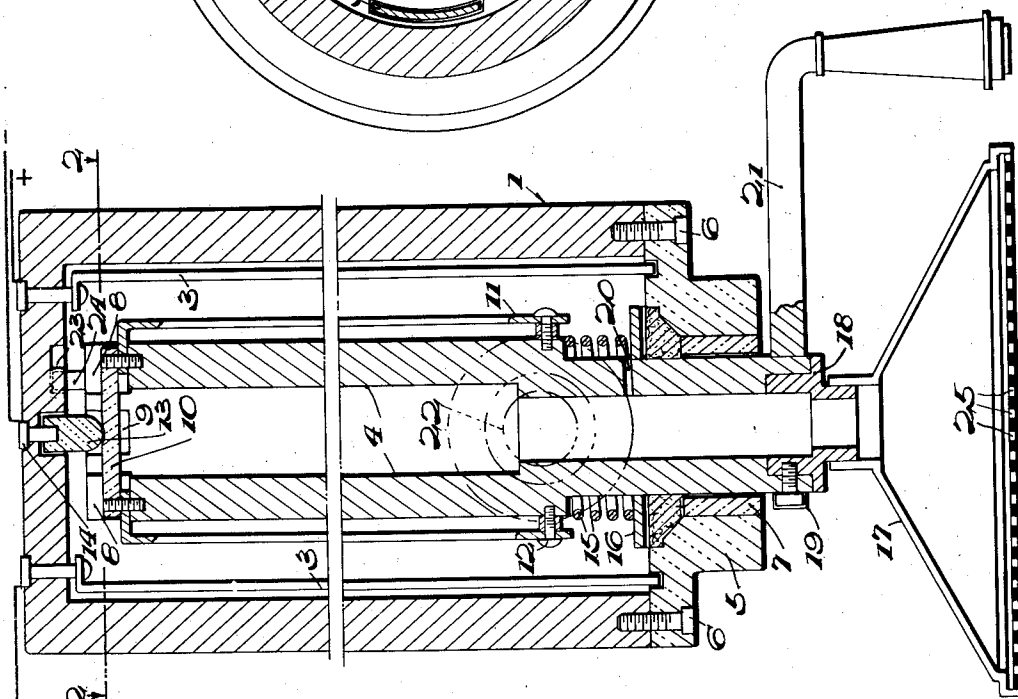


FIG. 1.



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ELECTRIC HEATER OF ADJUSTABLE
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4 Claims. (Cl. 219—40)

This invention relates to an improved electric heater, of adjustable temperature. It is an object of the present invention to provide a novel heating device in which the operative means for adjustably controlling the temperature of the water which is being heated, has been considerably simplified.

The improved type of electric heater in accordance with this invention is particularly adapted for the use for which it has been designed and a main advantage of the same is, among others, the fact that the closure or opening of the electric circuit is performed in an automatic manner, by the action of the same fluid which circulates through the apparatus. Besides, in the central conduit for the fluid, a suitable discharge opening is provided for the purpose of neutralizing any contact.

The apparatus according to this invention offers several important advantages, structural as well as operative, over similar devices of known construction, heretofore proposed or used for the same purpose.

The invention also aims at other objects which will more fully be understood when considering the following specification.

In order to facilitate the understanding of the invention and of the manner of carrying the same into practice, a preferred embodiment of the same has been shown in the accompanying illustrative drawing, in which:

Figure 1 shows a vertical central section of the heater which forms the object of this invention, in which the details of the construction of the device may be clearly seen, and

Figure 2 is a horizontal cross section on the line 2—2 of Figure 1, showing the displacement of the contact members.

Similar numbers of reference have been used to indicate like or corresponding parts in both views.

When referring to said drawing, it will be seen that the improved heater in accordance with this invention is essentially constituted by an outer casing or shell 1, formed by a cylindrical element without bottom; at two symmetric points of one of the diameters of the top or upper end of said cylindrical structure, two threaded orifices are provided for the reception of screws 2, which serve to retain by their upper ends, two plates 3 of sheet metal, connected by means of fixing screws to one of the leads of the electric line.

A tubular element 4, arranged in the interior of the outer shell 1, is held in position by means of a packing ring 5, secured by screws 6 to the

lower rim of the cylinder 1, so as to be concentrically situated with regard to said packing ring 5, a collar 7 being interposed between said packing ring 5 and the tubular element 4.

The tubular element 4 is provided at its upper end with openings 8 and 9, in communication with the interior of said element. A bar 10 serves as a bridge between the plates of sheet metal 11, normally situated in opposition to the aforementioned similar plates 3, and is secured at its free ends by means of screws 12 to the cylindric surface of the tube 4.

The connection of the plate 11 to the source of electric current is established by means of a stud 13 which presses with one of its ends against the bar 10, while its other end is connected to the source of current by means of a set screw 14.

In order to maintain a permanent contact between the elements 10 and 13, a coiled spring 15 is mounted around a part of reduced diameter of the cylindric tube 4, so as to rest under pressure on a washer 16 which acts after the manner of a packing gland.

For fixing the shower cone 17 in position, a nozzle 18, formed by two tubular sections, is concentrically inserted in the interior of the lower reduced end of the tube 4 and conveniently connected to the inlet end of the shower cone, the tube and said nozzle being held in their assembled position by means of a screw 19.

An opening 20 which extends radially through the wall of the tube 4, above the level of the washer 16, serves as an outlet duct for the liquid contained within the annular portion or chamber comprised between the elements 1 and 4.

A handle 21 constitutes the means for controlling the temperature, by causing the displacement to the desired extent of the metallic plates 3 and 11. At the lower part of the outer shell or casing 1, a suitable extension 22 is provided, adapted to be connected by means of a coupling member, to the corresponding feed water main.

The displacement of said handle 21 is limited by a stop 24, arranged to slide in a suitable guide channel 23.

Having thus described the several elements of the improved heater in accordance with our invention, the operation of the same is as follows:

The extension 22 having been coupled to the feed water main, the liquid will be allowed to enter into the heater and by rising in level, will act as a resistance between the plates 3 and 11 and thus cause the heating of the water. When the liquid has risen to the level of the openings 8 and 9, it will flow by these latter into the in-

terior of the tube 4 and will be discharged from the device by the orifices 25 of the shower cone 17.

When it is desired to lower the temperature of the water, it will be sufficient to turn the handle 21 in the manner indicated in Figure 2, whereby the plates 3 and 11 will be caused to separate from each other to the desired extent and thus cause a lowering of the temperature of the fluid.

When the discharge of water from the heater is stopped, the circuit is broken as the fluid which acted as a resistance between the plates, being discharged through the outlet duct 20 no longer completes the circuit between the electrode elements.

The invention will have been clearly understood from the foregoing description and no further explanation will be required by those skilled in the art.

It will be evident that several modifications of construction and detail may be introduced without departing from the principle and scope of this invention, as particularly defined in the claims annexed to this specification.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim and desire to secure by Letters Patent, is:

1. An electric water heater, comprising an outer casing containing a water inlet having an open bottom and a closed top with two apertures therein, a pair of elongated electrodes supported by fastening means in said apertures and extending the length of said casing, lead wires connecting said electrodes with one side of an electric circuit from a source of current, a tubular element concentrically mounted in said casing, so as to form therewith an annular water chamber for said water inlet, said tubular element being rotatably mounted in said casing between a packing gland and an electric contact plug, apertures in said tubular element opening from said water

chamber, electrodes mounted on the exterior of said tubular element, a transverse contact plate interconnecting said electrodes, said contact plug being in engagement with said plate, a lead wire connecting said plug to the negative pole of said source of current, said tubular element having an elongated reduced end extending below the open bottom of said casing and providing a shoulder within the lower end of said casing, said packing gland being adapted to seal the bottom of said casing around the exterior of the said tubular element's reduced end, below said shoulder, a coiled spring concentrically arranged on the said reduced end compressed between said shoulder and said packing gland, whereby said contact plate is maintained pressed against said contact plug, means secured to said reduced end of said tubular element for rotating the same, whereby the temperature of water in said chamber may be controlled by varying the angular distance between the said electrodes carried by the casing and the tubular element respectively upon such rotation, and means for limiting the angular rotation of said tubular element.

2. An electric heater of adjustable temperature, in accordance with claim 1, wherein the means for limiting the movement of the tubular element consists of a stud, slidably arranged in a channel provided on the lower side of the top plate of the said casing.

3. An electric heater of adjustable temperature, in accordance with claim 1, wherein the casing is provided at its lower end with a nozzle or coupling device for feeding the water to be circulated through a shower head.

4. An electric heater of adjustable temperature, in accordance with claim 1, wherein the internal tubular element is provided with a discharge opening radially arranged in the portion of reduced diameter of said element.

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