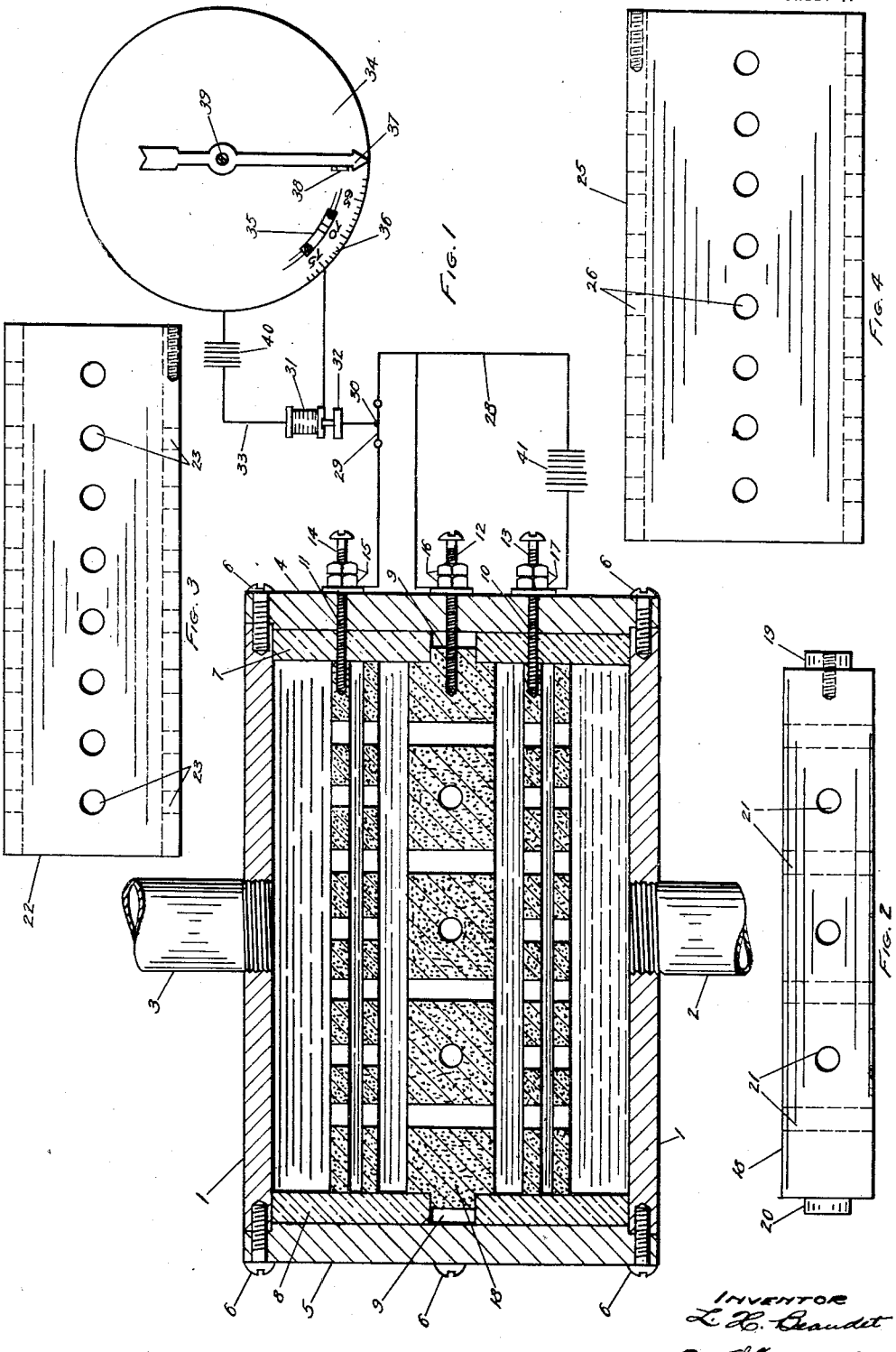
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ELECTRIC WATER HEATER.

APPLICATION FILED MAY 20, 1919. RENEWED AUG. 7, 1920.

1,355,644. **Patented Oct. 12, 1920.**

2 SHEETS—SHEET 1.



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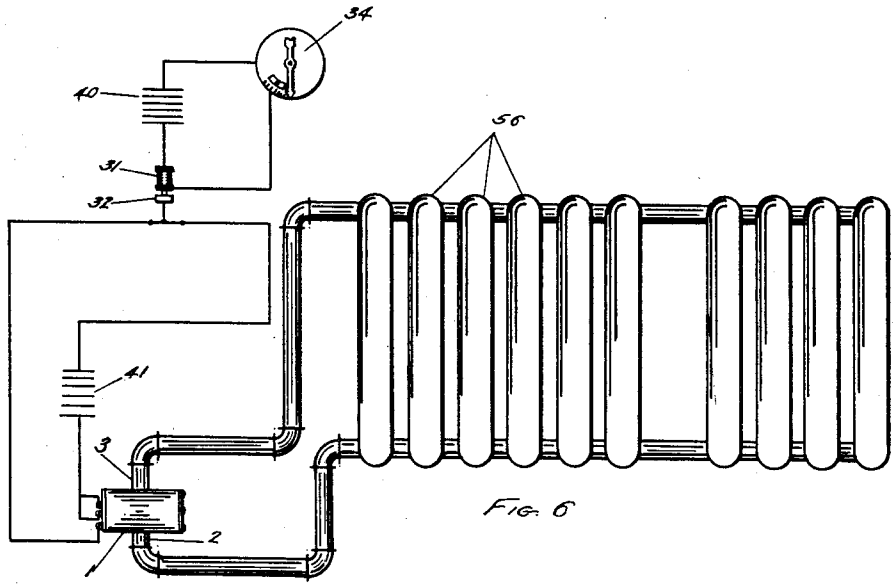


FIG. 6

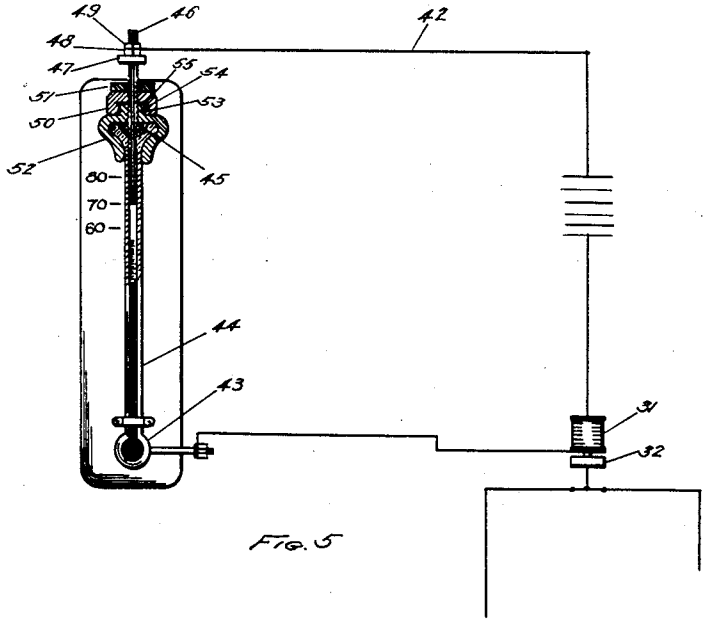


FIG. 5

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LEON HENRI BEAUDET, OF MONTREAL, QUEBEC, CANADA.

ELECTRIC WATER-HEATER.

1,355,644. Specification of Letters Patent. Patented Oct. 12, 1920.

Application filed May 20, 1919, Serial No. 298,550. Renewed August 7, 1920. Serial No. 402,001.

To all whom it may concern:

Be it known that I, LEON HENRI BEAUDET, a subject of the King of Great Britain, and residing at 1224 St. Denis street, in the city and district of Montreal, in the Province of Quebec, in the Dominion of Canada, have invented a new and useful Electric Water-Heater, of which the following is the specification.

The invention relates to electric water heaters as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially of the novel construction and arrangement of parts, whereby the water is heated in passage and the temperature of the water regulated in the circulating system connected to the heater.

The objects of the invention are to apply electricity as the prime heater for water circulating systems in houses, vehicles, buildings and other places; to economically heat the water and maintain at approximately an even temperature; to facilitate the installation and manipulation of heating plants; to establish a cleanly and sanitary heating system free from gases and the dangers of explosion; and generally to provide a cheap, safe and efficient means of heating flowing liquids.

In the drawings, Figure 1 is a longitudinal sectional view of the heater casing and thermostatic appliance.

Fig. 2 is a detail of the central carbon contact post.

Fig. 3 is a detail of the middle carbon contact cylinder.

Fig. 4 is a detail of the outer carbon contact cylinder.

Fig. 5 is a diagrammatic view showing another form of thermostatic attachment.

Fig. 6 is a general plan view of the device as applied to a hot water heating system.

Like numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, the casing is indicated by the numeral 1 and is formed with the inlet 2 and diametrically opposite the outlet 3.

The heads 4 and 5 are rigidly secured to the ends of the casing by the screws 6 and inside each head the slate disks 7 and 8 form the insulators supporting the electric elements. Each of said disks is formed with a central hole 9 or recess and the disk 7 also has the conductor screw holes 10 and 11, the hole 10 being closer to the central hole 9 than the hole 11. The electrical connector screws 12, 13 and 14 are screw-threaded into the head 4 and have the binding nuts 15, 16 and 17 mounted thereon, said screws projecting through the slate 7, one through the center hole 9, another within an inner ring near the center and the remaining screw within an outer ring beyond the inner ring.

The carbon contact post 18 is formed with reduced ends 19 and 20 fitting into the holes 9 in the slates 7 and 8 and the fluid passages or holes 21 at right angles to the axis thereof. The central screw 12 screws into the reduced end 19 of the post 18 and is quite sufficient to hold said post steady without any particular strain on the post or itself.

The carbon contact cylinder 22 having the numerous holes 23 forming water passages is within an imaginary inner ring and is held by the connector screw 13 and is at one or more places insulated by the insulation 24.

The carbon contact 25 having the numerous holes 26 forming water passages is within an imaginary outer circle beyond said inner circle and is held by the conductor screw 14 and at places insulated from the cylinder 22 by the insulation 27.

It will now be seen that a particular form of water receptacle is provided, in which carbon contacts of special shape and arrangement are established and with the flowing water form the conductors for the electric current in a circuit 28 ordinarily broken by the spaced carbon contacts and reëstablished by the water from contact to contact, which heats during its association with said contacts. The electric switch 29 is an arm coöperating with the contact 30 in maintaining the circuit 28 closed, but operable to break said circuit and thereby avoid too great a rise in the temperature of the heated apartment, room, shop, vehicle, or hall.

The switch arm 29 is operated by the electro-magnet 31, being connected to the weighted armature 32 of said magnet. The electro-magnet 31 is included in the local circuit 33, which also includes the metallic thermometer 34, as an automatic switch, for making and breaking said local circuit. One wire of the local circuit 33 is connected to the adjustable contact 35 placed in the row of graduations 36, which form the path of the point of the indicating hand 37 carrying the

electric contact 38 and forming an electric conductor or switch arm from the spindle 39. The spindle 39 forms the connector from the switch arm or indicating hand 37 to the other wire of the circuit 33.

The electric battery 40 is shown in the circuit 33, and the electric battery 41 is shown in the circuit 28, as a means of energizing the circuits, but it will be understood that these are shown merely to complete the elements making up the invention as in almost every installation the circuits will be energized from an electric generating plant public or otherwise.

In Fig. 5 the metallic thermometer is superseded by a mercury thermometer, in which the local circuit 42 has one wire connected to the mercury in the bulb 43 at the lower end of the tube 44, terminating at its upper end in the bowl 45 and the other wire to the connector rod 46, which is inserted into the tube 44 at the upper end and extends downwardly in said tube toward the rising mercury. The rod 46 is formed with the squared head 47 and a binding screw stem 48 and nut 49 above said head and intermediate of its length the said rod is threaded and carries on said threaded portion the nut 50 and lock nut 51. The bowl 45 is filled with mercury which effectually seals the tube 44 at the upper end and the cover 52 surrounds the rod 46 and is crimped around the edges of the bowl 45 and in the center extends upwardly around said rod in the threaded sleeve 53, on which the extension 54 of the nut 50 turns, said nut turning down onto the gasket 55.

The radiators 56 are shown as connected to the casing 1 and the water flows from the outlet 3 through said radiators and returns to said casing through the inlet 2.

In the operation of the invention, the system is supplied with feed water as customary in all heating systems and this water flows to and from the heat distributing radiators as usual and according to known practice.

In returning to the heater the water flows into the casing 1 through the inlet 2 and passes through the various holes in the carbon contacts and in fact fills up the small casing, so that electrical connection is established between the contacts 18 and 22 on the one hand and 25 on the other hand and this completes the circuit 28.

The heat generated in the casing 1 by the electric energy retained in the carbon contacts quickly heats the water and this water then passes into the radiators and after cooling somewhat is returned and again heated, until the temperature of the apartment or vehicle has reached the maximum permitted by this device, which is determined by the position of the adjustable contact of the thermometer. The adjustable contact is moved to a position on the graduations corresponding to the room temperature desired and in the metallic thermometer electric contact stops at the adjustable contact and this closes a local circuit including the electro-magnet and the latter through its armature lifts the switch arm of the main circuit and at once cuts off the current. The same operation occurs in the mercury thermometer, for the latter rises to the contact or conductor rod and closes the local circuit.

It will thus be seen that this heating device may be left in continuous operation at all times of day and night and in fact in all seasons, for so long as the room temperature is up to, say for example 70° Fahr., the electrical energy will be cut off by means of the local magnet circuit, of course other thermostatic devices may be applied to this invention and similar results obtained, in fact many changes may be made without departing from the spirit of the invention, and so long as such changes are within the scope of the claim for novelty following, the protection afforded shall not be invalidated.

What I claim is:—

The combination with heating and circulating water pipes, having an inlet and an outlet, of a plurality of carbon baffle members having passages therethrough and inclosed in a casing having outlet and inlet connected respectively to the aforesaid inlet and outlet and retarding the passage of water to said pipes, an electric circuit connected to a suitable source of power including said baffle members, and a thermostat governed by the room temperature and electrically controlling the delivery of current to said carbon baffle members and consequently regulating the temperature of the water in the heating pipes.

Signed at the city of Montreal, Quebec, Canada, this 14th day of May, 1919.

LEON HENRI BEAUDET.