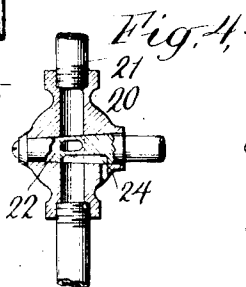
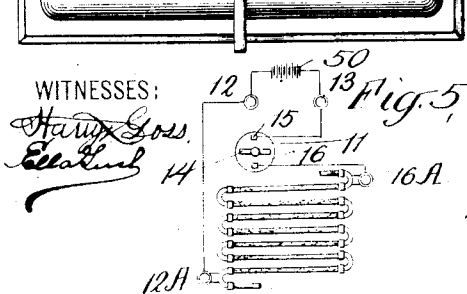
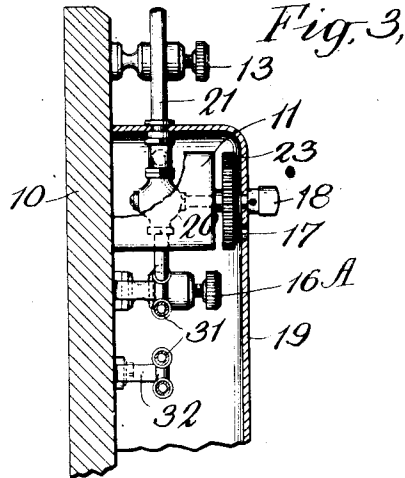
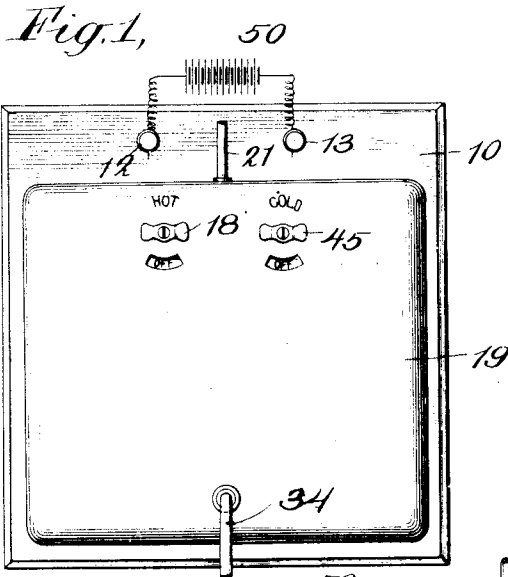
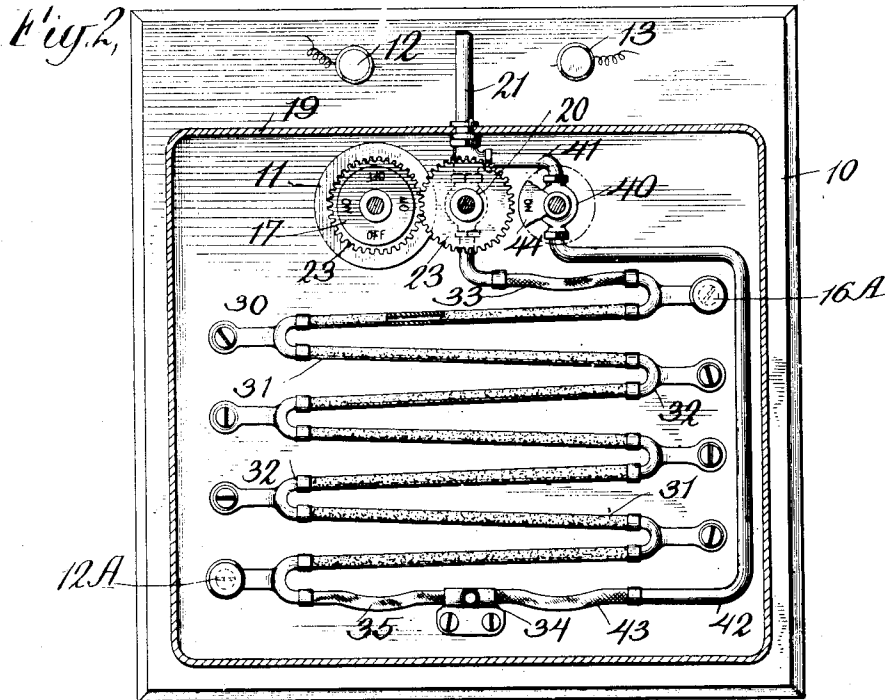


No. 870,577.

PATENTED NOV. 12, 1907.

E. NAUMER.
ELECTRICAL WATER HEATER.
APPLICATION FILED JULY 17, 1906.



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ELECTRICAL WATER-HEATER.

No. 870,577.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Application filed July 17, 1906. Serial No. 326,557.

To all whom it may concern:

Be it known that I, EMIL NAUMER, a citizen of the United States, and a resident of the borough of Brooklyn, in the city of New York, in the county of Kings and State of New York, United States of America, have invented certain new and useful Improvements in Electrical Water-Heaters, of which the following is a specification.

My invention relates to an arrangement for heating water by means of an electric current, and its object is to provide a simple and efficient apparatus for this purpose.

I will describe my invention in the following specification and point out the novel features thereof in claims.

Referring to the drawings, Figure 1 is a front elevation of my improved water heater. Fig. 2 is a sectional front elevation of the same device on a larger scale, the section being taken through its cover and the spindles of the electrical switch and the valves. Fig. 3 is an enlarged sectional side elevation of some of the parts shown in Fig. 2 showing them somewhat more in detail. Fig. 4 is an enlarged sectional side elevation of a special valve or cock which I use in carrying out my invention. Fig. 5 is a diagram of the electrical circuits.

Like characters of reference designate corresponding parts in all of the figures.

10 designates a base of slate or other suitable material.

11 is an electrical switch mounted upon this base 10 and connected to two binding posts 12 and 13 by wires or other suitable conductors. The switch 11 may be of any desired form or design, but I prefer to use a standard double-pole snap-switch.

In Fig. 5 I have arbitrarily shown a single-pole switch for the purpose of simplifying the diagram. It is there represented as comprising a pivoted blade 14 which may be moved onto or away from stationary contacts 15 and 16 and to thereby close or open an electrical circuit through certain parts of the apparatus.

On the spindle of switch 11 a dial 17, with the words "on" and "off" upon it, may be placed for the purpose of indicating whether the switch is in its open or closed position. 18 is a knob or handle securely attached to the spindle of switch 11, by means of which the switch may be manually operated.

20 designates a valve or cock which is placed in the supply-pipe 21. The spindle 22 of this valve is mechanically connected to the switch 11. In the present instance I have shown it connected to the switch 11 by means of gears 23, 23, which are so arranged that the valve 20 is turned to close the supply-pipe 21 whenever the switch 11 is turned to its "off" position, and to open and thereby turn on a supply of water through the supply-pipe 21 whenever the switch 11 is closed. A vent 24 may be provided in this valve which vent is arranged

to be open when the valve is closed, the purpose of which will appear hereinafter.

30 designates my improved heating coils or pipes which are preferably constructed of hollow carbon rods 31, 31, the ends of which may be connected together by metallic fittings 32, 32. These fittings 32, 32 also serve as brackets for supporting the heating pipes upon the base 10. One end of the continuous pipe-coil thus formed is connected to the supply pipe 21 below the valve 20 by a piece of tubing 33 of insulating material such as rubber. 34 is a water outlet-pipe and is connected to the other end of the pipe-coil by another piece of rubber tubing 35.

40 designates a by-pass valve which may be of a construction similar to that of the valve 20, but without the vent. The by-pass valve 40 is connected to the supply-pipe 21 by the pipe 41 and to the water outlet-pipe 34 by a pipe 42 and an insulating tubing 43. A knob or handle 45 is attached to the spindle of this valve 40, and a dial 44 may also be attached to its spindle to indicate whether it is in its open or closed position. I prefer to inclose this apparatus by a cover 19 which may be provided with holes or openings for the water-supply and outlet-pipes and for the knobs or handles and indicating dials on the electrical switch 11 and on the by-pass valve 40. The word "hot" may be inscribed on this cover over the knob or handle 18 of the electrical switch, and the word "cold" may be inscribed upon the cover over the knob or handle 45 of the by-pass valve 40.

The supply-pipe 21 may be connected to any suitable source of hydraulic supply, and the binding posts 12 and 13 may be connected to any suitable source of electrical supply, for example, a battery 50. It has been shown that these binding posts 12 and 13 are connected to the switch 11. This switch is also connected to the opposite ends of the continuous heater pipe-coil 30. At 16^A, as shown diagrammatically in Fig. 5, one end of this pipe-coil is connected to the contact 16, and at 12^A the other end of this heater pipe-coil is connected to the binding-post 12. It may be seen, therefore, that when the switch 11 is closed an electrical circuit will be completed through the heater pipe-coil 30. At the same time, through the mechanical connections above described, the heater pipe-coil 30 will be connected to the hydraulic supply and outlet-pipes so that this coil forms, at the same time, a conductor for the flow of current from the hydraulic supply, and for the flow of current from the electrical supply.

When this apparatus is not in use the switch 11 may be open and the by-pass valve 40 may be closed, in which case their indicating dials will both show through the cover the word "off".

It may be seen that the by-pass valve 40 connects the supply-pipe 21 directly with the outlet-pipe 34,

so that by turning the knob or handle 45 cold water may be obtained through the outlet-pipe 34. If this by-pass valve 40, however, is left in its closed position and the knob or handle 18 is turned to close the switch 11 and at the same time open the valve 20, an electrical circuit will be closed through the heater pipe-coil 30, and at the same time a current of water will be allowed to flow through the inside of this heater pipe-coil. This continuous pipe-coil, built up as described of 10 hollow carbon rods, forms a rheostat through which the electrical current flows, and forms means for converting the electrical energy into heat. This heat is immediately absorbed by the water which passes through these heater pipe-coils so that it emerges from the outlet-pipe 34 in a thoroughly heated condition. 15 This action is almost simultaneous, so that it is possible to obtain heated water immediately by turning the knob or handle 18.

If it is desired to regulate the temperature of the 20 water which flows through the outlet-pipe 34 it may be done by opening the by-pass valve 40 to a greater or less extent.

When both the by-pass valve 40 and the supply-pipe valve 20 are closed, no water will pass through the outlet-pipe 34. The vent 24, however, is provided 25 in the valve 20 for the purpose of allowing the heater pipe-coil 30 to be drained while the apparatus is at rest, and to assist in this function the heater pipes 31, 31 are all of them set on an incline.

The heater pipes 31, 31 may be so constructed that they will have a high electrical resistance, and may also be arranged to carry an electrical current of considerable strength. The fact that the water is turned 30 on so that it flows through these pipes at the same time that the electrical current flows through them prevents these coils and their connections from becoming heated to a dangerous temperature. 35

The arrangement above described for allowing the pipes to be drained off when the apparatus is not in use is for the purpose of heating the water more quickly 40 when it is first turned on. It has been found that without this arrangement the first water to come out from the outlet-pipe 34, when it is turned on, will not be heated to the desired temperature.

I have described my heater pipes as made of hollow 45

carbon rods, but it is, of course, not necessary that they shall be constructed of this material, as any other suitable material, which is a high resistance conductor of electricity, may be used for this same purpose.

The base 10 is preferably made of insulating material. The connections to the heater pipe-coil are made 50 by means of tubing of insulating material so that the water-heater connections, with the exception of the heater pipe-coil, are insulated from the electrical conductors. 55

Obviously, my invention may be used for heating other fluids than water, but I have described it as a water heater as that is one of its most advantageous uses.

What I claim is.— 60

1. A heater pipe-coil comprising hollow carbon rods, combined with an electric switch, a valve mechanically connected to said switch, and an independent by-pass valve. 65

2. A plurality of hollow carbon rods and metallic connections between the rods, said rods and connections being arranged to form a continuous conductor for both electric and hydraulic currents. 70

3. A plurality of hollow carbon rods and metallic connections between the rods, said rods and connections being arranged to form a continuous conductor for both electric and hydraulic currents, combined with a switch and a valve mechanically connected together. 75

4. A base, a plurality of hollow carbon rods mounted obliquely upon said base, metallic brackets connecting the rods together and to the base, said rods and brackets being arranged to form a continuous conductor for both electric and hydraulic currents, a hydraulic supply-pipe, a valve between said pipe and said rods, and a vent in said valve. 80

5. A base, a plurality of hollow carbon rods mounted obliquely upon said base, metallic brackets connecting the rods together and to the base, said rods and brackets being arranged to form a continuous conductor for both electric and hydraulic currents, a hydraulic supply-pipe, an outlet-pipe, insulating tubing connecting said pipes with the hollow carbon rods; a source of electrical supply, a switch therefor, a valve in the hydraulic supply-pipe, a vent in said valve, said switch and said valve being mechanically connected together, and an independent by-pass valve connecting the supply-pipe and the outlet-pipe. 85 90

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL NAUMER.

Witnesses:

ELLA TUCH,

B. F. JOHNSTON.