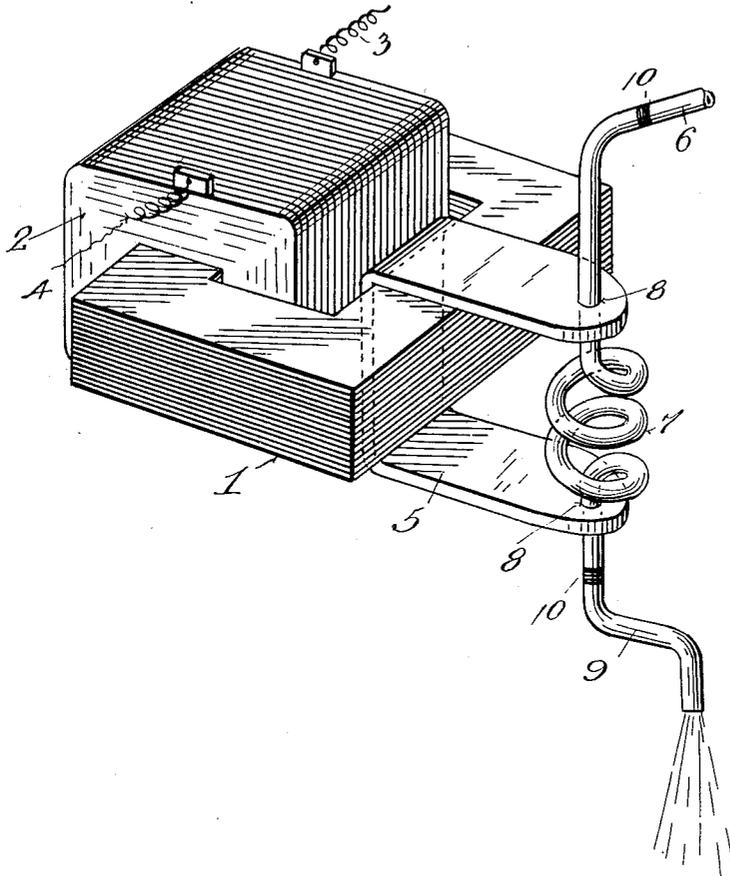


J. LEDWINKA.
ELECTRIC WATER HEATER.
APPLICATION FILED APR. 17, 1919.

1,402,873.

Patented Jan. 10, 1922.



Inventor
Joseph Ledwinka
By Henry Samuel Ellaby

UNITED STATES PATENT OFFICE.

JOSEPH LEDWINKA, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO EDWARD G. BUDD MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

ELECTRIC WATER HEATER.

1,402,873.

Specification of Letters Patent.

Patented Jan. 10, 1922.

Application filed April 17, 1919. Serial No. 290,782.

To all whom it may concern:

Be it known that I, JOSEPH LEDWINKA, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia, State of Pennsylvania, have made a certain new and useful Invention in Electric Water Heater, of which the following is a specification.

This invention relates to electric water heaters.

The object of the invention is to provide an electric heater of exceedingly simple and inexpensive structure adapted for use in heating water and other liquids.

The invention consists substantially in the construction, combination, location and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawing, and finally pointed out in the appended claims.

The single view of the drawing shows a structure of electric water heater embodying the principles of my invention.

In carrying out my invention I propose to employ an electric transformer and to include in the secondary circuit or coil of the transformer as a portion thereof a tube or pipe of conducting material and through which the water or other liquid to be heated flows.

Referring to the drawing, 1 designates the core of a transformer. This core may be constructed in any suitable manner, but I have found an excellently efficient arrangement to be to build up the core 1 of superposed metallic sheets or stampings of generally rectangular shape and having an opening punched or formed through the center thereof. 2 is the primary coil of the transformer through the turns of which alternating or interrupted current is passed, 3 and 4 designating the circuit terminals thereof. 5 designates the secondary circuit or coil of the transformer. This transformer secondary is shown in the form of a conductor bar or member which is looped around one of the legs of the core 1, the primary coil 2 being looped around the opposing leg of the core. A water supply pipe 6 has a portion 7 thereof formed of conducting material, and disposed between the two free ends of the secondary conductor member 5, being preferably soldered or otherwise

secured to said secondary ends as at 8; and 9, is the delivery portion of the pipe. If desired, an insulation 10 may be inserted in the pipe connections 6 and 9, although ordinarily this is not essential.

From the foregoing description it will be seen that the conductor section 7 of the water pipe by reason of its connection to the ends of the member 5 which is looped around a leg of the transformer core forms a part of a closed circuit which constitutes a single turn secondary coil of the transformer. The result is that a current of large amperage and low voltage is induced in the secondary coil or circuit of the transformer which includes in series in said circuit the pipe section 7, and consequently said pipe section 7 quickly becomes heated to a degree depending of course upon the control of current delivered through the windings of the transformer primary coil 2. The heat thus generated in the pipe section 7 is transmitted to water or other liquid flowing through said pipe section, and hence the device becomes a heater for the water, raising the temperature thereof quickly and economically to any desired degree. If desired, the section 7 of the pipe may be formed into coils in order to increase the heating action thereof.

From the foregoing description it will be seen that I provide an exceedingly simple and inexpensive water heater which can be easily regulated and controlled and which will rapidly and economically heat water to any desired degree of temperature. The water supply connection 6 may be quickly applied to or removed from the ordinary faucet or other pipe connection in a building and the delivery pipe 9 is disposed for delivery into any receptacle, basin, bath tub, or the like, for ordinary household use, and by suitably proportioning the coils 2 and the conductor members 5 and pipe section 7 the device is capable of being coupled into the ordinary alternating light circuit for a building by a plug similar to the application of an ordinary electric light bulb or lamp or other electrical connection. The parts are few, the device is cheap to construct, and is inexpensive in current consumption.

Having now set forth the objects and nature of my invention, and a structure em-

bodying the principles thereof, what I claim as new and useful, and of my own invention, and desire to secure by Letters Patent is,—

1. In an electric heater for liquids, a transformer including a core, a primary coil surrounding a portion of said core, a member looped around another portion of the core, and a pipe through which the liquid to be heated is adapted to flow, said pipe having an insulated portion thereof formed of conducting material, said portion being connected adjacent its ends to the respective free ends of said looped member to form therewith the closed secondary of the transformer.

2. In an electric heater for liquids, a transformer including a laminated element having a central opening therethrough, and constituting the transformer core, a coil surrounding one leg of the laminated member and constituting the primary of the transformer, a conductor looped around another leg of said core, a pipe having an electrically insulated portion through which the liquid to be heated is adapted to flow, said insulated portion being of conducting material and connected adjacent its end to the respective free ends of said looped conductor, and constituting therewith the closed secondary of the transformer.

3. In an electric heater for liquids, a mem-

ber composed of laminations having a central opening therethrough, a coil having its windings threaded through said opening and around one leg of said laminated member, a conductor bar also threaded through said opening and having its free ends encompassing another leg of said laminated member, and a pipe having an electrically insulated portion of conducting material connecting the free ends of said conductor bar and forming therewith the closed secondary for the transformer of which said laminated member is the core.

4. In an electric heater for liquids, a transformer including a core, a primary winding coiled upon a portion of said core, a conductor bar arranged to form a single turn secondary to the transformer, and a pipe through which the liquid to be heated is adapted to flow, the free ends of the conductor bar which forms the single turn secondary for the transformer being connected to said pipe to include a portion of said pipe between them, and form therewith a closed single turn secondary circuit for the transformer.

In testimony whereof I have hereunto set my hand on this 14th day of April A. D., 1919.

JOSEPH LEDWINKA.