July 31, 1923. 1,463,617

F. E. G. EISSELT

ELECTRIC LIQUID HEATER

Filed July 7, 1921

Fig.1

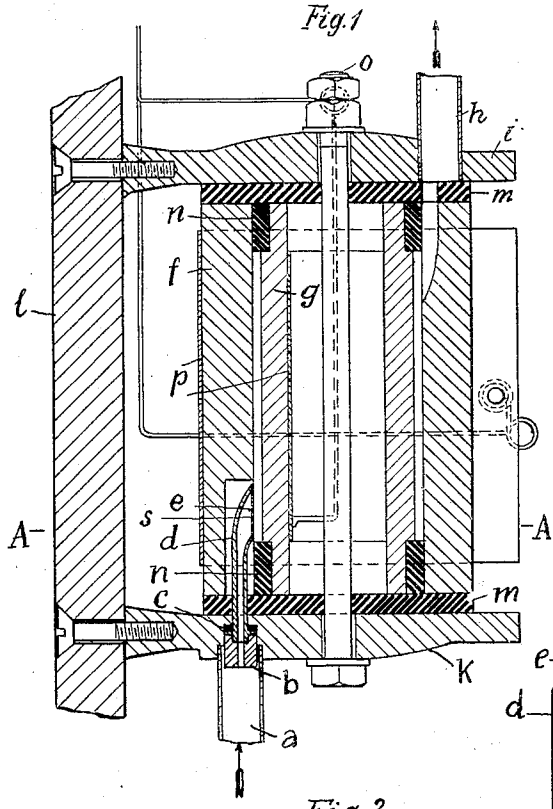


Fig.3

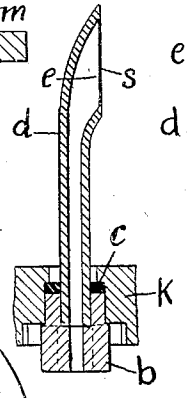


Fig.4

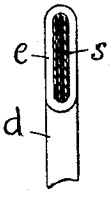
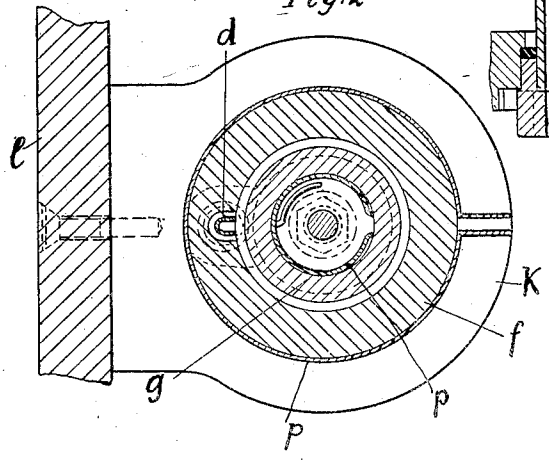


Fig.2



Witnesses

Inventor

F.E. Georg Eisselt

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Attorney

Patented July 31, 1923.

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UNITED STATES PATENT OFFICE.

FERDINAND E. GEORG EISSELT, OF CHEMNITZ, GERMANY, ASSIGNOR TO EDMUND RICHTER, OF CHEMNITZ, GERMANY.

ELECTRIC LIQUID HEATER.

Application filed July 7, 1921. Serial No. 483,113.

To all whom it may concern:

Be it known that I, FERDINAND EMIL GEORG EISSELT, a citizen of the Republic of Saxony, Germany, residing at Chemnitz, in the Republic of Saxony, Germany, have invented certain new and useful Improvements in Electric Liquid Heaters, of which the following is a specification.

This invention relates to electric devices for heating water or other liquids, which are utilized to furnish the necessary resistance to produce the heat in a liquid chamber arranged between electrodes. The objects of my improvements are, first, to provide a proper flow of the liquid through the said chamber; second, to prevent a revolving movement of the liquid in the said chamber; third, to reduce the mixing of the fresh cold liquid with the already heated liquid and fourth to arrange the liquid supply-pipe without perforating the electrode surrounding the liquid receiving chamber.

I attain these objects by the construction illustrated in the accompanying drawing, in which—

Figure 1 is a longitudinal section of the device; Fig. 2, a cross section on the line A—A of Fig. 1; Fig. 3, a longitudinal section of a detail on an enlarged scale; and Fig. 4, a view of a detail.

The liquid, for example water, is introduced into the heater through a pipe *a* which is connected to a nozzle *d* secured to the bottom *k* of the device by means of a screw *b* while it is provided with a rubber packing disc *c*. The nozzle *d* is curved and connected with an annular liquid chamber arranged between two hollow cylindrical electrodes *f* and *g* which are inserted one inside the other, the nozzle *d* extending from the bottom *k* upwardly into an oblong depression at the inside of the electrode *f* and being directed obliquely in an upward direction against the inner electrode *g*. The outlet aperture *e* of the nozzle *d* is laterally arranged and prolonged in the form of a slot arranged longitudinally of the liquid chamber. A discharge pipe *h* is connected to an opening arranged diagonally opposite the aperture *e* of the annular chamber.

The electrodes *f* and *g* are combined with plates *p* for the electrical connections and insulated from one another by means of rings *n* at their upper and lower ends respectively, and are made liquid tight by means of washers *m* which form supports of and also insulate the cover *i* and bottom *k* from the electrodes *f* and *g*, the said cover *i* and bottom *k* being pressed on the electrodes by means of a screw bolt *o*. In the opening *e* there is a gauze *s* provided, by means of which impurities are prevented from entering the heater. The fluid heater is preferably screwed to a marble slab *l*.

The action of the apparatus is as follows.

The water introduced through the pipe *a* to the nozzle *d* is conducted by the nozzle *d* in an oblique upward direction against the inner electrode *g*. The jet of the water breaks against the wall of the electrode *g* and forms a broad two armed cross current, of which one arm flows to the left and the other to the right half of the electrode *g*, while at the same time, in consequence of the oblique direction of flow, an upwardly directed liquid pressure is set up which prevents a backward movement of the already heated water in the upper part of the annular chamber. The fresh water does not mix with the already heated water, but forces the latter uniformly towards the outlet aperture of the annular chamber which is connected with the discharge pipe *h*, it being itself heated by the electric current. The water is heated up to boiling, and may, in suitable quantities be drawn off from the apparatus continuously in a boiling condition.

I am aware that prior to my invention electric heaters have been made with two electrodes leaving a suitable space for the passage of water within the outer electrode. I therefore do not claim such a communication broadly; but I claim:—

1. The combination, in an electric liquid heater, of a central electrode within a liquid receiving chamber surrounded by means of a cylindrical outer electrode, having at its inside an oblong depression extending upwardly from the bottom end of the said outer electrode, with a nozzle extending through the bottom of the said liquid receiving chamber into the said depression and adapted to lead the liquid from the bottom upwardly to the said liquid receiving chamber, all substantially as set forth.

2. The combination, in an electric liquid heater, of a central electrode within a liq-

uid receiving chamber surrounded by means of a cylindrical outer electrode, having at its inside an oblong depression extending upwardly from the bottom end of the said outer electrode, with a nozzle extending through the bottom upwardly into the said depression, said nozzle communicating with the said liquid receiving chamber by means of a lateral liquid discharge opening and adapted to lead the liquid from the bottom upwardly and against the central electrode, all substantially as set forth.

3. The combination, in an electric heater, of a central electrode within a liquid receiving chamber surrounded by means of a cylindrical electrode, having at its inside an oblong depression extending upwardly from the bottom end of the said outer electrode, with a curved liquid inlet-socket extending through the bottom of the said liquid chamber into the said depression and having a lateral slot-shaped discharge aperture adapted to lead the liquid upwardly and against the said central electrode, all substantially as set forth.

4. The combination, in an electric heater, of a central electrode within a liquid receiving chamber surrounded by means of a cylindrical electrode, having at its inside an oblong depression extending upwardly from the bottom end of the said outer electrode, with a curved liquid inlet-socket extending through the bottom of the said liquid chamber into the said depression and having a lateral slot-shaped discharge aperture adapted to lead the liquid upwardly and against the said central electrode, and a gauze arranged in the said aperture, all substantially as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

F. E. GEORG EISSELT.

Witnesses:
PAUL RAEDISCH,
JOHANNES GEORG ESCHE.