Oct. 30, 1923.

1,472,197

E. E. SUTHERLAND

ELECTRIC WATER HEATER

Filed Oct. 25, 1921

Fig. 1.

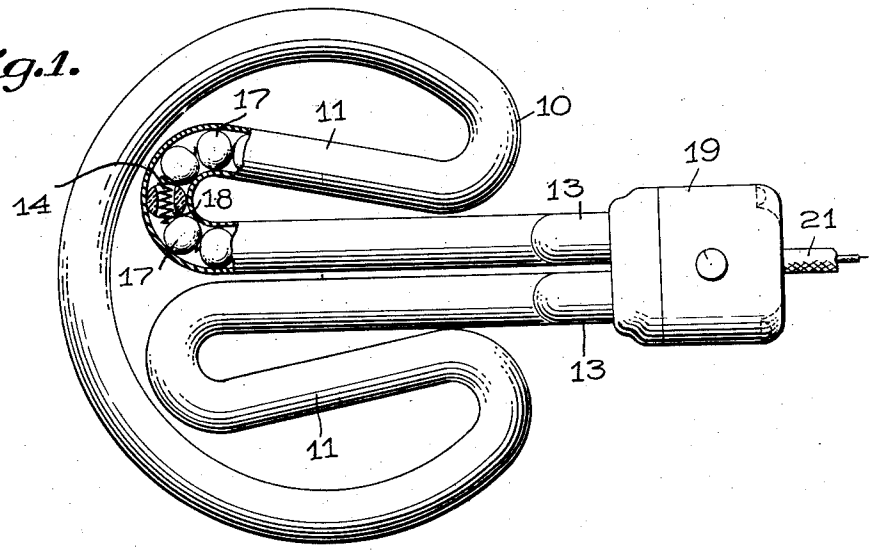
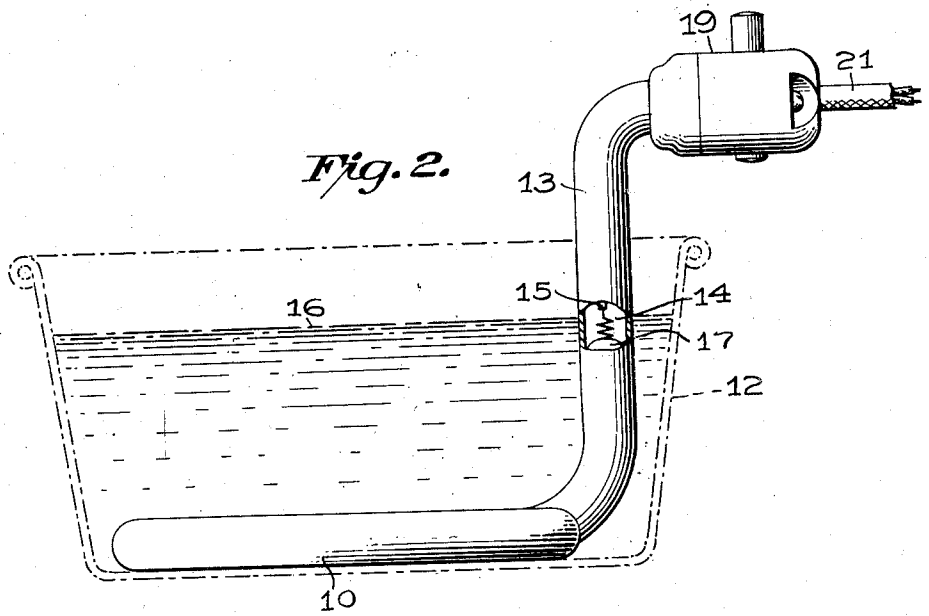


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ERNEST E. SUTHERLAND, OF MANSFIELD, OHIO, ASSIGNOR TO WESTINGHOUSE PRODUCTS COMPANY, A CORPORATION OF MICHIGAN.

ELECTRIC WATER HEATER.

Application filed October 25, 1921. Serial No. 510,319.

To all whom it may concern:

Be it known that I, ERNEST E. SUTHERLAND, a citizen of the United States, and a resident of Mansfield, in the county of Richland and State of Ohio, have invented a new and useful Improvement in Electric Water Heaters, of which the following is a specification.

My invention relates to electrically heated apparatus and particularly to electric fluid heaters and it has for its object to provide a relatively simple, light and easily handled immersion heater of relatively large size.

In practising my invention, I provide a preformed metallic tube in which is placed a flexible helical resistor on which are strung a plurality of perforated refractory members to maintain the resistor coaxially within the tube and to conduct heat from the resistor to the walls of the tube. I provide also a combined terminal block and switch casing mounted on the ends of the tube.

In the single sheet of drawings,

Figure 1 is a top plan view of an electric heater embodying my invention, a portion of the tube being broken away, and

Fig. 2 is a view, in side elevation, of the device illustrated in Fig. 1, a portion of the tube being broken away and a liquid-containing receptacle being shown by broken and dotted lines.

A metallic tube 10 comprises any desired number of return-bent portions 11 located in substantially the same plane to provide a sufficient length of tubing to substantially cover the bottom surface of a fluid-containing receptacle 12 with which it is to be operatively associated. While I have illustrated the tube 10 as covering an area substantially circular in contour, this is not an essential feature, as any desired contour may be effected to conform to the general outline of the base of the receptacle 12. The two end portions 13 extend upwardly from the plane of the return-bent portions and may then extend for a short distance in a plane substantially parallel thereto. While the extensions 13 are illustrated as at substantially right angles to the plane of the portions 11, they may extend at any other desired angle thereto.

A resistor member 14 comprises a helically wound resistor wire of substantially less diameter than the internal diameter of the tube 10 and provided with relatively heavy end portions 15 to prevent overheating of such parts of the extensions 13 as may not be immersed in a fluid 16 in the receptacle 12. A plurality of perforated refractory members 17 are loosely strung on the helical resistor 14 and on the end portions 15. The holes 18 in the members 17 have flaring ends to permit the resistor 14 to adapt itself to relatively sharp return bends, such as are illustrated in Fig. 1. The refractory beads or members operate to maintain the resistor member 14 and the end portions 15 substantially coaxial with the tube 10 and also to insulate the resistor from the walls of the tube, as well as to conduct heat thereto.

A combined terminal block and switch casing 19 is suitably secured to the ends of the tube 10 and is adapted to receive one end of a supply-circuit cord 21 to permit of energizing the resistor 14.

The device embodying my invention provides an electrical immersion fluid heater which may be adapted to the contour of the fluid container with which it is to be associated and further provides a relatively simple means for maintaining a flexible resistor member within an uninsulated metal tube, which construction permits of easily removing a damaged resistor. The assembled heating unit may be handled by the operator grasping the combined terminal-block-and-switch casing to insert the unit in, or remove it from a fluid container.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof and I desire that only such limitations shall be placed thereon as are imposed by the prior art or are specifically set forth in the appended claim.

I claim as my invention:—

In an electric immersion heater, in combination, a metallic tube comprising a plurality of return-bent portions located in one plane, whereby said heater may be supported in a fluid receptacle, and having end portions extending away from said return-bent

portions, a flexible resistor in said tube, a plurality of perforated refractory members loosely mounted on said resistor for maintaining it substantially coaxial in said tube and for conducting heat to said tube and a combined terminal block and control switch casing secured to the ends of said tube whereby said heater may be handled to insert it in and remove it from, a fluid-containing receptacle.

In testimony whereof, I have hereunto subscribed my name this eleventh day of October 1921.

ERNEST E. SUTHERLAND.