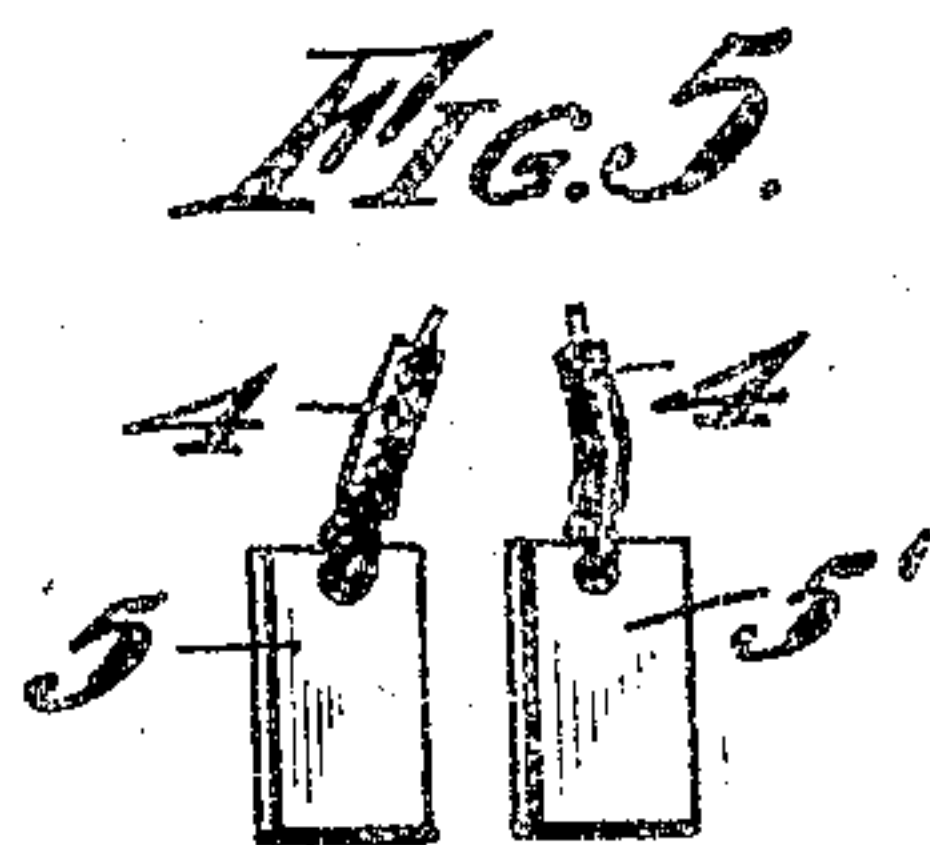
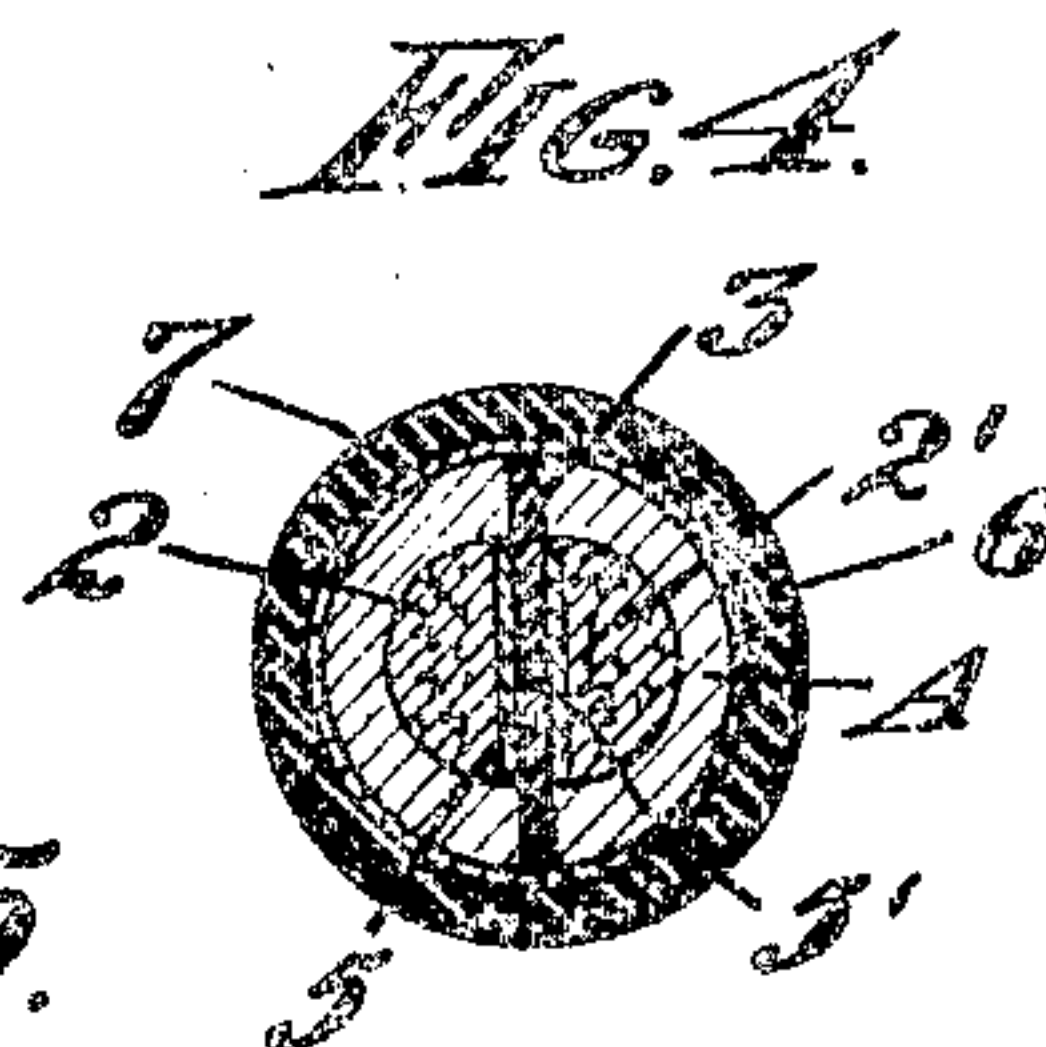
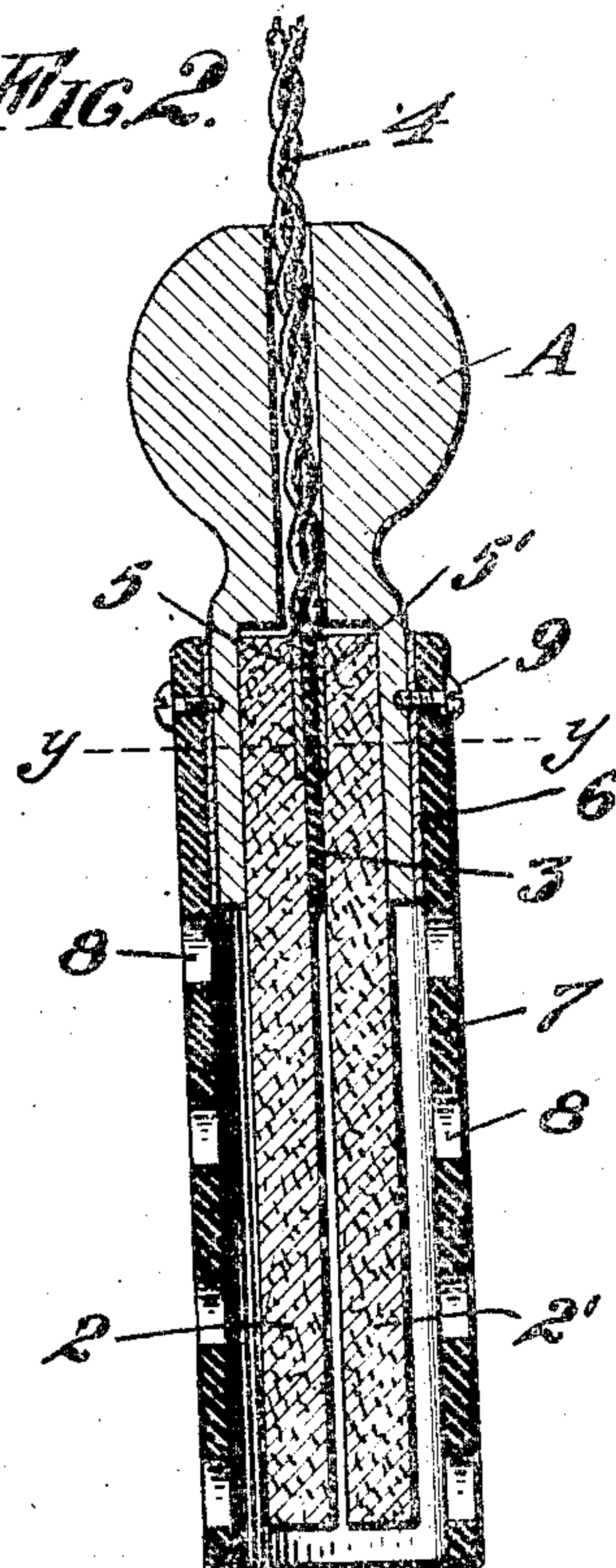
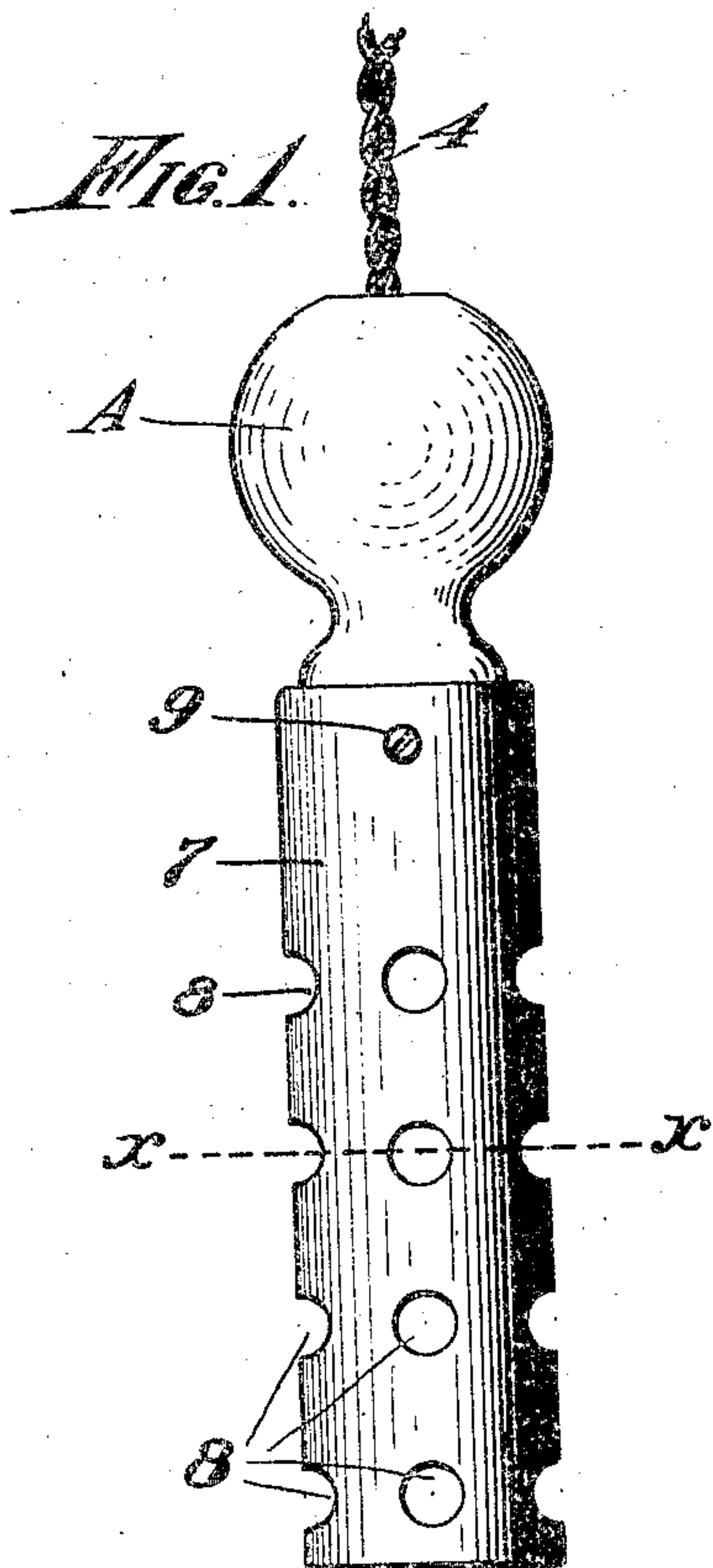


T. E. FOGALSANG.  
ELECTRIC HEATER.  
APPLICATION FILED JUNE 27, 1910.

Patented June 20, 1911.

995,591.



Witnesses;  
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# UNITED STATES PATENT OFFICE.

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## ELECTRIC HEATER.

995,591.

Specification of Letters Patent. Patented June 20, 1911.

Application filed June 27, 1910. Serial No. 569,000.

*To all whom it may concern:*

Be it known that I, THOMAS E. FOGALSANG, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Electric Heaters, of which the following is a specification.

This invention relates to an electric heater and particularly pertains to a device for heating water and other liquids by means of electricity.

It is the object of this invention to provide a simple, cheap, practical, sanitary immersion electric heater by means of which water or other liquids may be heated by being circulated between, and in direct contact with, non-metallic, non-corrosive electrodes, such as carbon.

A further object is to mount and arrange these electrodes so there will be no metal to come in contact with the fluid to be heated.

The use of metallic electrodes, where allowed to come in direct contact with the water to be heated, is objectionable, as the metal corrodes and also decomposes under the action of the electric current, causing electrolytic or chemical action to take place with the result that the liquid becomes polluted. These objectionable features are eliminated in this device by the use of carbon electrodes which, by reason of their being of a non-metallic nature, have no injurious effect, but on the contrary will tend to improve the qualities of the water being heated, thus rendering this a sanitary device.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is an elevational view of the invention. Fig. 2 is a vertical section. Fig. 3 is a cross-section on the line X X, Fig. 1. Fig. 4 is a cross-section on the line Y Y, Fig. 1. Fig. 5 is a detail of the wire terminals.

In the drawings A represents the handle of the device which is preferably made of hard wood or porcelain, or any other insulating or non-conducting material. The lower end of the handle A is tubular in form, so as to provide a chamber in which the upper ends of a pair of carbon electrodes 2—2' are inserted. These carbon electrodes

2—2' are preferably semi-circular in cross-section and are inserted in the handle A with their flat sides facing each other, and are slightly separated by means of a dielectric or insulating separator 3 which is interposed between the electrodes 2—2' in the handle A. The separator or spacer 3 is preferably formed of a flat slab of mica which is inserted in a kerf in the lower end of the handle A in such manner as to extend between the carbons 2—2'. The thickness of the insulating spacer 3 prescribes the distance that the carbons are kept apart, this distance being regulated according to the voltage of the circuit.

Suitable electric connections for the carbons 2—2' are provided by means of the ordinary two-part conductor cord 4 which passes through the handle A from any desired source of electric supply and terminates in contact plates 5—5'. These plates 5—5' are interposed between the carbons 2—2' and the separator 3 respectively, as shown in Fig. 2, the separator 3 acting as insulation between the plates 5—5'. The carbon electrodes 2—2', insulating separator 3 and contact plates 5—5' are securely retained in the tubular portion of the handle A by means of a ferrule 6 which is driven tightly over the end of the handle A so as to clamp the parts securely together.

Over the outside of the handle A and extending down over the carbon electrodes 2—2' is a porcelain or terra cotta tube 7 which covers and protects the carbons from outside interference, and also insulates the carbons from outside contact. This tube or shell 7 is perforated in a number of places, as at 8, so as to admit of a free circulation of liquid around and between the electrodes 2—2', and is secured to the handle A by means of screws 9.

In operation, the device is suitably suspended in a body of liquid, and a current of electricity is directed to either of the carbons 2—2' through one of the service wires 4. The current on passing through one of the carbon electrodes 2—2' flows across the gap between the carbons and through the water therebetween to the opposite carbon, thus raising the temperature of the water in the well-known manner. Such decomposition of the carbons 2—2' as may take



place will in no way prove injurious to the liquid being heated, as carbon has no deleterious effects on most liquids.

This construction of exposed non-metallic, electrical heating units may be employed in a variety of ways and for a variety of uses, as, not only as an ordinary water heater, but for heating flatirons, etc., where these exposed electrodes are surrounded by a body of liquid from which the heat is transmitted to the iron.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. An immersion electric heater comprising a handle having a tubular end forming a chamber, a pair of exposed, carbon electrodes each having one end fixed to the chamber of the handle, means for holding the electrodes apart to provide an intermedi-

ate water heating space, and a perforated inclosure for the electrodes, said inclosure being fixed to the tubular end of the handle.

2. An immersion electric heater comprising a handle having a tubular end forming a chamber, a pair of exposed carbon electrodes, each having one end fixed to the chamber of the handle; means for holding the electrodes apart to provide an intermediate water heating space, and a non-metallic shell having one end fixed to the handle, said shell inclosing the pair of electrodes and having openings to admit water thereto.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOMAS E. FOGALSANG.

Witnesses:

CHARLES EDELMAN,  
T. O'DONOGHUE.