T. LIDBERG.

ELECTROTHERMIC FURNACE FOR THERAPEUTIC PURPOSES.

APPLICATION FILED MAR. 4, 1918.

1,295,045.

Patented Feb. 18, 1919.

3 SHEETS—SHEET 1.

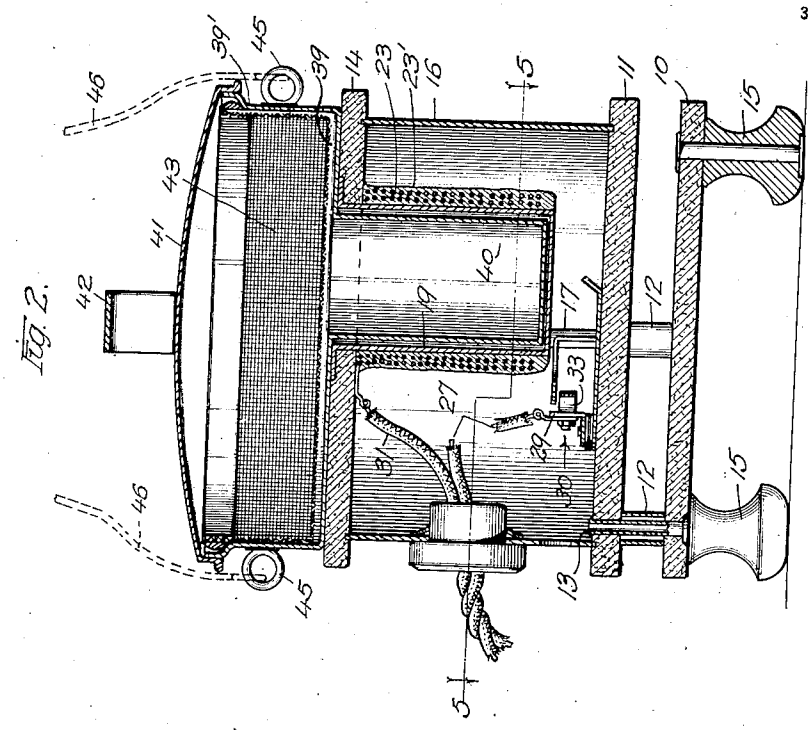


Fig. 2.

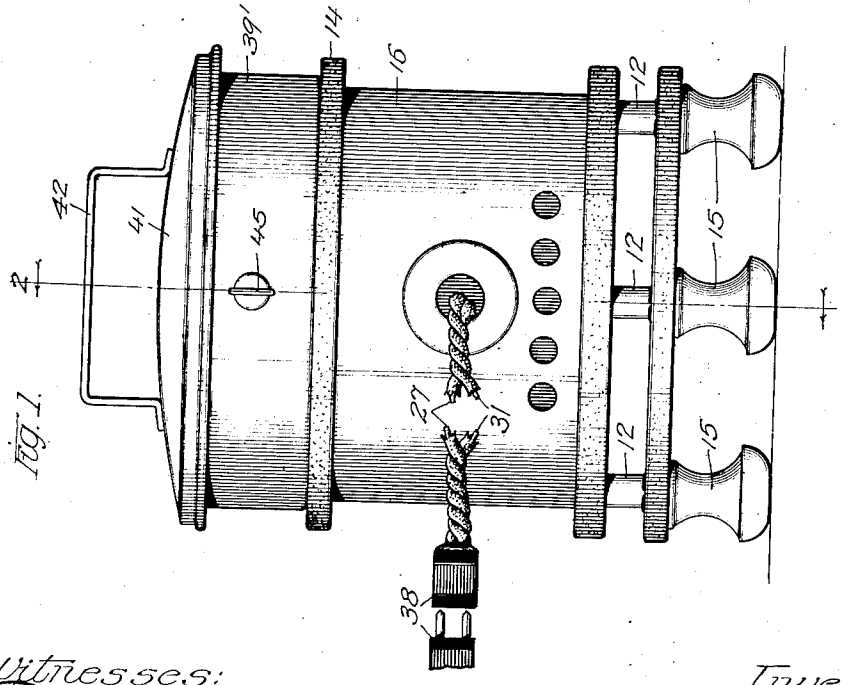


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 4.

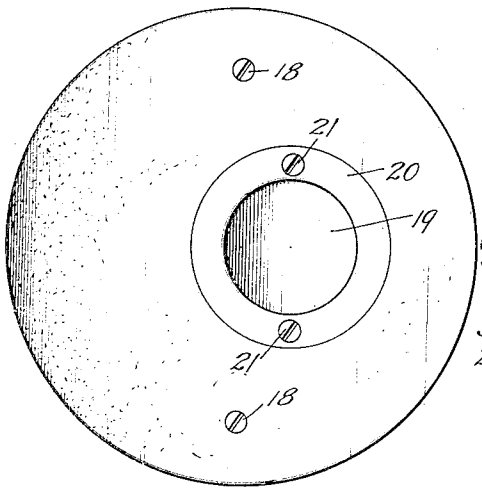


Fig. 5.

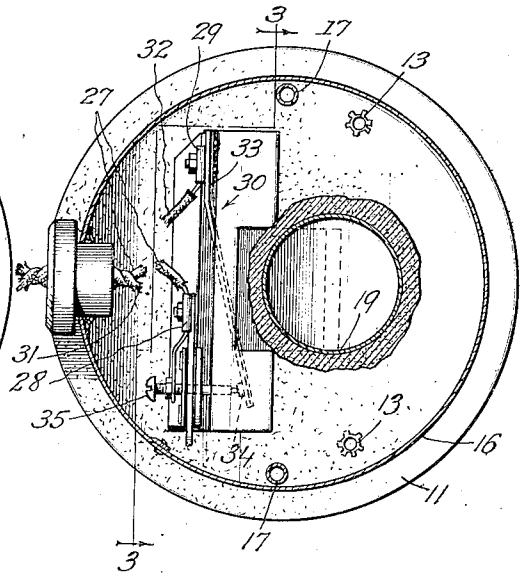
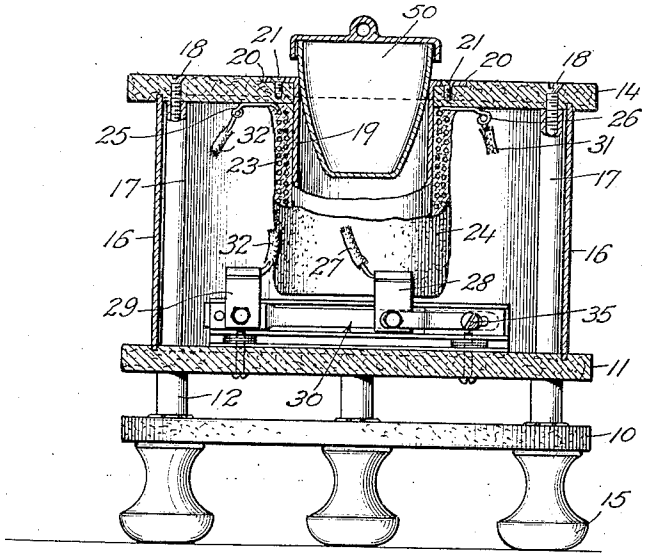


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 6.

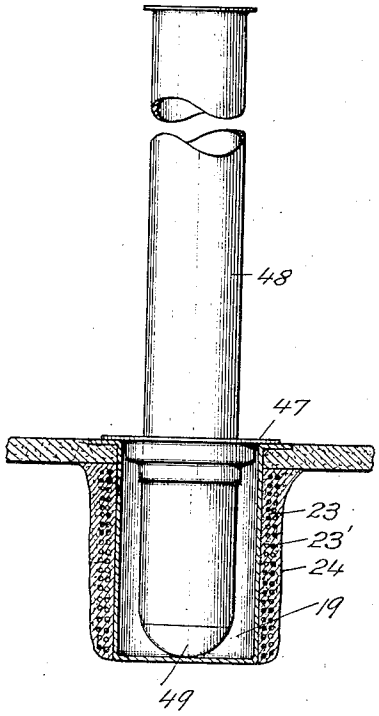


Fig. 7.

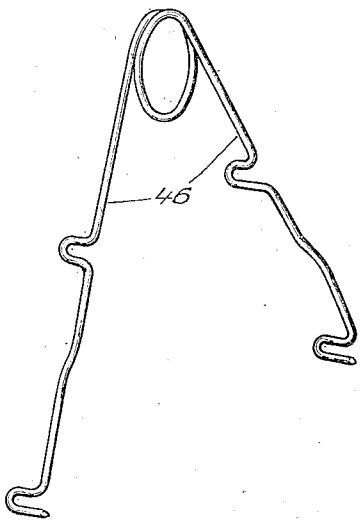
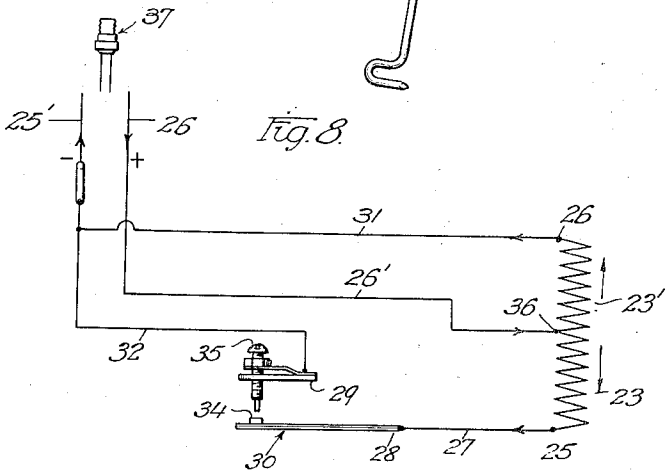


Fig. 8.



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UNITED STATES PATENT OFFICE.

TIODOLF LIDBERG, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO SURGICAL & ELECTRICAL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ELECTROTHERMIC FURNACE FOR THERAPEUTIC PURPOSES.

1,295,045. Specification of Letters Patent. Patented Feb. 18, 1919.

Application filed March 4, 1918. Serial No. 220,385.

To all whom it may concern:

Be it known that I, TIODOLF LIDBERG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrothermic Furnaces for Therapeutic Purposes, of which the following is a specification.

This invention relates to electro-thermic furnaces for therapeutic purposes.

One of the objects of my invention is to provide a relatively small compact and self-contained heating device, or furnace, especially adapted for portable use in the service of physicians, surgeons, and the like, whereby small quantities of liquid may be heated or evaporated, or in which instruments may be cleansed and sterilized.

A further object of my invention is to provide an instrument, of the character described, which may be connected to the ordinary electric light circuit by a plug and socket connection and, furthermore, that will heat the water, or other liquid or material, quickly, to a predetermined degree and which will thereafter automatically maintain said temperature constant, whereby, for example, water may be maintained at or near the boiling point without boiling over and other desirable effects may be conveniently produced.

Other and further objects of my invention will become apparent to persons skilled in the art, from a consideration of the following description when taken in conjunction with the drawings, wherein:—

Figure 1 shows a side elevation of the device;

Fig. 2 is a section taken on line 2 of Fig. 1.

Fig. 3 is a section taken on line 3 of Fig. 5.

Fig. 4 is a top plan view of Fig. 3 with the crucible removed.

Fig. 5 is a section taken on line 5 of Fig. 2.

Fig. 6 shows the manner of placing a test tube in the heating receptacle instead of a crucible, as shown in Fig. 3.

Fig. 7 shows tongs for handling the vessels when they are hot.

Fig. 8 is a simplified diagram of circuits.

In all the views the same reference characters are employed to indicate similar parts.

The device is a practical and unique addition to a laboratory for quickly furnishing heat for small quantities of material to be operated on and for maintaining the heat at any predetermined temperature. Owing to its compact form and the readiness with which all of the parts may be assembled it is especially well adapted for use by visiting physicians for sterilizing instruments, evaporating small quantities of fluids and for quickly drying small articles. It may be placed in a small bag for transit and when removed may quickly be attached to any electric light socket.

In the form illustrated, 10 is a sub-base spaced apart from a superposed base plate 11 by spacing sleeves 12 and held together by hollow bolts 13. The base plates 10 and 11 and the top plate 14 are made of a suitable insulating material which is rather refractory to the influence of heat, of which there are several such available compositions in the market.

The base plate 10 is supported on three porcelain knobs 15, serving as legs to support the device above the surface upon which it may rest.

Between the plates 11 and 14 is a sheet metal cylinder 16 held in place between the plates by rods 17 and screws 18.

The plate 14 is suitably perforated and in the perforation is suspended a cup 19, by its flange 20, which is held in place by the screws 21.

Around the cup 19 is wound a two part heating coil 23—23′, suitably insulated therefrom and preferably inclosed in a relatively refractory plastic covering material 24, to confine the heat and to protect the wire from the oxidizing effect of the atmosphere. The terminals 25 and 26 of the compound coil are connected to suitable circuit wires. A leading circuit wire 27 is connected to the terminal 28 of the thermo-responsive device 30 and the leading circuit wire 31 is connected to the terminal 26 of the heating coil 23′. The terminal 29 of the heat responsive device 30 is connected to the terminal 25 by wire 32. The thermostatic bar 33 is fixed, the free end of which carries a contact point 34 for coöperation with the adjustable contact screw 35. The wire 26′ is connected to the inner terminal 36 of the coil.

When the plug 37 is inserted in the socket or receptacle of an electric light circuit, the current will be through both coils 23 and 23′, when the circuit is closed between contacts

34 and 35, but when the temperature within the casing, of which the cylinder 16 forms the vertical walls, reaches a predetermined temperature, the bar 30 will thereby be warped, causing contacts 34 and 35 to be separated, whereupon coil 23 will thereby be cut out of circuit and only coil 23′ will furnish heat. Should the chamber within the casing cool down, the bar 30 will resume its former shape and close the contacts controlled by it, once more causing current to pass through both coils.

A switch or auxiliary plug 38 may be used to open the circuits temporarily without the necessity of removing the plug 37 from the fixture which may be located at a relatively remote point.

A vessel 39 has a body part 39′ practically equal in size to the plate 14 and is provided with a downwardly-depending cap 40, insertible in the cup 19 of the heater. It is also provided with a cover 41 which has a handle 42. Liquids may be placed in the cup 40 and in the body part 39′, to be boiled.

A foraminous basket 43 may be placed in the vessel 39 and when water is contained therein, small articles may be boiled or sterilized, or when liquid is left out the articles may thus be dried or dehydrated.

The vessel 39 is provided with bail ears 45, whereby the vessel and contents may be moved, when hot, by the tongues 46.

A series of rings 47 of varying internal diameters, to correspond with the diameters of as many test tubes 48, may be used, whereby to support said tubes in the heater 19.

The larger test tube 48, shown in Fig. 6, contains in its lower closed end, a piece of cork 49, to receive the concussion from an instrument that may be dropped in the tube for the purpose of sterilization. The test tubes are well adapted for sterilizing surgical and dental instruments that are relatively long and thin.

Small crucibles, such as 50, may be placed in the cup 19 for heating the contents thereof.

Other vessels for boiling, evaporating, sterilizing, etc., may readily be adapted for use with the furnace.

Having described my invention, what I claim is:—

1. A furnace of the character described comprising a housing provided by confronting top and bottom plates of insulating and relatively refractory material, each plate having a groove in its face near its periphery; a metal cylinder having its ends inserted in the respective grooves of the spaced apart plates; means for holding the plates in contact with said cylinder; a fixed cup secured to the upper plate and extending through an aperture into the furnace housing; a heating coil wound about the cup; a current controlling heat-responsive regulator in said housing in series with said coil, and an insulator secured to the vertical metal wall of the housing and providing an opening through which to insert the current conducting wires.

2. A furnace of the character described comprising a relatively large cylindrical casing; a fixed cup therein opening through the upper wall thereof; a heating coil wound about said fixed cup to heat the interior thereof; a thermo-responsive current-controlling switch within the casing; a removable cup, insertible in the fixed cup, expanded into a larger vessel substantially equal in diameter to the casing, above the casing, and a removable foraminous basket within the larger vessel within which to contain instruments to be sterilized.

3. A furnace of the character described, comprising a casing, composed of a base plate, an upper plate having an opening for the heating element and a cylinder secured between said plates; a heating element, comprising a cup insertible through said opening and having an annular flange overlying the edges of the opening, and a heating coil wound about said cup; a thermostatic bar, controlling contacts, in series with said coil and within the thermal influence of said coil, and a sub-base, spaced apart from said bottom plate, to support the casing, to permit free circulation of air therebetween.

In testimony whereof I hereunto set my hand.

TIODOLF LIDBERG.