M. J. WHELAN.

HEATING DEVICE.

APPLICATION FILED FEB. 17, 1922.

1,428,349. Patented Sept. 5, 1922.

Fig. 1.

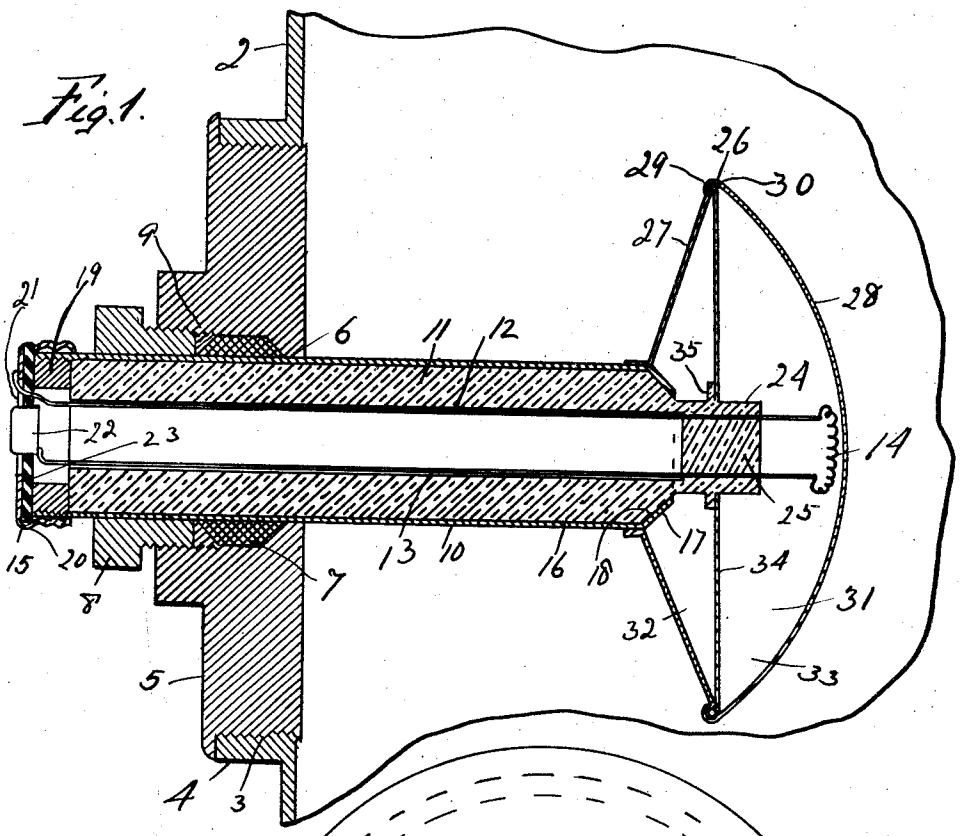
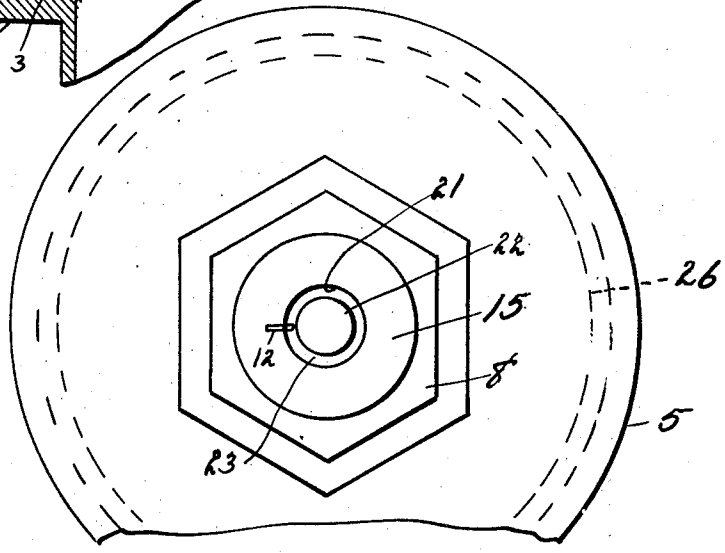


Fig. 2.



INVENTOR

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By W. W. Williamson Atty.

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UNITED STATES PATENT OFFICE.

MARTIN J. WHELAN, OF CLIFTON HEIGHTS, PENNSYLVANIA.

HEATING DEVICE.

Application filed February 17, 1922. Serial No. 537,215.

To all whom it may concern:

Be it known that I, MARTIN J. WHELAN, a citizen of the United States, residing at Clifton Heights, in the county of Delaware and State of Pennsylvania, have invented new and useful Improvements in a Heating Device, of which the following is a specification.

My invention relates to new and useful improvements in a heating device, and has for its object to provide a heating element of unique construction for submersion in the liquid to be heated.

Another object of the invention is to provide means for mounting the above mentioned heating element within a suitable liquid container.

A further object of the invention is to provide a heating element consisting of a glass rod to which the conductors and filament are attached having a two part casing enclosing that end of the rod which supports the filament, one of the parts of said casing being fused to the glass rod with the other part connected thereto in such manner as to permit expansion and contraction without breaking the point and a partition of insulating material so located within the casing as to keep some of the generated heat from reaching the major portion from the enclosed end of the glass rod.

With these ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains, may understand how to make and use the same, I will describe its construction in detail, referring by numerals to the accompanying drawings forming a part of this application, in which:—

Fig. 1, is a fragmentary sectional view of a container showing my improved heating element applied thereto, a portion of which is illustrated in section to set forth certain details of construction.

Fig. 2, is an outer end view thereof with a portion of the casing broken away.

In carrying out my invention as here embodied, 2 represents a container of any suitable size or configuration preferably in the form of an upright boiler having any suitable valve controlled inlet and outlet for the liquid. The container also has an access opening 3 leading thereto which opening is surrounded by a flange 4 internally threaded to receive the plug 5 provided with a bore 6 of two different diameters so as to produce a packing chamber 7 to hold a suitable packing which is compressed by the gland 8 threaded in the chamber 7, a follower ring 9 being preferably located between the gland and the packing substance.

The numeral 10 denotes my improved heating element consisting of a tube or body 11 constructed from glass or other suitable heat resisting and insulating material which is held in place by the packing material within the chamber 7 and through this tube or body pass the conductors or wires 12 and 13 connected at one end with the filament 14 and at the other end with suitable parts of the plug 15.

The major portion of the tube or body 11 is inclosed in a metal barrel 16 having an inturned flange 17 at its inner end for engagement with the shoulder 18 forming a ground joint for said inner end of the barrel. The barrel 16 is held in place on the body by a ring nut 19 having threaded engagement with the inside of the barrel at its outer end and adapted to contact with the outer end of the tube or body 11.

The plug 15 may be of any desirable construction but for convenience of illustration it is herein shown as comprising a cap 20 set over the outer end of the barrel 16 and secured thereto in a suitable manner, the body of said cap having an opening 21 therein through which projects a plug 22 carried by a suitable disc 23 of insulation material mounted in the cap. One of the conductor wires is fixed to the plug 22 and the other is secured directly to the cap 20. Such construction permits of disassembling the parts should the necessity arise.

The inner end of the tube of body 11 is preferably reduced to provide an extension 24 within which is fused an additional amount of glass 25 to fasten the conductor

wires at this point and produce a gas tight closure. This extension and the filament are enclosed within a two part casing 26 wholly of metal or other suitable heat conducting material consisting of the frusto-conical back member 27 with its smaller end secured to the inner end of the barrel and a concavo-convex front member 28 having a clinch flange 29 for coaction with the similar clinch flange 30 formed at the larger end of the back member 27 which construction will permit free movement of the parts during expansion and contraction of the casing without breaking the joint between the back and front members. This casing forms a gas chamber 31 from which the air is first extracted and then filled with a suitable element or gas such as nitrogen as in a nitrogen lamp. This chamber is divided into two compartments 32 and 33 by the heat reflector 34 produced from any suitable material and is supported in the angle of the casing formed at the junction of the two parts 27 and 28. This heat reflector or partition only loosely fits the parts of the heating element so that the compartments 32 and 33 are in communication practically the same as one single chamber and this reflector, if found desirable, may engage a flange 35 on the extension of the body.

In actual practice the filament is located as close to the front member 28 of the casing as is practicable without forming a short circuit so that the greatest amount of heat will be trasmitted to the substance being heated.

From the foregoing description it will be seen that such a device will be relatively inexpensive in the cost of manufacture although strong and durable and when installed within a suitable container the heat generated will be transmitted from the casing 16 to the surrounding liquid and cause it to be quickly raised in temperature.

Of course I do not wish to be limited to the exact details of construction as herein shown as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is:—

1. In a heating device the combination of a container having an access opening leading to the interior thereof, an interiorally threaded flange surrounding said opening, a plug having a bore therethrough of two different diameters, the larger diameter forming a chamber for the reception of packing material, said plug having threaded connection with the flange, a packing gland having threaded connection with the plug to set up the packing within the chamber, and a heating element connected with the plug and held in position by the compressed packing in the packing chamber.

2. In a heating device the combination of a container having an access opening leading to the interior thereof, an internally threaded flange surrounding said opening, a plug having a bore therethrough of two different diameters, the larger diameter forming a chamber for the reception of packing material, said plug having threaded connection with the flange, a packing gland having threaded connection with the plug to set up the packing within the chamber, a heating element detachably connected with the plug and consisting of a glass bar or body, conductors embedded in said body, a filament at the inner end of said body with which said conductors are joined, and a casing surrounding the inner end of said body with a portion thereof embedded in said body.

3. In a device of the character stated, a heating element consisting of a glass bar body, a filament supported by its inner end, a connector plug carried by the outer end thereof, conductors embedded in said body and joined to the filament by which any electric current may be conveyed from a source of electrical energy to the filament, a two part body consisting of a frusto-conical back member having its smaller end embedded in the body, and a concavo-convex front member provided with a roll flange connected with a socket formed from the larger end of the back member, said casing forming a chamber for holding nitrogen, and a partition of insulating material supported within the casing for dividing the interior thereof into two compartments with the major portion of the inner end of the glass body in the compartment without the filament.

4. A heating element comprising a body of heat resisting material to support a filament and a metal casing enclosing said filament.

5. A heating element consisting of a body, a metal casing on one end of said body to form an air tight chamber and a filament supported by the body within said chamber.

6. A heating element consisting of a body, a metal casing on one end of said body and forming a gas chamber and a filament supported by the body within said chamber in close proximity to one of the walls of the casing.

7. A heating element consisting of a body of heat resisting material, a metal casing mounted on one end of said body and forming a chamber which is filled with gas after the air is extracted, a filament supported by the body within said chamber in such close proximity to the casing as will not form a short circuit and a heat reflector within the casing.

8. A heating element consisting of a body

of heat resisting material, a metal casing mounted on one end of said body and forming a chamber which is filled with gas after the air is extracted, a filament supported by the body within said chamber in such close proximity to the casing as will not form a short circuit and a heat reflector within the casing, said reflector also acting as a partition to protect a portion of the body from the heat in the chamber.

In testimony whereof, I have hereunto affixed my signature.

MARTIN J. WHELAN.