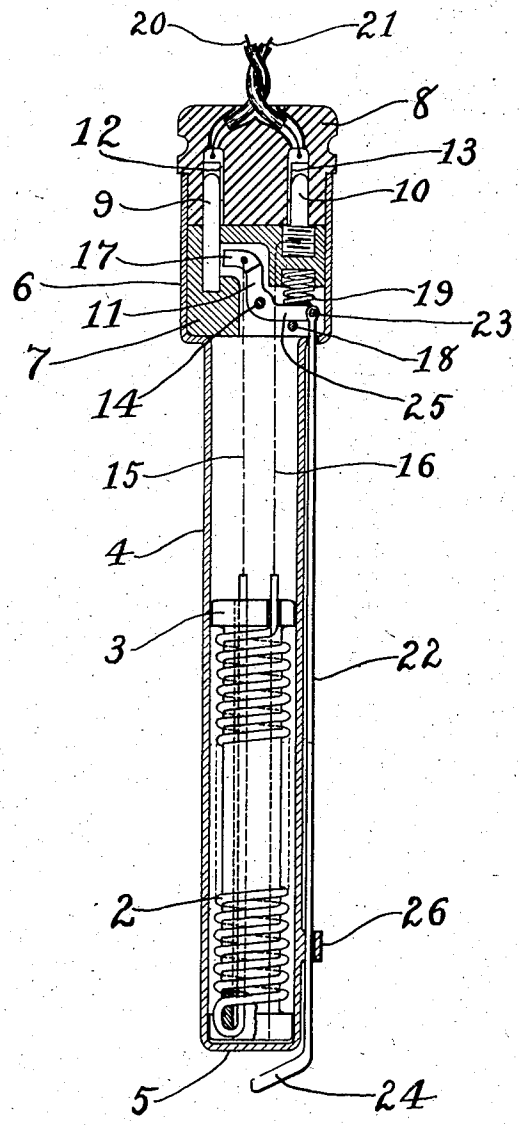
J. O'CONNOR.

ELECTRIC HEATER.

APPLICATION FILED JUNE 28, 1916.

1,251,411. Patented Dec. 25, 1917.



Witness:

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UNITED STATES PATENT OFFICE.

JAMES O'CONNOR, OF NEW YORK, N. Y.

ELECTRIC HEATER.

1,251,411. Specification of Letters Patent. Patented Dec. 25, 1917.

Application filed June 28, 1916. Serial No. 106,292.

To all whom it may concern:

Be it known that I, JAMES O'CONNOR, a citizen of the United States, and a resident of New York, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

This invention relates to electric heaters and particularly to that class thereof which is specially provided for heating liquids, in which they are immersed.

The object of my improvements is to provide a heater of the class specified in which are incorporated automatic gravity actuated means for throwing the current on and off when the device is placed in and removed from a receptacle respectively.

To these ends my improvements comprise features more fully set forth hereinafter and illustrated in the accompanying drawing, wherein the figure is a vertical sectional view of an electric heater embodying my improvements.

One of the chief objections to the ordinary devices of this class is their liability to be burned out by the electric current if that current is permitted to circulate through the coil when that coil is not immersed in the liquid to be heated.

Several attempts, more or less successful, have been made to obviate this objection. One such attempt is directed to the flotation of the coil in the liquid to be heated and through that flotation the establishing of the heating current in the coil. Another proposed plan is to provide means for contact with the outer wall of the containing vessel and thus establish the current in the coil; while another employs circuit closing means actuated by the engagement of a member with the upper flange of the containing vessel. These and such other proposed solutions of the problem with which I am familiar are open to one or more serious objections such as, cumbersomeness, frailty, liability to easy derangement and unsanitariness.

My improved device is directed to the elimination of these and other objections to be found in previous devices of this general character.

In the figure of the drawing in which I have illustrated the preferred embodiment of my improvements, the usual resistance coil 2 is wound on a spool 3 of insulating material, and both coil and spool are contained within a tubular shell 4 having a closed bottom 5. The upper portion of said shell is enlarged at 6 to receive head 7 and cap 8, both of insulating material. Said head 7 is suitably chambered for the reception of electrical connections 9 and 10, and for the pivotal support of switch 11. Said connections 9 and 10 are fixed in head 7 and protrude upwardly therefrom for engagement with contact pieces 12 and 13 respectively, fixed in cap 8. Switch 11, pivoted at 14 in head 7, is principally of insulating material but is provided with metallic nose 17 for engagement with connection 9, and is electrically connected by means of wire 15 with one end of coil 2. Connection 10 is electrically connected with the other end of said coil by means of wire 16. Switch 11 is urged against stop 18 by spring 19, whereby said switch is yieldably held out of engagement with connection 9. Current may be supplied to the device from some suitable source not shown, through wires 20 and 21 connected to contact pieces 12 and 13 respectively, in cap 8.

For operating switch 11 I provide rod 22, slidably mounted parallel with and closely contiguous to shell 4. At its upper end said rod passes freely through an aperture in the lower end of enlarged portion 6 of shell 4 and is pivotally connected at 23 with end 25 of switch 11 remote from nose 17. Said rod 22 extends downwardly a short distance beyond the bottom 5 of shell 4 and is preferably turned inwardly as at 24, under said bottom, but sufficiently remote therefrom to permit an upward movement of said rod sufficient to operate switch 11 to cause its nose 17 to contact with connection 9. The lower end of rod 22 is guided in its vertical movement by ear 26 fixed to shell 4 and through an aperture in which ear said rod is free to slide.

The operation of my improved device will be readily understood from the foregoing description of its construction; therefore suffice it to say that when the coil containing tubular portion 4 is inserted into a vessel containing a liquid to be heated, the lower end 24 of rod 22 will come into contact with the inside of the bottom of said vessel an instant prior to the time of greatest submersion of the device in said liquid. Immediately upon the contact of the lower end of rod 22 with said vessel bottom the weight

of the device, otherwise the force of gravity, will cause said rod to move upwardly relatively to the device, against the compression of spring 19, a short distance but sufficient to rock switch 11 on its pivot 14 and to cause nose 17 to engage connection 9, thereby automatically establishing current through the coil, whereby heat is disseminated therefrom to the liquid in which the device is immersed. When said liquid is sufficiently heated the device may be lifted out and laid aside for future use. Immediately following the commencement of the lifting out of the device, end 24 of rod 22 is freed from engagement with the bottom of the containing vessel and spring 19 acts to press downwardly end 25 of switch 11 and thus break the electric contact of nose 17 and connection 9, whereby the current is automatically cut off from coil 2.

It will be observed that the device may be handled and laid down, or may hang from its wires 20, 21 without danger of establishing current in the coil, and that it is only when the device is stood on end right side up that current is supplied to the coil. Also the device is so arranged that current may be entirely cut off by withdrawing cap 8 from its seat in the enlarged portion 6 of shell 4, whereby the device may be laid away conveniently.

I claim:

1. An electric heater including in combination a heating member, means for supplying electric current thereto, and means including a push rod actuated by the weight of the device when said rod encounters an obstacle for establishing electric current circulation in the heater.

2. An electric heater including in combination means for supplying electric current thereto, a switch mounted on the heater for governing the current supply, and means actuated by the weight of the device when said means encounters an obstacle for moving the switch into contacting position.

3. An electric heater including in combination a heating member, means for supplying electric current thereto, a switch mounted on the heater for governing the current supply, and a switch actuating rod having its lower end adapted for engagement with the bottom of a receiving vessel.

4. An electric heater including in combination a heating member of tubular form, means for supplying electric current thereto, a switch mounted on the heater for governing the current supply, and a switch actuating rod mounted for vertical movement in parallelism with said tubular heating member and having its lower end projecting below the bottom of the heating member.

5. An electric heater including in combination a heating member, a switch mounted on the heater for governing the current supply, and means extending from said switch downwardly to below the bottom of said heating member and operable by the weight of the device to close said switch when the downwardly extending end encounters an obstacle.

6. An electric heater including in combination a heating member, means for supplying electric current thereto, a switch, and gravity actuated means including a push rod whose lower end extends below the heating member for operating said switch.

Signed at New York, borough of Bronx, in the county of Bronx and State of New York, this 26th day of June, 1916, before two subscribing witnesses.

JAMES O'CONNOR.

Witnesses:
ARTHUR CONROW,
SUE A. O'NEILL.