

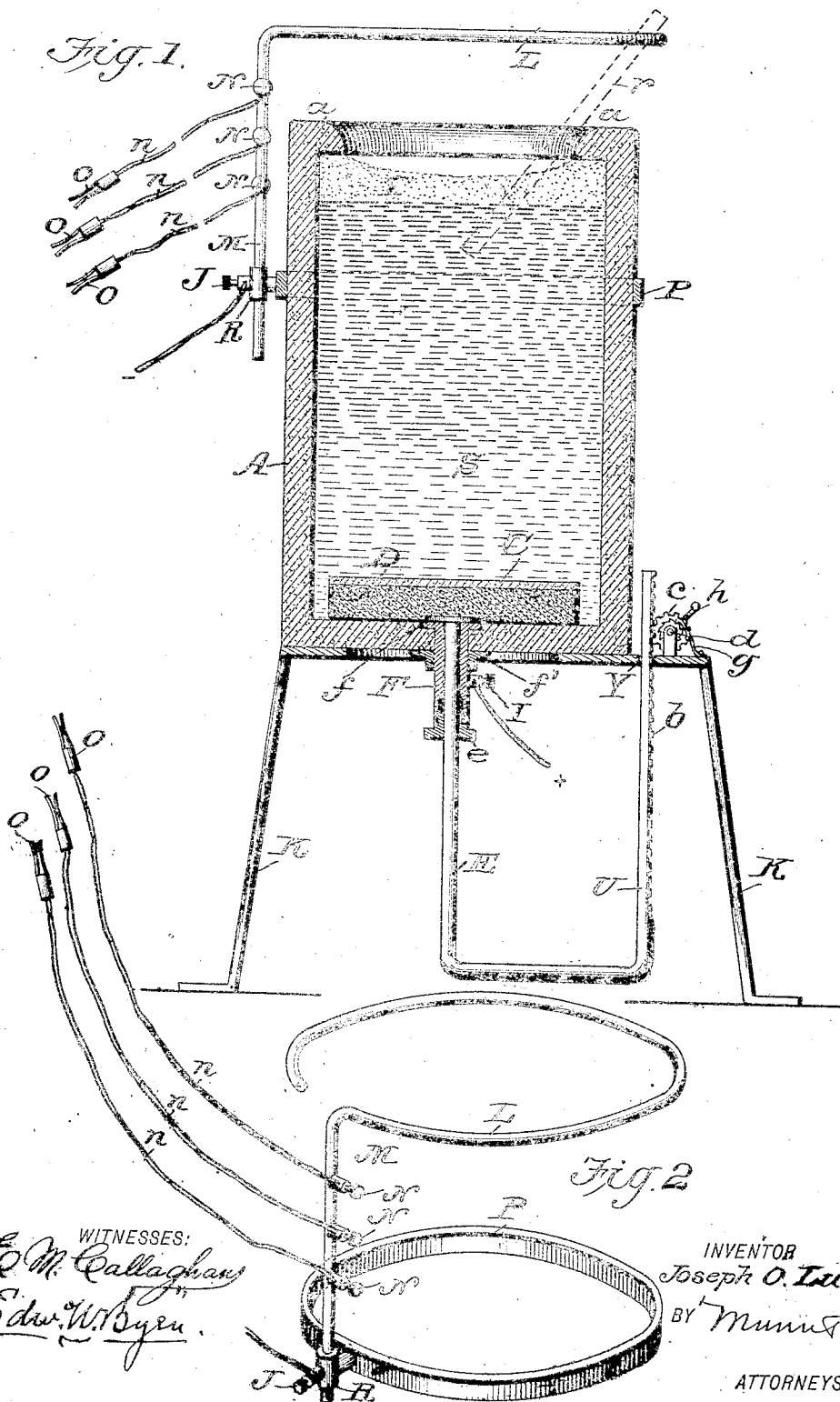
No. 852,732.

PATENTED MAY 7, 1907.

J. O. LUTHEY.

ELECTRIC HEATER FOR METAL WORKERS.

APPLICATION FILED FEB. 1, 1906.



UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER FOR METAL-WORKERS.

No. 852,732.

Specification of Letters Patent.

Patented May 7, 1907.

Application filed February 1, 1906. Serial No. 299,013.

To all whom it may concern:

Be it known that I, JOSEPH OTTO LUTHY, a citizen of Switzerland, residing at Austin, in the county of Travis and State of Texas, have invented a new and useful Improvement in Electric Heaters for Metal-Workers, of which the following is a specification.

My invention is in the nature of a novel means for enabling blacksmiths, machinists, and other metal workers, to quickly and conveniently heat metal to a welding temperature without the use of a forge, or of a fire of any kind.

The invention is an electric heater of novel construction of parts and certain reagents forming a bath for utilizing the electric current through the bath to raise to a red heat any piece of metal plunged into this bath, as hereinafter fully described with reference to the drawing, in which

Figure 1 is a vertical central section and Fig. 2 is a perspective view of the rest forming the upper electrode.

In the drawing A represents a containing vessel for the bath which vessel is made of any material which is a non-conductor of electricity, such as fire clay, and which may be of any desired shape. It is mounted on suitable legs K and is open at the top.

D is the lower electrode which is made of a plate or block of carbon mounted upon and vertically adjustable with a central metal stem E. This stem enters a central opening in the bottom of the vessel A, so as to connect with the carbon electrode within the vessel. The opening through which the stem passes is formed by a metal bushing F having a flange f inside the vessel and a stuffing box e at its lower end to render the joint liquid tight. A screw nut, f', turns upon an exterior thread of the bushing F and serves to clamp the material of the vessel firmly between the flange f of the bushing and said nut f'. On top of the carbon electrode D is a non-conducting guard plate C, for the purpose hereafter described.

The vessel A is filled nearly to the top with a solution of sal ammoniac in water, about one teaspoonful of the crystals of sal ammoniac to one quart of water. On top of the surface of this bath is a floating layer of pulverized graphite T. The upper edge of the

vessel A preferably has an inturned lip a which may be formed integrally with the vessel.

M is a vertical standard contained in a socket R carried by a metal band P encircling the vessel A. This standard M forms the support for the upper electrode and it is attached at its upper end to a circular rest L which extends around the upper edge of the vessel A. The standard M is provided with any suitable number of binding posts N N N to which corresponding insulated wires n n n are connected, which wires at their ends are provided with clasps or socket pieces O O O adapted to seize and firmly hold the bar or other piece of metal to be heated.

J is the binding post with which the wire for the upper electrode connects, and I is the binding post with which the wire for the lower electrode connects. The binding post I is connected to the metal bushing at the bottom of the vessel A and is in electrical connection with the stem E and carbon electrode D. The binding post J connects with the socket R for standard M, which with its wires and clasps O and rest L forms a multiple upper electrode connection. The binding post J is so connected with the socket R as to permit the standard M to be raised or lowered and also allows the rest L to be swung around the vertical axis of standard M to take the rest L away from over the top of the vessel A.

The vessel A may be of any size, but for ordinary use will not be larger than a quart measure.

The operation of my heater is as follows. The rod, or rods, or other pieces of metal to be heated and welded, are secured in the clasps O and a current of 220 volts and 5 amperes, more or less is turned into the binding posts I and J. The rods held by the clasps O are then dipped through the graphite layer and into the solution of sal ammoniac to a depth as far as it is desired to heat the rods white hot. These rods then become the upper electrode terminals and the current from the lower carbon electrode D passing through the sal ammoniac bath and into the rods will heat the latter white hot as far as they are immersed and they may then be withdrawn and quickly welded together. In

some instances it may be more convenient to simply rest the rod to be heated against the electrode rest L and allow the rod which is to be heated to dip down into the bath as shown by the rod in dotted lines at r.

The purpose of the graphite layer T is two fold. In the first place it acts as a covering blanket or muffling layer to the sal ammoniac solution to prevent it from sputtering and splashing out under the vaporizing influence of the heated end of the article to be welded. This graphite layer also forms a bed into which, or on to which, a flat body may be laid horizontally to be uniformly heated throughout its entire surface, and the object of the intumed lip, a is to avoid the splashing out and spilling of the graphite over the edge of the vessel A.

To vary the resistance of the bath S the carbon electrode D is made vertically adjustable through its supporting stem E. This stem is connected at the bottom to a vertical bar U which passes up through a guide Y on the stand and is formed at its upper end with rack teeth b on the side. These rack teeth are engaged by a small pinion c on a horizontal shaft d and this shaft is turned by a crank A and is held to its adjustment by a ratchet and pawl g. By elevating the electrode D, by the means just described, the resistance of the bath between the electrodes is decreased and the energy of the heating effect may thus be varied. When the lower electrode D is at its higher adjustments, there is some risk of touching it by the rods or other articles to be heated, and if this should happen the heating effect would be lost because the bath would be short circuited by the direct metal contact of the upper and lower electrodes. By placing a non-conducting disk C of fire clay on top of the lower electrode this contingency is avoided.

With regard to the special value of the sal ammoniac bath, I would state that it serves several useful purposes. First it increases the conductivity of the water, second it involves no corrosion of the metal parts and third it acts as a flux to promote the union of the welded surfaces when hammered together.

In carrying out my invention, I do not

confine myself to the exact details of construction as shown and described, as these may be varied without departing from the scope of my invention as set forth in my claims.

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

1. An electrical heating bath having a superficial layer of pulverulent material.
2. An electrical heating bath having a superficial layer of graphite.
3. An electrical heating bath consisting of a solution of sal ammoniac and a floating superficial layer of graphite.
4. An electrical metal heating device consisting of a containing vessel of non-conducting material, a resistance bath, an electrode immersed in the bottom of the vessel and a non-conducting guard covering said electrode.
5. An electrical metal heating device, consisting of a containing vessel of non-conducting material, a resistance bath, an electrode immersed in the bottom of the vessel, means for adjusting the same vertically and an electrode connection at the top of the vessel.
6. An electrical metal heating device, consisting of a containing vessel of non-conducting material having an inwardly projecting lip at its upper edge, a resistance bath in the vessel, an electrode at the bottom thereof, a superficial layer of muffling material on the top of the bath and an electrode connection for the top of the vessel.
7. An electrical metal heating device, consisting of a containing vessel of non-conducting material having a stuffing box in its bottom, a resistance bath in the vessel, an electrode in the bottom of the bath, a supporting stem attached to the electrode and passing through the stuffing box, a rack bar attached to said stem and a shaft with gear wheel meshing with the rack and means for adjusting the same.

JOSEPH C. LUTY.

Witnesses:

SOLOMON O. KEMON;
PERRY E. TURNER.