Aug. 11, 1925. 1,548,828

J. C. DONELAN

ELECTRIC HEATER

Filed Nov. 11, 1924

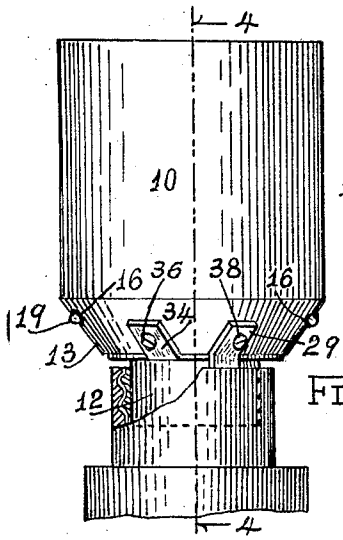


FIG. 1.

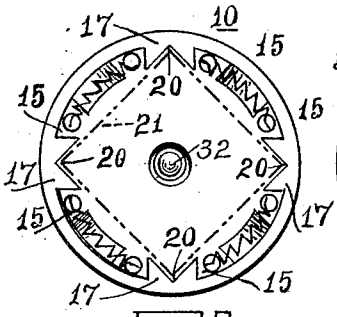


FIG. 2.

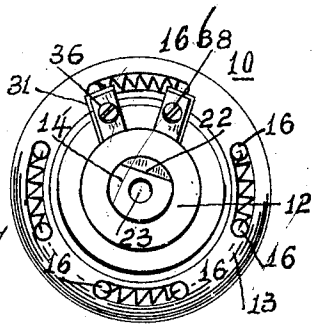


FIG. 3.

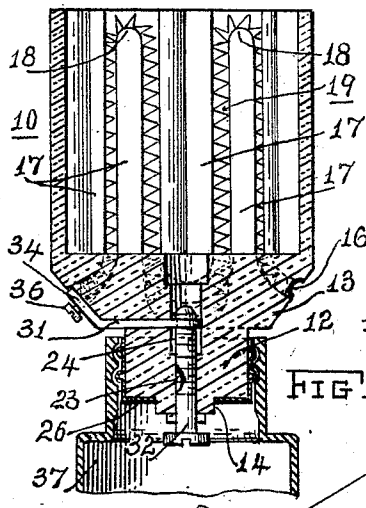


FIG. 4.

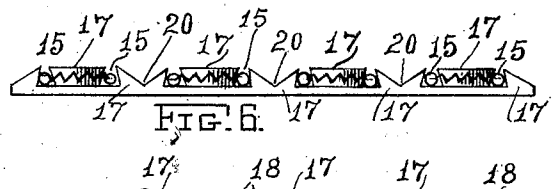


FIG. 6.

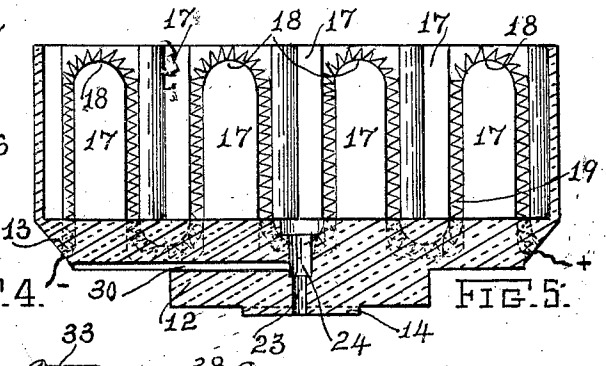


FIG. 5.

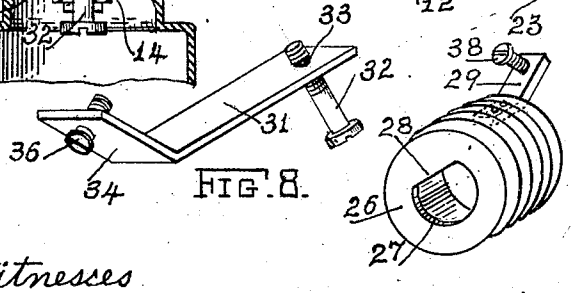


FIG. 8.

FIG. 7.

Witnesses
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UNITED STATES PATENT OFFICE.

JAMES C. DONELAN, OF SPRINGFIELD, ILLINOIS.

ELECTRIC HEATER.

Application filed November 11, 1924. Serial No. 749,197.

To all whom it may concern:

Be it known that I, JAMES C. DONELAN, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a new and useful Electric Heater, of which the following is a specification.

This invention relates primarily to relatively small heaters such as are used by dentists in laboratory work or such as are used my manufacturers of small articles which may be advantageously treated in portable heaters of the type described.

The purposes of the invention are to provide a light and easily portable heater which may be used in connection with the usual lamp-sockets of an electric lighting system; to provide a heater having relatively high heating value considering the size of the heater; to provide a heater having a continuous electric resistance element extending the full length of the heating chamber and entirely around its inner wall; to provide simple and effective means to facilitate the insertion of resistance element in the heater; to provide means preventing accidental displacement of the resistance coil; to provide a heating chamber adapted to receive and hold upright, either cylindrical crucibles, or polygonal crucibles; or containers; containing the articles to be treated; and to provide improved means for electrically connecting the heater with a lamp-socket of usual construction.

With these ends in view my invention consists in the novel features of construction a combination of parts shown in the accompanying drawing to which reference is hereby made; and now to be described and finally recited in the claims.

The invention is illustrated in the accompanying drawing in which;

Figure 1 is a front elevation of an electric heater embodying my invention. Fig. 2 is a top view and Fig. 3 is a bottom view of the same heater. Fig. 4 is a vertical section through the heater taken on the line 4—4 of Fig. 1. Fig. 5 is a reduced developed plan partly in section, showing the continuous resistance coil in place in the inner wall of the heater. Fig. 6 is a top view of the developed circular wall of the heater. Fig. 7 is a perspective view of the screw threaded metal sleeve which surrounds the reduced cylindrical part of the heater and engages in the lamp-socket; and Fig. 8 is an enlarged perspective view of one contact plate. The same reference numerals designate the same parts in all the views.

The heater body 10 is preferably of porcelain or fire-clay, or other heat-resisting and insulating material, and has a reduced cylindrical extension 12. The intermediate part 13 of the body is beveled or tapered as shown. The part 12 has an integral downwardly extending neck 14, the purpose of which will be explained later. A series of dove-tail vertical grooves 15 are formed in the inner wall of the heater. At the lower end of each vertical groove is a corresponding hole 16 extending downwardly through the beveled part 13. Vertical columns 17 integral with the wall of the heater, separate the grooves 15. The upper ends of the columns 17 are rounded as shown at 18 to facilitate the inserting of a continuous coil 19 in the grooves and across the upper ends of the columns.

To place the resistance coil 19 in the heater, one end of the coil will be inserted in one of the openings 15, the coil will then be pushed upward in the corresponding dove-tail groove and will be carried across the rounded upper end 18 of the column 17; and then downward through the next groove; and so on until the resistance coil occupies all the grooves. The inclined walls of the dove-tail grooves will prevent the resistance coil from being accidentally detached and falling into the heater.

A number of the columns 17 in the present instance four have vertical grooves, 20 one in each column. The grooves 20 are in such relation to each that the vertical edges of a polygonal crucible or container indicated by dotted lines 21 may engage in the grooves and hold the crucible or container against rotation in the heater.

The neck 14 has a flat part 22 and a central bore 23. The bore 23 extends upwardly through the neck and into an enlarged counterbore 24 in the part 13. A metal screw threaded sleeve 26 is partially closed at one end leaving an opening 27 to receive the terminal members of the neck 14. The wall 28 of the sleeve engages on the shoulder 22 of the neck to prevent rotation of the sleeve on the neck. A contact plate 29 is riveted on the inside of the sleeve.

A screw threaded socket 37 of usual con-

struction, electrically connected with any suitable source of electric supply, receives the screw-threaded sleeve 26 to connect it electrically with the source of supply and to support the heater in an upright position convenient for use.

To assemble the parts, the electric resistance element 19 will be placed in the retaining grooves in the inner wall of the heater body as already described; the contact plate 31 will be inserted in the radial way 30 with the hole 33 in the plate in line with the bore 23 in the extension 12; and the outer terminal part 34 of the plate will be connected with one terminal of the coil 19 by the binding screw 36; the screw threaded sleeve 26 will be placed on the extension 12 with the neck 14 in the opening 27 and the wall 28 of the sleeve against the shoulder 22 of the neck, to prevent rotation of the sleeve relative to the extension 12; the screw 32 will be inserted in the bore 23 and will be engaged in the hole 33, to connect the screw with the plate 31; the contact plate 29 will be connected with the other terminal of the coil 19 by the binding screw 38; and the sleeve 26 will be screwed into the socket 37 to support the heater in a vertical position.

To energize the electric heating element it is necessary only to rotate the body to screw the sleeve further into the socket and thereby close the electric circuit in the usual well known manner.

Following is a brief description of a typical use of the heater in the art of dentistry, for the purpose of eliminating wax used in the process of dental inlay work. After preparing a cavity so that a wax form can be taken without distortion a lump of plastic wax will be pressed into the cavity to produce the required pattern form; the lump of wax will then be mounted on a metal "sprue former" one end of which is heated and applied to the lump of wax to form an indentation such that upon the cooling of the wax it will adhere to the "sprue former" which will then be set in a suitable container, which may be either cylindrical or polygonal, in form; an investment compound preferably consisting of a quick setting mixture of silex and plaster paris with water, will be poured gently into the container until the investment compound surrounds and covers the wax form sufficiently. After the investment has hardened it will be placed in the heater and electric current will be applied to energize the resistance element to produce sufficient heat to volatilize the wax form and cause its complete absorption by the porous body of the investment; the sprue former will then be removed from the investment and the casting of the inlay will then proceed in the usual manner.

Many other different uses of the heater will be obvious to skilled users and need not be described here.

I am aware of the common use of electric resistance elements in heaters. I therefore do not claim broadly the use of such elements.

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

1. An electric heater comprising a hollow body of insulating and heat-resisting material having a perforated reduced cylindrical extension and a beveled intermediate part having a series of openings; a series of columns lengthwise of and integral with said body and having beveled edges associated to form a series of lengthwise dove-tail grooves in line with the openings through said intermediate part on electric resistance element inserted through an opening in said intermediate member and extending lengthwise and downwardly through successive grooves between said columns, across the upper ends of some columns, and under other columns and constituting entire series of grooves in the inner wall of the heater and held in place by the beveled edges of said columns.

2. An electric heater comprising a hollow body of insulating and heat-resisting material having lengthwise internal columns with beveled edges associated to form dove-tail grooves, also having a reduced cylindrical section having a central bore and a neck provided with a flat shoulder; a continuous electric resistance element held in place by the beveled edges of said columns; a screw-threaded sleeve surrounding said extension and having a central opening and a flat part engaging on the shoulder of said extension to keep the sleeve from rotating on the extension; a first contact member on said sleeve electrically connected with one terminal of said resistance element; a screw extending inwardly through the bore of said extension; and a second contact member electrically connected with said screw and with the other terminal of said resistance element, to perfect the electric circuit.

3. An insulating structure for electric heaters, comprising a hollow body of insulating and heat-resisting material having lengthwise internal columns integral with the body, said columns having beveled edges associated to form dove-tail grooves to receive and hold an electric resistance element, some of said columns having also angular lengthwise grooves adapted to receive an upright polygonal container and keep it from turning in the body, said body having also a radial way to receive a contact plate; said body having also a cylindrical extension adapted to support a sleeve

pressed thereon; said extension having a vertical bore to receive a binding screw and having also a neck with a shoulder adapted to prevent rotation of a sleeve carried by said extension.

4. An electric heater comprising a hollow body of insulating and heat-resisting material having lengthwise internal columns integral with the body, said columns having beveled edges associated to form dovetail grooves to receive and hold an electric resistance element, some of said columns having also angular lengthwise grooves to accommodate an upright polygonal container and keep it from turning in the body, said body having also a reduced cylindrical extension having a central bore and a neck provided with a shoulder; a continuous resistance element held in place by the beveled edges of said columns; a screw-threaded sleeve on the extension of said body and having a central opening and a flat part engaging on said shoulder to keep the sleeve from rotating on the extension; a first contact member on said sleeve, electrically connected with one terminal of said resistance element; a screw extending inwardly through the base of said extension; and a second contact member electrically connected with said screw and with the other terminal of said resistance element to perfect the electric circuit.

Signed at Springfield, Sangamon County, Illinois, Nov. 1st, 1924.

JAMES C. DONELAN.

Witnesses:

D. C. JONES,

JOHN J. DONELAN.