No. 760,315. PATENTED MAY 17, 1904.

J. R. DAVIS.

COMBINED ELECTRIC HEATER AND BATTERY.

APPLICATION FILED DEC. 8, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

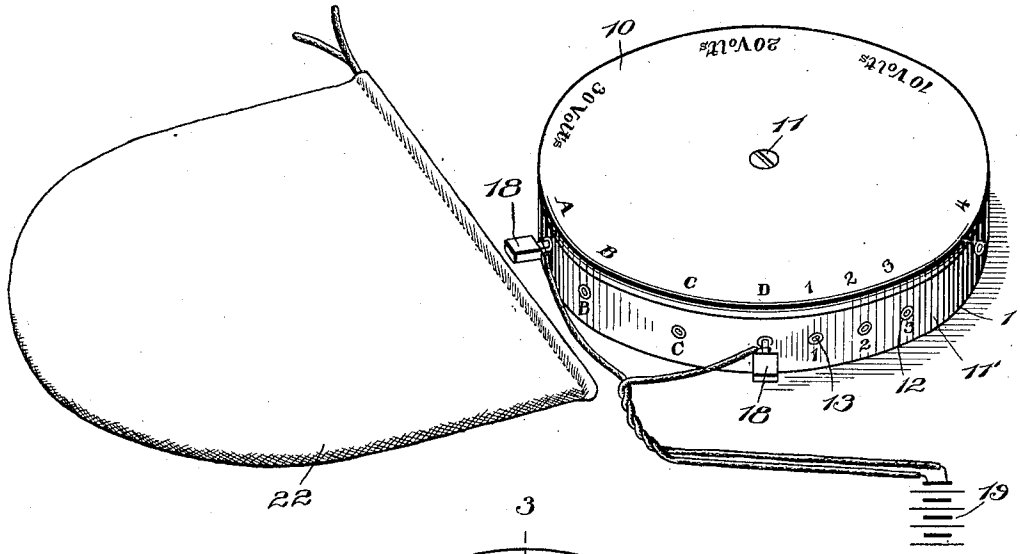


Fig. 2.

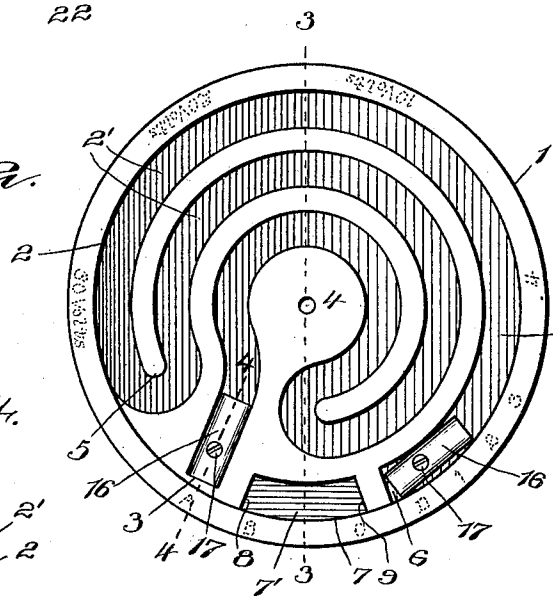


Fig. 4.

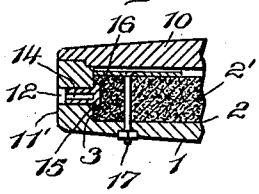


Fig. 5.

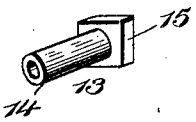
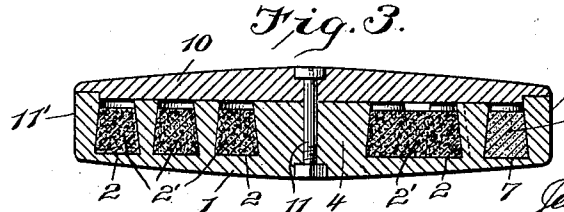


Fig. 3.



Witnesses

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COMBINED ELECTRIC HEATER AND BATTERY.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 6.

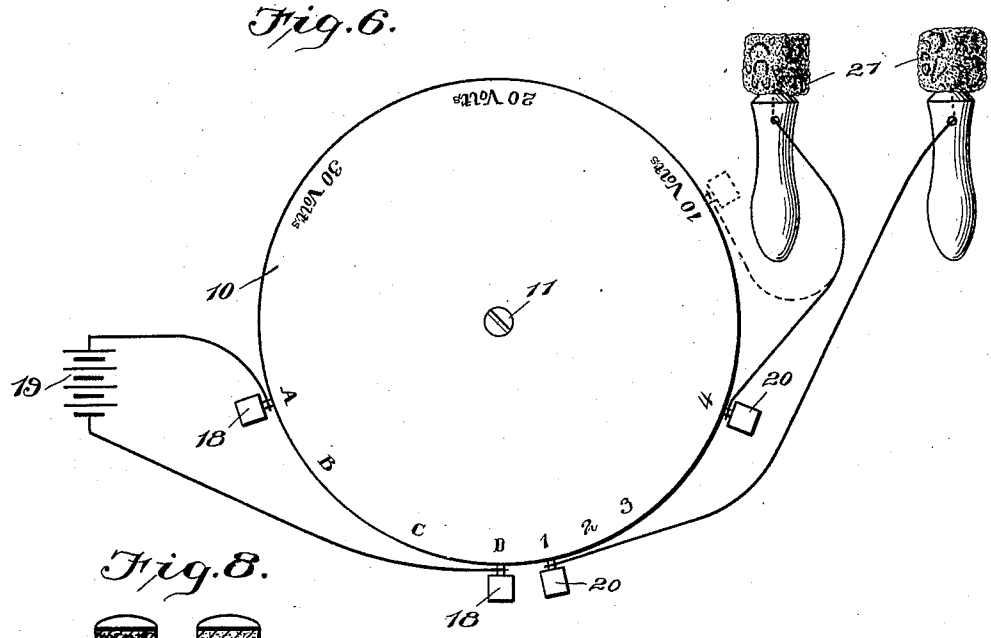
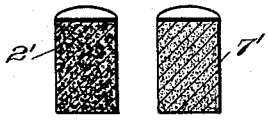


Fig. 8.



Solidified mixture of graphite with non combustible and non conducting material

Fig. 7.

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UNITED STATES PATENT OFFICE.

JESSE R. DAVIS, OF PARKERSBURG, WEST VIRGINIA, ASSIGNOR OF ONE-THIRD TO CHARLES A. WADE, OF PARKERSBURG, WEST VIRGINIA.

COMBINED ELECTRIC HEATER AND BATTERY.

SPECIFICATION forming part of Letters Patent No. 760,315, dated May 17, 1904.

Application filed December 8, 1903. Serial No. 184,325. (No model.)

To all whom it may concern:

Be it known that I, JESSE R. DAVIS, a citizen of the United States, residing at Parkersburg, in the county of Wood and State of West Virginia, have invented certain new and useful Improvements in a Combined Electric Heater and Battery; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to a combined electric heater or foot-warmer and medical battery, and has for its object to provide a device which can be used as a heater solely, as a combined heater and battery, or as a battery only.

A further object of my invention is to provide a portable heater which can be used as a foot-warmer in sleighs, vehicles, &c., or for foot-warming in bed.

A further object of my invention is to provide a combined heater and battery the strength or voltage of the current of which is under control.

With all these objects in view my invention consists in arranging a body or base of non-conducting material, preferably of earthenware, having a winding or tortuous channel therein for the purpose of carrying a mixture or compound of a current-resisting material, said channel being preferably wider at its bottom than at its top, so as to securely hold the current-resisting material in place and prevent the same from falling out.

My invention further consists in providing a division in the resistance-channel, so as to adapt the device for battery purposes without heating the heater.

My invention further consists in certain other details of construction and in combination of parts, which will be first fully described, and afterward specifically pointed out in the appended claims.

Referring to the accompanying drawings, Figure 1 is a perspective view of device, showing position of electric-generator-connecting plugs for heating the heater and also covering-bag. Fig. 2 is a plan view of heater with lid removed. Fig. 3 is a vertical section taken on line 3 3 of Fig. 2. Fig. 4 is a fragmentary vertical sectional view taken on line 4 4 of Fig. 2. Fig. 5 is a perspective view of one of the heater-electrodes within which the generator and electrode connecting plugs enter. Fig. 6 is a plan view showing connection when using the device as a combined heater and battery. Fig. 7 is a plan view showing connections when using the device as a battery only. Fig. 8 is a view showing the relative current-resistance quality of the compounds in the resistance-channel and in the division in the resistance-channel.

Like characters of reference indicate the same parts throughout the several figures, in which—

1 is the body or base of the heater, made of a suitable strong non-conducting material, which body or base is preferably circular, but, as a matter of fact, may be of any suitable shape or contour.

2 indicates the resistance-channel, which has a winding or tortuous path and which for sake of convenience will be hereinafter termed "coil." The said channel or coil is preferably wider at its bottom than at its top, Fig. 3, and starts at 3, winding around the center 4 and back around itself to the point 5, where it turns upon itself and follows the periphery of the base and ends at 6. The division 7, between the two ends 3 and 6 of the coil, is also wider at its bottom than at its top, Fig. 3, and extends from points 8 to 9.

Within the channel or coil 2 I place a mixture or compound of current-resisting material 2′, preferably a mixture of graphite and some inert non-conducting non-combustible material, such as mineral wool or asbestos, and in the division 7 I place a mixture or compound of the same materials, 7′, but having a smaller percentage of graphite, thereby rendering the mixture in the division capable of a higher resistance.

Over the top of the base and coil I provide a lid 10 and a central bolt 11 for securing the

same in position. For office use and analogous purposes the lid may be perforated to give off the heat more freely, if desired.

In the vertical wall or on the periphery 11' of the base I provide a series of openings or perforations 12, extending into the coil, and in each of said openings I insert a metallic electrode 13, Fig. 5, having a barrel 14 and a head 15, the head entering the resistance-coil, as shown in Fig. 4, so as to provide for a greater contact with resistance material. Over these electrodes at both ends of the resistance-coil I provide a hood or metallic cover 16, secured in place by a bolt 17 or by any other suitable means, the purposes of this construction being to press or bind the resistance material more firmly against the metallic electrodes 13 in order to make a good connection at these points.

The connecting-plugs 18 from the battery 19 or from any suitable electric generator enter the barrels 14 of the metallic electrodes 13, as do also the connecting-plugs 20 of the electrodes 21, the positions of which for the various uses of the device will be now described.

Referring to Fig. 1, it will be seen that the plugs 18 on the wires from the electric generator are placed in the metallic electrodes, (designated by A and D.) Referring to Fig. 2, it will be seen that these are at the two ends of the resistance-coil. The current must therefore pass entirely through the resistance-coil in order to make the circuit, and on account of the resistance the current is transformed into heat, which diffuses itself throughout the entire base and effectually heats the same, the amount of heat obtained depending upon the strength of the current and the quality of the resistance material. The device having been sufficiently heated, the plugs 18 can be withdrawn and the cover 22 drawn over the heater, when the same is ready for use, actual experiments showing the heater to give out heat for a period of four hours, for the reason that both the resistance material and the base itself diffuse heat very slowly, retaining the same for quite a period of time.

Referring to Fig. 6, it will be seen that the plugs 20 of the electrodes 21 are placed in the electrodes designated by Nos. 1 and 4, while one of the plugs is shown in dotted lines at the point 10 and may also be placed at the points indicating twenty or thirty volts when a stronger current is desired. The closer the plug is brought to the point A the stronger the current, as the more resistance is cut out. In this instance the heater is being used as a battery while the device is being heated, and the electrodes, which are illustrated as sponges, are dampened and placed to affected parts, the same as sponge electrodes are usually employed.

Referring now to Fig. 7, which illustrates the device acting as a battery only without being heated, it will be seen that the electric-generator plugs 18 are at the points A and B, and reference to Fig. 2 shows the point A to be one end of the resistance-coil, while the point B is one end of the division 7 between the ends of the resistance-coil. It will also be seen that the plugs 20 of the electrodes 21 are at C and D, C being the other end of the division 7, while D is the other end of the resistance-coil. An examination of these connections shows the current from the generator to enter at B, pass through the resisting material in the division 7, out at 6, and into the resistance-coil at D, the current having been used before entering the resistance-coil, where it passes out again at A, thus making a circuit.

In the illustrations I show only sponge electrodes; but of course I wish it understood that I intend to employ also the usual metallic electrodes and a small electric light and cauterizing device as other attachments, the light being for the purpose of making minute examination of the throat or for any analogous purposes, the strength of the current for these connections being controllable at will by moving the plugs to cut in or out the resistance-coil, the latitude of which is from one to thirty.

Having thus set forth my invention, I do not wish to be understood as limiting myself to the exact construction herein set forth nor of course to the precise uses herein described, as I have not gone into detail in this latter regard, but only so far as to convey a clear and lucid idea of the construction and objects of my invention. As a matter of fact, the device may be used for any and all purposes wherein a medical battery is employed, and the heater is capable of adaptation to all the many and varied uses to which a heater may be put.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In an electric heater, the combination of a non-conducting base, a resistance-coil channel in said base, said channel being wider at its bottom than at its top, openings in said base, and suitable electrodes inserted therein, a suitable current-resisting material within said resistance-channel, and in contact with said electrodes.

2. In an electric heater, the combination of a non-conducting base, a resistance-coil channel in said base, openings in said base extending from the outside thereof into the said channel, suitable electrodes in said openings, a suitable current-resisting material in said channel, and hoods or covers over the points of contact of said electrodes with the said current-resisting material.

3. In an electric heater, the combination of a non-conducting base, a resistance-coil channel in said base, electrodes in said base, and

a suitable current-resisting material in said channel in contact with said electrodes, a division-channel in said base between said resistance-coil channel, and a suitable current-resisting material in said division-channel, said latter material having a greater current-resisting power than the material in said resistance-coil.

4. In an electric heater the combination of a non-conducting base having a resistance-coil channel and a division-channel between the ends of said resistance-coil channel, said channels being wider at their bottoms than at their tops, suitable current-resisting material in said channels and electrodes in contact with said current-resisting material in said channels.

In testimony whereof I affix my signature in presence of two witnesses.

JESSE R. DAVIS.

Witnesses:
JAS. F. HAYS,
JAS. S. WADE.