

1,144,981.

Patented June 29, 1915.

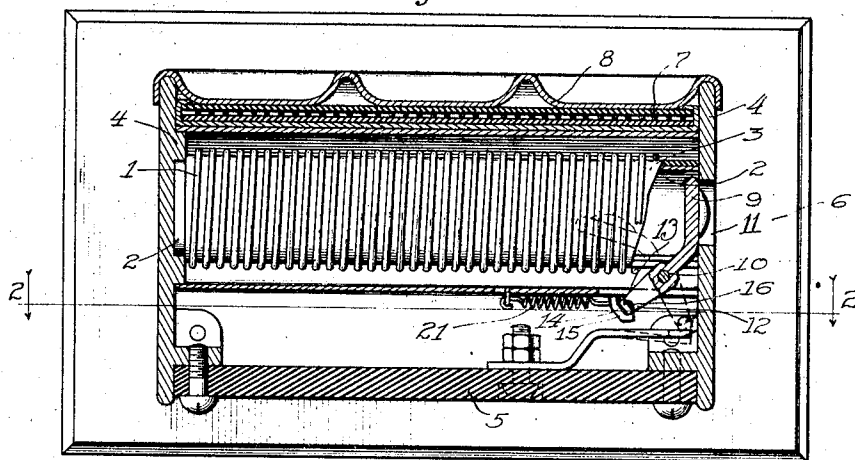
 $\overrightarrow{I\tilde{u}g}.1.$ 

Fig. 2.

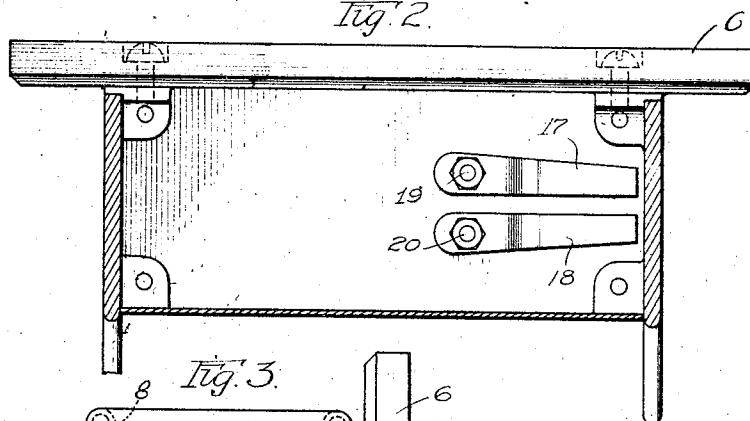


Fig. 3.

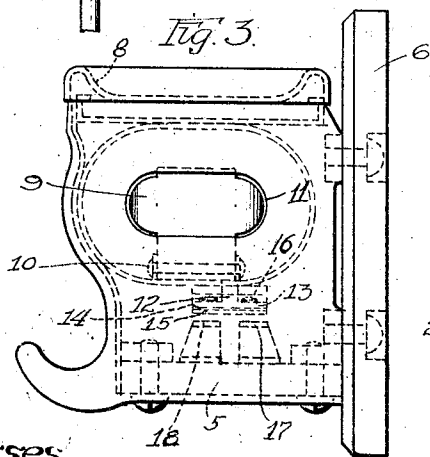
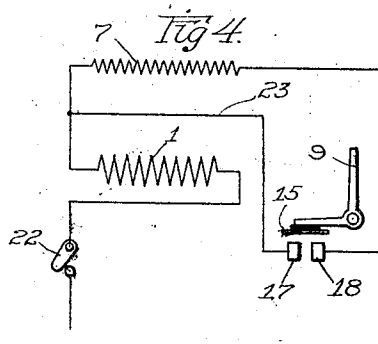


Fig 4.



Witnesses:

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Inventor

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UNITED STATES PATENT OFFICE.

EDWIN N. LIGHTFOOT, OF NEW YORK, N. Y.

ELECTRIC HEATER.

1,144,981.

Specification of Letters Patent. Patented June 29, 1915.

Application filed November 18, 1911. Serial No. 661,161.

To all whom it may concern:

Be it known that I, EDWIN N. LIGHTFOOT, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Electric Heaters, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to electric heaters.

One of the objects of the invention is to provide an improved electric heater in which the circuit connections of the heating coils are changed by insertion of an object to be heated into the heater.

Another object is to provide an improved means for controlling the circuit connections of the heating coils by the insertion of an object to be heated into the heater.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawings illustrate an embodiment of the invention.

In the views of these drawings:—Figure 1 shows a partial longitudinal sectional view of a heater. Fig. 2 shows a sectional view on line 2—2 of Fig. 1. Fig. 3 shows an end elevation of the heater. Fig. 4 shows a diagram of one form of circuit connections.

In the construction shown, I have illustrated a heater of the type known as a combined curling iron and grease paint heater, described in an application of Harry W. Denhard, Serial No. 651,813, filed Oct. 31, 1911. As in the construction shown in that application, I preferably provide a heating coil 1 which is wound about a central sleeve 2 and insulated therefrom by a suitable sheet of insulation 3, the sleeve and coil being carried in a substantially closed chamber between the end members 4 of a suitable frame, preferably provided with a bottom plate 5. The frame 4 is preferably carried upon a suitable base 6. Above the heating coil 1 a second heating coil or unit 7 is preferably provided, being suitably carried between the end members 4, and above this coil or unit 7 suitable grease pans 8 are preferably mounted. The construction of this portion of the heater, however, forms no part of my invention and is the invention of Harry W. Denhard and described in his application heretofore referred to. Various other forms of construction may be used if desired.

In a preferred form, I provide a door 9 pivoted at 10 in the frame and arranged to normally close an opening 11 in one of the end members 4 which leads in to the interior of the heating chamber in the sleeve 2. In the form shown, this door is movable about its pivot within the interior of the tube and when the object to be heated is inserted in the sleeve, the door is thrown back to the dotted line position shown in Fig. 1. By preference, I provide the lower end of the door with an extension 12 having lugs or other projections 13 on its end which extend substantially at right angles on opposite sides of the body of the extension (see Fig. 3). In a preferred form, the extension 12 is located near one of the ends of the pivot pin 10 as shown in Fig. 3. The projections or lugs 13 preferably carry a suitable sheet of insulation 14 and on the opposite side of said sheet of insulation are preferably provided with a conducting strip 15 which extends across the bottom of the lugs 13 as shown in Fig. 3. These conducting strips may be attached to the studs 13 by any suitable means as, for instance, by screws 16, and these screws are preferably suitably insulated from the studs.

Upon the bottom plate 5 is preferably seated a plurality of resilient conducting strips 17 and 18 which are attached to the bottom plate by means of suitable screws, bolts or other devices 19 and 20. By preference, these resilient members are bent slightly upward intermediate their ends as shown in Fig. 1, their free ends normally extending in a plane substantially parallel with the plane of the bottom plate 5. When an object to be heated is inserted in the sleeve 2, the door 9 is thrown back about its pivot 10 until the conducting strip 15 bridges the two resilient contacts 17 and 18. Conversely when the article to be heated is removed from the heating chamber, the door 9 is thrown forward about its pivot by the resilient action of the contacts and returned to its normal position closing the opening to the heating chamber. If desired, I may provide an additional coiled spring 21 for returning the door which has one end attached to the extension 12 and the other fixed to the frame.

In Fig. 4 I have illustrated diagrammatically one form of circuit connections which I preferably employ. These circuit connections may be controlled by a switch

mechanism of the type just described. Obviously, however, various other forms of switch mechanism may be employed to produce the results which I obtain by my improved arrangement of circuit connections. As shown in Fig. 4, the heating coils 1 and 7 are arranged in series with the line when the movable contact member 15 is in open circuit position. In a preferred form the coil 7 is so constructed as to have a higher resistance than the coil 1. With the coils in series as shown in Fig. 4, the current flows successively through the same upon the closure of a suitable line switch 22 of any desired type.

When the coils are in series the total resistance in the circuit is high and a relatively small current flows. The high resistance coil 7 develops a greater percentage of heat than the coil 1 and consequently the grease paint heater is operative with the coils in series. Ordinarily the current which flows when the coils are in series is not sufficient to cause the coil 1 to generate enough heat to heat a curling iron. To meet this condition, I provide a shunt including a conductor 23 around the grease paint heater and locate the switch mechanism in this shunt so that it will make and break the same. Thus when the curling iron is inserted in the heating chamber, the shunt around the grease paint heater or coil 7 is closed and this coil is short circuited, permitting a greater amount of current to flow through the coil 1 of the curling iron heater to provide the requisite amount of heat.

By my improved circuit connections and my improved construction, I have provided an electric heating device wherein the heat is distributed in the required proportion to the object to be heated. By short circuiting the grease paint coil, I am able to concentrate the heat in the curling iron coil and thus more quickly bring the curling iron to the desired temperature. At the same time that the curling iron coil is supplied with the maximum current, the heat developed by this coil is radiated upward to the grease paint heater which is located above the same so that the grease paint pan is kept at the proper temperature. When it is desired to remove the curling iron, the original circuit connections are restored and the grease paint heater is again thrown in series with the curling iron heater, the effect being to cut down the amount of energy absorbed by the curling iron coil and supply energy to the grease paint coil. If at any time it is desired to throw both of the coils out of circuit all that it is necessary to do is to open the line switch. By my improved arrangement of circuit connections, I am able to increase the efficiency of the heating coils and to distribute the heat more nearly in the proportion required. Further, by my im-

proved construction of switch mechanism, I am able to provide an extremely simple and rugged construction including a small number of parts of a type well adapted to withstand long service and to be manufactured at small expense. Further, by my improved construction, I am able to arrange the switch parts very compactly so that they occupy but little space.

While I have in this application described one form which my invention may assume in practice, I do not wish to be limited to the specific form shown for purposes of illustration, but wish rather to include within the scope of this application all of those forms of my invention which fall within its spirit.

What I claim as new and desire to secure by Letters Patent is:—

1. In an electric heating device, a plurality of heating coils normally simultaneously in circuit and means actuated by the placement of the object to be heated within the heating zone for short circuiting one of said coils.

2. In an electric heating device, a plurality of heating coils of different resistance normally simultaneously in circuit, and means actuated by the placement of the object to be heated within the heating zone for short circuiting certain of said coils.

3. In an electric heating device, a plurality of heating coils of different resistance simultaneously in circuit, and means actuated by an object to be heated for short circuiting certain of said coils having a higher resistance.

4. In an electric heating device, a plurality of coils simultaneously in circuit, one of said coils being arranged to form a chamber, a door for said chamber, and means for short circuiting one of said coils upon movement of said door.

5. In an electric heating device, a plurality of heating coils in series, one of said coils being arranged to form a chamber, a door for said chamber, and means actuated by said door for short circuiting one of said coils.

6. In an electric heating device, a plurality of heating coils of different resistance in series, one of said coils being arranged to form a chamber, a door for said chamber, and means controlled by movement of said door for short circuiting the coil of higher resistance.

7. In an electric heating device, a plurality of heating coils of different resistance arranged in series, one of said coils forming a chamber, a door for said chamber, and a plurality of resilient contacts bridged upon movement of said door to short circuit one of said coils.

8. In an electric heating device, a plurality of heating coils of different resistance

adapted to be simultaneously in circuit, one of said coils being arranged to form a chamber, a door for said chamber, and means controlled by movement of said door for short circuiting the coil of higher resistance, said means serving to hold said door normally closed.

9. In an electric heating device, a plurality of heating coils of different resistance arranged in series, one of said coils being arranged to receive an object to be heated, a plurality of objects heated thereby, a frame in which said coils are carried, and means actuated upon the movement of one of the objects to be heated for short circuiting one of said coils.

10. An electric heater having a heating chamber adapted to receive an object to be heated, a movable element mounted adjacent the open end of the chamber and normally biased to obstruct the entrance of the object to be heated, means carried by said element for closing a circuit, said element being adapted to be moved by the object as it is inserted whereby the circuit is closed by the insertion of the object into the heating chamber.

11. An electric heater having a heating chamber adapted to receive an object to be

heated, a door pivoted adjacent one end of said chamber normally biased to obstruct the entrance of an object to be heated, means carried by said door for completing an electric circuit, said door being adapted to be moved by the object as it is inserted whereby the circuit is closed by the insertion of the object into the heating chamber.

12. An electric heater having a heating chamber adapted to receive an object to be heated, a plurality of contacts mounted adjacent one end of said chamber, a door pivoted adjacent the same end of the chamber, conducting means carried by said door adapted to engage said contacts, a spring for biasing said door to normally obstruct the entrance of an object into the heating chamber, said door being adapted to be moved by the object as it is inserted whereby the conducting means coöperates with the contacts to complete an electric circuit by insertion of the object into the heating chamber.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

EDWIN N. LIGHTFOOT.

Witnesses:

W. D. HADAWAY,
GEORGE J. MALLON.

Corrections in Letters Patent No. 1,144,981.

It is hereby certified that in Letters Patent No. 1,144,981, granted June 29, 1915, upon the application of Edwin N. Lightfoot, of New York, N. Y., for an improvement in "Electric Heaters," errors appear in the printed specification requiring correction as follows: Page 1, line 81, for the word "studs" read *lugs*; page 2, line 53, first column, for the word "pain" read *paint*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office

Signed and sealed this 27th day of July, A. D., 1915.

[SEAL.]

R. F. WHITEHEAD,
Acting Commissioner of Patents.