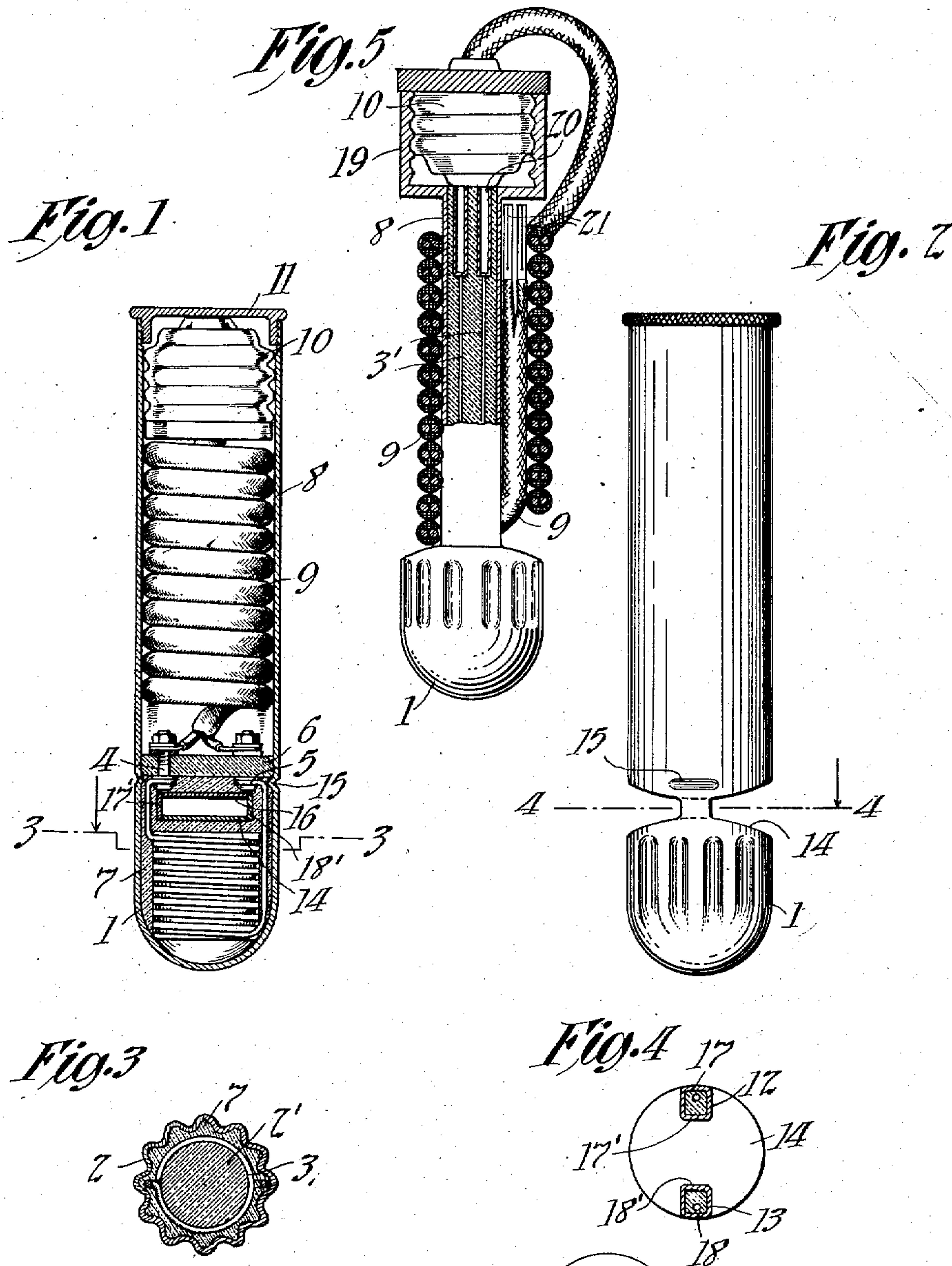


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 PORTABLE ELECTRIC HEATER.  
 APPLICATION FILED MAY 25, 1909.

969,849.

Patented Sept. 13, 1910.



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# UNITED STATES PATENT OFFICE.

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## PORTABLE ELECTRIC HEATER.

969,849.

Specification of Letters Patent. Patented Sept. 13, 1910.

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*To all whom it may concern:*

Be it known that I, FRANK L. DYER, a citizen of the United States, and a resident of Montclair, in the county of Essex and State of New Jersey, have made a certain new and useful Invention in Portable Electric Heaters, of which the following is a description.

My invention relates to electric heaters, and my object is to provide a simple, compact and efficient device which may be easily carried about in one's pocket or with one's belongings, and easily connected to any suitable source of electric current when it is desired to heat water or any desired substance.

Other objects of my invention reside in the construction of parts and combinations of elements as will be described in the following specification and more particularly pointed out in the appended claims.

Referring to the accompanying drawings, in which the same reference characters are used throughout to denote corresponding parts, Figure 1 represents a central vertical section through a form of my device, the lamp plug, connecting cord and heating coil being shown in elevation; Fig. 2 represents a side elevation of the same; Fig. 3 represents a horizontal section on line 3-3 of Fig. 1; Fig. 4 represents a cross section on line 4-4 of Fig. 2 looking downwardly in the direction of the arrow, and Fig. 5 represents a modification, partly in vertical section and partly in elevation.

Referring to the drawings, the heater 1 is formed with a convoluted or fluted surface 2 for the purpose of providing as extensive a heat radiating surface as possible. This heater 1 is hollow and in the process of manufacture, the core 2' having the heating coil 3 wrapped about the same is inserted therein. The ends of the heating coil 3 extend upwardly and are connected to the binding posts 4 and 5, which are mounted in the insulating plate 6. The insulating material 7 is then secured in position about and above the coil 3 to fill all the lateral space between the coil and the inner surface of the heater 1 to effectively insulate the convolutions of the coil 3 from each other electrically, a substance being used, however, which will not interfere with the conduction of heat generated in the coil 3 to the body

of the heater 1. The coil 3 is of such a material and so constructed as to have a high resistance and rapidly generate a considerable amount of heat on the passage of an electric current therethrough.

The body 1 of the heater is preferably of metal and is a good conductor of heat.

The hollow tubular casing 8 is provided axially in line with the heater 1 for containing the electric connection 9 and the plug 10 attached to the end thereof when the device is not in use. The connection 9 is in the form of a flexible cord, which may be coiled up within the tubular casing 8 when not in use, and which may be extended therefrom to allow the plug 10 to be inserted within a convenient lamp socket or similar source of current. The lower end of the cord 9 is attached to the binding posts 4 and 5 on the upper side of plate 6. The cap 11 may be provided and screw threaded into engagement with the upper end of tubular casing 8 for closing the upper end thereof. This cap may be provided with a knurled edge, as shown, for convenience in screwing or unscrewing the same.

As shown, the heater body 1 and casing 8 are one integral structure, the heater 1, however, being connected to casing 8 at several separated points only, whereby the upper surface of heater 1 is effective for the radiation of heat as well as the other surfaces of said heater. As shown, the connection between the heater and the hollow casing 8 may take the form of two metal conduits 12 and 13 at diametrically opposite points, the ends of the heating coil 3 extending through these conduits in their passage to the binding posts 4 and 5.

In assembling the device, the coil 3 mounted on core 2' is first inserted through the upper end of casing 8 and the electric insulating material 7 inserted in position between the same and the bore of the heater. The conduits 12 and 13 may then be formed with the upper ends of the coil extending upwardly through the same. In forming the blank for the shell of the device, the metal may be cut away to separate the heater from the casing 8, metal being left, however, for the necks 17 and 18 as shown at opposite points, with additional metal on each side of the necks 17 and 18. This addi-



tional metal may be cut loose to form flaps, and the latter bent inwardly and brazed or otherwise secured together at the ends to form the conduits 12 and 13, the inner sides of which are shown in the drawings as 17' and 18'. More of the insulating material 7 is then placed above the coil 3 and the metal plate 14 placed in position above that and brazed or otherwise secured in position to close the upper end of the heater 3 and furnish the upper heat radiating surface, the said plate 14 fitting around the conduits 12 and 13. These conduits 12 and 13 are then filled with insulating material around the conducting wire extending therethrough, and the insulating plate 6 carrying binding posts 4 and 5 to which the ends of cord 9 are connected, lowered into position. The outer surface of tube 8 is provided with an inwardly directed shoulder 15 upon which the plate 6 is adapted to rest. In assembling the device, the plate 16 which is similar in shape to plate 14 is then secured in position to close the lower end of tube 8, insulating material being first secured in position to fill the recesses between the upper surface of plate 16 and the lower surface of plate 6. The cord 9 having plug 10 connected thereto may then be coiled within the tube 8 and cap 11 secured in place.

When it is desired to use the device, the plug 10 may be inserted in the lamp socket, the connection 9 extended and the heater placed in a vessel of water or any other substance which it is desired to quickly heat.

In the modification shown in Fig. 5, the hollow chamber 8 in which the coil 9 has been described as coiled is dispensed with, the coil in this case being wrapped for convenience around the outside of the device when not in use. As shown, the tube 8' is formed with the hollow head 19 at its upper end, in which the plug 10 may be placed for convenience when the device is out of use, the plug being illustrated as inserted into the head with the end thereof which screws into a lamp socket directed downwardly, and given several turns in engagement with the threaded bore of the head 19 to secure it firmly in place. The connections 3' from the heating coil 3 are brought up through the bore of the tube 8, and at their upper ends are attached to the closed lower ends of short tubes or sockets 20, preferably of copper, the upper ends of which open into the head 19. The space surrounding the wires 3', or conduits in which they may be placed, and the copper sockets 20, is filled with insulating material. The cable 9 carrying the two necessary wire connections is connected at one end to plug 10 and is wrapped around the outside of tube 8', the cable ending in jacks 21, to each of which one of the wires in the cable 9 is connected.

When it is desired to use this apparatus, the plug 10 is unscrewed from its container 19 and screwed into a lamp socket, and the jacks 21 stuck into the sockets 20, thus completing the circuit for the heating coil 3.

In both forms of the heater, all surfaces are preferably smooth and polished, so that they may be readily cleaned, and the device rendered sanitary when used for heating broths, milk or the like.

It is obvious that various changes may be made in my device without departing from the spirit of the invention.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:

1. In a portable heater, the combination of a heater, a heating coil within said heater, a plug and connections between and joined to the same and said coil, and a chamber for inclosing said plug and connections when not in use integral with said heater, substantially as described.

2. In a portable heater, the combination of a casing, a plug inclosed within and electric connections therefrom coiled within said casing and adapted to be extended therefrom, a heater secured to said casing having a heat radiating extended surface and a heating coil secured within said heater and joined to said connections, substantially as described.

3. In a portable heater, the combination of a casing, electric connections coiled within said casing and adapted to be extended therefrom, a heater secured to said casing at several separated points only having a curved heat radiating extended surface almost entirely surrounding the same, and a heating coil secured within said heater and joined to said connections, substantially as described.

4. In a portable heater, the combination of a tubular casing, a plug and electric connections inclosed within said casing and adapted to be extended therefrom, a heater axially in line with said casing and secured thereto at several separated points only, and having a curved heat radiating surface surrounding the same except at the points of attachment, and a heating coil secured within said heater and joined to said connections, substantially as described.

5. In a portable heater, the combination of a closed hollow heater body having a polished heat-radiating surface, a heating coil within said body, a flexible connection joined to said coil and extending from said body, and means for retaining the connection in compact form when not in use secured to said body and axially in line therewith, substantially as described.

6. In a portable heater, the combination of a heater, a heating coil within the same,

a plug and connections therefrom joined to said coil, and means for retaining said plug and connections in compact form when not in use, comprising an elongated body and  
5 an inclosure for said plug, secured to and axially in line with said heater, substantially as described.

This specification signed and witnessed  
this 24 day of May 1909.

FRANK L. DYER.

Witnesses:

DYER SMITH,  
JOHN M. CANFIELD.