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2,488,964

HEATING UNIT

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Fig. 1.

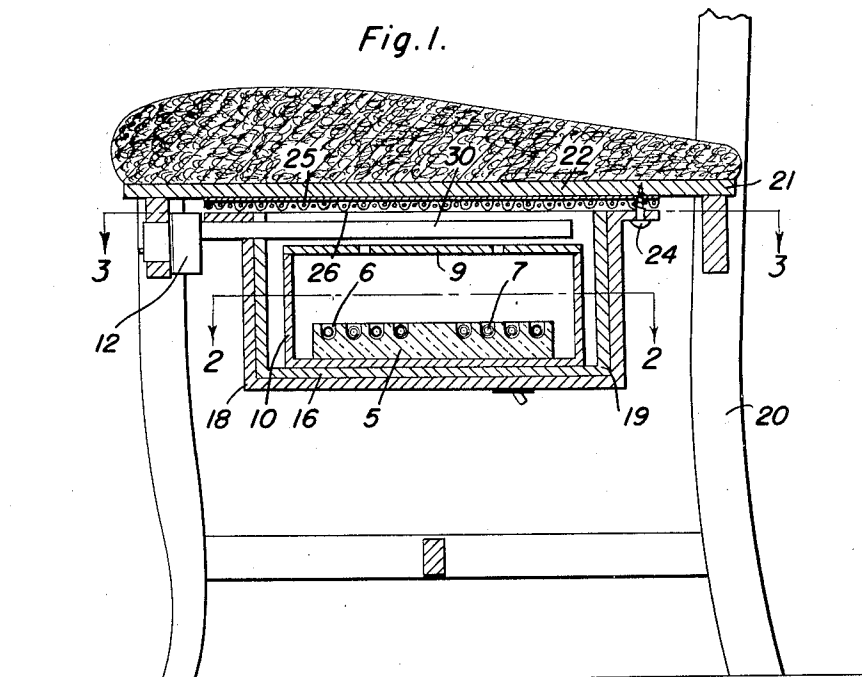


Fig. 2.

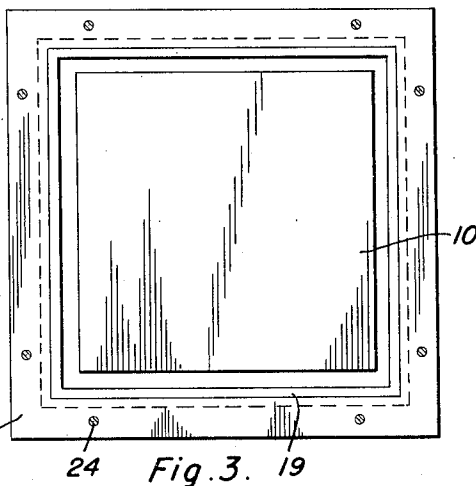
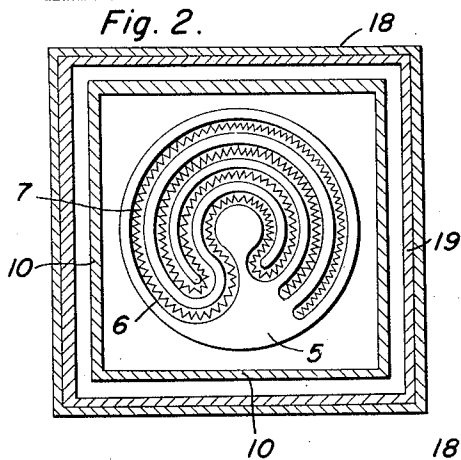


Fig. 3.

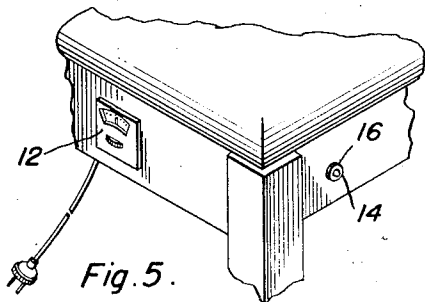


Fig. 5.

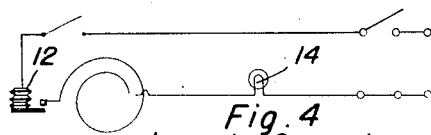


Fig. 4
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UNITED STATES PATENT OFFICE

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HEATING UNIT

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Application March 22, 1948, Serial No. 16,181

2 Claims. (Cl. 219—19)

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This invention relates to electric heating units adapted to supply heat over protracted periods and it has for its main object a unit with a relatively short heating or warming up period, which gives off or radiates slowly limited quantities of heat over a relatively long period and which may therefore be used as a source of heat for persons having to stay outdoors at low temperatures for long periods or for therapeutic purposes.

Units according to the invention are of limited weight and bulk and are therefore portable, so that they may be taken along by the persons intending to use them. When the heat has been spent the unit may be recharged at any outlet the time necessary for doing so being not sufficiently long to cause discomfort to the exposed person.

Essentially, according to the invention the unit consists of a heater, completely enclosed by a copper box which is surrounded by and enclosed within a box of insulating material. The latter is preferably provided with a wall section of a limited heat absorbing and heat transmitting capacity, which transmits the heat generated and radiated by the copper box to the outside and to the person to be protected, or to be treated. The outside box may also surround said heat absorbing surface and may be provided with holes through which the person desirous of protection may insert hand or feet.

A further feature of the invention consists in providing a thermostatic switch with the thermostat arranged on or near the surface transmitting heat or on or near the copper box, which switch automatically turns the current off when the desired temperature of the box has been reached and which turns the current on when the temperature drops below a predetermined limit below said desired temperature. If the limit is set appropriately the box or the heat transmitting surface may be maintained at an approximately constant temperature if used for therapeutic purposes and if permanently connected with a source of current. A pilot light included in the circuit may indicate the condition of the heater to the user.

The invention is illustrated in the accompanying drawings showing one modification and application thereof. It is however to be understood that the embodiment shown represents merely an example permitting to explain the principle of the invention and the best mode of applying it; it is not to be considered as the sole embodiment and application of the invention, as will be clear from the following specification and modifications and further applications of the same are therefore not necessarily a departure from the invention.

In the drawings:

Figure 1 is an elevational sectional view of

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one modification of the invention as applied to the unit serving to emit heat in the vicinity of a chair.

Figure 2 is a sectional plan view through the box unit, the section being taken along the line 2—2 of Figure 1.

Figure 3 is a plan view of the box unit when detached as indicated by line 3—3 of Figure 1.

Figure 4 is a diagram.

Figure 5, is a perspective view of a portion of the rail of the chair showing the location of the switch and of the pilot light.

The radiating heating unit according to the invention essentially consists of a box preferably of copper surrounding a heating element and enclosed within an outer insulating container or box which may be provided with openings for the hands or feet of a person to be protected against the cold or treated therapeutically for example. Alternatively the box as shown in Figure 1 may also be mounted under a chair, in such a manner that it radiates heat towards a person to be protected against cold.

Units of this type are primarily useful in providing protection against discomfort for persons having to stay out of doors and exposed to the cold without being able to move around sufficiently.

The unit according to the invention comprises the heater 5 which consists of a porcelain body with grooves 6 in which the coiled heating element 7 is laid out as usual. This heater is mounted within a copper box 10, which is completely closed by means of a lid 9 through which access may be had to the heating element, if necessary. The heating element 7 is connected with a thermostatic switch 12 and with a pilot lamp 14. Both may be enclosed within the copper box 10 but preferably as shown in Figure 5, the pilot lamp 14 is mounted in a socket 16 provided behind the rail of the seat and is visible outwardly through a hole.

The copper box is enclosed within a fiber box 18 which is provided with an insulation 19 of asbestos. The outer side of the copper box and the inside of the fiber box are both provided with a dull black finish. The box may be fixed to the seat 21 of a chair 20 as shown in the figure. In this case the seat is to be warmed sufficiently but must be kept from being overheated. The top of the box 18 is therefore formed by asbestos paper 25 and by a copper screen 26 consisting of reticulated copper wire which may be fixed to the wooden seat 22 of the chair together with the fiber box itself by means of appropriate screws 24.

The same type of construction may for instance be used where a platform for a standing person is to be provided. The thermostatic element 30 of the switch 12 may extend rearwardly as shown in Figure 1 so as to be exposed to the

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heat radiated by the box. The switch 12 will then operate in conformity with the temperature of the radiation.

The main purpose of the unit is to provide a dark heat radiation emanating from the copper box which slowly and over protracted periods gives off the heat which has been generated within a relatively short time. In fact experiments have shown that a sufficient amount of heat to keep a person comfortable in cold weather is radiated from the box about one and one-half hours after the current was switched off from the heater. The heating period on the other hand did not as a rule extend over ten minutes with the same unit.

Another purpose of the box is to keep an object or a part of a human body inserted in or into the fiber box at a constant temperature.

The radiating box may be carried along in its heated state and may serve its purpose at the place at which the person using it takes his stand. The heating period moreover is so short that from time to time the box may be sent or carried to a place where an outlet permits to heat up the heating element and to recharge the unit the period of heating being short enough to permit the person using the box to do without it without great inconvenience. The thermostatic switch 12 automatically cuts out the current when the maximum heat obtainable has been absorbed and further heating becomes unnecessary. The duration of the heating or charging period is observed by means of the pilot lamp.

As above stated the application of the invention may vary and it may be used for therapeutical or other purposes as well. Likewise it will be clear that the construction and shape will vary with this purpose.

Having described the invention, what is claimed as new is:

1. An electric heating unit adapted for heat storage and supplied by an electric heater, comprising a heating element, means for supplying the heating element with current, including a

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heating circuit, a copper box forming a completely closed chamber enclosing an air space and also enclosing and surrounding said heating element, a fibre box lined with asbestos and enclosing an air space and said copper box, said fibre box having a heat absorbing wall with limited heat transmission consisting of asbestos paper and a copper screen, and a thermostatic element, with a switch included in said heating circuit, said thermostatic element having its heat responsive element arranged between said copper box and the wall with limited heat transmission.

2. A chair seat heater adapted to supply a chair seat with stored heat comprising a closed fibre box lined with asbestos adapted to be placed below the chair seat, a cover for said box, adapted to be applied against said seat, consisting of asbestos paper and a copper screen, transmitting heat slowly from said box, a completely closed copper box forming a chamber arranged within said closed fibre box with an air space between the said copper box and the said fibre box walls and cover, an electric heating element consisting of a coiled wire embedded within the insulator within the said copper box, occupying a fraction of the air space enclosed by said box, means to supply said heating element with current, and a thermostatic switch with a heat responsive element, inserted between the fibre box cover and the copper box, said switch controlling the flow of supply current to the heating element.

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