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ELECTRICAL HEATING APPARATUS

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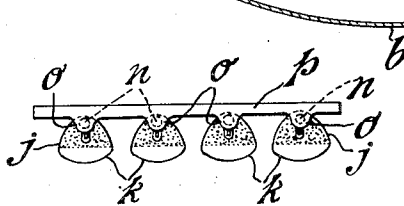
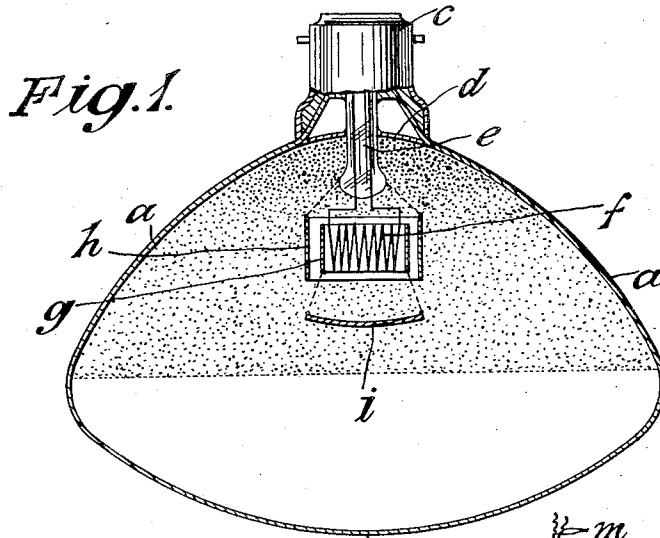


Fig. 5.

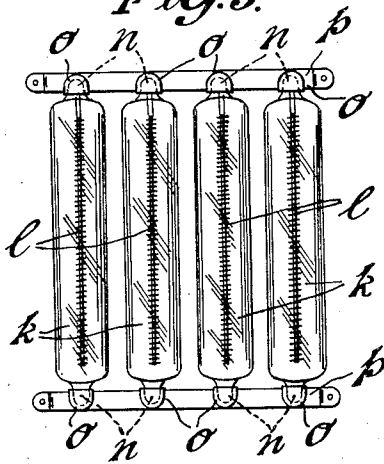


Fig. 4.

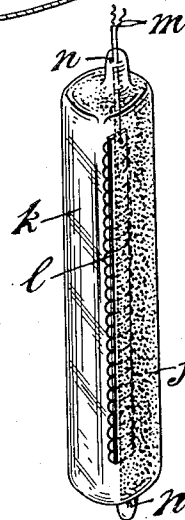


Fig. 2.

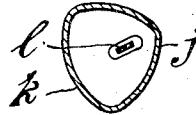


Fig. 3.

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ELECTRICAL HEATING APPARATUS

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3 Claims. (Cl. 219—34)

This invention relates to electrical heating apparatus preferably, but not essentially of the low temperature type.

In the conventional forms of electrical low temperature heating apparatus the resistance element is either exposed to the atmosphere or else embedded in asbestos or other suitable substance, a sufficiently large area of heating surface being obtained by making the same in the form of panels for application to the walls and/or ceilings of the house or other structure to be heated. Such methods of heating are very inefficient on account of the losses by convection necessitating a large area of heating surface and a heavy consumption of current. A further disadvantage in the case of panel heating is that the same is non-directional, the rays of heat spreading in all directions.

One of the objects of the present invention is to provide a heating apparatus employing radiant heat in which the rays are concentrated so as to be capable of being usefully directed and in which losses by convection are reduced to the minimum.

Broadly the present invention consists of an electrical heating unit for the directional transmission of radiant heat comprising, in combination, an evacuated casing, one side of which forms a parabolic reflector, a relatively large body disposed at the focal point or line of the reflector for emitting radiant heat onto the reflector for directional transmission into the atmosphere and a resistance disposed in suitable relationship to the radiant heat emitting body so that when said resistance is heated electrically it effects the heating of the said heat emitting body.

A heating apparatus may comprise one or more of the units according to this invention and where more than one are employed they may be connected so as to be in parallel in the electrical circuit.

In order that the invention may be clearly understood and carried into effect two forms of heating unit will now be described by aid of the accompanying drawing in which:—

Fig. 1 is a sectional elevation of the first or bulb form of unit according to this invention.

Fig. 2 is a perspective view of the second or tubular form of unit according to the invention.

Fig. 3 is a cross sectional view of the unit shown in Fig. 2.

Figs. 4 and 5 are an elevation and plan view respectively showing one manner of assembling a number of tubular units in parallel whereby the combined heat rays may be directed in concentrated form in any required direction.

The unit illustrated in Fig. 1 comprises an evacuated glass bulb which is circular in cross section and so shaped that the upper portion *a* forms a parabola. The interior or exterior surface of this parabolic portion is silvered or otherwise rendered reflective whilst the lower portion *b* is left clear.

Normally the continuity of the reflective surface would be broken where the bulb is fitted into the cap *c*. To avoid this the opening thus formed may be closed by a separate piece *d* which is shaped to complete the continuity of the parabola. This separate piece *d* may either be of glass silvered internally or externally or the same may be of metal or other suitable material. In the arrangement shown this piece *d* is formed integrally with or otherwise supported by the pinch *e*.

The heater element or resistance in the example shown in Fig. 1 is in the form of a ring and comprises a length of wire bent to form convolutions *f* and bedding against the interior surface of a tube or ring of asbestos or other suitable refractory material, the whole being situated so as to surround the focal point of the parabolic reflector. By this means the greater portion of the heat rays are directed outwards by the reflector in a controlled direction.

In the present example the refractory tube or ring *g* is surrounded in spaced relationship by a further ring *h* of iron or other suitable material which is blackened so as to increase the heat emanation when the same becomes heated by the element *f*. To prevent loss from non-reflected heat rays, a small or subsidiary reflector *i* may be provided, such subsidiary reflector being suspended in any suitable manner so as to obstruct the direct passage of rays downwards from the element and cause the same to be reflected back to the main reflector.

The iron ring *h* and the subsidiary reflector *i* are however not essential and may, if desired, be dispensed with. The iron ring *h* is usually only provided where a high temperature resistance is employed.

In the example illustrated in Fig. 2 a tubular form of glass casing is employed but here again it is so shaped as to have one side *j* in the form of an elongated parabola and made suitably reflective and the opposite side *k* left clear.

In this form an elongated element is used, the same consisting of a length of resistance wire wound spirally around a narrow strip *l* of refractory material, the whole having a comparatively large superficial area. This element is placed at

the focal line of the reflecting surface with its narrow edge opposing said surface.

The leads *m* from the resistance element may either both be brought out at one end of the tubular casing as shown in Fig. 2 or one lead may come out at one end and the other at the opposite end.

In the form shown the casing is formed with pintles *n* at each end and one or both of these may be provided with metal caps or terminals so as to fit into and make contact with opposing sockets *o* carried by parallel frames *p* one or both of which may constitute common conductors for the current, the same being suitably insulated for the purpose. By this means a plurality of units may be arranged parallel to each other and by suitably swivelling the same the resistances may be so arranged in relation to each other as to result in the combined rays being directed in concentrated form in any direction required.

I claim:

1. An electrical heating unit for the directional transmission of radiant heat comprising, in combination, an evacuated casing one side of which forms a parabolic reflector, a relatively large open ended tubular iron body surrounding the focal point of the reflector for emitting radiant heat of low temperature onto the reflector for directional transmission into the atmosphere and a resistance disposed within said tubular radiant heat emitting body so that when said resistance

is heated electrically it effects the heating of said heat emitting body, and a subsidiary reflector associated with the heat emitting body and disposed forwardly thereof.

2. An electrical heating unit for the directional transmission of radiant heat comprising, in combination, an evacuated casing one side of which forms a parabolic reflector, a relatively large open ended tubular iron body surrounding the focal point of the reflector for emitting radiant heat of low temperature onto the reflector for directional transmission into the atmosphere and a resistance disposed within said tubular radiant heat emitting body so that when said resistance is heated electrically it effects the heating of said heat emitting body.

3. An electrical heating unit for the directional transmission of radiant heat comprising, in combination, an evacuated casing one side of which forms a parabolic reflector, a relatively large open ended tubular iron body surrounding the focal point of the reflector for emitting radiant heat of low temperature onto the reflector for directional transmission into the atmosphere and a resistance wound into the form of a tube disposed within said tubular radiant heat emitting body so that when said resistance is heated electrically it effects the heating of the said heat emitting body.

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