

Feb. 1, 1949.

W. A. ELLIS

2,460,625

BASE-BOARD ROOM HEATER

Filed Oct. 31, 1945

2 Sheets-Sheet 1

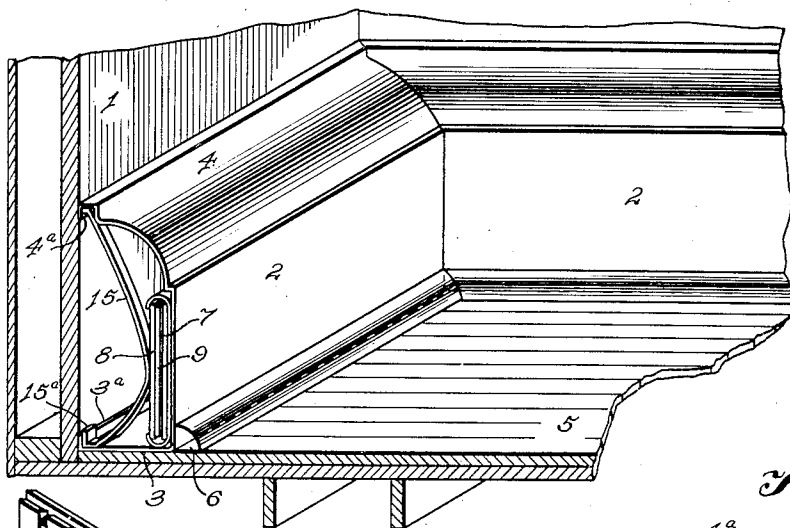


Fig. 1.

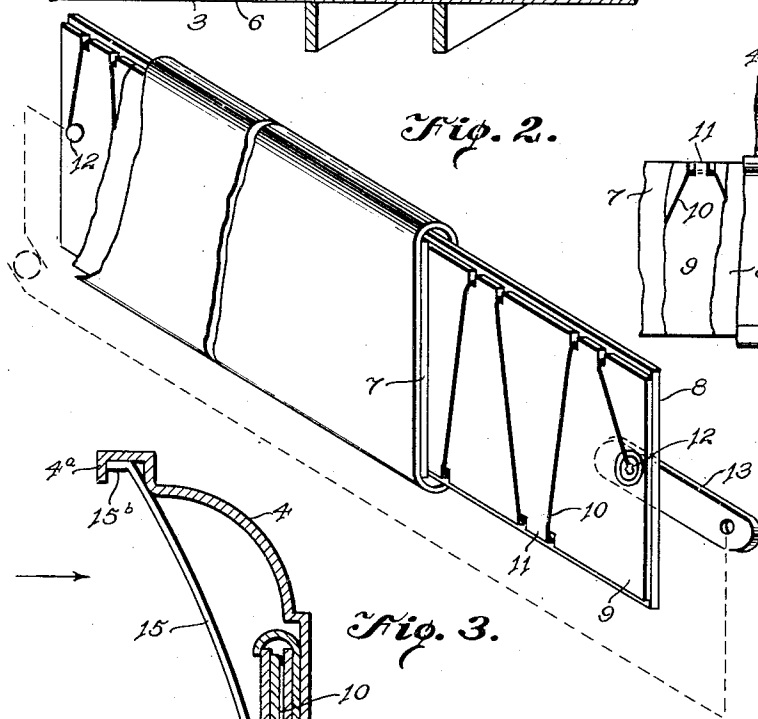


Fig. 2.

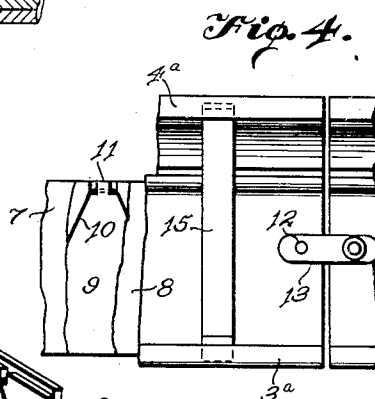


Fig. 4.

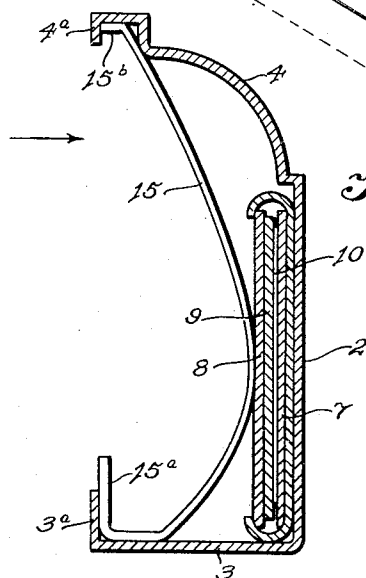


Fig. 3.

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Fig. 5.

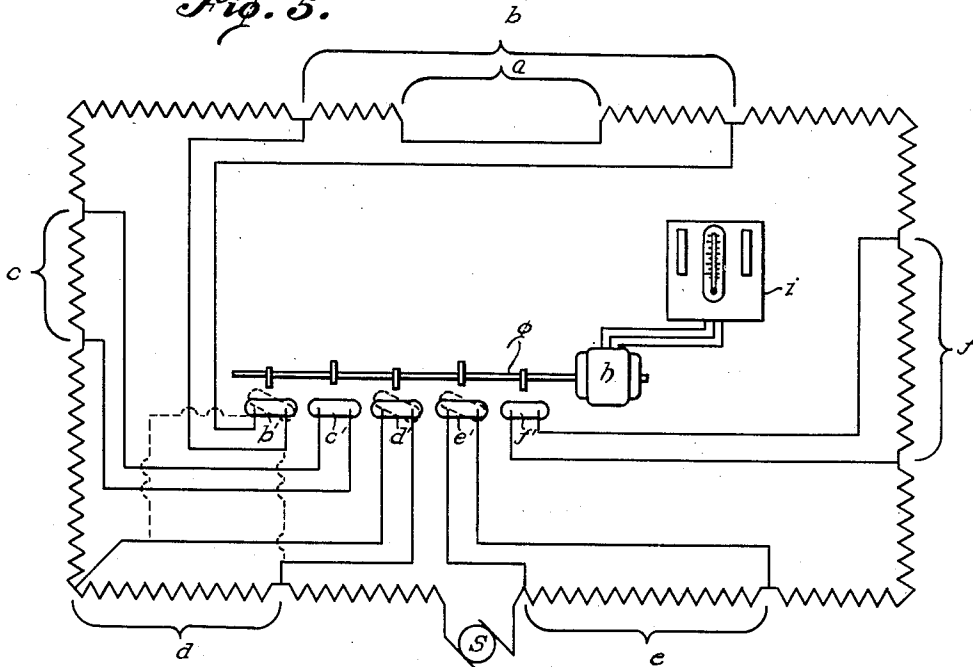


Fig. 7.

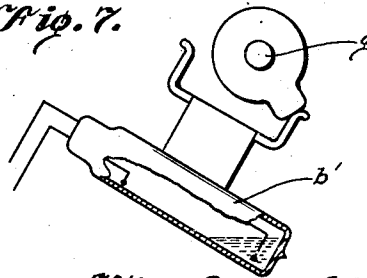


Fig. 6.

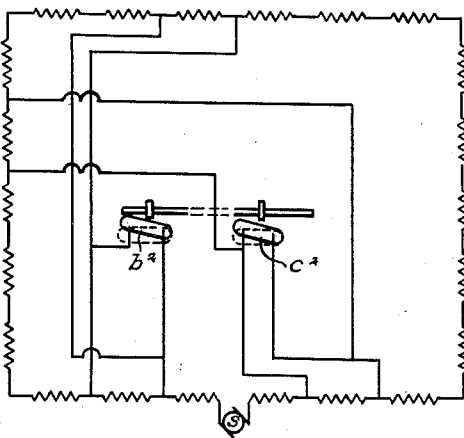


Fig. 8.

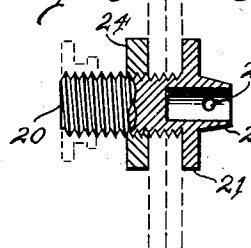
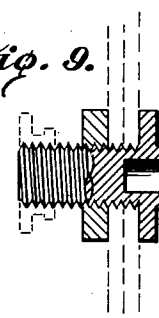


Fig. 9.



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BASEBOARD ROOM HEATER

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3 Claims. (Cl. 219—34)

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My present invention relates to the heating of dwellings, offices and similar enclosed spaces and to the control of the temperature therein. It has for its object to provide a source of radiant heat which may be evenly created around the several sides of the room and when a given temperature is reached to reduce the radiation by discontinuing the operation of certain units some of which may be spaced apart in different locations in the room, while maintaining such of the others in operation as may be required to prevent a too rapid drop of the temperature and thus maintain the maximum desired heating at a substantially given temperature level.

Another object of my invention is to provide a novel radiant method of heating rooms by use of hollow room trimmings such as base-boards, window sills and window and door casings, preferably made of aluminum, and including therein electrical resistance units so arranged that those of a selected room serve as a continuous radiator at all sides of a room adjacent the floor and the trimmings around room openings, at whatever degree of heat is required to maintain the room at the desired temperature.

My invention also comprehends a novel arrangement of both the room trimmings, the resistance units therein and the means for connecting these parts.

Another object of my invention resides in the means for connecting the units in series and the provision of automatic means for short circuiting selected units when a predetermined room temperature has been obtained.

To these and other ends my invention embodies further improvements all as will be more fully described in the accompanying specification, the novel features thereof being set forth in the appended claims.

In the drawings:

Figure 1 is a perspective view showing one corner of a room fitted in accordance with my invention, a part of side wall and the floor being shown in section.

Figure 2 is a perspective view illustrating the construction of one of my heating units.

Figure 3 is a section of a metal base-board showing the heating unit in position and the locking member for securing the parts together.

Figure 4 is a fragmentary side view of the parts

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shown in Fig. 3 and looking in the direction of the arrow of Fig. 3.

Figure 5 is a diagrammatic view illustrating an assembly of heating elements as applied to a rectangular room and showing schematically a wiring diagram in conjunction with a temperature regulating apparatus by means of which various units may be cut out or brought into service as circumstances may require.

Figure 6 is a similar diagram showing the control by switches of heating units at different sides of a room.

Figure 7 is a schematic view of one of the circuit switches.

Figure 8 is a detail view of a form of the electrical connector employed for uniting the resistance units.

Figure 9 is a view of the connector after the resistance wire or ribbon has been secured thereto.

In the several figures similar reference characters indicate similar parts.

In carrying out my invention I employ a hollow base-board, i. e. one which is preferably formed of sheet aluminum, in such a way as to provide an offset from the inner wall surface sufficiently to provide a space to accommodate an electrical resistance unit. In practice I form this element with a vertical panel 2 rising from a floor piece 3 and carrying at its upper edge an ornamental molding 4. The latter and the floor piece are coextensive and these parts are respectively provided with reentrant edges or lips 3a and 4a, which lie against the wall surface 1. The part 3 of the base-board rests upon the flooring 5 and is held firmly in place by a tacking strip 6 which is removably held in place by light nails, or brads, or screws which pass through it at suitable intervals and engage the flooring, as will be understood.

The heating of the room is accomplished by radiation from the base-board and as this always presents a considerable area in any room it will be seen that when its entire length is utilized a large radiating surface is available. I take advantage of this fact by making my heating units in a flat form and of given lengths so that they may be held in close contact with the panel portion 2. In Fig. 2 I have illustrated one of my heating units as comprising a sheath formed of

an aluminum plate having rolled edges forming a container open at its inner sides. Into this sheath the additional parts of the unit are slipped endwise. These comprise a thin front insulating sheet 7 of mica or similar material, a thicker back sheet 8 of asbestos and an intermediate or center sheet 9 of suitable material carrying the resistance wire 10. The latter may be held in any approved manner and in practice I weave it along the face of the center sheet which lies against the sheet 7 and hold the loops of the wire behind tongues 11 formed by notching the edges of the sheet 9 in the manner shown. At the ends of the units the extremities of the wire are secured beneath the heads of rivets 12, the upset ends of which also extend through the asbestos back sheet 8. One of these rivets secures at one end of one of the units a plate connector 13, and the other rivet is threaded to form a binding post. By this arrangement succeeding units may be readily joined by slipping the connector 13 on one of them over the post of another where it is secured by a binding nut on the post.

The resistance units may be made in any convenient lengths and assembled throughout the length of a base-board section while it is lying on a work bench. When the placing of the units has been accomplished I lock them in place. The manner in which these parts are secured in place from the rear side of the base-board whereby the units are firmly secured in position but may be easily removed if necessary is an important part of my invention. It is to this end that I provide the base-board with the two reentrant edges or lips 3a—4a, as they form abutments for engagement with the ends of compression springs. 15. The latter are bowed, as shown in Fig. 3, and press against the face of the asbestos sheet 8. These bow springs at their lower ends 15a are curled and lie in engagement with the upper face of the floor piece 3 and the inner face of the lip 3a. At their upper ends the extremities of the springs are bent outwardly as indicated by 15b, for contacting the inner face of the narrow lip 4a.

Fig. 5 illustrates the multiple number of resistance units lying within the base-boards extending along the several sides of a room. These are connected in series with a source of current, and where interruptions occur, such as at doorways, one of which is indicated by a, a jumper wire is used.

In order to carry out another feature of my invention I provide in conjunction with thermostatically controlled devices, circuits for shorting out unit sections at one or another of the different sides of the room whenever a given temperature therein has been reached. For the purpose of illustration I have shown five of such sections b, c, d, e and f from the ends of each of which are circuit leads connected to terminals in mercury switches b', c', d', e' and f', respectively, such as shown in Fig. 5. A means for operating these switches may be a series of cams on a shaft g rotated by a motor h which is set into motion for rotation in one direction or the other by a thermostatic control i.

The switches shown may have their terminals connected to resistance units located at different sides of the room as indicated in Fig. 6, and this I consider preferable where only a few switches are employed in the setup and it is desired to control the room temperature within a close margin.

In this figure two of the oscillator mercury switch b² and c² are shown, each controlling cir-

cuits of rheostat units which are widely separated instead of being contiguous as shown in Fig. 5. To meet particular conditions of temperature control certain of the units may be connected with others in parallel circuits.

In practice, I have found it convenient to make the resistance units in various wattages from 50 to 200 watts which can be connected in various combinations of either series or parallel circuits and supplied from sources of house current commonly available and ranging in different districts from 115 to 220 volts. Due to the low heat created at any given point resulting from the relatively large radiating area the possibility of creating a fire hazard is avoided and no deterioration from oxidation of the resistance windings or lacework occurs. Data obtained from practical tests shows that for a room having a base-board of 70 linear feet and of 3200 cubic feet can be maintained at a 70° temperature with a 46 watts per linear foot of base-board producing a surface temperature thereon of 165° F. during the period of warming up the room. Thereafter it is only necessary to maintain a flow of current through the resistance units sufficient to create a temperature of between 100° and 150° on the base-board.

Since it is essential that the terminals of the resistance wires or ribbons, in installation of this nature, be permanently secured in place I have devised a specially constructed connector, as shown in Figs. 8 and 9. It comprises a threaded shank 20 having a comparatively thin head 21 of large diameter with a hollow nipple extension 22 extending beyond it. This extension has a transverse perforation 23 which may be circular to receive a wire, or rectangular to accommodate a ribbon. The nipple is in effect a hollow rivet which may be upset after the resistance element is inserted in the aperture and in practice, after this is accomplished, I braze the end of the element to the connector. The purpose of this arrangement of the parts and the making of the head comparatively large in diameter and also thin is to give a wide bearing against the resistance carrying sheet 7 against which it may be drawn down tightly by the unit 24 bearing against the backing sheet 8. In this way the upsetting of its rivet extension does not protrude sufficiently to interfere with assembling the several sheets by slipping thereon endwise into the sheath. Where this connector is used, as indicated at 12, the shank 20 will form a rivet, the end of which is upset against the bar 13; but where it forms a post for receiving the free end of said bar it will be threaded to receive a set nut for securing said bar, as will be understood.

I claim:

1. An electrical heater for rooms comprising a hollow base-board having a panel section and provided with top and bottom flanges extending from the panel into engagement with the wall and providing an enclosed space, a resistance heating unit made in flat form located therein, angular lips on said flanges, means supported by said flange lips and engaging said unit to hold it in contact with said panel, and a source of current supply connected to the unit.

2. A hollow base-board heater for rooms comprising a flat vertical panel, a floor flange and a molding flange having angular edges engaging the wall of a room behind the panel, an electrical resistance unit lying between said flanges having a face portion in engagement with the inner face of said panel, and flat bow-shaped retaining springs held at their ends by the edges and con-

tacting at their mid portions the rear side of said unit.

3. A hollow base-board heater for rooms comprising a flat vertical panel, a floor flange and a molding flange engaging the wall of a room behind the panel, each having reentrant lips, an electrical resistance unit having front and rear parallel faces, the former being in contact with the inner face of said panel, a bow-shaped retaining member engaging the rear face of said unit and retained in position by the engagement of its ends with said lips.

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