

Sept. 16, 1941.

G. B. GALLUP

2,256,049

HEATER

Filed Sept. 4, 1940

2 Sheets-Sheet 1

Fig. 1.

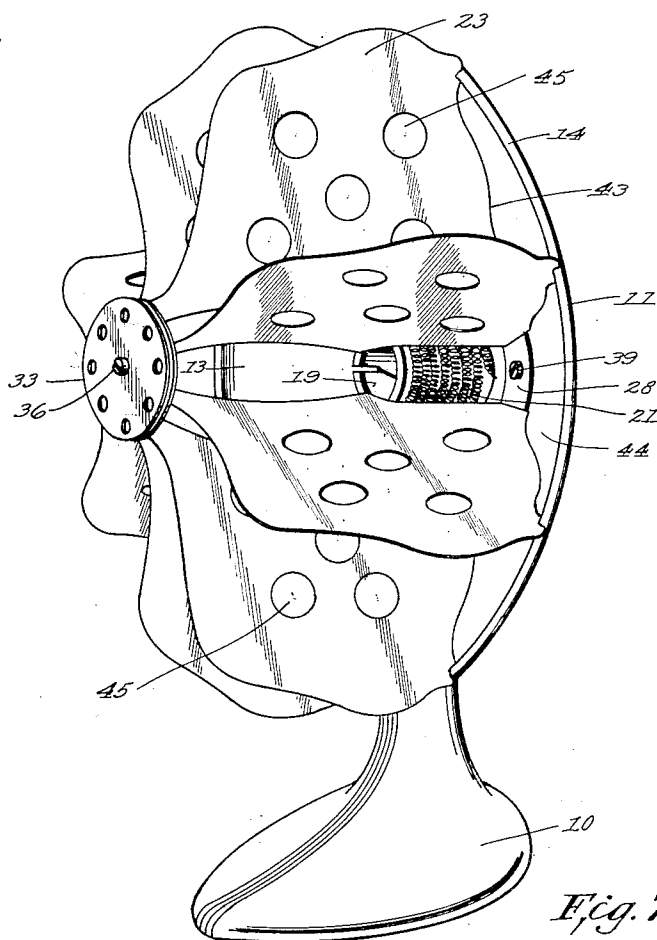


Fig. 7.

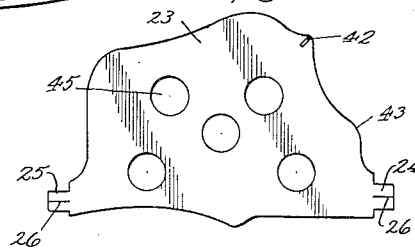


Fig. 4.

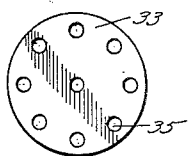
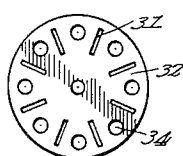


Fig. 3.



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Fig. 2.

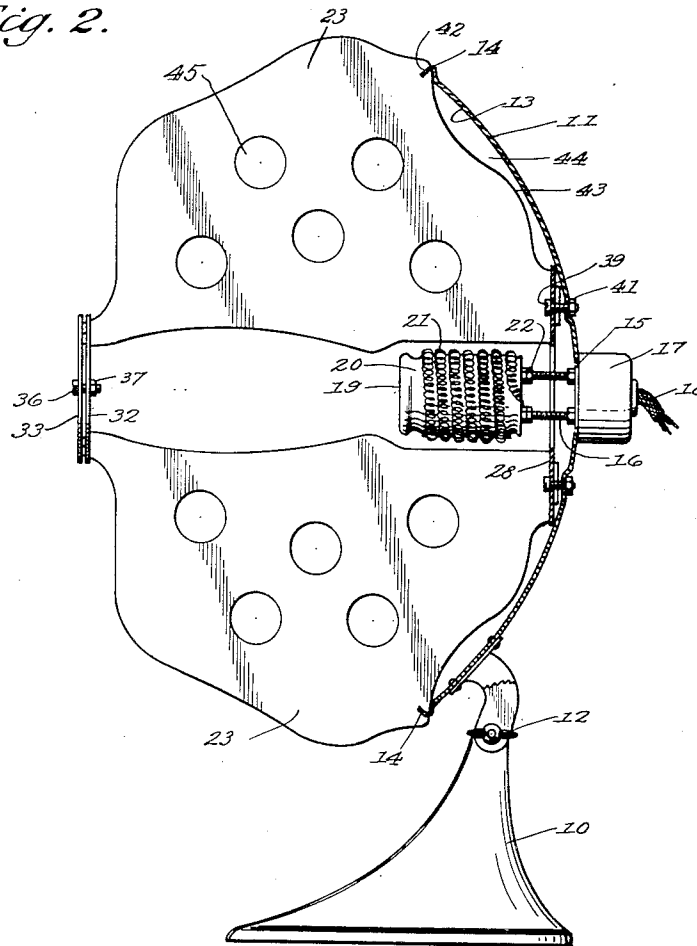


Fig. 5.

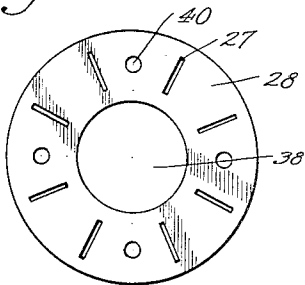
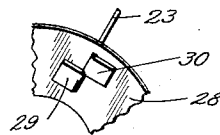


Fig. 6.



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UNITED STATES PATENT OFFICE

2,256,049

HEATER

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Application September 4, 1940, Serial No. 355,398

9 Claims. (Cl. 219—34)

The present invention relates to heaters and more particularly to improvements in the construction and operation of reflecting heaters.

An important object of the invention consists in the provision of simple, efficient and economical means associated with a heater for the purpose of insuring increased heating of the air passing through the heater.

In the well known types of electric reflecting heaters, most of the heat is dissipated forwardly due to the fact that the reflector directs most of the radiant energy towards the front of the heater and very little heat is transmitted from the sides or laterally of the heater to heat effectively the room. Accordingly a further object of the invention consists in providing an attachment which may be readily connected to any ordinary or standard type of reflecting heater or stove at a minimum expense of time and effort, said attachment preferably including spaced metallic plates or fins disposed in close proximity to but spaced from the electrical heating element, and which extend longitudinally of the heating element so that a substantial area of each plate is heated, thus insuring an increased absorption of heat by the air circulated through the passages between the heating element and the plates. The metallic plates are so constructed and arranged as to distribute the heated air outwardly and laterally from the device.

A further object consists in positioning the metal plates or fins so that they are disposed substantially parallel to the axis of the heating unit and are spaced therefrom so as not to obstruct movement of the heated air currents outwardly from the heater or to interfere appreciably with the radiant heat as it is reflected from the parabolic surface of the heater and moved outwardly therefrom.

Another object consists in providing each of the metallic plates or fins with perforations or openings to permit free circulation of air through these members so as to provide turbulence to the air currents circulating through the heater, and thus increase the heating capacity of the device. These perforations also act to prevent overheating or buckling of the metal plates, and give an attractive appearance to the heater. The heat absorbing fins or plates are associated with the heater and are so positioned relative to the electric heating element as to intercept and absorb a part of the radiant energy issuing from the heating element and directed generally forwardly, so as to heat the air passing through the perforated fins, and in greater volume than would be

obtained if the fins were not used. Moreover, after the current is cut off, the heater continues to function for an appreciable period of time due to the energy stored in the fins.

Other objects and advantages of the invention will become apparent from the following description when taken in conjunction with the accompanying claims and drawings.

Referring to the drawings in which is shown a preferred embodiment of the invention:

Figure 1 is a perspective view of a heater constructed in accordance with the present invention,

Figure 2 is a vertical sectional view of the heater,

Figure 3 is a detail front view of the front supporting member,

Figure 4 is a detail front view of the cover plate associated with the front supporting member,

Figure 5 is a detail front view of the rear supporting member,

Figure 6 is a detail view showing the means for securing the plates or fins to their supporting members, and

Figure 7 is a detail side view of one of the plates.

For the purpose of illustration, the invention is shown associated with a well known and standard type of electric reflecting heater. The heater may comprise a portable or fixed base 10 to which the casing 11 is pivotally and adjustably connected as at 12. The inner rear wall of the casing 11 is curved to form a concave or parabolic reflecting surface 13 which terminates in an inwardly extending peripheral flange 14. The casing is also provided with a medially disposed opening 15 through which extend a pair of threaded bolts 16 that project outwardly from a conductor cover or shell 17 which bears against the outer side of the reflector and in which is housed the wires leading from the electrical cable 18 connected to any suitable source of current supply. An electric heating or resistance element 19 of any well known type is positioned centrally within the casing, and may comprise a porcelain or other suitable refractory support 20. Spirally mounted on the support 20 is a resistance wire 21 which is connected at its opposite ends to the wires in the cable 18. The heating element 19 is secured to the casing by the threaded bolts 16 and is maintained in spaced position relative to the inner wall thereof by the locking nuts 22 threaded on the bolts 16. Manifestly, any other well known means may be provided for securing the heating element 19 in position, such as by

forming the inner end of the heating element with an exteriorly threaded portion arranged to be connected to a complementary threaded socket in the conductor 17.

In order to increase the air heating efficiency of the heater and to increase absorption of heat by the induced air current passing through the heater, means are provided in the form of spaced radially disposed metallic plates or fins 23 for receiving and transmitting the heat from the heating element 19 upwardly and outwardly from the reflector 13 so as to distribute the heated air both upwardly and radially off the heater. As shown, eight metallic plates 23 are arranged so as to be disposed circumferentially around the casing 11, and are concentrically positioned relative to the heating element 19. The plates 23 may be formed of any suitable metal such as 24 gauge black iron coated with aluminum. Heaters with which the invention may be associated usually have heating units of between 600 and 800 watts and generate temperatures in excess of 1400° F. Consequently, the heat transmitted by conduction, convection currents and radiation from the heater passes outwardly in all directions through the passages between the plates, the air currents being heated to a temperature of over 200° F., thus insuring an increased heating of the induced air currents.

The plates 23 may be connected to the heater by any suitable means, preferably these plates are provided with outwardly projecting flexible lugs 24 and 25, each of which is split as at 26 (Figure 7). Each of the lugs 24 extends into a complementary slot or opening 27 formed in an annular supporting member or ring 28. The split portions of the lugs are then bent back against the ring and in opposite directions so as to form the retaining arms 29 and 30 (Figure 6) so as to securely connect the plates to the ring 28. Similarly the lugs 25 at the forward ends of the plates 23 extend through slots or openings 31 in a supporting member or disc 32, and then are bent outwardly in opposite directions against the member 32 in a manner similar to the arms 29 and 30. A cover plate 33 is preferably associated with the supporting member or disc 32 so as to conceal the bent portions of the lugs 25. The supporting member or disc 32 and the plate 33 may also be provided with aligned openings 34 and 35 respectively, which communicate with the uninterrupted passages formed between adjacent plates 23 so as to further facilitate the circulation of the air through the heater when the device is in operation. The plate 33 is secured to the supporting member 32 in any suitable manner such as by the threaded bolt 36 and the nut 37. It will be seen that when the plates 23 are connected at their extremities to the supporting members 28 and 31 that the parts constitute a unitary and rigid assembly or attachment, which may be readily connected to any well known type of heater at a minimum expense of time and labor, or which may constitute a permanent part of a heater. The rear supporting member or ring 28 has a central opening 38 (Figure 5) of slightly larger diameter than the diameter of the heating unit or element 19 so that when the plates are connected to their supporting members, the attachment may be inserted over the heating unit 19 in order that the supporting member 28, which preferably is of larger diameter than the supporting member 32, may be connected to the inner reflecting surface of the casing, by any suitable retaining means, such as the threaded bolts 39 which extend through aligned openings 40 in the

supporting member 28 and the rear wall of the casing so as to be rigidly secured thereto by the nuts 41. Each plate adjacent the outer end of the casing is provided with a slot or recess 42 which receives the flange 14 so that when the device is assembled, the blades and their associated parts are maintained in proper position relative to the casing and the heating element 19.

The portions of the plates 23 between the lugs 24 and the slots 42 are preferably cut away or reduced as at 43 so as to be spaced from the adjacent wall of the reflector and thus provide passages 44 for facilitating the distribution of air into and through the heater. The plates 23 are also preferably perforated as at 45 so as to give turbulence to the induced air currents to increase the absorption of the heat by the surrounding atmosphere and also prevent overheating and buckling of the plates 23 when subjected to a very high degree of heat. It will be seen that the fins act to intercept and absorb a part of the energy rays directed generally forwardly while the air rising through the perforated fins in various directions, transposes these energy rays into an increased amount of circulating heated air, and in greater volume than would be obtained if the fins were omitted. Moreover, when the current to the heater is cut off and the heating element begins to cool, the stored heat in the fins or plates 23 will continue to heat the air for at least several minutes, so that none of the energy used in heating the fins is lost. The fins constitute heat absorbing means which are associated with the heater and are positioned relative to the heating element to utilize a part of the radiant energy issuing from the heating element to heat the air passing through and between the fins, and in greater volume than could be obtained if the fins were not used. Thus the attachment provides means whereby a heating effect is produced not only in front, but also on the sides of the heater as well, and insures efficient circulation of the heated air through the room or compartment in which the heater is located. There is also a cross radiation at angles between the plane surfaces of the sides adjacent the fins 23. As each of the fins is connected as at 42 to the rim of the reflector, heat by conduction increases the heat in the reflector above what it would be if the fins were omitted.

It will be noted that the plates 23 are mounted within the casing so as to be spaced from the heating element 19 but are disposed in close proximity thereto and extend longitudinally or axially of the heater and beyond the heating element 19 so as to provide spaced uninterrupted passages for the free circulation of the heated air outwardly and radially of the heater. While the attachment has been shown associated with a standard type of reflector heater, it will be manifest that it may be used with various other kinds of heaters to obtain increased heating of the air currents issuing from the heating means for a given current or power consumption.

It is to be understood that the form of the invention shown is merely illustrative of a preferred embodiment and that such changes may be made as fall within the purview of one skilled in the art without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. In combination with a heater having a curved reflecting surface, said surface having an axis along which radiant energy is directed there-

by, a heating unit extending outwardly from said surface, and spaced metallic plates in such relation to said reflecting surface as to absorb radiant energy therefrom, said plates extending generally radially from and substantially parallel to said axis, said plates being disposed substantially parallel to said heating unit and in close proximity thereto but spaced therefrom so as to intercept and utilize a part of the radiant energy issuing from the heating element to heat the air between the plates, the air heated between the plates being diffused radially and outwardly from the sides of the heater.

2. The combination specified in claim 1 in which the plates are provided with openings for facilitating the circulation of air through and between the plates.

3. The combination specified in claim 1 in which each of said plates has means connecting an intermediate portion thereof to the heater.

4. The combination specified in claim 1 in which each of said plates has means connecting an intermediate portion thereof to the heater, said plates between the intermediate portions and the reflecting surface being spaced from the heater to provide passages for the circulation of air into and through the heater.

5. The combination specified in claim 1 in which the outer end portions of the plates project beyond the adjacent end of said heating unit.

6. The combination specified in claim 1 in which the reflecting means is provided with an inwardly extending marginal plane, and means connecting each of the plates to said flange.

7. In combination with a heater having a curved reflecting surface, said surface having an axis along which radiant energy is directed thereby, a heating unit extending outwardly from said surface, a pair of spaced supporting members, means connecting one of said members to said reflecting surface adjacent the heating unit, spaced metallic plates between said members, said plates having open longitudinally disposed outer

edges and the space between the plates being radially uninterrupted, and means connecting the ends of said plates to said members, said plates being disposed substantially parallel to said heating unit and in close proximity thereto but spaced therefrom so as to utilize a part of the radiant energy issuing from the heating element to heat the air between the plates, the heated air being diffused radially and outwardly from the sides of the heater between the spaced plates.

8. An attachment for heaters having a reflecting surface, said attachment including a pair of spaced horizontally disposed annular members, means connecting one of said members to the reflecting surface of the heater, spaced metallic plates extending radially from said members, means connecting the ends of said plates to said members, said plates being disposed substantially parallel to the horizontal axis of said members so that the air heated between the plates is diffused radially and outwardly therefrom.

9. In an electric heater having a reflecting surface and a heating unit extending outwardly from said surface, an attachment for said heater including a pair of spaced horizontally disposed annular members, means connecting one of the members to said reflecting surface adjacent the heating unit, spaced metallic plates extending radially from said members, means connecting the ends of said plates to said members, said plates being disposed substantially parallel to said heating unit and in close proximity thereto but spaced therefrom so as to intercept and utilize a part of the radiant energy issuing from the heating unit to heat the air between the plates, and means on each of said plates spaced from the inner end thereof and secured to complementary means on the rim of the reflecting surface for maintaining the plates in a relatively fixed position, said plates being provided with longitudinally disposed openings for facilitating the free circulation of air into and from the heater.

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