Our invention relates to heaters and particularly to electrically operated space heaters.

An object of the invention resides in providing a heater which will be extremely compact in construction and which will produce a relatively large amount of heated air.

Another object of the invention resides in providing a heater in which the heat generated is rapidly transmitted to the air passing through the same, so that the exposed portions of the heater are held at a suitable low degree.

Another object of the invention resides in constructing the heater with a heat transfer unit having heat conducting members to which heat is radiated by a heating element and in constructing said unit with channels through which air may pass for the purpose of absorbing heat from the heat conducting members.

A still further object of the invention resides in constructing the unit with other channels extending in a cross direction with reference to the first named channels and in arranging the heating element so as to radiate the heat to the heat conducting members of the unit along said second named channels.

A feature of the invention resides in constructing the heat transfer unit substantially cylindrical, and with a chamber disposed axially thereof.

Another object of the invention resides in constructing the heat transfer unit with radial channels extending outwardly from said chamber and in providing a heating element in said chamber adapted to radiate heat in said channels and to said said member comprising the unit.

A still further object of the invention resides in constructing the heat transfer unit with one or more longitudinal channels forming air passageways through which the air to be heated may pass.

Another object of the invention resides in constructing the heat unit from a foraminous sheet wound in the form of a spiral with spaced convolutions forming one or more air passageways through which the air to be heated may pass.

A feature of the invention resides in constructing the sheet corrugated in form to provide a multiplicity of longitudinal passageways adjacent the various corrugations of the sheet.

A feature of the invention resides in providing one or more spaced ribbons between the convolutions to hold the same in position.

A still further object of the invention resides in constructing the sheet from wire cloth.

Another object of the invention resides in providing air impelling means located at one end of the heat transfer unit for impelling the flow of air through the longitudinal passageways thereof.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is a longitudinal elevational sectional view illustrating an embodiment of our invention.

Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view taken on line 5—5 of Fig. 1.

Our invention comprises a case 10 constructed with two sections 11 and 12. The section 11 is substantially conical in form, while the section 12 is somewhat cylindrical in form. The section 11 is open at the rear and is closed by means of a cap 13. The section 12 is open at the front and is similarly closed by means of a cap 14.

The case 19 is supported on a base 15 which has a lug 16 projecting upwardly therefrom. Two flanged ears 17 and 18 are welded to the section 11 of case 10 and straddle the lug 16. A bolt 19 passes through the said ears and lug and serves to hold the case attached to the base 15. By means of this construction, the case 10 may be tilted to various angles and held in adjusted position by tightening the bolt 18.

The cap 13 is attached to the section 11 of case 10 in the following manner; At the marginal portion of the said cap is formed an offset 21 which provides a groove 22. The extreme edge 23 of the section 11 is adapted to be received in said groove when the cap 13 is forced into the position shown in Fig. 1. The cap 12 is formed with a number of openings 24 in the same by means of which air may enter into the interior of the case 10. In like manner, the cap 14 is attached to the forward end of the section 12 of case 10. This cap likewise has a number of openings 25 in the same and through which the heated air passes on leaving the heater.

The two sections 11 and 12 of the case 10 are secured together by means of a number of screws 26 which pass through the marginal portions of the same. For this purpose, the marginal portion 27 of the section 11 of case 10 is offset to receive the marginal portion 28 of the section 12 of case 10.

A handle 29 is secured to the uppermost portion of the section 11 of case 10. This handle has a forward end 31 secured under one of the screws 26 and a rearward end 32 held under another
When the device is energized, the heat waves produced by the heating element 42 are transmitted radially and are absorbed by the heat transfer members of the heating unit 51. The fan 59 draws air through the openings 24 in cap 13 and forces the air through the openings in partition 36 and through the passageway 58 formed by the corrugations 53. The air passing through the heat exchange unit 51 absorbs heat from the heat transfer members thereof and is discharged from the device through the openings 25 in the cap 14.

The advantages of my invention are manifest. An ordinary heating element may be used for the purpose of space heating and functions in a manner to heat a large volume of air. Due to the use of the heat transfer unit, the heat radiating from the heating element is absorbed by the unit and then released to the air passing through the same. In this manner, the case of the unit is kept relatively cool so that danger of burning or injury to the user is entirely prevented. The device is extremely small and compact and a heater having a relatively large capacity results. The device may be adjusted to throw the heat in any particular direction without affecting the spirit of our invention.

Changes in the specific form of our invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of our invention.

Having described our invention, what we claim as new and desire to protect by Letters Patent is:

1. A heater comprising a heat transfer unit substantially cylindrical in form and having a substantially centrally disposed chamber within the same, said unit being constructed from heat transfer members arranged to provide a number of channels extending radially from said chamber and another channel intersecting said first named channels and extending in a substantially longitudinal direction, said last named channel forming an air passageway for conducting air past said heat transfer members, and a heating element within said chamber and adapted to radiate heat to said heat transfer members along the first named channels.

2. A heater comprising a heat transfer unit substantially cylindrical in form and having a substantially centrally disposed chamber within the same, said unit being constructed of a foraminous sheet wound spirally to form a longitudinal extending channel therethrough and radially extending channels communicating therewith, said longitudinally extending channel forming an air passageway for conducting air past the foraminous sheet and a heating element in said chamber adapted to radiate heat along said radial channels and to various portions of said foraminous sheet.

3. A heater comprising a heat transfer unit substantially cylindrical in form and having a substantially centrally disposed chamber within the same, said unit being constructed of a sheet of wire cloth wound spirally to form a longitudinally extending channel therethrough and radially extending channels communicating therewith, said longitudinally extending channel forming an air passageway for conducting air past the sheet and a heating element in said chamber adapted to radiate heat along said radial channels and to various portions of said sheet.

4. A heater comprising a heat transfer unit substantially cylindrical in form and having a
5. A substantially centrally disposed chamber within the same, said unit being constructed of a corrugated foraminous sheet wound helically to form a plurality of communicating longitudinally disposed channels extending along the corrugations of the sheet and radially extending channels communicating therewith, said longitudinally disposed channels forming air passageways for conducting air past the foraminous sheet and a heating element in said chamber adapted to radiate heat along said radial channels and to various portions of said foraminous sheet.

6. A heater comprising a heat transfer unit substantially cylindrical in form and having a substantially centrally disposed chamber within the same, said unit being constructed of a sheet of corrugated wire cloth wound spirally with the corrugations extending longitudinally to form a plurality of communicating longitudinally disposed channels extending along the corrugations of the sheet and radially extending channels communicating therewith, said longitudinally disposed channels forming air passageways for conducting air past the sheet and a heating element in said chamber adapted to radiate heat along said radial channels and to various portions of the sheet.

6. A heater comprising a heat transfer unit having a centrally disposed chamber within the same, a radiant heating element within said chamber adapted to radiate heat in two opposite directions, said unit comprising a plurality of heat transfer members disposed on each side of said element each spaced from each other in the direction of radiation of said element, said members providing channels extending in the direction of radiation of said element whereby radiant heat from said element may directly impinge upon portions of each of said members on both sides of said element, the spacing of said members providing other channels extending transversely of said first named channels and intersecting the same, said second named channels serving to conduct air past said members.

7. A heater comprising a heat transfer unit substantially centrally disposed chamber within the same, said unit being constructed of foraminous sheet material having inner and outer parts arranged substantially circumferentially about said chamber to provide a longitudinal channel therebetween encircling said chamber, the openings in said sheet forming radial channels communicating with said longitudinal channel, said longitudinal channel forming an air passageway for conducting air past said parts, and a heating element in said chamber adapted to radiate heat along said radial channels to various portions of said parts.

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