

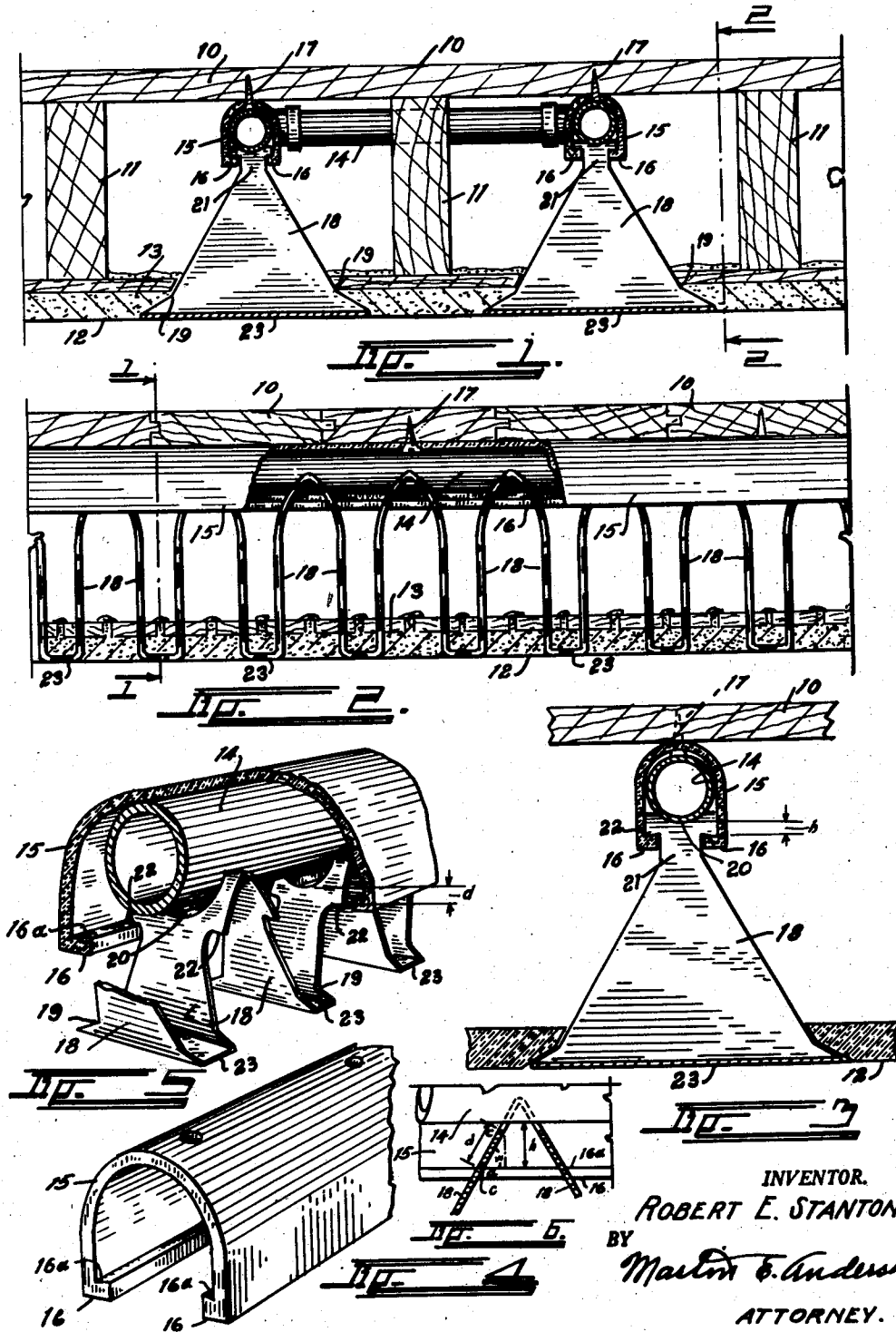
Aug. 30, 1949.

R. E. STANTON

2,480,427

HEAT RADIATING UNIT FOR PANEL HEATING

Filed Dec. 22, 1947



UNITED STATES PATENT OFFICE

2,480,427

HEAT RADIATING UNIT FOR PANEL HEATING

Robert E. Stanton, Denver, Colo.

Application December 22, 1947, Serial No. 793,205

7 Claims. (Cl. 257—124)

1

This invention relates to improvements in radiant panel heating and has reference more particularly to a radiant heating radiator unit designed more especially for use in ceiling panel heating systems.

Extended surface panel heating has been found to be both efficient and satisfactory and various constructions have been used.

Many radiant heating installations have the heat radiating devices installed in the floor, and some are in the walls.

It is the object of this invention to produce a heat radiating unit or assembly that shall be especially well suited for use in connection with radiant ceiling panel heating and which shall be of light weight and so designed that its cost of production shall be low and so that it can be readily installed at a minimum cost of labor.

The above and any other objects that may become apparent as the description proceeds are attained by means of a construction and an arrangement of parts that will now be described in detail, and for this purpose reference will be had to the accompanying drawing in which the invention has been illustrated, and in which:

Figure 1 is a section through a floor, taken on line 1—1, Figure 2;

Figure 2 is a section taken on line 2—2, Figure 1, parts being shown in elevation and with parts broken away to better disclose the invention;

Figure 3 is a view similar to that shown in Figure 1 showing the parts to a somewhat larger scale;

Figure 4 is a fragmentary perspective view of the insulating trough;

Figure 5 is a perspective view showing a short section of radiator, partly in section; and

Figure 6 is a diagram illustrating one of the features of the invention.

Referring now to the drawing, reference numeral 10 designates a floor that rests on joists 11, and reference numeral 12 designates the ceiling which, in the example shown, is of the ordinary and well known construction employing laths 13 and plaster. The steam or hot water pipes are positioned between the floor and the ceiling as shown in Figure 1 of the drawing. The pipes have been designated by reference numeral 14 and are of the ordinary size and the material usually employed for such purposes. In the example shown, the pipes run back and forth in the spaces between the joists, and do, of course, radiate a considerable amount of heat between the floor and the ceiling. For heating

2

the room below a heat radiating assembly that forms the subject of this invention has been shown. This assembly consists of a covering of heat insulating material for substantially the

entire length of the pipe. This covering has been designated by reference numeral 15 and is of a shape resembling the inverted capital letter U. The curvature on the inside is substantially the same as the curvature of the pipe that is positioned therein. The ends of the opposite sides of the covering are provided with inwardly extending ribs 16 that provide supporting ledges on their upper surfaces. The pipe covering element may be constructed of any suitable heat insulating material. One material that is found to be very satisfactory is sold under the name of Transite, which is a dense, smooth, rigid material of asbestos; however, any other suitable material may be used. It is necessary, however, that the material employed shall have good heat insulating properties. The covering is secured to the under surface of the floor by screws 17 or by any other suitable means. In order to conduct heat downwardly so that it may radiate from the ceiling of the room below, a heat conducting element is provided which will now be described.

The heat conducting element is made from metal in sheet form and folded in the manner shown in Figure 2. In Figure 2, the folded heat conducting element is shown as a continuous piece, but where the distance is great it may be formed from several sections. It may also be made of a plurality of sections, if desired. It will be observed that the heat radiating element has downwardly extending portions 18 that flare outwardly in a downward direction to the point indicated by reference numeral 19, forming what may roughly be described as truncated isosceles triangle. From point 19 the outward inclination is greater so as to form a ledge on which the plaster 12, or any other ceiling material, such as Celotex, rests. The heat radiating element consists of a plurality of sections which, when viewed from the edge as in Figure 2, have a more or less hairpin like appearance. The upper truncated or narrow ends or loops have notches 20 of a curvature to fit the outer surface of pipes 14. The truncated ends have been designated by reference numeral 21 and are provided with shoulders 22 that rest on the ledges formed by the upper surfaces of ribs 16 as shown most clearly in Figure 5. The adjacent hairpin-like assemblies are connected at the bottom by flat connecting portions 23.

The vertical distance from the upper surfaces

3

of ribs 16 to the lowermost surface of the pipe has been designated by h and this is somewhat less than the distance from the bottom of the curved opening 20 to the lower edge of shoulders 22, the latter distance having been designated by d in Figure 6, as a result of this, when the pleated strip is extended so that it projects downwardly at a considerable angle like that shown in Figure 6, it can be slipped into the cover element without great difficulty because it will not contact with the pipe when it is thus extended. After it has been moved into the position shown, the two sides of each unit 18 are moved inwardly thereby decreasing the angular relation and forcing the edges of the curved notches 20 against the under surface of the pipe. After the heat conducting element has been adjusted to the shape shown in Figure 2, the truncated ends will be in close contact with the pipe and the elements will rest on the ledges formed by the upper surfaces of ribs 16. The dimensions of the heat conducting strips will, of course, vary with the size of the pipe, the size of the pipe covering and the width of the joists. It is not essential that the heat insulating coverings be supported against the under surface of the floor as shown in Figure 1. If the construction shown requires heat conducting elements of too great a length, the assemblies may be supported some distance below the floor.

Referring now to Figure 6, where the parts have been shown diagrammatically, reference numeral 14 designates a portion of the under side of the pipe and reference numeral 16a designates the upper surface of rib 16. The distance between b and c is the same as that designated by d in Figure 5 and has been so designated in Figure 6. The distance between the upper supporting surfaces 16a and the under surface of the pipe is h . The distance d is greater than the distance h so that when the angle of members 18 relative to the supporting surfaces 16 is increased from that shown in Figure 6, the upper ends of the depressions 20 will come into close contact with the under surface of the pipe. This is considered to be an important feature of the construction because, due to this relationship of the parts, the heat conducting folded strip of metal can be inserted, and, if necessary, removed, without difficulty and can be brought into good heat conducting contact with the pipes by merely increasing the angle w .

From the above description it will be seen that by means of the radiating element or assembly that has been described, it is a simple matter to provide a ceiling with an extended heat radiating surface. When the parts are positioned as shown in this drawing, the floor above will also be heated to some extent and such a construction is, therefore, very well suited for residences having a second story. By making the covering elements thick and of good heat insulating material, only a small fraction of the heat will pass upwardly or through the walls of the insulating elements, most of the heat will then be transmitted by conduction downwardly and radiated from the connecting sections 23.

Attention is also directed to the fact that the heat radiating elements are downwardly flared so that their cross section increases in a downward direction. This facilitates the flow of heat and increases the efficiency of the heat transfer.

Having described the invention what is claimed as new is:

4

1. A heat radiating device for radiant heating systems, comprising in combination, a pipe, a heat insulating pipe covering of substantially U-shaped cross section partially enclosing the pipe, the inner surfaces of the covering, adjacent the edges thereof, having inwardly extending ribs forming supporting ledges, and a plurality of longitudinally spaced heat conducting fins having one end in contact with the pipe, and outwardly directed shoulders resting on the supporting ledges the fins extending outwardly of the covering, forming heat conducting and radiating surfaces.

2. A heat radiating device for radiant heating systems, comprising in combination, a pipe, a heat insulating pipe covering of substantially U-shaped cross section, partially enclosing the pipe, the inner surfaces of the covering, adjacent the edges thereof, having inwardly extending ribs forming supporting ledges, and a plurality of truncated triangular shaped longitudinally spaced heat conducting fins positioned with their truncated ends in engagement with the pipe, the sides of the fins having shoulders resting on the supporting ledges, the fins extending outwardly of the covering, forming heat conducting and radiating surfaces.

3. A heat radiating device for use in radiant panel heating systems comprising, a pipe, a covering of heat insulating material therefor, the covering having a U-shaped cross section, the sides of the covering along the open edges thereof having inwardly extending ribs forming supporting ledges, and a plurality of heat conducting fins of truncated triangular shape having their truncated ends in heat conducting contact with the pipe, the side edges of the fins having outwardly extending shoulders lapping the ledges for supporting the fins with their truncated ends in engagement with the pipe, the outer edges of the fins having lateral flanges positioned substantially in a common plane, forming radiating surfaces.

4. A device in accordance with claim 3 in which the heat conducting fins are formed in a continuous strip and pleated.

5. A device in accordance with claim 3 in which the truncated ends have curved notches for embracing the pipe.

6. A heat conducting and radiating unit for use in a radiant panel heating unit formed in part from a pipe having an elongated covering of heat insulating material of substantially U-shape, each side of which has a ledge extending inwardly adjacent its end, comprising, a strip of metal formed from a series of pairs of truncated triangular shaped units, whose upper connecting portions between the truncated ends, have a round opening which, when the parts are folded along a diameter of said opening, form semicircular recesses for the reception of the pipe, and shoulder means extending outwardly from opposite sides of the unit adjacent the recesses which serve to support the unit from its upper end from said ledge.

7. A heat radiating device for use in radiant panel heating, comprising, a covering of heat insulating material of a substantially U-shape, each side of the covering having a ledge extending inwardly adjacent its edge, a pipe positioned within the covering element adjacent its bottom and a plurality of longitudinally spaced heat conducting fins of sheet metal having one end positioned within the covering element, the extreme inner end being in heat conducting contact

2,480,427

5

with the pipe, the opposite edges of the portion within the covering element having shoulders resting on the ledges, the outer ends of said fins terminating in the same plane, forming heat radiating surfaces.

ROBERT E. STANTON.

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