

Feb. 11, 1930.

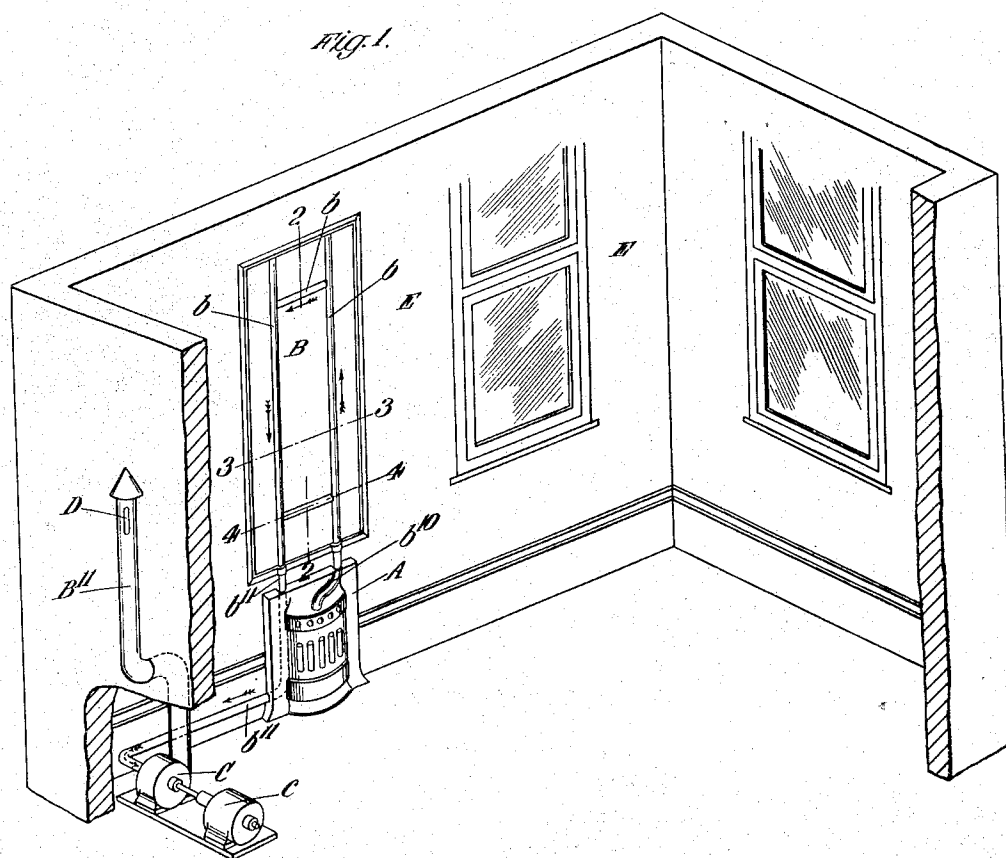
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APPARATUS FOR HEATING BUILDINGS AND FOR LIKE PURPOSES

Filed Nov. 26, 1926

2 Sheets-Sheet 1



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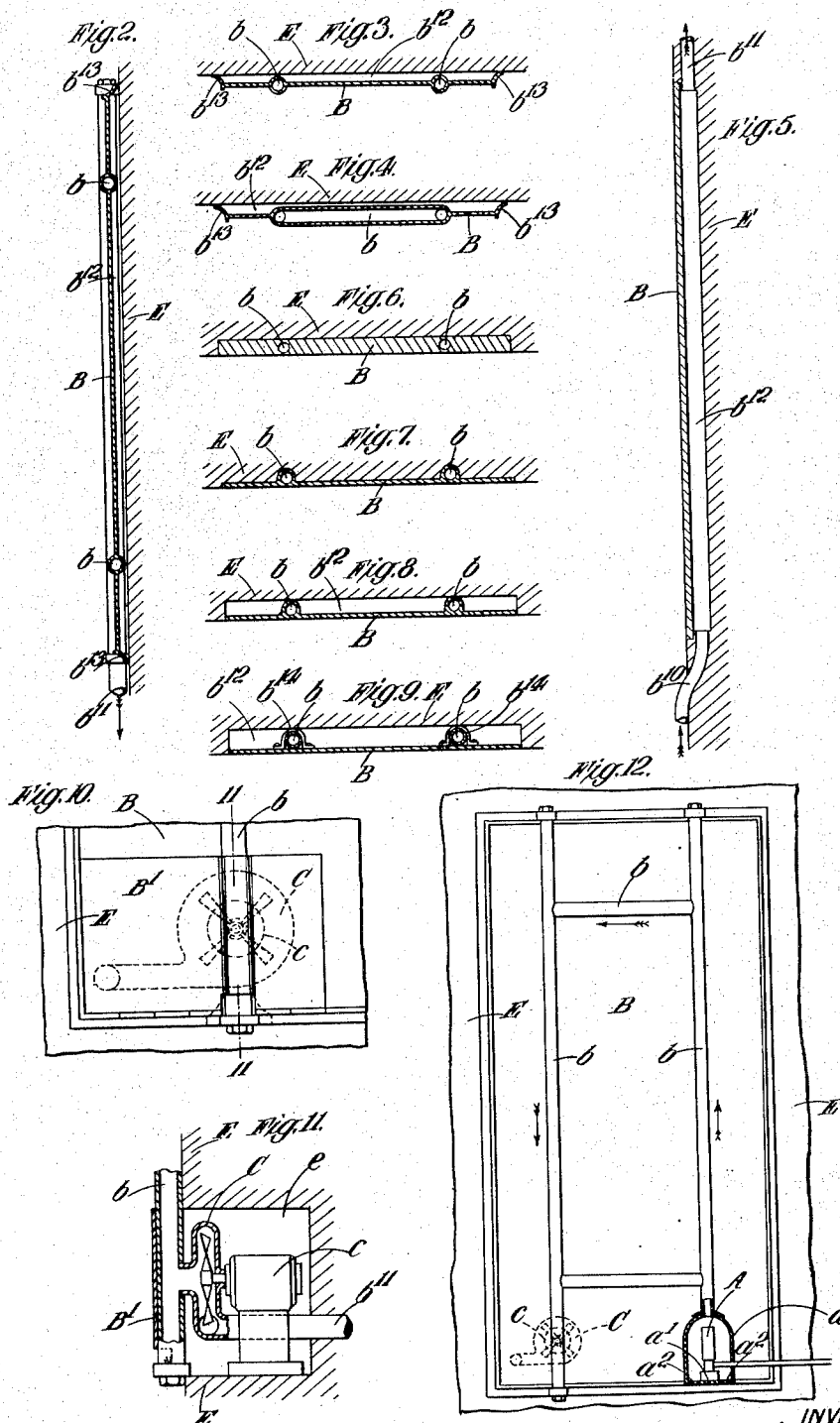
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APPARATUS FOR HEATING BUILDINGS AND FOR LIKE PURPOSES

Application filed November 26, 1926, Serial No. 150,656, and in Great Britain December 8, 1925.

This invention relates to devices for heating buildings and for like purposes and is particularly applicable in cases where a gas fire, flame or burner or the like is available, the object of the invention being to enable the heat of the hot gases of combustion from the gas fire, flame or burner or the like to be utilized to the best advantage by arranging means whereby what would ordinarily be waste heat escaping through a flue or outlet may be usefully employed without said gases entering the room to be heated.

The invention comprises a device consisting of a flat and extensive heat radiating plate or plates affixed to the wall or ceiling of a room or other structure to be heated with or without a space or spaces located immediately behind the heat radiating plate or plates and closed to the flow of external air over the back of said plate or plates and of means for causing hot gaseous products of combustion derived from a gas fire flame or burner or any other source to pass to said plate or plates and after heating them to pass away through an outlet.

The means employed for causing the gaseous products of combustion to pass to said plate or plates for heating them and to pass away through an outlet may consist of a fan driven by a motor, and the gaseous products of combustion may pass to and from said plates through a conduit or conduits which may form part of or be partly located within said space or spaces or may constitute part of or extend through the body of the heat radiating plate or plates. When the conduit or conduits extend through the body of the heat radiating plate or plates, the said space or spaces may be dispensed with, in which case suitable means may be provided for preventing undue heat losses at the back of the heat radiating plate or plates.

In the accompanying drawings.

Figure 1 represents a perspective view of a portion of a room illustrating by way of example the application of the invention where an ordinary gas stove is available.

Figure 2 is a vertical section of the heat radiating plate shown in Figure 1 taken approximately on line 2—2 thereof.

Figures 3 and 4 are horizontal sections taken approximately on the lines 3—3 and 4—4 of Figure 1 respectively.

Figure 5 is a vertical central section of a modified form of the heat radiating plate illustrated by Figures 2 to 4.

Figures 6 to 9 are horizontal sections similar to Figure 3 illustrating further modifications of the said plate.

Figure 10 is a fragmentary front elevation and

Figure 11 a vertical section taken approximately on the line 11—11 thereof illustrating the lower left hand corner of the heat radiating plate provided with a panel for giving access to the motor driven fan.

Figure 12 is a front elevation illustrating the heat radiating plate with a gas flame or burner located thereon for supplying the hot gaseous products of combustion.

Referring more particularly to Figures 1 to 4, A indicates the gas stove, B the flat or substantially flat and extensive metal heat-radiating plate having passages or conduits b formed therein and C indicates the fan for causing the hot gaseous products of combustion to pass through a pipe b^{10} from the gas stove to the heat radiating plate and thence through a pipe b^{11} to an external outlet D. The heat radiating plate B is affixed by any suitable means to the wall E (or ceiling) of the room, with or without a space immediately behind it, and if the space b^{12} be provided, as illustrated in Figures 2 to 4, the heat radiating plate may have a flange b^{13} at the back to constitute the marginal boundary of said space, or it may be a plain plate (i. e. flangeless) arranged in a countersunk space to and from which the gaseous products pass by the inlet and outlet pipes b^{10} , b^{11} , as shown at Figure 5. The said heat radiating plate may be formed in one piece or in sections secured together. The conduits b may be formed integrally with the plate B, as in Figures 3, 6, 7 and 8, or separately therefrom, in which latter case they would be made of metal pipes suitably secured in position on the back by metal straps b^{14} , as in Figure 9. The passages or conduits b of the heat radiating plate are, in Figures 1 to 4, integral with said plate

and project slightly above the exposed surface thereof, said passages or conduits serving to conduct the gaseous products coming from the gas stove through the pipe b^{10} along the uptake conduit near the right hand side of the plate to the transverse conduit near the upper end of the plate and thence along the downtake conduit near the left hand side of the plate to the outlet pipe b^{11} leading to the exhaust fan C. The two extensions of the uptake and downtake conduits shown at the upper end of the plate and the transverse conduit shown at the lower end of the plate form no part of the circulating system and are only retained to preserve the symmetrical appearance of the plate. The said passages or conduits b may extend wholly through the body of the plate, as in Figure 6, or they may form an integral part of the back of said plate, as in Figures 7 and 8, and in the latter case (Figure 8) they may protrude into the space b^{12} immediately behind the plate. The said fan C may be driven by a small electric motor c (Figure 1) or by any other suitable power device. Instead of a fan, I may employ a pump or other appropriate form of circulating device for causing the hot gaseous products to pass through the conduits. It will thus be seen that the hot gaseous products that would ordinarily escape from the gas stove through the usual flue are caused to pass through the conduits b and give up their heat to the heat radiating plate B which in turn gives up its heat to the room almost entirely by radiation and hardly at all by convection; the heat of such hot gaseous products will be thus utilized to the greatest advantage before they are passed to waste through the pipe b^{11} and outlet D.

In some cases the fan or other circulating device and its motor may be mounted behind a hinged or otherwise movable panel B^1 (Figures 10 and 11) forming part of the heat radiating plate B, the wall E being recessed at e to take the motor and fan. The advantage of such an arrangement is that not only will the motor and fan or other circulating device be readily accessible for inspection, renewal or repair, but no unsightly appearance will be presented as regards the interior aspect of the room.

When a gas flame or burner is to be used in place of a gas stove, the said flame or burner may be arranged on the heat radiating plate itself, as shown at Figure 12, where it is represented as being surrounded by a hood a communicating with the uptake conduit b and supported by a bracket piece a^1 on the plate B having air inlets a^2 therein; Of course the hood may be supported in position in any other suitable manner. The products of combustion from the flame or burner are caused to flow through the conduits b by the fan C, as already explained in connection with Figure 1.

In place of a gas stove, flame or burner I may employ any other means by which hot gaseous products of combustion can be generated and circulated behind or through the heat radiating plate or plates; in other words, the invention is not to be limited to any particular source of hot gaseous products of combustion. For example, they may be obtained from the exhaust of an internal combustion engine or from the flue of a furnace. The invention also is not to be limited to any particular means adopted for circulating the said gaseous products and I may vary the form of the heat radiating plates and also the manner of arranging the same and the means adopted for ensuring proper register between successive sections, when the arrangement is of a sectional nature.

In the following claims when I refer to "the wall" of the room, I intend to include the ceiling, and when I refer to the heat radiating plate having "conduits" I intend to include one or more of such conduits. Also, when I refer to "heat radiating plate" I intend to include a plurality of such plates.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A heating device for buildings and the like, adapted to be used in conjunction with a heat source capable of supplying heated fluid, comprising a substantially flat and extensive heat-radiating plate adapted to be attached to the wall of the building with only one face thereof exposed to the surrounding air, said plate being provided with at least one relatively small conduit so positioned as to permit a flow of the heated fluid in a counter-current direction, means for leading the heated fluid to one end of said conduit, and means for effecting the positive movement of the heated fluid through said conduit to effect substantially uniform diffusion of the heat throughout the radiating plate.

2. A heating device for buildings and the like, adapted to be used in conjunction with a heat source capable of supplying gaseous products of combustion, comprising a substantially flat and extensive heat-radiating plate adapted to be attached to the wall of the building with only one face thereof exposed to the surrounding air, said plate being provided with at least one relatively small conduit so positioned as to permit a flow of the heated fluid in a counter-current direction, means for connecting the heat source to one end of said conduit, and means connected to the other end of said conduit for effecting the positive movement of the gaseous products of combustion through said conduit to effect substantially uniform diffusion of the heat throughout the radiating plate.

3. A heating device for buildings and the like, adapted to be used in conjunction with a heat source capable of supplying gaseous

products of combustion, comprising a substantially flat and extensive heat-radiating plate adapted to be attached to the wall of the building and having marginal portions adapted to cooperate with the wall to prevent contact with the surrounding air except on one face of the plate, said plate being provided with at least one relatively small conduit so positioned as to permit a flow of the gaseous products of combustion in a counter-current direction, means for leading the gaseous products of combustion to one end of said conduit, and means for effecting the positive movement of the gaseous products of combustion through said conduit to effect substantially uniform diffusion of the heat throughout the radiating plate.

4. A heating device for buildings and the like, adapted to be used in conjunction with a heat source capable of supplying gaseous products of combustion, comprising a substantially flat and extensive heat-radiating plate adapted to be attached to the wall of the building and having marginal portions adapted to cooperate with the wall to prevent contact with the surrounding air except on one face of the plate, said plate being provided with at least one relatively small conduit so positioned as to permit a flow of the gaseous products of combustion in a counter-current direction, means for leading the gaseous products of combustion to one end of said conduit, and means mounted behind said plate and connected to the other end of said conduit for effecting a positive movement of the gaseous products of combustion through said conduit to effect substantially uniform diffusion of the heat throughout the radiating plate.

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