Oct. 11, 1949. H. A. MARBLE 2,484,457

WALL-TYPE FUEL BURNING HEATER

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FIG_1_

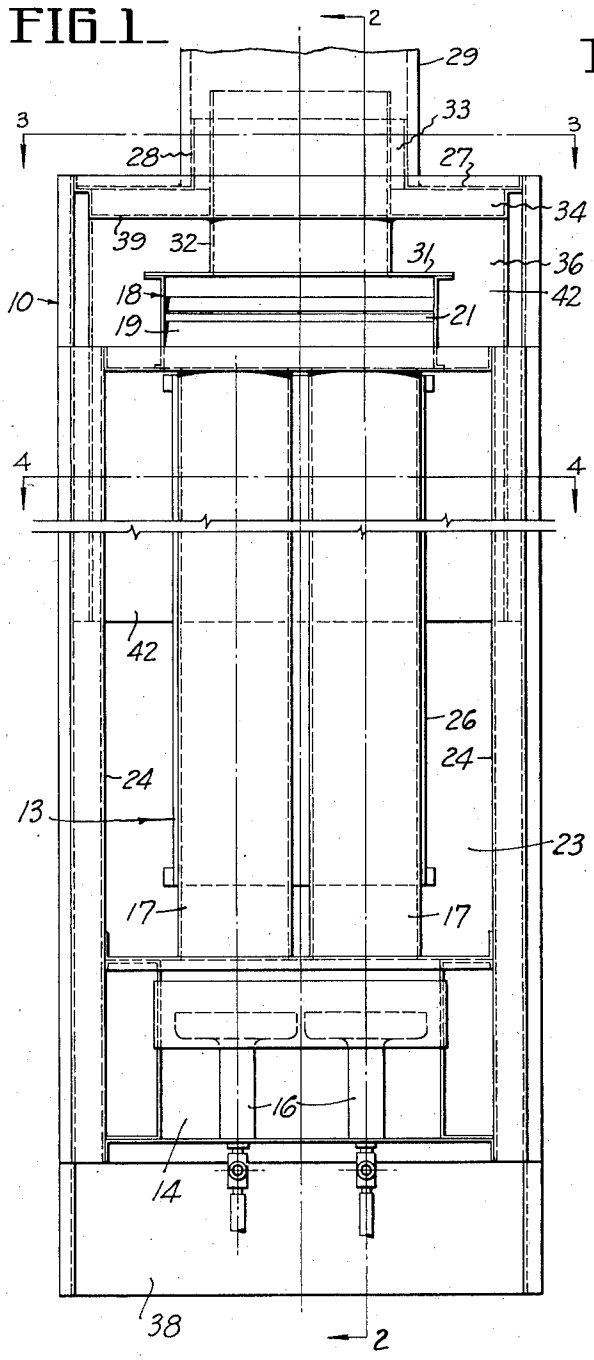
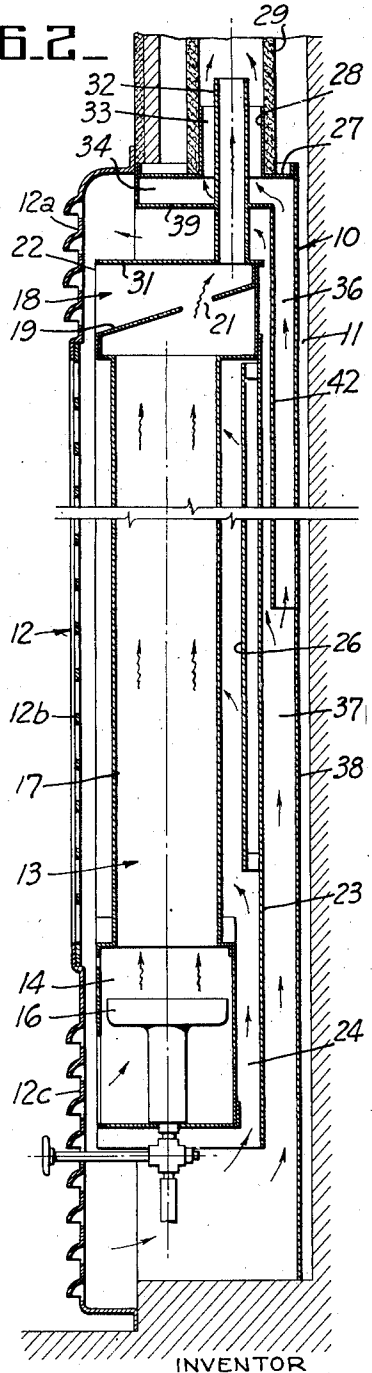


FIG_2_



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FIG. 3

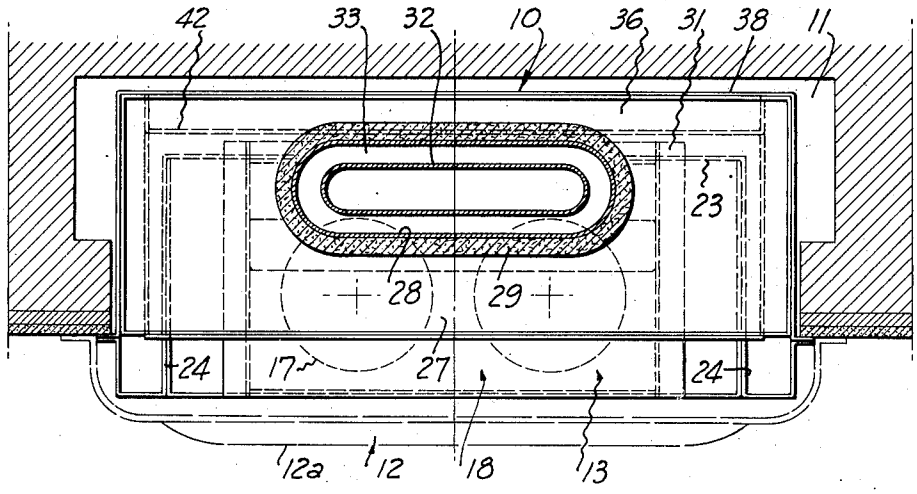
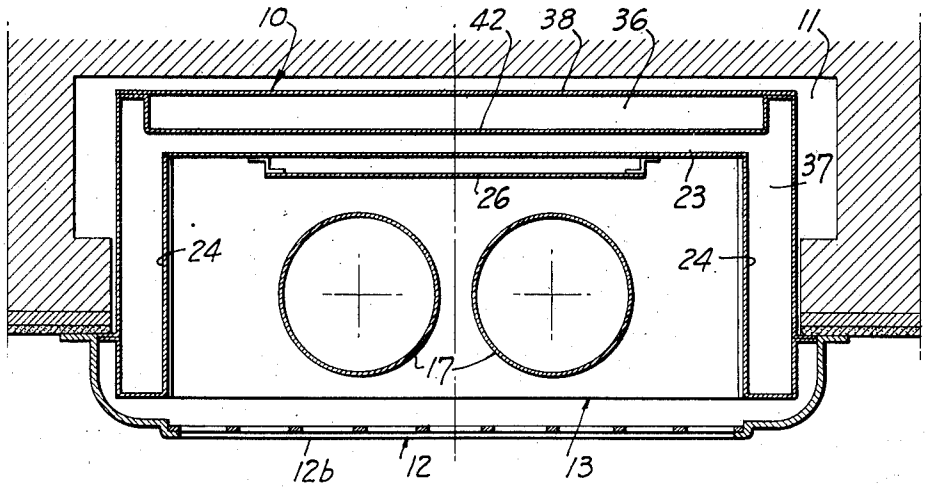


FIG. 4



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WALL-TYPE FUEL BURNING HEATER

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3 Claims. (Cl. 126—90)

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This invention relates generally to the construction of room heaters of the so-called wall type.

In the past it has been common to construct relatively compact gas heaters adapted to be installed in a wall recess, and arranged to connect with a flue pipe which is likewise concealed within the wall. A grill extends over the front of the heater whereby air from the room circulates into and out of the grill in heat transfer relationship with a suitable heating unit.

Room heaters of the above type, such as have been made in the past, have been subject to certain disadvantages. Particularly the flue pipe into which the hot gaseous products of combustion are discharged tends to be heated to a relatively high temperature, thus causing a fire hazard. This is due to the relatively high temperature of the gaseous products of combustion leaving the heating unit. In addition the back wall of the heater housing tends to be heated to a relatively high temperature, due to absorption of heat from the heating unit.

It is an object of the present invention to provide a wall type of room heater which avoids heating of the associated flue pipe to an unduly high temperature.

Another object of the invention is to provide a heater of the above type having provision for more adequate cooling of the back wall of the housing.

Further objects of the invention will appear from the following description in which the preferred embodiment has been set forth in detail, in conjunction with the accompanying drawing.

Referring to the drawing:

Figure 1 is a front view, with the grill removed, showing a gas heater incorporating the present invention.

Figure 2 is a cross-sectional view taken along the line 2—2 of Figure 1.

Figure 3 is a cross-sectional view taken along the line 3—3 of Figure 1.

Figure 4 is a cross-sectional view taken along the line 4—4 of Figure 1.

Referring first to Figures 1 and 2, my heater consists of a sheet metal housing 10, which is adapted to be fitted into the wall recess 11. The front side of the housing is covered by the grill 12, which consists of the upper part 12a, the intermediate part 12b, and the lower part 12c.

Within the housing there is a heater unit 13 which may vary as to details of construction. The particular unit illustrated consists of a lower fire box 14, which is provided with fuel burners 16. Heat exchange tubes 17 extend upwardly from the fire box 14, and are connected at their upper ends to the flue box 18. The flue box may be of conventional construction, and is shown provided with the inclined baffle wall 19, having a slot 21 for passage of products of combustion. The front side 22 of this box, above the baffle 19, is open through the grill.

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The heating unit 13 is surrounded on three sides by baffle walls, including the vertical back wall 23, and the vertical side walls 24 (see Figure 4). An additional vertical baffle wall 26 is mounted in spaced relationship with the wall 23.

At the upper end of the wall recess there is a plate 27, which extends completely across the recess, and which is attached to the wall studding. A short conduit 28 is carried by the plate 27, and communicates through the same. Conduit 28 fits within the lower portion of the regular flue pipe 29, which is generally made of suitable refractory material, and which extends upwardly through the wall to a point of discharge.

Extending upwardly from the wall 31 of the flue box 18, there is a conduit 32 which is considerably smaller than the conduit 28. It will be noted that when installed, conduit 32 extends upwardly through the conduit 28, leaving a space or passage 33 for flow of air. Passage 33 communicates with the connected passages 34 and 36, the latter having a lower open end communicating with the space 37 between the baffle wall 23 and the back housing wall 38. Passage 34 is defined by the sheet metal wall 39, which underlies the plate 27, and by the vertical wall 42, which extends between and is spaced from baffle wall 23 and the back housing wall 38.

Operation of the heater described above is as follows: Before installing the heater the lower end of the flue pipe 29 is fitted with conduit 28, and the plate 27 is suitably attached to the adjacent studding. When the heater is placed in the wall recess, care is taken to introduce the conduit 32 through the conduit 28, and to fit the upper part of the heater housing about the plate 27 in the manner illustrated in Figure 2. When the heater is in use, air from the room will circulate into and out of the housing through the front grill. Convection currents of air entering the lower part of the heater housing flow in part upwardly through the passage 37, and part of this air enters the passage 36, and discharges through the passage 33 into the flue 29. Gaseous products of combustion at an elevated temperature are discharged from the flue box 18, through the conduit 32, and into the flue pipe 29. The hot gases

discharging from the upper end of the conduit **32** intermingle with the much cooler air being delivered through the passage **33**, and therefore as a result the temperature of the products of combustion is immediately lowered to prevent undue heating of the flue pipe.

In addition to effectively reducing the temperature of the flue pipe **29**, the temperature of the back wall of the heater is materially reduced. This is due to the increased upward circulation of air from the room through the passage **37**, which is induced by the flow of air through the passages **36**, **34** and **33**. It is also due in part to the location of the passage forming wall **42**. A decrease in the dew point of the gases in the flue 29 also takes place, thereby allowing a lower flue temperature without condensation occurring.

The heater is not critical with respect to the point at which passage **36** communicates with the housing of the heater. However it may be desirable that wall **42** extend downwardly beyond the middle of the heater, thus receiving air which is reasonably cool, and also enabling it to serve as a heat baffle.

I claim:

1. In a heater construction of the fuel burning type suitable for mounting in a wall recess and adapted to be connected with a flue pipe extending upwardly within the wall from the recess, an outer metal housing adapted to fit the recess, a grill extending over the front of the housing, a heating unit enclosed within the housing to heat air circulating through the grill and the housing, said heating unit including a lower fire box provided with a fuel burner and an upper flue box in communication with the fire box, a conduit communicating with the upper end of the housing and adapted to be fitted into the lower end of the flue pipe, a second conduit communicating with the flue box and extending upwardly through the first named conduit to discharge into the flue pipe, the second conduit being of smaller diameter than the first named conduit to provide a passage therebetween, and means for directing a part of the air circulating through the housing into said passage.

2. A heater as in claim 1 in which said last named means includes a baffle wall disposed between the heating unit and the back wall of the

housing, and providing with the back wall a vertically extending passage communicating at its upper end with said passage, and open at its lower end to receive air from the room.

3. In a heater construction of the fuel burning type suitable for mounting in a wall recess and adapted to be connected with a flue pipe extending upwardly within the wall from the recess, an outer metal housing comprising vertical side and back walls adapted to fit within the recess, a grill extending over the front of the housing and permitting air from the room to circulate through the housing, a heating unit enclosed within the housing to heat air circulating through the same, said heating unit including a lower fire box provided with a fuel burner and an upper flue box in communication with the fire box, a vertical baffle wall disposed behind the heating unit and spaced with respect to the vertical back wall of the housing, a conduit communicating with the upper end of the housing and adapted to be fitted into the lower end of the flue pipe, a second conduit communicating with the flue box and extending upwardly through the first named conduit to discharge products of combustion into the flue pipe, the second conduit being smaller in diameter than the first named conduit to provide a passage therebetween, and walls serving to form a passage extending upwardly from the space between said baffle wall and the back wall of the housing and serving to deliver air into said passage between said conduits whereby air is caused to intermingle with the products of combustion in the flue pipe.

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