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2,743,720

SPACE HEATER FOR USE WITH A FIREPLACE

Filed May 19, 1951

2 Sheets-Sheet 1

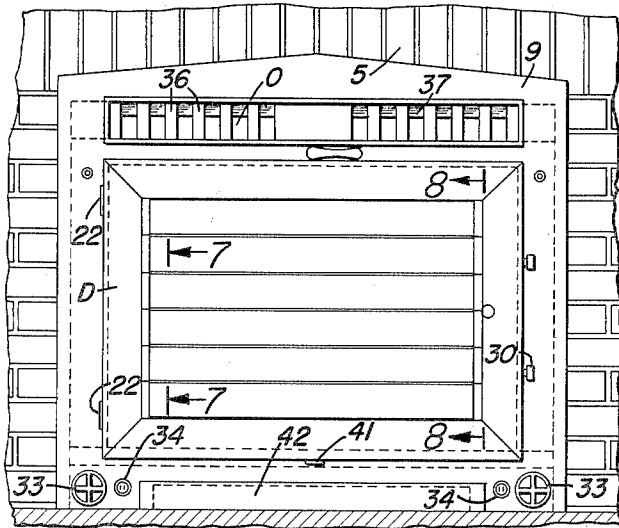


FIG. 1.

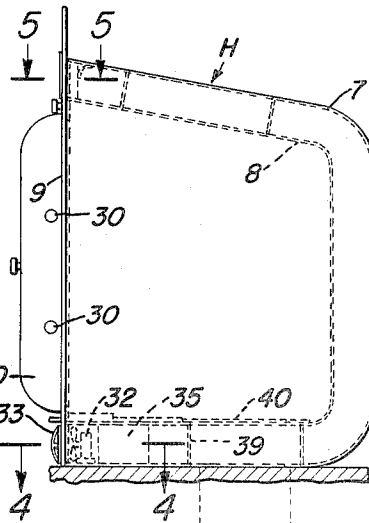


FIG. 2.

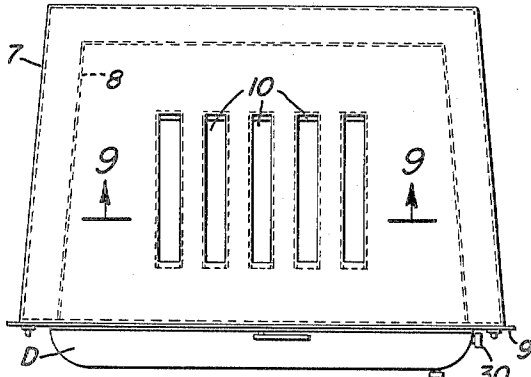


FIG. 3.

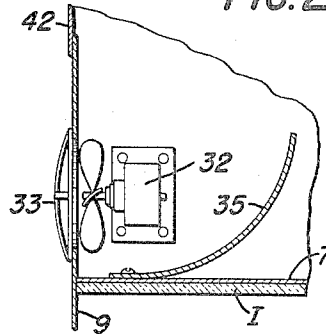


FIG. 4.

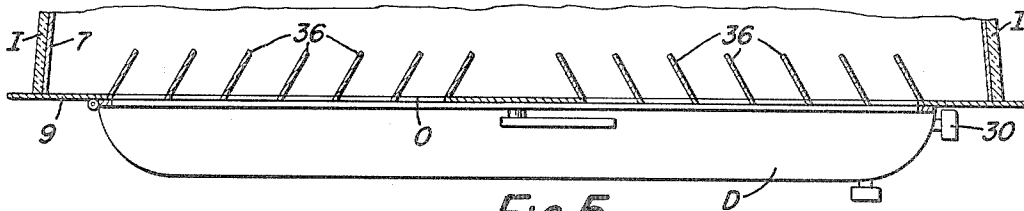


FIG. 5.

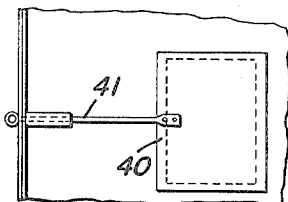


FIG. 6.

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SPACE HEATER FOR USE WITH A FIREPLACE

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2 Sheets-Sheet 2

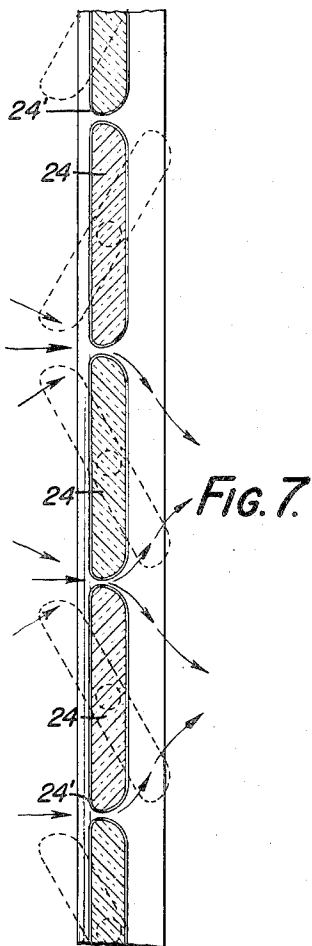


FIG. 7.

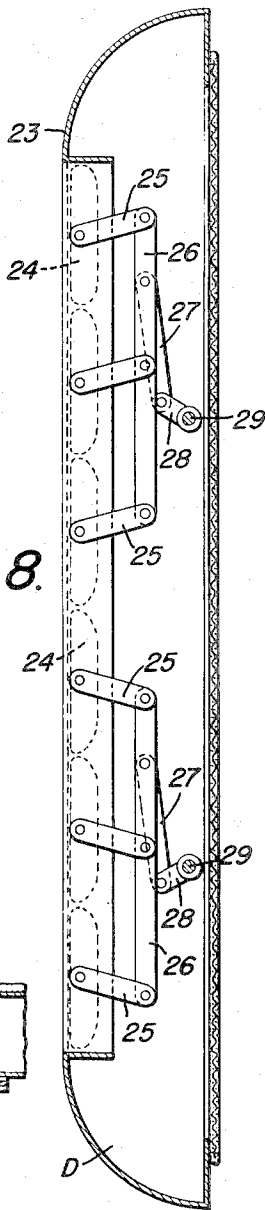


FIG. 8.

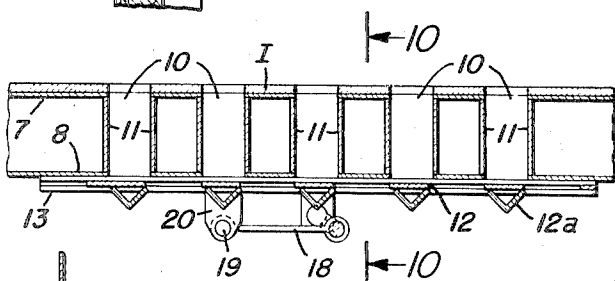


FIG. 9.

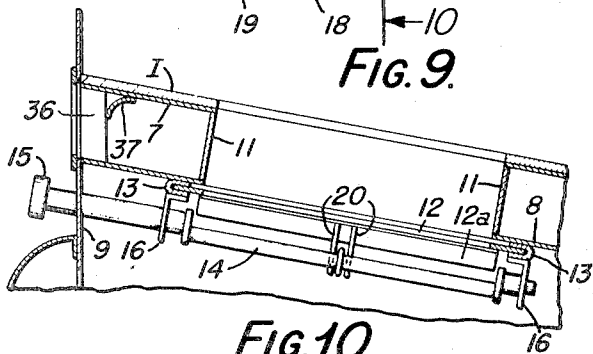


FIG. 10.

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1

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SPACE HEATER FOR USE WITH A FIREPLACE

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4 Claims. (Cl. 126—121)

This invention relates to a space heater for use in combination with a fireplace.

The conventional fireplace is notoriously inefficient for heating a room since the greater part of the heat produced, escapes up the chimney, and the rest of the produced heat, is poorly distributed throughout the room so that persons before the fireplace "bake" on one side and "shiver" on the other.

Furthermore, combustion in the common fireplace is inefficiently controlled by the usual chimney damper which must be left open a substantial amount so that smoke will go up the chimney and not issue into the room. Because of this poor combustion control, the fire can rage furiously for a short interval and then quickly die down, with a consequent uneconomic use of fuel.

The conventional fireplace is somewhat of a fire hazard unless a fire screen is used but the screen tends to obscure the cheery appearance of the flames as well as to limit conduction of heat into the room.

The present invention has for its purpose a fireplace unit for use in combination with a conventional fireplace whereby there is even distribution of heat throughout the room, whereby the combustion of the fuel is prolonged as well as rendered more uniform, and whereby the waste of heat up the chimney is greatly reduced so that the heat waste does not substantially exceed that of a stove or like heater. All of this is effected without sacrificing the beauty and charm of an open hearth.

The various features and advantages of the invention will appear from the detailed description and claims when taken with the drawings in which:

Fig. 1 is a front view of a portion of a fireplace with the heater of the present invention incorporated therein;

Fig. 2 is a side view and Fig. 3 is a top view of the present heater;

Fig. 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 2 showing one of the distributing fans and one of the deflector plates associated therewith;

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2 illustrating the distributing vanes in the heat outlet to the room;

Fig. 6 is a fragmentary view of the movable closure for the ash discharge outlet of the heater;

Fig. 7 is a vertical section taken through the draft-adjusting louvers taken on the line 7—7 of Fig. 1;

Fig. 8 is a section on the line 3—8 of Fig. 1, illustrating the mechanism for adjusting the louvers;

Fig. 9 is a section taken on the line 9—9 of Fig. 3, showing the construction of the damper which controls the smoke outlet from the heater to the chimney; and

Fig. 10 is a section taken on the line 10—10 of Fig. 9 illustrating the mechanism for operating the damper at the smoke outlet.

Referring to the drawings, 5 designates a fireplace and H generally designates a heater mounted therein and cooperating therewith.

2

This heater is in the form of a complete unit H which can be installed merely by inserting it into the fireplace 5 to rest on the hearth thereof, with the front portion of the unit completely closing the usual opening to the fireplace. The heater comprises an outer metal shell 7 and an inner metal shell 8 nested therein in spaced relation to the outer shell to define an air chamber completely enclosing the inner shell except at the front of the unit where the front edge of the shells 7 and 8 are sealed to the front plate 9 as by welding. The top of this plate has an opening 0 therein which communicates with the air chamber. It will be understood that inner shell 8 holds the burning fuel and serves as a combustion chamber from which combustion gases and smoke escape to the fireplace chimney through spaced passages 10 defined by the smoke flues 11 in the top of the unit. As herein illustrated, these flues are rectangular in form (Fig. 3) and have their upper and lower ends sealed to the outer and inner shells respectively (Fig. 9). The draft from the combustion chamber to the chimney is controlled by a sliding damper in the form of a metal plate 12 having rectangular openings therein of an area and spacing such that these openings can be alined with the smoke passages or alternatively the portions of the plate between these openings can be alined with the smoke passages. The plate 12 is reinforced, against warping due to heat, by means of triangular metal strips 12a welded to the under side of this plate, as shown (Fig. 9). The plate 12 is adjustable along spaced guides 13 (Figs. 9 and 10) on the under surface of the top of the inner shell extending parallel to the front of the fireplace so that the plate moves across the smoke flues. Preferably the upper surface of the damper is spaced from the adjacent surface of the inner shell so that there is always sufficient draft through the smoke passages to support some combustion even when the damper is in its so-called closed position. The damper can be adjusted in any convenient manner but as herein illustrated (Figs. 9 and 10), it is reciprocated by means of a rotatable eccentric shaft 14 extending from the back of the unit to the front thereof where it projects through the front plate 9 to terminate in a handle 15. This shaft which is supported on the brackets 16 is connected by a locomotive drive link 18 having one end thereof rotatably mounted on the eccentric portion of the shaft 14 and the other end thereof pivoted on pin 19 carried by lugs 20 on the damper.

The front of the combustion chamber is normally closed by a door D hinged at points 22, 22 on the front plate 9, but it can be opened to introduce fuel into the chamber. The door is in the form of an outwardly dished open support or frame 23 (Figs. 5 and 8). The opening in the door frame can be substantially closed by two or more sets of horizontally extending transparent louvers 24. Each louver at an intermediate point on each of its ends is pivoted on the frame 23, and one louver end has secured thereto a crank-arm 25. The three crank arms 25 of each set of louvers are pivoted at their free ends to the link 26. This link is pivotally connected to one end of the drive link 27, the other end of link 27 being pivotally connected to the crank arm 28 secured on the crank shaft 29. The crank-shaft projects through the door frame to terminate in a knob 30 by which the angular position of its related set of louvers can be adjusted.

It should be mentioned that the louvers 24 are preferably made of heat-resistant glass, and the edges of adjacent louvers are spaced slightly as shown in Fig. 7 so that even when the louvers are closed, currents of air flow through these spaces tending to prevent blackening of the inner surface of the louvers. The edges of the louvers, as shown at 24', have a streamlined or semi-

parabolic contour so the entering air currents tend to diverge. This tends to keep smoke away from the inner surfaces of the louvers so that they need only to be cleaned infrequently. Furthermore, this arrangement tends to keep the entire louver at a uniform temperature which eliminates substantially all breakage due to heat.

Circulation of air through the air chamber of the unit, is effected by a pair of electrically driven fans 32, each positioned back of an intake opening 33 located in the front 9 of the unit near the hearth. An electrical outlet 34 is provided through which current can be supplied to operate the fan motor. Each fan has associated therewith a deflector 35 attached to the inner surface of a side wall of the outer shell. This arrangement of the fans and the deflectors insures that the air will be directed to the hottest parts of the inner shell as well as circulated throughout the air chamber. In this manner there results an efficient transfer of heat from the combustion chamber to the stream of air which issues through the opening O into the room. As shown in Fig. 5, deflecting baffles 36 and the downwardly curved deflector plate 37 (Figs. 1 and 10) are provided at the opening O, to distribute the issuing heated air toward the floor and more widely throughout the room.

The bottoms of the inner and outer shells have alined openings therein to receive an ash disposal pipe 39 which has its ends respectively sealed to the shells at the mentioned openings therein. The pipe 39 registers with a conventional ash disposal passage in the hearth of the fireplace. The pipe 39 is normally closed by a plate 40, slidable on the inner surface of the bottom of the inner shell, by means of a rod 41 which projects through the front of the unit. Also when no electrical current is available, the plate 42 is removed to permit a larger opening for incoming air, so that the air circulates by gravity rather than by fan action.

What I claim is:

1. A space heater adapted to be mounted inside a fireplace for use therein, comprising an outer shell and an inner shell, each of said shells having bottom, side, back and top walls and being closed except at its front, said inner shell being nested in said outer shell with its several walls spaced from the several corresponding walls of said outer shell to define an air space between said shells, a front plate secured to the front faces of the bottom, top and side walls of both the inner and outer shells to close said air space, said inner shell serving as a fire-box, said front plate having an air-inlet opening therethrough communicating with said air space adjacent the bottom thereof, said front plate having an air-discharge opening therethrough communicating with said air space adjacent the top thereof, said front plate having an opening therethrough communicating with the inside of said inner shell to permit introduction of fuel into said fire-box, a door hinged on said front plate for closing the last-named opening, said door comprising a plurality of transparent slats made of heat-resistant material and mounted in said door for rotation on parallel horizontal axes, means for simultaneously adjusting said slats from a closed position in which they extend generally in a common plane with adjacent end faces slightly spaced from each other to open positions in which said slats are inclined to said common plane, the end faces of said slats, when said slats are in their closed position, being inclined to said common plane so that adjacent end faces of adjacent slats diverge from one another inwardly from front to back of said slats when said slats are in open position, the top walls of said shells having registering openings therethrough, and a flue pipe open at both ends and sealed in said registering openings to extend through said air space, said flue pipe communicating at its inner end with said fire-box.

2. A space heater adapted to be mounted inside a fireplace for use therein, comprising an outer shell and an inner shell, each of said shells having bottom, side, back

and top walls and being closed except at its front, said inner shell being nested in said outer shell with its several walls spaced from the several corresponding walls of said outer shell to define an air space between said shells, a front plate secured to the front faces of the bottom, top and side walls of both the inner and outer shells to close said air space, said inner shell serving as a fire-box, said front plate having an air-inlet opening therethrough communicating with said air space adjacent the bottom thereof, said front plate having an air-discharge opening therethrough communicating with said air space adjacent the top thereof, said front plate having an opening therethrough communicating with the inside of said inner shell to permit introduction of fuel into said fire-box, a door hinged on said front plate for closing the last-named opening, said door comprising a plurality of transparent slats made of heat-resistant material and mounted in said door for rotation on parallel horizontal axes, means for simultaneously adjusting said slats from a closed position in which they extend generally in a common plane with adjacent end faces slightly spaced from each other to open positions in which said slats are inclined to said common plane, the end faces of said slats, when said slats are in their closed position, being inclined to said common plane and having substantially semi-parabolic contours in cross-section so that adjacent end faces of adjacent slats diverge from one another inwardly from front to back of said slats when said slats are in the first-named position, the top walls of said shells having registering openings therethrough, and a flue pipe open at both ends and sealed in said registering openings to extend through said air space, said flue pipe communicating at its inner end with said fire-box.

3. A space-heater adapted to be mounted inside a fireplace for use therein, comprising an outer shell and an inner shell, each of said shells having bottom, side, back and top walls and being closed except at its front, said inner shell being nested in said outer shell with its several walls spaced from the several corresponding walls of said outer shell to define an air space between said shells, a front plate secured to the front faces of the bottom, top and side walls of both the inner and outer shells to close said air space, said inner shell serving as a fire-box, said front plate having an air-inlet opening therethrough communicating with said air space at the bottom thereof, said front plate having an air-discharge opening therethrough communicating with said air space adjacent the top thereof, said front plate having an opening therethrough communicating with the inside of said inner shell to permit introduction of fuel into said fire-box, a door hinged on said front plate for closing the last-named opening, said door comprising a plurality of slats adjustable from a position in which they extend generally in a common plane with their adjacent end faces slightly spaced from each other to positions in which said slats are inclined to said common plane, the top walls of said shells having registering openings therethrough, and a flue pipe open at both ends and sealed in said registering openings to extend through said air space, said flue pipe communicating at its inner end with said fire-box.

4. A space heater adapted to be mounted inside a fireplace for use therein, comprising an outer shell and an inner shell, each of said shells having bottom, side, back and top walls and being closed except at its front, said inner shell being nested in said outer shell with its several walls spaced from the several corresponding walls of said outer shell to define an air space between said shells, a front plate secured to the front faces of the bottom, top and side walls of both the inner and outer shells to close said air space, said inner shell serving as a fire-box, said front plate having an air-inlet opening therethrough communicating with said air space at the bottom thereof, said front plate having an air-discharge opening therethrough communicating with said air space adjacent the

5

top thereof, said front plate having an opening there-
 through communicating with the inside of said inner shell
 to permit introduction of fuel into said fire-box, a door
 hinged on said front plate for closing the last-named open-
 ing, said door comprising a plurality of slats adjustable
 from a position in which they extend generally in a com-
 mon plane with their adjacent end faces slightly spaced
 from each other to positions in which said slats are in-
 clined to said common plane, the top walls of said shells
 having a plurality of pairs of registering openings there-
 through, a flue pipe sealed in each pair of registering
 openings to extend through said air space, each flue pipe
 being open at both ends and communicating at its inner
 end with said fire-box, guide ways on the inside of the
 top wall of said inner shell, and a damper mounted to
 slide in said guideways, said damper having a plurality of
 spaced openings therein which can be aligned with flue
 pipes by movement of said damper, the upper surface
 of said damper being slightly spaced from the inside
 surface of the top wall of said inner shell so that there

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is always some draft through said flue pipes even in the
 closed position of said damper.

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