Dec. 9, 1958 J. HOFFMAN 2,863,443

FIRE PLACE CONVERSION UNIT

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Fig-1

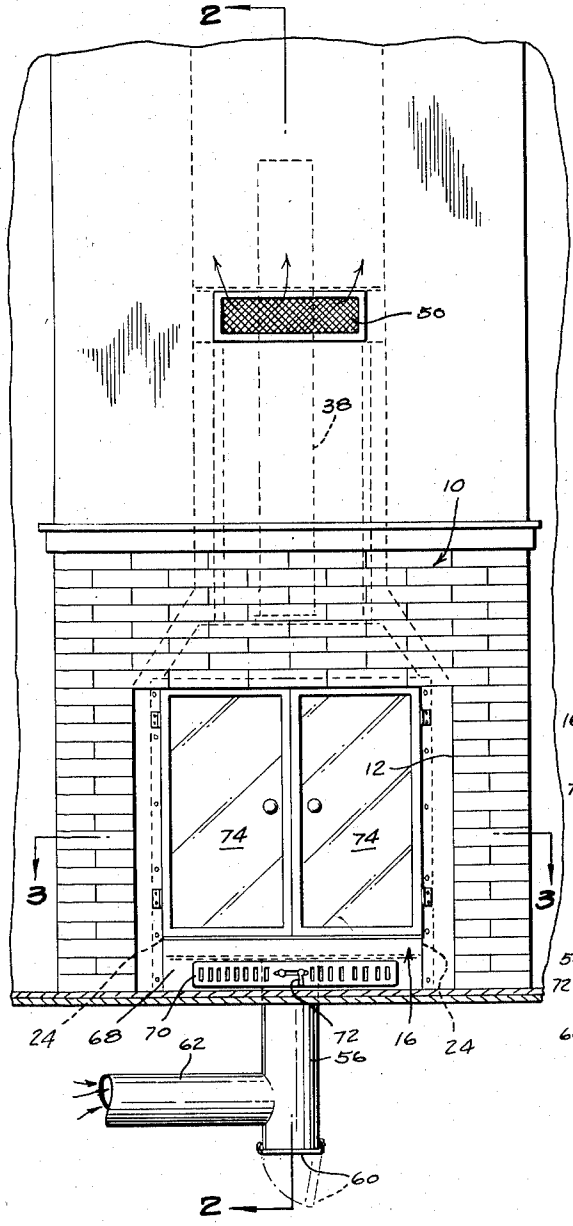
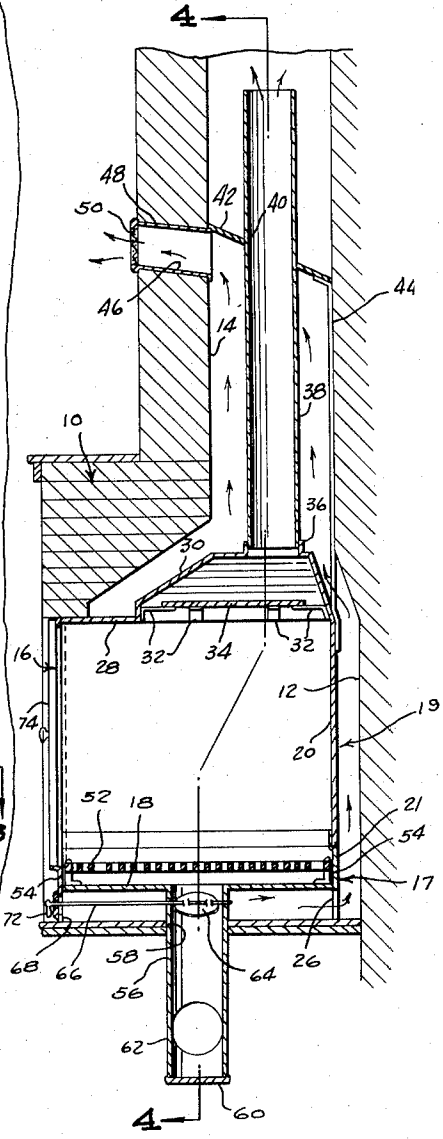


Fig-2



INVENTOR.

JOHN HOFFMAN

BY

McMorrow, Berman & Davidson

ATTORNEYS

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Fig-3

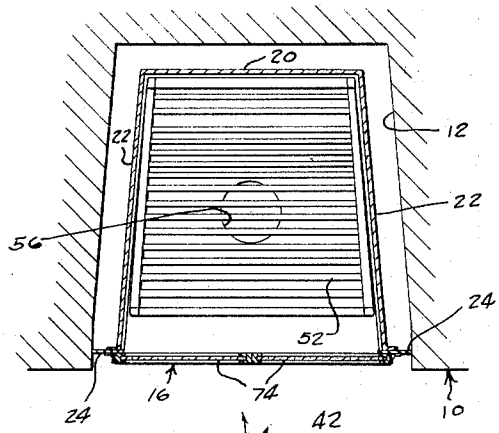


Fig-4

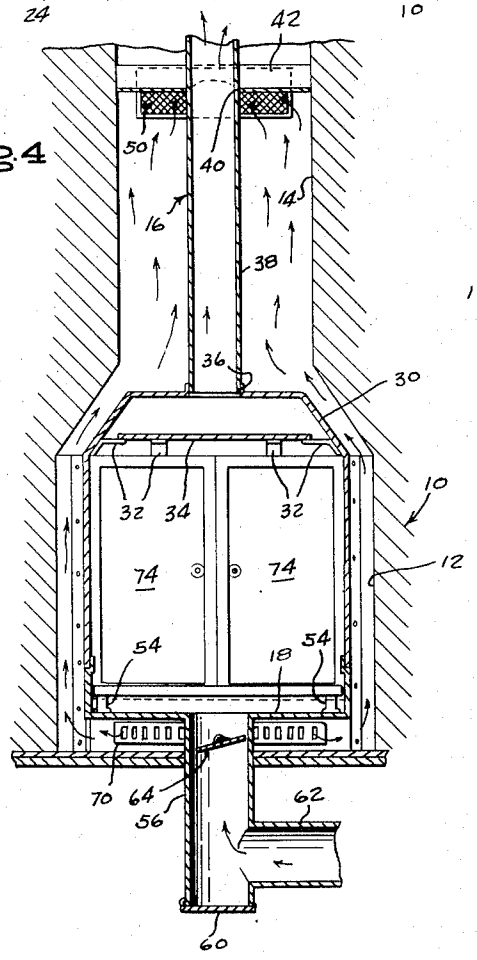
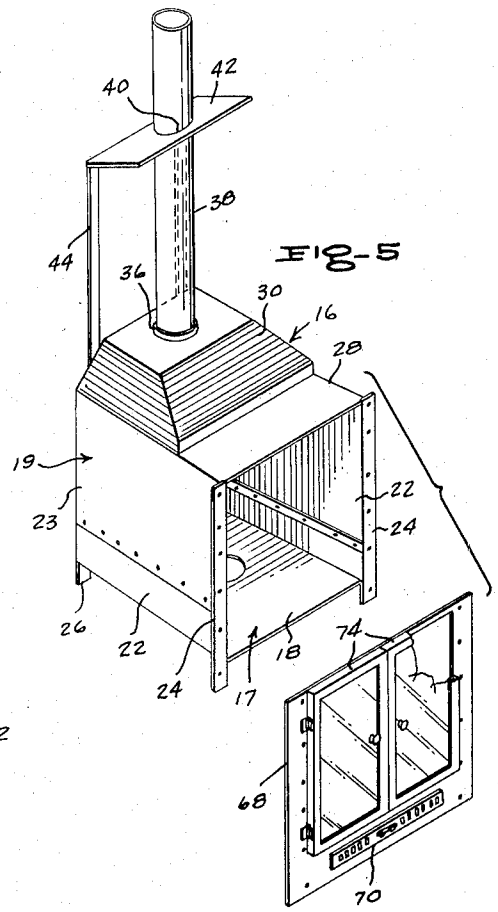


Fig-5



INVENTOR.

JOHN HOFFMAN

BY

McMorrow, Berman & Davidson

ATTORNEYS

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2,863,443

FIRE PLACE CONVERSION UNIT

John Hoffman, Ocean Grove, N. J.

Application July 8, 1955, Serial No. 520,757

3 Claims. (Cl. 126—121)

This invention relates to a heating apparatus for installation in existing, open hearth fireplaces.

It is well known that open fireplaces are highly inefficient in use, and accordingly, it has heretofore been proposed to install, in a fireplace of this type, means for converting the fireplace into a space heater. Ordinarily, the installation of units of this type involves considerable expense, whether said installation be effected at a time following completion of the fireplace or, alternatively, during actual construction of the fireplace. In some instances, the units must in fact be installed at the time the fireplace is being constructed, and in the remaining instances, the installation is attended with considerable difficulty, and entails a considerable expense requiring extensve modification or preparation of the fireplace, accomplished only by the use of skilled labor.

The main object of the present invention is to provide a generally improved heating unit for fireplaces, so designed as to particularly facilitate its partial preassembly or fabrication, with installation of the unit being capable of being accomplished by the householder himself, with an attendant reduction in cost below that normally required for installation of a unit of this type.

Another object of importance is to provide a unit as stated which will be so designed as to provide for greater heating efficiency than many similar units already in use.

Still another object of importance is to provide a fireplace conversion unit which will be so designed as to permit the same to be readily adapted for installation in fireplaces of various shapes and sizes.

Yet another object is to form the fireplace unit in such a manner as to provide an attractive installation which will detract to a minimum from the exterior appearance of the fireplace.

Other objects will appear from the following description, the claims appended thereto, and from the annexed drawings in which like reference characters designate like parts throughout the several views and wherein:

Figure 1 is a front elevational view of a fireplace in which has been installed a conversion unit formed according to the present invention;

Figure 2 is a vertical section on line 2—2 of Figure 1;

Figure 3 is a horizontal section on line 3—3 of Figure 1;

Figure 4 is a vertical sectional view at right angles to the cutting plane of Figure 2, taken on line 4—4 of Figure 2;

Figure 5 is an exploded perspective view, portions being broken away, of the conversion unit per se.

A conventional fireplace generally designated **10** includes the usual combustion chamber or fire pit **12**, and the flue **14** extending upwardly from and communicating with the upper end of said combustion chamber.

The device constituting the present invention has been generally designated at **16**, and includes a rectangular fire box adapted to fit into the combustion chamber of the fireplace. The fire box is, as shown in Figure 5,

made in two sections, these being a lower section generally designated **17**, and an upper section generally designated at **19**. Each of these sections may be preassembled during manufacture of the device, and then connected to one another within the fireplace, in a manner to be made presently apparent.

The lower section **17** of the fire box includes a horizontal bottom wall **18**, and (see Figure 2) projecting upwardly from the rear edge of the bottom wall **18** is a low back wall section **21**. Low, upstanding side walls **22** are provided upon the opposite side edges of the bottom wall **18**, and these are connectable, within the fireplace, to the bottom edges of the upper side wall portions **23**, provided on the upper fire box section **19**. The upper fire box section additionally includes a back wall **20**, interfitting, in the same manner as the side wall portions **22**, **23**, with the back wall **21** of the lower fireplace section. The back and side walls of the lower fireplace section, as shown in Figure 2, can have upwardly projecting, inwardly offset flanges defining shoulders against which the lower edges of the back and side walls of the upper fireplace section abut, after which screws or equivalent fastening elements can be employed to complete the construction of the rectangular, open front fire box illustrated in Figure 5.

Connectable by bolts or equivalent fastening elements to the side edges of the fire box, are vertically disposed flanges **24**, the lower ends of which extend below the bottom wall **18** to provide supporting legs for the fire box at the front thereof. Provided upon the rear corners of the lower section **17** are rear legs **26**, cooperating with the front legs to support the bottom wall **18** in a plane elevated above the bottom of the fireplace.

A top wall **28** is provided upon the fire box, said top wall being open at its rear and being in communication at this point with an upwardly tapering extension chamber **30** in which the hot products of combustion are collected, said chamber being formed integrally with the top wall in the illustrated example of the invention, but being adapted to be preformed as a separate unit if desired.

Secured to and projecting inwardly from the several walls of the chamber **30** (see Figure 2) are brackets **32** disposed in a common horizontal plane, and supported upon said brackets is a horizontally positioned baffle **34**, the edges of which are spaced inwardly from the side walls of the collection chamber.

Above the baffle **34**, the collection chamber **30** is formed with a low, upstanding neck **36**, in which is fitted the lower end of a cylindrical stack **38**, the upper end portion of which extends through an opening **40** formed in an inclined partition or shelf **42** the edges of which abut snugly against the side walls of the flue **14**. The rear edge of the partition is supported upon the inwardly projected upper end portion of an elongated support bar **44** secured at its lower end to the rear of the fire box.

Immediately below the forward edge of the partition **42** there is formed an inclined opening **46**, said opening being formed in the front wall of the flue and communicating between the room space and the area within the flue disposed below the partition **42**, to provide an outlet for heated air into the room space. A screen **50** or other type of grille is mounted across the outlet of the opening **46**.

Within the lower portion of the fire box, a grate **52** is suported upon brackets **54**, and below the grate, there is centrally formed in the bottom wall **18** an opening, communicating with the upper end of a depending pipe **56**, mounted in a center opening **58** formed in the bottom of the fireplace. A door **60** is hinged to the lower end

of the pipe 56, and is normally engaged in a closed position by a hasp and pin means or similar device.

Extending laterally from the lower portion of the pipe 56 in communication therewith is an air inlet pipe 62, the inlet end of which will be in communication with atmosphere at a location outside the house.

In the upper portion of pipe 56 there is mounted a damper 64, from which extends a control rod 66 projecting through a vertically disposed frame plate 68 extending transversely of the fireplace and connectable at its ends to the flanges 24. The frame plate 68 has an elongated, slot-like opening, in which is mounted a slidable closure 70, the handle 72 of the damper control rod 66 projecting through said closure to permit operation of the damper from within the room, regardless of the position of the closure 70. The closure has a longitudinal series of vertically disposed inlet openings, said openings being fully opened in one position of the closure and being closed or only partially opened in other positions of said closure to control the passage of air therethrough into the fire chamber of the fireplace, about the fire box.

A pair of doors 74, formed to include door frames in which are mounted panes of fire resistant, tempered glass, are provided with hinges at their outer side edges connectable to the frame plate 68.

In installing the unit, an air vent opening 46 is cut in the front wall of the chimney at the desired height, after which the partition or shelf 42 is installed in an inclined position in the chimney just above the air vent opening, so as to direct warm air into the room. The metal stack 38 is then inserted in the chimney through the partition and is secured in place.

The upper section 19 of the fire box is now inserted through the fireplace opening and installed, with the stack being fitted to the neck 36. Then, the lower section of the fire box, designated at 17, is placed under the upper section and secured thereto. The side flanges 24 are now installed, to close the air spaces at the sides of the fire box within the fireplace opening, after which the doors and the frame plate 68 are attached to said side flanges. The combination ash disposal and outside air inlet conduit 56, 62 may now be installed, should such conduit be desired.

It will be seen that the device can be partially preassembled, so as to constitute a prefabricated unit capable of installation in an existing fireplace with minimum difficulty and expense.

In use of the unit, draft air enters the fire box through the conduit 62, 56, with the inflow of air being regulated by the damper 64. The doors are, of course, kept closed, and the air will pass upwardly within the fire box through the grate, to maintain combustion of fuel supported on the grate. The hot products of combustion pass upwardly through the stack 38 and out the existing chimney. Meanwhile, air is drawn into the space surrounding the fire box at the sides, bottom, and back thereof, from the room, through the openings of the closure 70, in the direction of the arrows shown in Figure 2. The walls of the fire box are of a sheet metal having a high rate of thermal conductivity and radiation, and hence the air passing about the fire box is warmed, moving upwardly as a consequence within the space surrounding the stack 38 below partition 42, and passing through the air outlet conduit 48 into the room space.

In the thus described invention, there is the desirable characteristic wherein the device can be formed in preassembled components, with said components being readily connectible directly within the fireplace in minimum time and without the requirement of skilled labor. The unit, once installed, provides a space heater for the room, with the room air being continuously recirculated through the space surrounding the fire box and stack below the partition, for continuous warming of the air. Further, additional heat is radiated through the glass panels of the doors, further adding to the heating efficiency of the device.

It is believed apparent that the invention is not necessarily limited to the specific use or uses thereof described above since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. A heating unit comprising a firebox adapted to be installed in a space having a communicating flue, said box including a lower section embodying a horizontal bottom wall having a rear edge, a pair of side edges and a front edge, a back wall extending along the rear edge of said bottom wall and a side wall extending along each of the side edges of said bottom wall, each of said back and side walls being provided with a shoulder extending therealong adjacent the upper end thereof, an upper section embodying a top wall having a rear edge, a pair of side edges and a front edge, a back wall extending along the rear edge of said top wall and a side wall extending along each of the side edges of said top wall, said upper section being positioned so that the lower ends of said back and side walls thereof abut and rest upon the shoulders of the back and side walls of said lower section with the top wall in spaced parallel relation with respect to the bottom wall of said lower section, means detachably securing the portions of the back and side walls of said upper section adjacent the lower ends of the adjacent portions of the back and side walls of said lower section, a vertically disposed frame plate extending between and abutting the front edges of the wall of said lower section and the top wall of said upper section and detachably secured to the adjacent edges of the side walls of said lower and upper sections, there being a closed slot in said frame plate, a closure slidably mounted on said plate and movable over said slot, a chamber rising from the top wall of said upper section, a neck in said chamber, and a shelf positioned above and spaced from said neck and adapted to be arranged in an inclined direction in a communicating flue of a space in which said firebox is installed.

2. A heating unit comprising a firebox adapted to be installed in a space having a communicating flue, said box including a lower section embodying a horizontal bottom wall having a rear edge, a pair of side edges and a front edge, a back wall extending along the rear edge of said bottom wall and a side wall extending along each of the side edges of said bottom wall, each of said back and side walls being provided with a shoulder extending therealong adjacent the upper edge thereof, and an upper section embodying a top wall having a rear edge, a pair of side edges and a front edge, a back wall extending along the rear edges of said top wall, and a side wall extending along each of the side edges of said top wall, said upper section being positioned so that the lower edges of said back and side walls thereof abut and rest upon the shoulders of the back and side walls of said lower section with the top wall in parallel spaced relation with respect to the bottom wall of said lower section, means detachably securing the portions of the back and side walls of said upper section adjacent the lower edges to the adjacent portions of the back and side walls of said lower section, a vertically disposed frame plate extending between and abutting the front edges of the bottom wall of said lower section and the top wall of said upper section and detachably secured to the adjacent edges of the side walls of said lower and upper sections, there being a closed slot in said frame plate, a closure slidably mounted on said frame plate and movable over said slot, a chamber rising from the top wall

of said upper section, a neck on said chamber, a shelf positioned above and spaced from said neck and adapted to be arranged in an inclined direction in a communicating flue of a space in which said firebox is installed, and a stack adapted to be arranged in the communicating flue of a space in which said firebox is installed and having the lower end received and supported in said neck and extending through said shelf.

3. A heating unit comprising a firebox adapted to be installed in a space having a communicating flue, said box including a lower section embodying a horizontal bottom wall having a rear edge, a pair of side edges and a front edge, a back wall extending along the rear edge of said bottom wall and a side wall extending along each of the side edges of said bottom wall, each of said back and side walls being provided with a shoulder extending therealong adjacent the upper edge thereof, and an upper section embodying a top wall having a rear edge, a pair of side edges and a front edge, a back wall extending along the rear edge of said top wall and a side wall extending along each of the side edges of said top wall, said upper section being positioned so that the lower edges of said back and side walls thereof abut and rest upon the shoulders of the back and side walls of said lower section with the top wall in parallel spaced relation with respect to the bottom wall of said lower section, means detachably securing the portions of the back and side walls of said upper section adjacent the lower edges to the adjacent portions of the back and side walls of said lower section, a vertically disposed frame plate extending between and abutting the front edges of the bottom wall of said lower section and the top wall of said upper sections and detachably secured to the adjacent edges of the side walls of said lower and upper sections, there being a closed slot in said frame plate, a closure slidably mounted on said frame plate and movable over said slot, a chamber rising from the top wall of said upper section, a neck on said chamber, and a horizontally disposed baffle fixedly positioned within said chamber and spaced below said neck.

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