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HEATER UTILIZING OPTIONAL FUELS

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2 Sheets-Sheet 1

Fig. 1

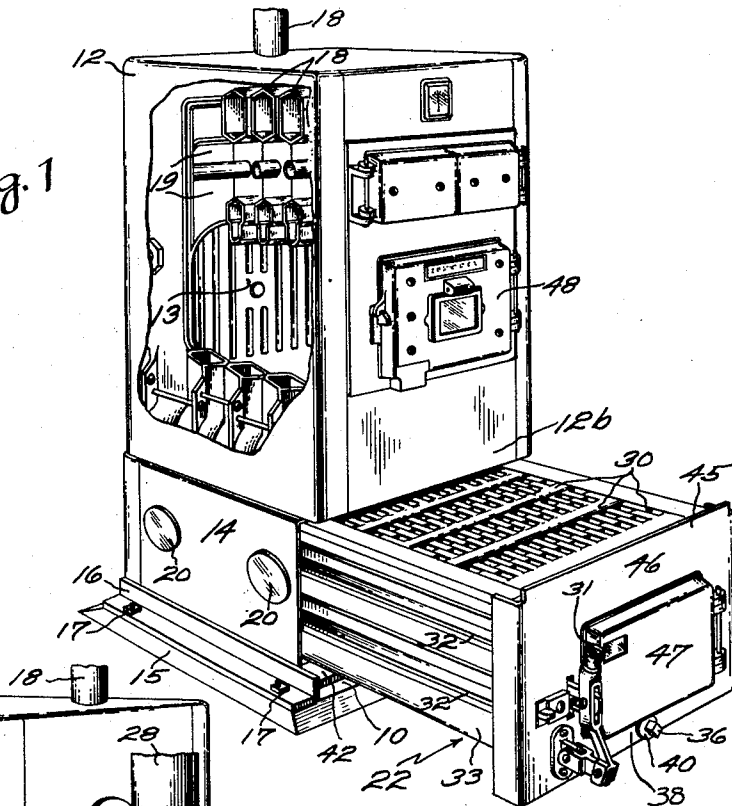
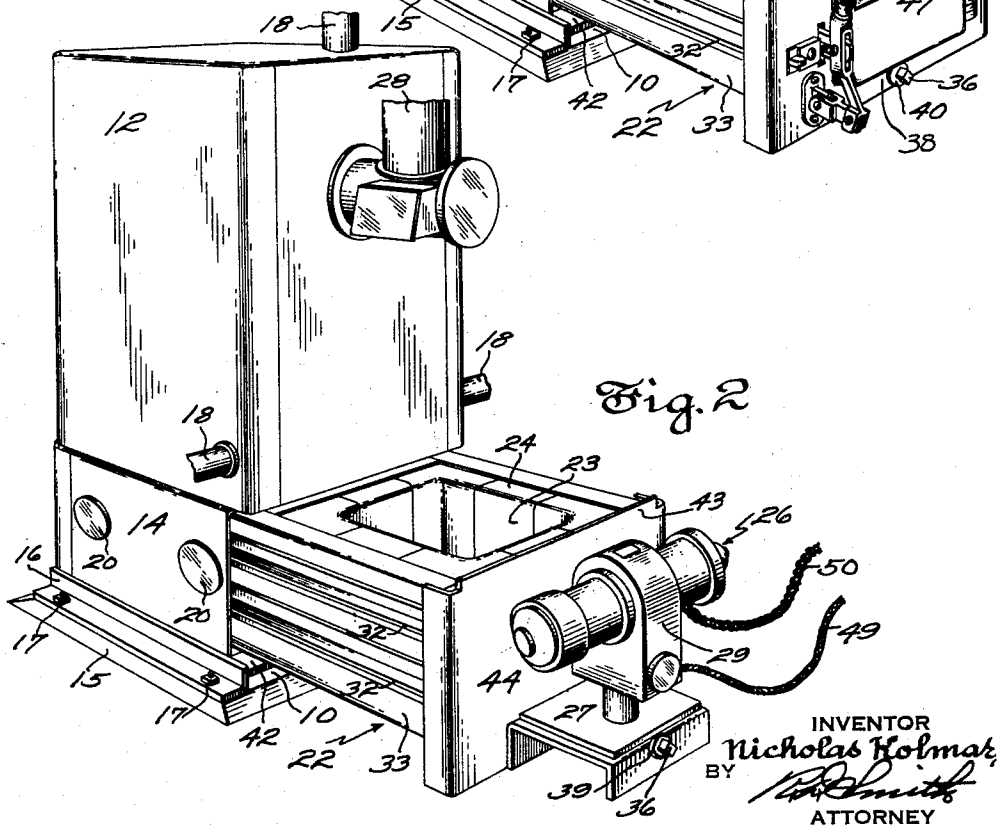


Fig. 2



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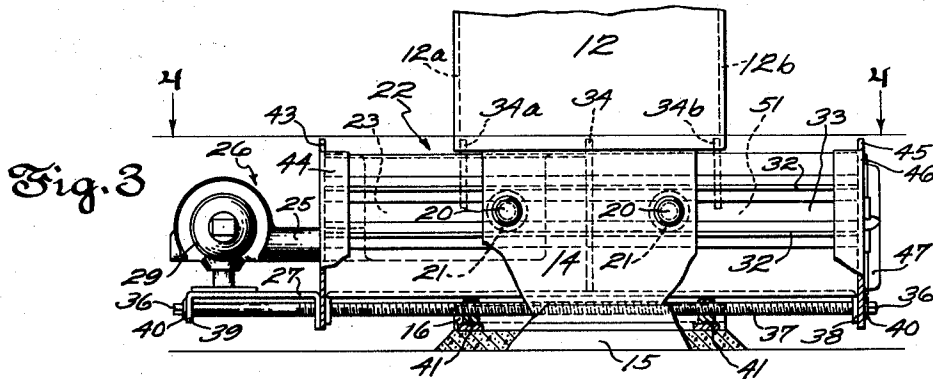
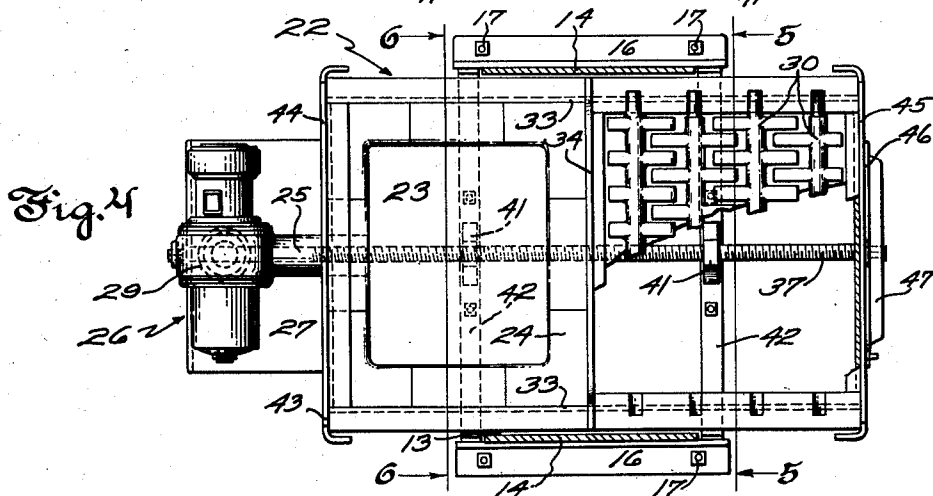
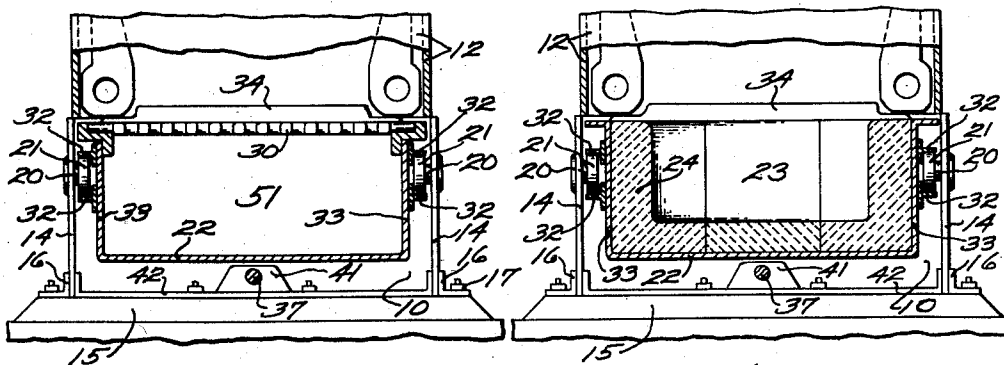
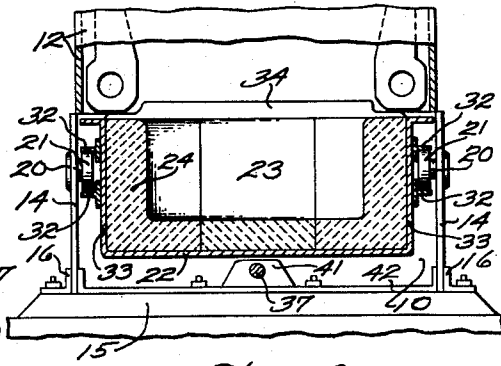
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2 Sheets-Sheet 2



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1

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HEATER UTILIZING OPTIONAL FUELS

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4 Claims. (Cl. 110—22)

This invention relates to furnaces, boilers or other types of apparatus for heating residences, apartment houses, industrial establishments or other buildings and relates especially to such heating apparatus when adapted for the optional burning of different kinds of fuels without requiring reconstruction of the heater or the dismantling of any of its permanently assembled parts. For instance the invention aims to give an ordinary householder the choice of burning either solid or fluid fuels in the same heater. The disclosed illustrative embodiment of the invention gives a choice between burning coal by hand firing or burning oil under automatic control.

A need for heating apparatus that is easily convertible to the use of optional fuels is illustrated by the prevalent use of oil burners depending for their operation of a constant supply of electric current derived from the house line, this current serving to energize the blower motor of the oil burner and to generate the fuel igniting spark and to operate the usual thermostatic and safety controls. When the supply of current becomes cut off from an oil heated building by reason of storms or other causes of service interruption, an oil burning heater becomes hopelessly inoperative because even in the gun type of oil burner having an empty fire pit such pit is not suited to the burning of solid fuels.

Heretofore there have been proposals for leaving permanently installed in the heater a solid fuel burning apparatus, such as a conventional grate for burning coal or wood, and then adding to such grate in the same fire box therewith some additional kind of apparatus for burning a different kind of fuel, usually illuminating gas. It has been proposed that gas burning apparatus can be located permanently in an out-of-the-way place in the regular fire box or be displaceable from interference with the grate when burning coal. These proposals, even if practical for the optional burning of gas or solid fuel, are not feasible as related to oil burners whether or not of the gun type which require a rather large fire pit of quite different size and character from the conventional fire box in which solid fuels can be burned.

In contrast with such former proposals it is an object of this invention to effect with respect to the main body of a heater not an accumulation, but an interchange, of heat generating units utilizing respectively different kinds of fuel, so that either kind of unit can be used without an interfering presence of the other and without dismantling any permanently assembled structure of the heater.

A related object is to effect the interchange of heat generating units without moving such units relatively to each other or separating either of them from the main body of the heater.

A further object is to enable such units to be interchanged very quickly and easily without the need for tools or expert knowledge of heaters and heat generation.

A further object is to arrange portions of a composite

2

fuel burning unit capable of shifting movement relative to the heater and that shall be sturdy and not likely to get out of order or otherwise give trouble as a result of use or being shifted in unison between different positions relatively to the heater.

A still further object is to insure that the heat generating space within the heater shall at all times be flame proof and dependably sealed against dangerous escape of heat into the open cellar despite the shiftable nature of the fuel burning apparatus.

With these objects in view a practical embodiment of the invention and its manner of use are explained in the following description having reference to the accompanying drawings wherein:

Fig. 1 shows in perspective front view a compact vertical type of house heater embodying the invention, the upright wall of its heat utilizing hollow superstructure being partly broken away and the heat being delivered by a concealed underlying oil burner unit that is visible in withdrawn position in Fig. 2.

Fig. 2 shows the same house heater in perspective rear view with the oil burning unit withdrawn and its place taken by the coal burning grate structure that is visible in withdrawn position in Fig. 1.

Fig. 3 is an elevation of the heater with the upright sidewall of its ash pit partially broken away to expose a shiftable duplex heat generating unit slidable there-within.

Fig. 4 is a plan view looking downward from the section plane 4—4 in Fig. 3.

Fig. 5 is a view taken in section on the plane 5—5 in Fig. 4 looking in the direction of the arrows.

Fig. 6 is a view taken in section on the plane 6—6 in Fig. 4 looking in the direction of the arrows.

In the drawings the main frame structure embraces a conventional hollow heat utilizing superstructure 12. This heat utilizing structure may be of various kinds and equipped with ducts or conduits 18 for circulating house heating air, water or steam. Around these ducts or conduits the gases of combustion pass through the smoke box or flue gallery 19 from a fire box compartment 13 to the chimney funnel 28. A conventional permanent ash pit 10 underlies the conventional fire box compartment 13.

The ash pit 10 is flanked by upright walls 14 whose bottom portions serve as legs to support the superstructure 12 thus forming a tunnel therebetween beneath compartment 13. These side walls can be bolted to the cement platform 15 of a cellar floor by means of welded base angle-irons 16 held down by nuts 17 in threaded engagement with upstanding screw studs embedded in the cement of the cellar floor.

Each of the upright walls 14 fixedly carries a pair of stationary heavy duty pivot studs 20 projecting inwardly of the ash pit 10, and each stud pivotally supports a roller wheel 21 which if desired may turn on heavy duty ball bearings or roller bearings.

A box-like structure 22 having an open top comprises an elongate slidable rigid drawer-like chassis bearing thereon near one of its ends an oil burner fire pit 23 lined with fire bricks or refractory material 24. The usual gun nozzle 25 of the oil burner unit 26 projects into this pit. The burner unit includes a conventional blower fan in the casing 29. Oil burners other than of the gun type can take the place of the pit 23. Casing 29 is firmly secured on an outboard shelf extension 27 of the box-like structure 22 and never enters the ash pit 10. In Fig. 1 of the drawings the fire pit 23 is shown to be completely within the confines of the ash pit 10.

At the opposite end of chassis 22 the open top of the latter is spanned transversely by coal burning grate bars 30 pivotally supported at their ends atop the side

3

walls 33 of chassis 22 so as to be rockable in usual manner for dumping ashes by reciprocating an arm 31 that is receptive to a shaker handle, the grate bars having the usual intermeshed gear teeth or connecting linkage (not fully shown) for causing all bars to rock when one is rocked by arm 31. In Fig. 2 of the drawings the grate bars 30 are on a level dividing fire box compartment 13 from ash pit 10.

Thus one or the other half of chassis 22 always occupies the fire pit 10 while the other half protrudes therefrom. It is slidably supported for anti-frictional horizontal movement through the ash pit by means of two vertically spaced horizontally extending flanges 32 which may consist of angle irons welded against the outer surfaces of each side wall 33 of the chassis 22. The two flanges on each side of the chassis are respectively above and below the two roller wheels 21 and form a channel that tracks thereon. They are spaced slightly farther apart vertically than the overall diameter of the roller wheels and not only enable the chassis 22 to slide easily lengthwise, despite its considerable weight, but also keep it from tilting out of horizontal level in all positions to which the chassis is slidable in relation to the fire pit 10, including all positions that are between or intermediate its two extreme positions shown respectively in Figs. 1 and 2.

Lengthwise shifting of chassis 22 can further be facilitated by equipping the latter with a long screw-threaded rod 37 that is journaled to turn freely in a rotary bearing 38 fixed on the grate carrying end of chassis 22 and in a like bearing 39 fixed on the oil burner supporting extension 27 of the chassis. Rod 37 has thrust collars 40 fixed thereon which prevent its longitudinal movement relatively to drawer 22. The threaded length of the rod extends through and is in threaded engagement with one or more internally threaded posts 41 stationed on the base plate 42 of the fire box compartment as shown in Figs. 3-6, inclusive.

Figs. 3 and 4 show a partition plate 34 that upstands fixedly in drawer 22 to a greater height than the side walls 33 of the drawer midway the length of the drawer between the refractory lining of the oil burner wall 23 and the tray that is formed by the drawer beneath the grate bars 30. In Fig. 3 partition wall 34 is in a position of transition from one to another of the service positions of drawer 22. In Fig. 1, however, the top margin of partition plate 34 occupies its broken line position 34a shown in Fig. 3 and thereby overlaps the inner surface of the rear wall 12a of the heat utilizing superstructure. In its broken line position 34b said top margin of the partition plate overlaps the inner surface of the front wall 12b of the superstructure 12. Thus in either case the joint between plate 34 and the walls of the superstructure is effectively sealed to prevent outward escape of flame or heat from the fire box compartment 13. The upstanding lip or flange 43 on the rear end plate 44 of drawer 22 correspondingly overlaps the rear heater wall 12a when the drawer is positioned as in Fig. 2. Likewise the upstanding lip or flange 45 on the front end plate 46 of drawer 22 overlaps the front heater wall 12b when the drawer is positioned as in Fig. 1. Thus the ash pit compartment 10 in both Figs. 1 and 2 is safely sealed at both ends simultaneously against fire hazard.

The mode of practicing this invention has been made obvious by the foregoing description. When oil is to be burned, either of the squared ends 36 of the screw-threaded rod 37 is turned by a suitable crank wrench (not shown) to position the parts as in Fig. 1. When coal is to be burned the turning of rod 37 in a reverse direction positions the parts as shown in Fig. 2.

The usual clean-out door 47 for removing ashes from the tray end 51 of chassis 22 beneath grate bars 30 may be hinged on the end plate 46 of the drawer which may be of sheet metal or cast iron. Preferably chassis 22 will be made of sheet steel. The usual hinged fire door

4

48 is mounted to close a hand stoking opening in the front wall 12b of the heater giving access to fire box 13 and into which opening coal will be shoveled to feed the bed of coals resting on grate bars 30. Flexible oil conduit 49 and flexible electrical attachment cord 50 are employed to trail easily the shifting movements of chassis 22 between its positions in Figs. 1 and 2.

Among its features this invention will be recognized as novel in proposing to place in the conventionally located ash pit of a heater, a withdrawable ash receptacle 51 roofed over by shakable grate bars which are interchangeable with an oil burner, or at least the fire pit 23 thereof. While the illustrated embodiment of the invention is of such nature that it could be incorporated in a complete factory-built heater in the form the same would be merchandised, the principles of the invention lend themselves to being practiced also by rebuilding or modification of the structure of heaters already installed and in use.

Some of the claims are directed to and intended to cover versions of the invention wherein the interchangeable burners of different kinds of fuels are not united on a common chassis but may individually be placed in and removed from the ash pit of a heater, preferably being equipped with roller casters for this purpose. These and such other obvious modifications of the construction and arrangement of parts as are herein particularly described will be understood as contemplated and intended to be covered by the language of the appended claims which therefore is to be given its broadest fair interpretation.

I claim:

1. In a heater convertible without dismantling its parts for optionally burning different fuels, the combination of, a hollow main heater frame structure including upright walls embracing in heat exchange relationship a permanent fire box compartment with a heat utilizing gallery in heat receptive relation thereto and an ash pit beneath said compartment, two of said upright walls being opposite walls each containing an aperture forming an opening from said ash pit to the outside of the heater whereby said ash pit comprises a tunnel extending crosswise of the heater under said fire box compartment opening at both ends to the outside of the heater, a fuel utilizing unit including a rigid elongate chassis mounted to be shifted in relation to said ash pit adaptable for mounting fuel burning apparatuses on respectively different portions thereof said unit comprising in at least one portion of said shiftable chassis apparatus for burning fuel and of shape and size to alone enter and occupy a fuel burning position underlying said fire box compartment simultaneously with the vacating of said position by another of said portions of said chassis when said chassis is so shifted, and support means inside said ash pit bearing the weight of said chassis in a manner to permit sliding movement of the latter in shifting relation to said tunnel while a portion of said chassis projects therefrom into outboard relation to the heater frame through at least one of said apertures.

2. In a heater convertible without dismantling its parts for optionally burning different fuels, the combination of, a hollow main heater frame structure including upright walls embracing in heat exchange relationship a permanent fire box compartment with a heat utilizing gallery in heat receptive relation thereto and an ash pit beneath said compartment, two of said upright walls being opposite walls each containing an aperture forming an opening from said ash pit to the outside of the heater whereby said ash pit comprises a tunnel extending crosswise of the heater under said fire box compartment opening at both ends to the outside of the heater, a fuel utilizing unit including a rigid elongate chassis mounted to be shifted in relation to said ash pit adaptable for mounting fuel burning apparatuses on respectively different portions thereof said unit comprising in at least one portion of said shiftable chassis apparatus for burning

5

fuel and of shape and size to alone enter and occupy a fuel burning position underlying said fire box compartment simultaneously with the vacating of said position by another of said portions of said chassis when said chassis is so shifted, and antifrictional support means including cooperative roller wheels and tracks carried in part by said chassis inside of said ash pit bearing the weight of said chassis in a manner to permit easy sliding movement of the latter in shifting relation to said ash pit while a portion of said chassis projects from the heater frame through at least one of said apertures.

3. In a heater as described in claim 2, the combination defined in said claim, in which the said antifrictional support means includes roller wheels pivotally mounted on the said heater frame structure, and a track fixed on the said chassis in position to glide on said roller wheels, at least two of said wheels being sufficiently spaced apart lengthwise of said chassis to prevent the latter from being tilted by the offset weight of either of the said portions of the said chassis when in outboard relation to the said tunnel.

4. In a heater convertible without dismantling its parts for optionally burning different fuels, the combination of, a hollow main heater frame structure including upright walls embracing in heat exchange relationship a permanent fire box compartment with a heat utilizing gallery in heat receptive relation thereto and an ash pit

6

beneath said compartment, and a fuel utilizing unit including an elongate rigid drawer-like chassis supported in lengthwise slidable relation to said heater frame to be shifted in relation to said ash pit and adaptable for mounting fuel burning apparatuses on respectively different portions thereof located near respectively opposite ends of said chassis, said unit comprising in at least one portion of said shiftable chassis apparatus for burning fuel and of shape and size to alone enter and occupy a fuel burning position underlying said fire box compartment simultaneously with the vacating of said position by another of said portions of said chassis when said chassis is so shifted.

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