

July 20, 1943.

R. MARTIN

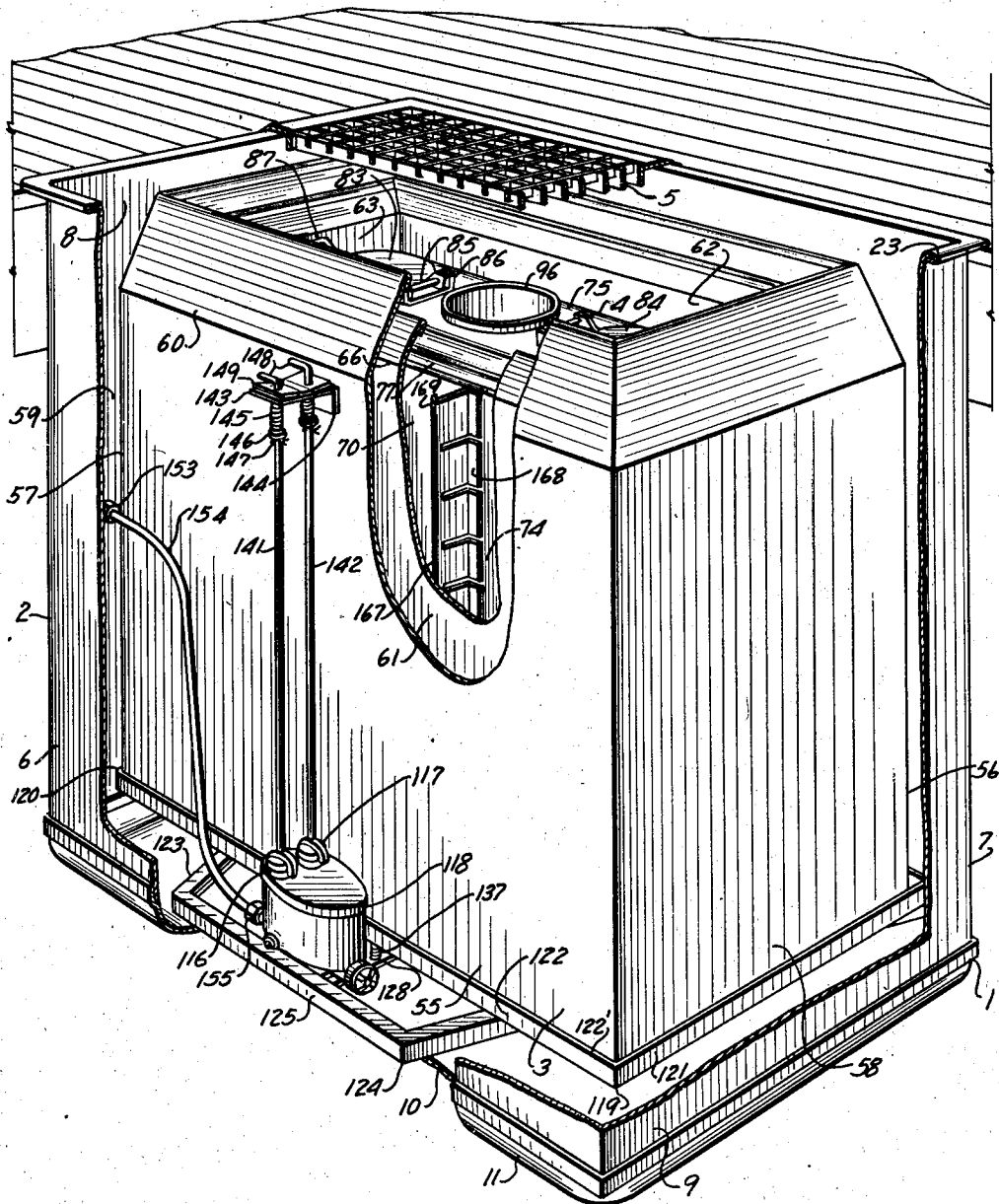
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FLOOR FURNACE

Filed Feb. 13, 1941

4 Sheets-Sheet 1

Fig. 1.



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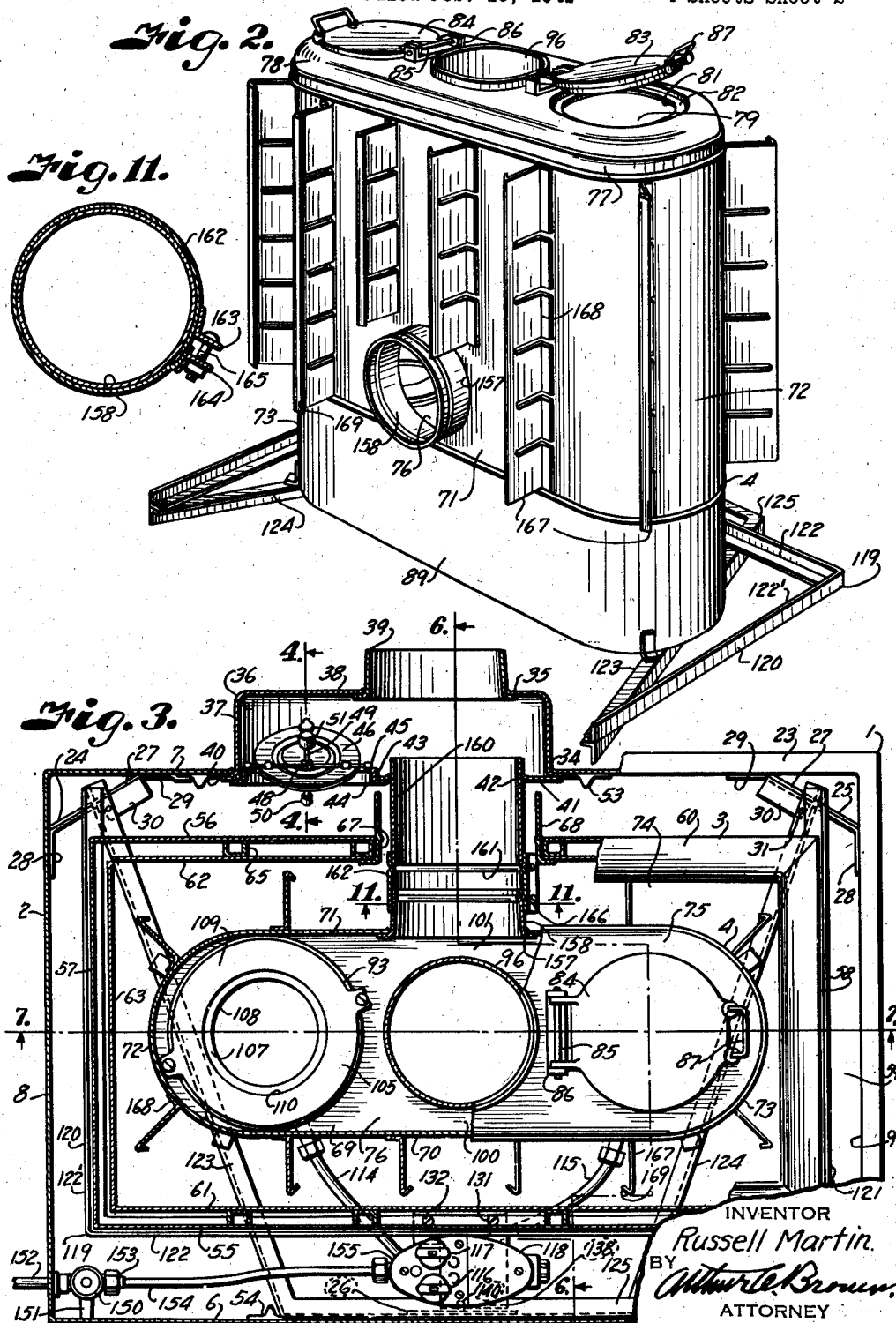
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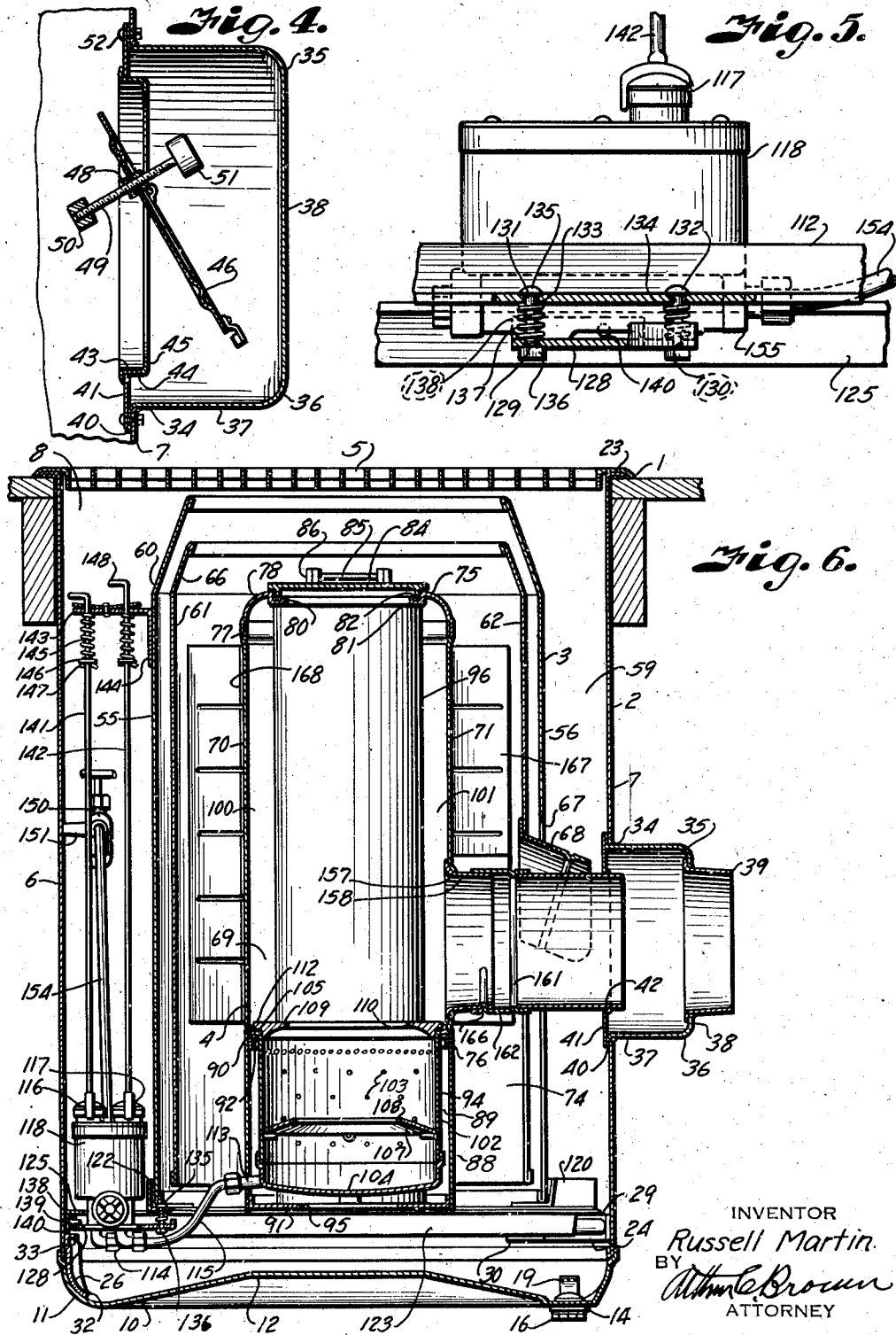
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4 Sheets-Sheet 4

Fig. 7.

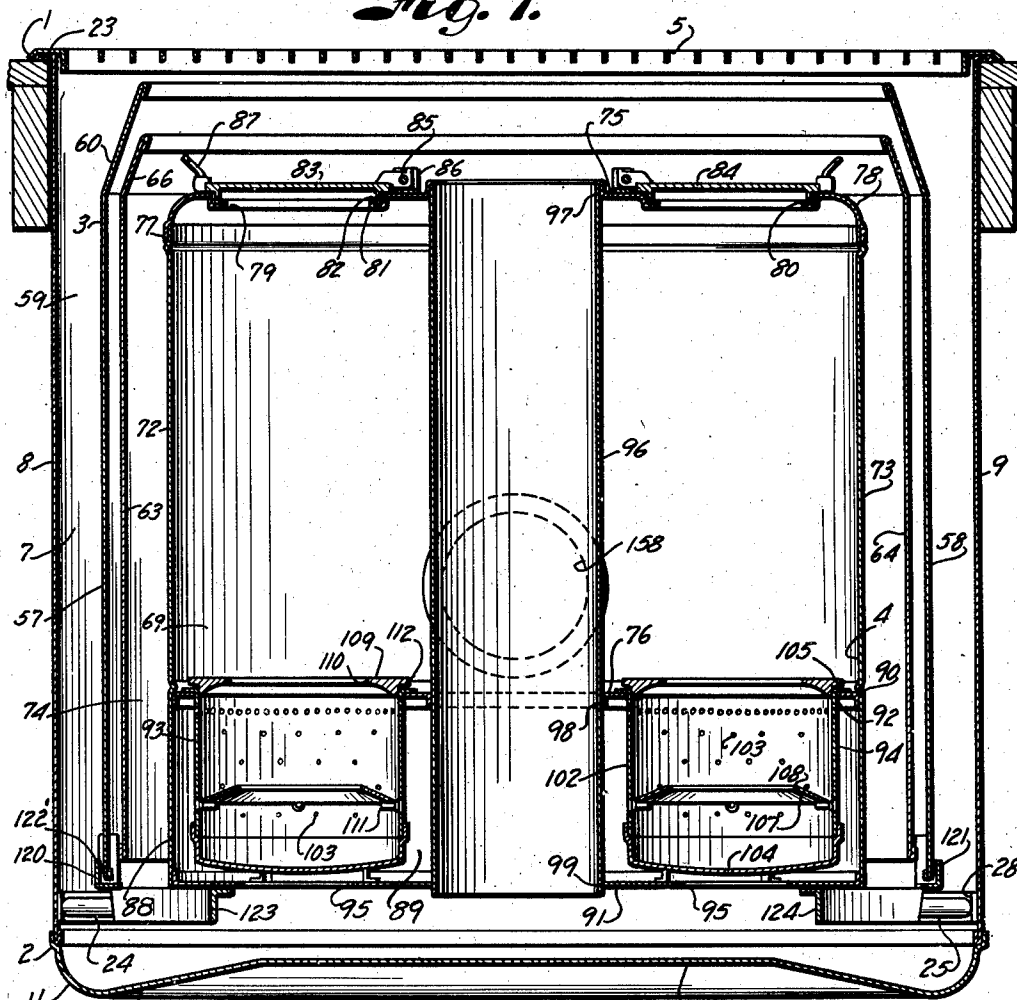


Fig. 8.

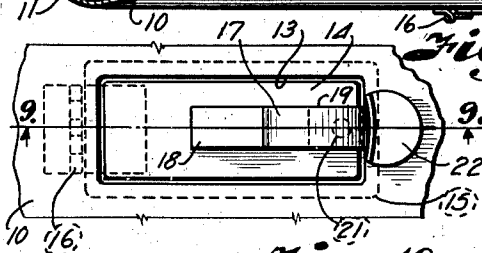


Fig. 9.

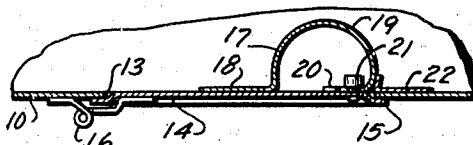
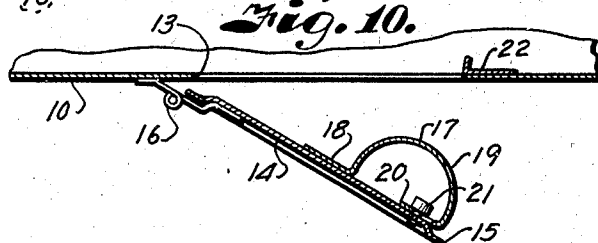


Fig. 10.



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FLOOR FURNACE

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Application February 13, 1941, Serial No. 378,698

11 Claims. (Cl. 126—116)

This invention relates to furnaces, and more particularly to a type adapted for suspension within a floor opening and commonly known as floor furnaces.

Furnaces of this character are often installed in confined out of way places and in buildings having no basement, consequently they must be self-contained in an outer jacket or casing, which is completely closed at the sides and bottom and usually without exterior means of access except through the top thereof. Operating adjustment and servicing of such furnaces are difficult, especially when equipped for burning liquid fuels, since in furnaces as heretofore constructed these operations must be carried on in close spaces under the floor of the building.

Therefore, the principal object of the present invention is to provide a simple, inexpensive construction, adapted for operating and servicing through or from above the floor opening.

Other objects of the invention are to provide the furnace with a heater and burner assembly that is completely removable as a unit through the top opening of the outer jacket; to provide a floor furnace particularly adapted for use in connection with liquid fuels; and to provide the floor furnace with a combustion chamber which may have two burners and an intermediate heat exchanger tube arranged so that the products of combustion from either burner do not readily mix with those of the other and thereby obtain high thermal efficiency when the burners are operated at different burning rates.

Other objects of the invention are to provide fuel and flue connections for the removable unit that may be readily effected within the furnace jacket; to provide a shut-off valve for the fuel which is located within the furnace casing; to provide a stable support for the removable unit within the outer jacket; to provide a fixed mounting of the fuel control valve with respect to the level of the burner fire-pots; to provide a levelling adjustment of the fuel control and safety valve on the supporting frame of the removable unit which is readily manipulated when the removable unit is in operating position; to provide the removable unit with means for locating and supporting the inner jacket which separates the moving air columns within the furnace; to provide the supporting means with fastening devices to anchor the removable unit within the casing for shipping purposes; and to provide the furnace with a combination draft regulator and flue connection that can be readily assembled into the outer casing from the in-

terior thereof after the casing has been installed.

Other objects of the invention are to supply air from within the outer jacket to support combustion and for regulating the draft through the draft regulator; and to provide a draft regulator which responds to difference in pressure inside the burner and the pressure in the furnace casing.

Further objects are to provide a draft regulator so designed that it may be readily adjusted through the top of the furnace while observing condition of the flame through a peep-hole in the top of the combustion chamber; to provide the outer jacket with a clean-out door in the bottom thereof which is readily opened and closed from the floor level above the furnace; and to provide the fuel lines leading from the constant level control and safety valve to the burner pots with controls having operating stems readily manipulated through the floor grill and which are supported from the inner jacket and removable therewith.

Other objects of the invention are to provide a combustion chamber designed for maximum heat exchange between the products of combustion and the air to be heated which is circulated through the furnace; to provide a heating unit having a relatively large heating surface; and to provide the combustion chamber with an up-draft air circulating tube located between a pair of fire-pots to increase the heating surface and to effect uniformly distributed heat flow, thus preventing excessive hot spots on the floor grill.

In accomplishing these and other objects of the invention, as hereinafter described, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view showing installation of a floor furnace embodying the features of the present invention, a part of the outer and inner jackets and floor grill being broken away to better illustrate the construction of the furnace.

Fig. 2 is a perspective view of the removable heating unit viewed from the flue side thereof.

Fig. 3 is a plan view of the furnace, a part of which is shown in horizontal section.

Fig. 4 is an enlarged section through the draft regulator on the line 4—4 of Fig. 3.

Fig. 5 is a detail view of the constant level control and safety valve mounting, parts being shown in section to better illustrate the construction thereof.

Fig. 6 is a vertical section through the furnace on the line 6—6 of Fig. 3.

Fig. 7 is a vertical section taken at right angles to the section shown in Fig. 6, and on the line 7—7 of Fig. 3.

Fig. 8 is a detail view of the clean-out door in the bottom of the outer jacket.

Fig. 9 is a section through the clean-out door on the line 9—9 of Fig. 8.

Fig. 10 is a similar section showing the door in open position.

Fig. 11 is a section through the flue connection.

Referring more in detail to the drawings:

1 designates a floor furnace constructed in accordance with the present invention, and which includes an outer jacket or casing 2, an inner jacket 3, a burner and heating unit 4, and a floor grill 5. The outer jacket 2 comprises a box-like shell having sheet metal front and rear walls 6—7 connected by side walls 8—9 and a bottom 10, the margin of the bottom 10 being curved downwardly and inwardly as indicated at 11, and then inclined upwardly to a flat central portion 12. The curvature of the bottom not only enhances the rigidity thereof but serves to streamline the flow of down-draft air into an upwardly flowing column and provides a marginal trough to facilitate sweeping of dirt accumulating in the bottom of the furnace toward a clean-out opening 13, normally closed by a door 14.

The door 14 fits closely within the opening and has a marginal flange 15 engaging the under face of the furnace bottom. The door is attached at one end by a hinge 16 so that it swings downwardly when pushed open. The opposite end of the door carries a latch and handle 17, formed of spring material and having one end 18 attached to the inner face of the door and the other end curved upwardly in the form of a loop 19 and terminating in a slotted head 20 slidably retained in engagement with the inner face of the door by a rivet 21, as shown in Fig. 9, the ear cooperating with the loop in forming a latch to engage with a keeper 22 fixed to the jacket bottom at the end of the clean-out opening. The upper edges of the side walls terminate in laterally extending flanges 23 that are adapted to engage the marginal edges about a floor opening when the furnace is installed, as later described.

Mounted in two adjacent corners of the jacket, and spaced slightly above the bottom, are brackets 24 and 25 cooperating with a single bracket 26 located substantially in the center at the opposite side of the jacket to support the burner and heating unit 4, later described. The brackets 24 and 25 have bridge portions 27 extending diagonally across the corners and terminating in ears 28 and 29 that are secured to the inner faces of the jacket. The bridge portions of the brackets have inwardly extending lateral flanges 30 provided with openings 31 for a purpose later described. The bracket 26 has an attaching portion 32 and a laterally extending flange 33 located in a plane parallel with the flanges 30 of the brackets 24 and 25.

The rear wall 7 of the jacket is provided with an elongated opening 34 to accommodate a draft regulator assembly 35, the opening preferably having semicircular ends. The draft regulator assembly includes a substantially pan-shaped, elongated body 36 having its side wall 37 projecting through the opening 34 and its back wall 38 carrying a flue pipe connecting collar 39

at one end thereof, as shown in Fig. 3. The front of the wall 37 has a marginal flange 40, and fixed thereto is a plate 41 having an opening 42 substantially in registry with the flue collar 39 and an opening 43 in the opposite end to accommodate a draft regulator. The draft regulator comprises a frame 44 inset within the opening 43 and forming a seat 45 for a regulator valve 46. The regulator valve is suitably trunnioned at the sides thereof at a point above its horizontal diameter so that the regulator valve is out of balance and will swing outwardly at the bottom. The regulator valve is normally urged to closed position by a weight 51 that is attached thereto as shown in Fig. 4. The regulator valve is provided at a point above the trunnioning axis with an internally threaded insert 48 to mount the threaded shank of a balance adjusting screw 49.

The inner end of the adjusting screw carries a knob 50, and the other end the weight 51 so that by adjusting the relative position of the weight 51 with respect to the regulator valve 46, the regulator valve automatically opens with response to chimney draft to control the draft on the heater and burner unit. The draft regulator valve is thus responsive to differential in pressure within the flue pipe and the air in the furnace casing. Since this air is of fairly uniform room temperature, the draft regulation is better effected in oil burning floor furnaces and there is not such irregular operation as would be the case where the temperature of the air varies widely. The complete draft regulator assembly is inserted through the opening 34 from the interior of the jacket 2 and is secured therein by fastening devices, such as screws 52, extending through suitable openings in the corners of the plate 41 and through registering openings in the wall of the jacket, as shown in Fig. 4. The rear wall 7 of the jacket has reinforcing ribs 53 attached to and extending vertically of the inner face thereof, and the opposite wall 6 has similar reinforcing ribs 54 which form guides in facilitating insertion of the burner and heating unit, as later described.

The inner jacket includes front and rear walls 55—56 and side walls 57—58 spaced inwardly from the corresponding walls 6—7 and 8—9 of the outer jacket to provide down-draft air passageways 59. The inner jacket is of sufficient length to extend from substantially the plane of the brackets 24, 25 and 26 to a point spaced below the flanges of the outer jacket where they converge inwardly, as at 60, forming widened throats for the passageways 59. The terminal edges of the walls are flanged inwardly to enhance the rigidity thereof. The walls just described are preferably provided with liners 61—62 and 63—64, respectively, of slightly shorter height than the outer walls and supported therefrom by channel-shaped spacers 65 (Fig. 3). The upper ends of the liners also converge inwardly, as at 66, but terminate short of the upper ends of the jacket walls so that the effective outlet opening is substantially the same capacity as that formed by the outer flanges as shown in Fig. 7. The rear wall 56 and the liner 62 are provided with slotted openings 67 registering with the flue opening and extending through the bottom edges thereof, whereby the inner jacket may be passed over a flue connection as later described. Fixed within the upper end of the slotted opening is a substantially arcuate-shaped hood 68 to divert the air moving downwardly in the passageway 59

over the sides of the flue connection and to conduct air heated by the flue connection into the heated column of air.

The burner and heating assembly 4 includes a combustion chamber or heating unit 69 formed by a wall sheet rolled to provide parallel front and rear walls 70 and 71 connected by substantially semicircular end walls 72 and 73, spaced from the liners 61—62 and 63—64, respectively, to provide up-draft passages 74 therebetween. The upper end of the combustion chamber is closed by a top 75, and the lower end by a bottom 76. The top 75 has a flange 77 sleeved over the upper edges of the combustion chamber walls, and is provided with a crowned upper portion 78 having openings 79 and 80 at the respective ends thereof and which are provided with inset flanges 81 to receive packing 82 for seating lids or doors 83 and 84, the doors being hinged by rods 85 extending through ears on the doors and through ears on brackets 86 attached to the upper face of the top as shown in Fig. 2. The door and handles 87 are located on the sides opposite the hinges. The margins of the doors are shaped to form peripheral flanges overlapping the edge of the openings to provide substantially gas-proof joints when the doors are closed.

The combustion chamber bottom 76 is inset within the lower portion 88 of the combustion chamber walls a distance to form a burner chamber 89 therebelow, and is welded to the walls as indicated at 90 to provide a gas-tight joint therebetween. The burner chamber is closed at the bottom by a plate 91. The combustion chamber bottom has openings 92 therein located coaxially with the door openings in the top wall to suspend burner pots 93 and 94, and the bottom plate has coaxial air inlet openings 95 for admitting combustion supporting air to the burner pots. The elongated construction of the combustion chamber not only provides space for a plurality of burner pots, but also provides maximum heat transfer surface for a given size furnace.

In order to increase the heat transfer area, to provide better heat flow distribution through the grill, and provide for control of the products of combustion in their movement toward the flue opening, the combustion chamber has an up-draft air circulating tube 96 located midway between the burner pots and sealed within openings 97 and 98 in the top and bottom plates of the combustion chamber, as best shown in Fig. 7, the lower end of the tube extending through a registering opening 99 in the bottom plate 91. The tube is of a diameter relative to the front and back depth of the combustion chamber that relatively narrow spaces 100 and 101 are provided therebetween.

The burner pots 93 and 94 preferably have cylindrical walls 102 provided with air inlet openings 103 formed therein at a point spaced above the bottom 104. The rims of the pots are provided with lateral flanges 105, which are secured to the upper surface of the combustion chamber bottom. Supported directly above the first series of air inlet openings 103 is a conical-shaped, low flame ring 107 forming a relatively narrow flame opening 108 to better control combustion of the fuel when the fuel supply is turned relatively low in providing a low heat. The open tops of the fire-pots are provided with high flame burner rings 109 having flame openings 110. The low flame rings are supported in position by pins 111 extending inwardly from the walls of the pots. The high flame burner rings 109 have shouldered

peripheries 112 adapted to seat upon the flanges 105. The fire-pots are provided adjacent the bottom thereof with fuel inlet openings 113 that are connected by tubes 114 and 115 with valves 116 and 117, respectively, the valves being positioned in and forming a part of the fuel level control and safety valve unit 118.

The burner and heating unit is attached to a frame 119. The frame 119 includes angle-bars 120 and 121, arranged parallel with the side walls 8 and 9 of the outer jacket and positioned so that the inner jacket seats thereon, as shown in Fig. 7, the forward end of the bars being connected by a cross-bar 122 seating the front wall of the inner jacket, as shown in Fig. 6. The bars just described are preferably formed of a single angle-bar, cut and bent to form the corner connections and arranged so that the vertical flanges 122' thereof engage the outer faces of the front and side walls of the inner jacket to space the inner jacket relatively to the outer jacket and maintain fixed width of the passageways 59. The frame also includes angularly extending bars 123 and 124, having their rear ends welded to the rear ends of the bars 120 and 121 and their forward ends secured to the horizontal flanges of the cross-bar 122 as by welding or the like. The free ends of the angle-bars are connected by a cross-bar 125 that is spaced forwardly of the cross-bar 122. This member of the frame is also formed of an angle-bar. The cross-bar 125 is of a length so that the junctures thereof with the bars 123 and 124 engage the ribs 54, whereby the frame is guided into position within the outer jacket when it is inserted therein. The frame just described is secured to the bottom of the burner and heating unit by welding or suitable fastening devices. When the supporting frame, including the heater and burner unit, is in position in the outer jacket, the rear ends of the angle-bars seat upon the flanges 30 of the brackets 24 and 25, and the vertical flange of the cross-bar 125 seats on the flange 33 of the bracket 26. The brackets thus provide a three-point support for the frame so that it is retained in stable position regardless of any misalignment occurring in the outer jacket after it has been installed.

The fuel level control and safety valve unit 118 is also mounted on the frame to be supported in predetermined relation to the fuel inlet connections of the fire-pots and so that it is within the relatively uniform temperature of the outer jacket, thereby avoiding change in the viscosity of the fuel, which would cause irregularity in flow of the fuel to the burner. It is also desirable that the valve unit be adjustably positioned on the frame whereby it may be levelled regardless of any inclination occurring in the frame. This is effected by means of a plate 128 positioned between the cross-bars 122 and 125 (see Figs. 5 and 6). The forward end of the plate is provided with spaced openings 129 and 130 which pass the shanks of screws 131 and 132 which are loosely projected through openings 133 and 134 in the flange of the cross-bar 122 and are suspended therein by the heads 135 thereof engaging the upper face of the flange. The plate 128 is supported by nuts 136 attached thereto, and urged away from the angle-bar 122 by means of coil springs 137 having their ends bearing against the flange of the cross-bar and plate, respectively, as shown in Fig. 5. The opposite edge of the plate is provided with a vertical flange 138, having an opening 139 engaging a

trunnion 140 projecting from the inner face of the vertical flange of the front cross-bar 125. The plate is thus adapted to pivot on the trunnion in all directions by adjusting the fastening devices 131 and 132 so that the nuts 136 on the shanks thereof support the plate in level position.

The fuel level control and safety valve may be of any approved construction, and is provided with the valves 116 and 117 which are incorporated therein and adapted to be operated by means of stems 141 and 142. The lower ends of the stems are releasably engaged with the valves, while the upper ends are journaled in an arm 143 of a bracket 144 attached to the upper portion of the front wall of the inner jacket, as best shown in Fig. 6. The stems are yieldingly retained in engagement with the valves by coil springs 145 engaging the arm of the bracket and washers 146 supported on the stems by cotter pins 147. The upper ends of the stems are bent laterally, as at 148, so that they may be selectively engaged by means of a key (not shown) projectable through openings in the grill.

Supported adjacent the end wall of the outer jacket, on the inner side thereof, is a shut-off valve 150, which is held in stable position by an arm 151 attached to the front wall 6 of the outer jacket as shown in Fig. 3. The fuel supply line 152 (Fig. 3) extending through a suitable opening in the outer jacket is connected to the inlet of the valve, and the outlet of the valve is connected by a union nut 153 with a tube 154, having its opposite end connected with the inlet 155 of the constant level control and safety valve as shown in Fig. 3. The rear wall of the combustion chamber has an opening 157 registering with the flue opening 42 of the draft regulator assembly, and fixed within the opening 157 is a collar 158 having a groove in one side thereof. Slidable within the flue opening is a thimble 160 adapted to be spaced from the terminal edge of the collar 158, and which is adapted to abut a bead 161 in a clamping band 162 that is fixed thereto. The clamping band 162 is sleeved over the collar 158, and the terminal ends thereof are provided with ears 163 and 164 adapted to be drawn together to close the band about the collar and thimble by fastening devices, such as bolts 165. When the band is in position, a bead 166 therein engages in the groove of the collar to space the thimble from the collar and retain the thimble in position relatively to the opening 42.

To enhance the radiating surfaces of the combustion chamber, the exterior thereof may be provided with a plurality of vertically arranged fins 167. Each of the fins has a footing flange 168 welded to the wall of the combustion chamber and a hook-shaped reinforcing flange 169 on the opposite edge as shown in Fig. 2. The fins may also be provided with transverse slots 170.

The floor grill 5 may be of any approved construction, having sufficient strength to support the weight of persons standing upon the grill, or walking thereacross.

When the furnace is prepared for shipping, bolts are extended through openings in the ends of the bars 123 and 124, and through the openings 31 in the flanges 30 of the brackets. Two bolts are also put through the front of the furnace into the bracket, so that the removable unit is securely anchored within the outer jacket. These bolts, however, are removed and discarded when the furnace is uncrated.

When the furnace is to be installed, an opening is made in the floor of the building and the floor joists are connected by suitable headers as in conventional practice. Flue connections may be made from a chimney to the point of connection with the furnace, and the fuel line 152 is installed from the source of supply. The outer jacket is then passed through the floor opening so that it is supported by the flanges 23 and secured to the edge surrounding the floor opening. The draft regulator and flue connection unit 35 is then passed through the open top of the jacket and projected through the opening 34 so that the collar 39 thereon connects with the flue pipe and the flange 40 thereof abuts against the inner face of the jacket. The draft regulator is then secured in position by the fastening devices 52. The supply pipe 152 is connected to the valve 150. The thimble 160, carrying the loosened clamping band 162, is pushed back into the opening 42. The heating and burner unit assembly, which includes the supporting frame 119 with the fuel level control and safety valve mounted thereon, is passed through the open top of the outer jacket and lowered thereinto, with the rear of the supporting frame guided by the corners of the jacket and the front by the ribs 54, until the supporting frame seats upon the brackets 24, 25 and 26. The fuel control and safety valve unit may then be adjusted to level position by rotating the screws 131 and 132. The pipe 154 is then connected with the shut-off valve by applying the union 153. The clamping band is then slid over the collar 158 so that the rib therein engages in the groove of the collar, whereupon the fastening devices are tightened to secure the band about the collar 158. The inner jacket carrying the valve stems is then moved into position so that the lower end thereof seats upon the angle-bars of the supporting frame, the notch in the rear wall of the jacket accommodating the flue connection. The valve stems are then connected with the control valves.

The fuel may then be turned on to the respective fire-pots by opening the stop valve 150 and opening the regulating valves 116 and 117 to low setting. When the valves are thus opened, fuel will flow into the fire-pots. The fuel is lighted through the door openings in the top of the heater, after which the doors are closed. As the fire-pots heat up the fuel valves 116 and 117 may be gradually opened to full setting. The draft regulator is then adjusted by the knob 50 to obtain a desired flame color. This may be noted through suitable peep openings in the top of the heating chamber. The grill is then applied over the open top of the furnace, completing the installation.

The products of combustion rising from the fire-pots travel upwardly to the combustion chamber top, then downwardly over the combustion chamber and draft tube walls to the flue opening. As the combustion chamber walls are heated, air circulation occurs through the floor grill, the hot air rising in the space around the combustion chamber and being discharged through the central portion of the grill, which air is replaced by cooler air passing downwardly through the marginal portions of the grill and through the down-draft passages 59, under the lower edge of the inner jacket, and then upwardly in heat exchange relation with the heating surfaces.

Since the constant level control and safety valve unit is located within the outer jacket and

in the path of cool air delivered to the furnace, it is maintained at substantially uniform temperature so that the fuel maintains a uniform viscosity and has continuous uniformity of flow to the burner pots. Since the draft control air as well as the combustion supporting air are taken from the room served by the furnace, the proper pressure difference between the inside of the burner and outside the burner is maintained by adjusting the position of the weight on the regulator valve.

After the furnace has been in use and servicing becomes necessary, the floor grill is removed, followed by the inner jacket. The union 153 is then disconnected from the shut-off valve and the clamping band 162 is loosened to slide the thimble 160 retractively into the opening 42. The heater and burner unit is then removed so that the entire servicing operations may be carried on above the floor level. Dirt, and the like, may accumulate in the outer jacket, and this may be readily removed through the clean-out opening in the bottom of the outer jacket upon opening of the door 14. This is effected by pushing against the door with a suitable rod to release the latch, whereupon the door drops away from the opening. The dirt and dust may then be swept into the trough-like margin of the jacket bottom and moved out through the clean-out opening 13. The door is closed by engaging the loop-shaped handle thereof with a hooked end of the rod and pulling on the rod to latch the door. After servicing of the burners and metering valves has been completed, the heating unit assembly is again installed in the furnace. The clamping band of the flue connection is then retightened and the pipe 154 is connected with a shut-off valve. When the stop valve is opened, fuel supply is again established to the control valves. The inner jacket is then inserted and the actuating stems 141 and 142 are connected with the control valves. The grill is then replaced, thus restoring the furnace to operative condition.

It is thus obvious that all of the regulating and maintenance operations are carried on from within the inside of the outer jacket, or above the floor level of the room, and that the parts requiring service are readily removed as a complete unit assembly, thereby simplifying servicing and cleaning of the furnace.

What I claim and desire to secure by Letters Patent is:

1. A floor furnace including, a jacket having a flue connection, a heating unit comprising a burner and combustion chamber positioned in the jacket and removable through the top thereof, an outlet collar fixed to the combustion chamber, a contractable band for removably connecting the outlet collar with the flue connection, and a supporting frame carrying said unit and having support within said jacket.

2. A furnace of the character described including, a jacket having a flue connection, a heater assembly including a combustion chamber and a burner positioned in the jacket, a supporting frame carrying said assembly and having support within said jacket, a collar on the combustion chamber having coaxial alignment with said flue connection, an inner jacket around said assembly and supported by said supporting frame, said inner jacket having a notch-like opening passing the flue connection, and a contractable band connecting the collar with the flue connection.

3. In a floor furnace, a removable heater and

burner assembly including a supporting frame, a constant level control valve for supplying fuel to the burner of said assembly, and means for mounting the constant level control valve on the frame including a plate-like member having trunnioned support on the frame at one side of said plate-like member and levelling support on the opposite side.

4. In a liquid fuel burning floor furnace, a casing having an open top, a combustion chamber, burner and constant level fuel control valve assembly having removable support in the casing whereby said assembly is removable as a unit through the open top of the casing, a fuel supply duct extending into the casing, and coupling means connecting said duct with the constant level fuel control valve for disconnecting the supply duct when said assembly is to be removed from the casing.

5. In a liquid fuel burning floor furnace, a casing having an open top, a combustion chamber, burner and constant level fuel control valve assembly having removable support in the casing whereby said assembly is removable as a unit through the open top of the casing, a fuel supply duct extending into the casing, coupling means connecting said duct with the constant level fuel control valve for disconnecting the supply duct when said assembly is to be removed from the casing, and a shut-off valve in the casing ahead of said coupling means for shutting off the fuel supply upon disconnection of the coupling means.

6. A furnace of the character described including, a casing, brackets in said casing, a unitary assembly including a combustion chamber, heater, and a burner, a supporting frame carrying the unitary assembly on said brackets, a valve unit in said casing controlling supply of fuel to the burner of said unitary assembly, and levelling means mounting said valve on the supporting frame.

7. A floor furnace including, an open top casing, frame supporting means in said casing, a frame having removable support on said supporting means, a heating unit comprising a burner, combustion chamber, and a fuel control valve all carried by the frame for insertion and removal with the frame through the open top of the casing, and an adjustable mounting attaching the control valve on the frame and adapted for levelling said valve on the frame.

8. A floor furnace including, an open top casing, frame supporting means in said casing, a frame having removable support on said supporting means, a heating unit comprising a burner, combustion chamber, and a constant level fuel control valve all carried by the frame for insertion and removal with the frame through said open top of the casing, levelling means mounting said constant level valve on the frame, a jacket seat on the frame, and a jacket insertable through the open top of the casing to surround the heating unit and form downdraft and updraft passageways, said constant level valve being located on said frame within the downdraft passageway.

9. A floor furnace including, an open top casing, frame supporting means in said casing, a frame having removable support on said supporting means, a heating unit comprising a burner, combustion chamber, and a constant level fuel control valve all carried by the frame and insertable through the open top of the casing with the frame and removable with the frame through said open top of the casing, means mounting the

constant level valve on the frame, a jacket seat on the frame, a jacket insertable through the open top of the casing to surround the heating unit and form downdraft and updraft air passageways, said constant level valve being located on said frame within the downdraft passageway, and an actuating rod for the constant level valve having rotatable support by the inner jacket and a removable connection with the constant level valve.

10. A floor furnace including, a casing, a heating unit assembly positioned in the casing comprising a burner and combustion chamber, a flue connection on the casing, an outlet collar fixed to the combustion chamber in registering alignment with the flue connection, and a clamp member removably connecting said collar with the flue connection, said heating unit assembly being

removable through the open top of the casing upon disconnection of said clamp member.

11. A floor furnace including, an open top casing for support within a floor opening, a unit assembly including a burner, a combustion chamber and a constant level fuel metering valve, venting means extending through a wall of the casing and having connection with the combustion chamber, fuel supply means extending through a wall of the casing and connected with the constant level fuel metering valve, and coupling means in both the venting means and the fuel supply means accessible through the open top of the casing for disconnection to permit removal of said unit assembly through the open top of the casing.

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