

Aug. 25, 1942.

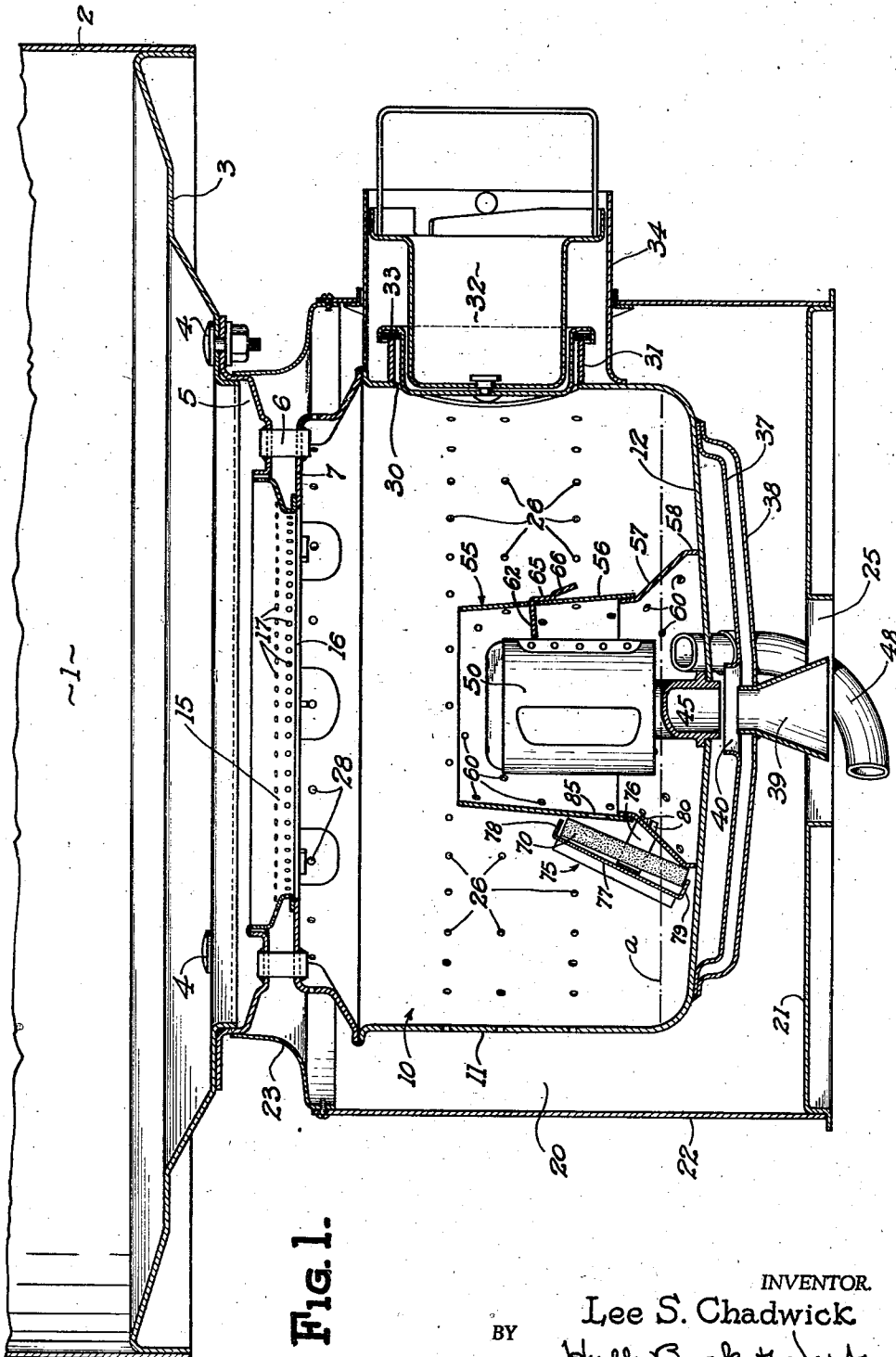
L. S. CHADWICK

2,293,697

FLAME PROPAGATOR FOR PILOT BURNERS

Filed Oct. 20, 1939

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

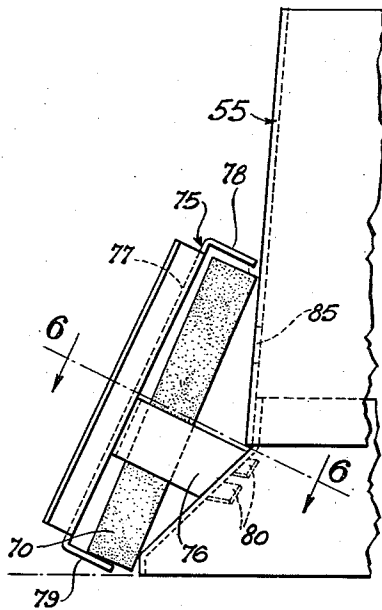


FIG. 2.

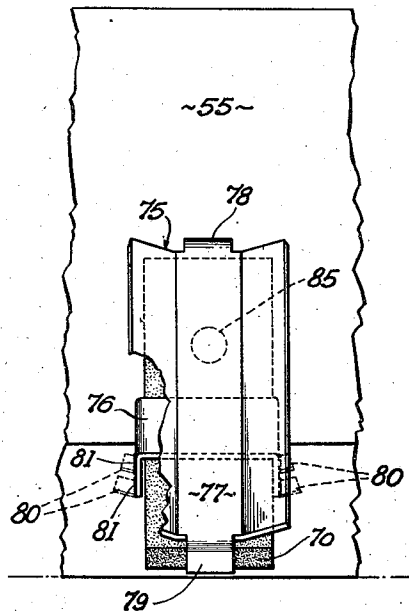


FIG. 3.

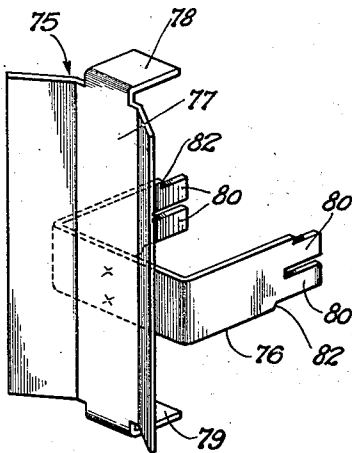


FIG. 4.

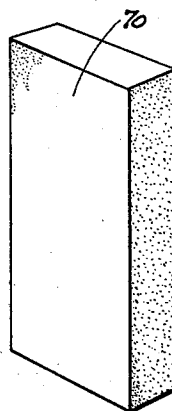


FIG. 5.

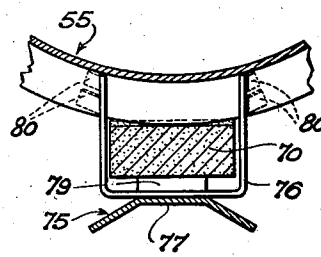


FIG. 6.

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4 Sheets-Sheet 3

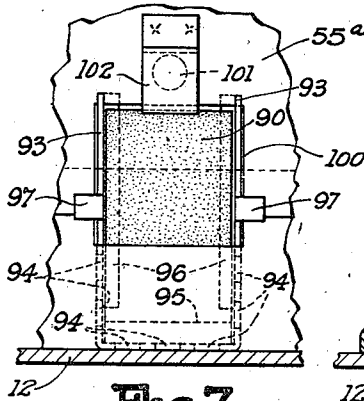


FIG. 7.

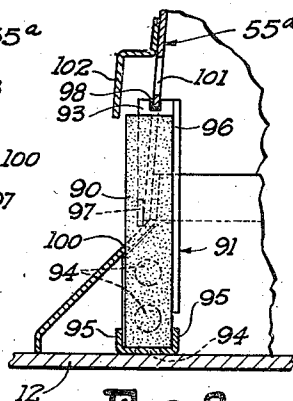


FIG. 8.

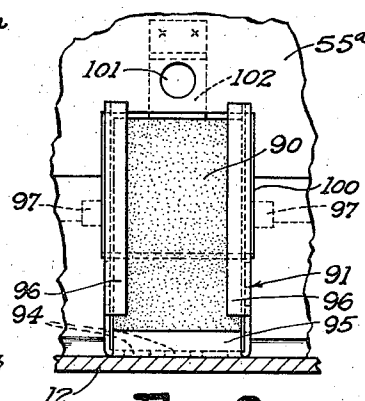


FIG. 9.

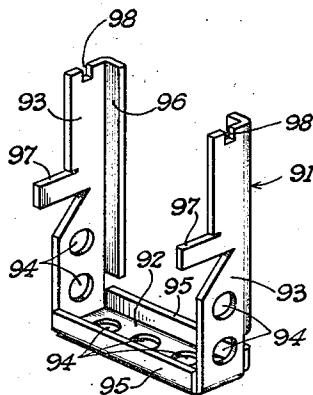


FIG. 10.

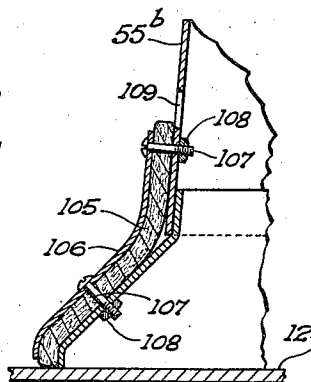


FIG. 11.

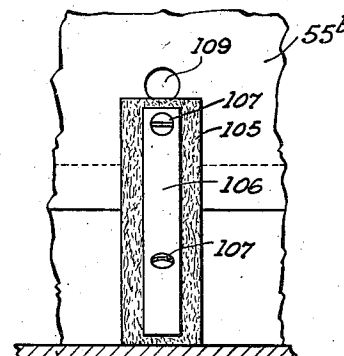


FIG. 12.

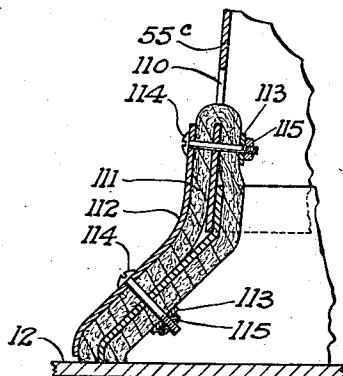


FIG. 13.

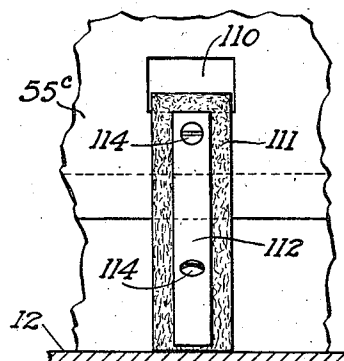


FIG. 14.

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4 Sheets-Sheet 4

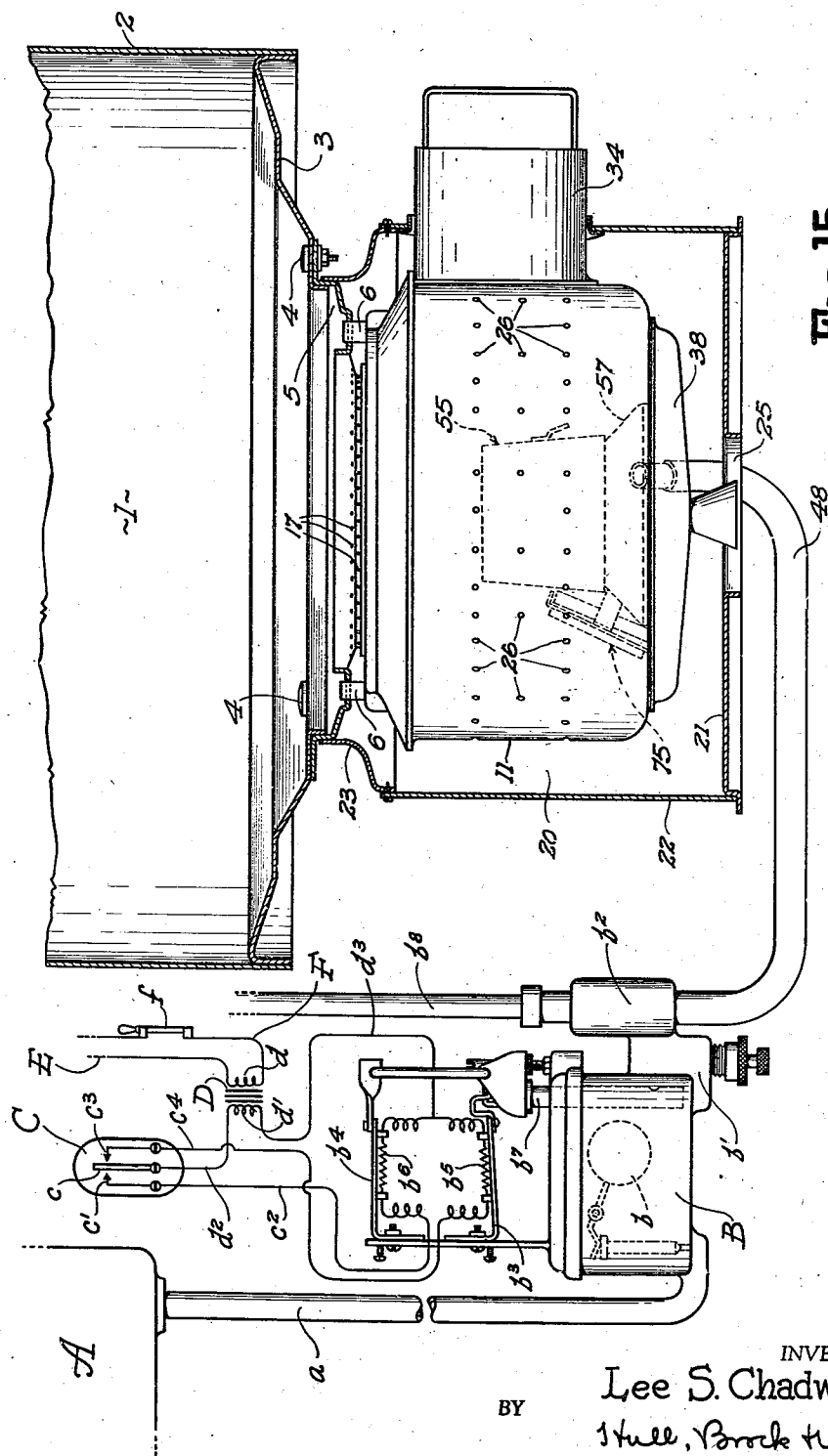


Fig. 15.

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UNITED STATES PATENT OFFICE

2,293,697

FLAME PROPAGATOR FOR PILOT BURNERS

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a corporation of Ohio

Application October 20, 1939, Serial No. 300,428

11 Claims. (Cl. 158—91)

This invention relates, generally, to liquid fuel burners of the so-called "pan or tray" class in which the fuel is burned from a pool or sump, the present invention being characterized by a structure defining a pilot fire space and a higher fire space, with means for communicating combustion from the pilot flame to the fuel in the higher fire space.

Such a burner, referred to as being of the bowl or pot type, is disclosed and claimed in an application filed by Theodore B. Focke and Joseph R. Kirkpatrick on July 14, 1939, Serial No. 284,544; and the present invention, shown herein as embodied in such a structure, more particularly relates to improvements in the flame propagating means.

The broad purpose of the invention is to provide, in combination with liquid fuel burning apparatus including a pilot fire space and a higher fire space (with means for feeding fuel to the pilot fire space and occasionally to the higher fire space and for preventing the fuel from rising within the latter space above a maximum level), flame propagating means consisting of a capillary conductor or wick that dips into the fuel pool and extends above the maximum fuel level in the higher fire space into lighting relation to the pilot flame.

It is a further purpose of the invention to provide, in conjunction with a bowl type burner characterized by a wall or partition that divides its interior into a pilot fire space and a higher fire space, an efficient and reliable means that is smooth and practically instantaneous of action for communicating or transmitting combustion from the pilot flame to fuel in the higher fire space so that there is no perceptible interruption in operation when the burner goes from pilot to higher fire, and which means is simple; is quick and convenient of installation; is inexpensive, and is durable and substantial so as not to be liable to injury when the burner is cleaned.

Additional objects and advantages will appear as I proceed to describe the invention in detail by reference to the accompanying drawings wherein Fig. 1 is a fragmentary sectional view, partly in elevation, of a liquid fuel combustion apparatus incorporating a bowl type burner having an enclosed pilot burner equipped with the wick of my invention in its present preferred form; Fig. 2 is a side elevation of the wick and the adjacent portion of the pilot burner, this and the remaining views being on a scale considerably enlarged over that of Fig. 1; Fig. 3 is a front elevation, with parts broken away, of what is shown in Fig. 2;

Fig. 4 is a perspective view of the metal support and shield for the ceramic or refractory element that constitutes the wick proper; Fig. 5 is a similar view of the wick; Fig. 6 is a section on the line 6—6 of Fig. 2; Figs. 7, 8 and 9 are, respectively, a front elevation, a sectional side elevation, and a rear elevation of a modified form of the invention, the views including the adjacent portion of the pilot burner; Fig. 10 is a perspective view of the metal support and shield for the ceramic or refractory wick of said modification; Figs. 11 and 12 are a sectional side elevation and a front view, respectively, of a form of the invention in which a wick of flexible material is used; Figs. 13 and 14 are like views of a further modification incorporating a wick of similar character, and Fig. 15 is a schematic representation of the invention including a fuel feeding and automatic control means.

The apparatus illustrated in Fig. 1 comprises a combustion chamber 1 enclosed by a drum or casing 2, to the apertured or annular bottom wall 3 of which is fastened, by means of bolts 4, a ring-like member 5. Secured, as by posts 6, to the member 5 in spaced relation thereto, is the top wall 7 of the burner bowl that is designated generally by the reference numeral 10. The upper end of the peripheral wall 11 of the burner bowl is welded or otherwise attached to the edge portion of the top wall 7, and shown as formed integral with the peripheral wall 11 is the slightly dished bottom wall 12.

A neck 15 connects the top wall 7 of the burner bowl, about a large central opening 16 thereof, with the inner edge of the ring-like member 5, and said neck is provided with perforations 17 through which secondary air is admitted to the combustion space from a surrounding air compartment 20 enclosed by a bottom wall 21, a peripheral wall 22 and an inwardly and upwardly convergent top wall 23 through which the peripheral wall 22 is joined to the ring-like member 5 in the region of the latter's connection with the bottom wall of the combustion chamber. Air is supplied to the compartment 20, either naturally or by artificial means, through an opening 25 in the bottom wall thereof. The peripheral wall 11 of the burner bowl has air inlet openings 26, and the top wall 7 may also be provided with air openings, as shown at 28.

A relatively large lighting and cleanout opening 30 in the peripheral wall 11 is shown as surrounded by a flange 31, and said opening is adapted to be closed by a plug 32, which carries a gasket 33 for engagement with the flange 31.

The plug fits within a sleeve 34 that is secured to the burner bowl about said flange 31, the plug and sleeve having parts that cooperate to removably hold the plug in position to seal the opening 30.

Insulating shells 37 and 38 are applied to the bottom wall 12 of the bowl, and the outer shell 38 is shown as having secured within a central aperture thereof the smaller upper end of a funnel 39 whose lower end is disposed within the air inlet opening 25. In register with the upper end of the funnel 39 is a central opening 40 of the inner shield 37, and arranged centrally within the burner bowl is an air tube 45 that has its lower end extended through an opening in the bottom wall and to which wall the tube is suitably secured.

Liquid fuel is adapted to be delivered to the burner bowl or pot through a supply pipe 48 that passes upwardly through openings in the shields 38 and 37 and the wall 12, the pipe being welded or otherwise secured to said wall with a leak-proof joint. As disclosed in Fig. 15, the supply pipe 48 is a part of the communicative connections between the burner and a source A of liquid fuel supply, such source being represented as a tank. Fuel gravitates from said source through a pipe *a* to a vessel B wherein float mechanism, designated generally by the reference letter *b* and shown in dotted lines, establishes a maximum liquid level within the portion of the system including the burner bowl, such level being indicated by the dot-and-dash line *a* in Fig. 1.

The fuel feeding and control means shown in Fig. 15 forms the subject matter of an application Serial No. 273,969, filed May 16, 1939, by Theodore B. Focke. Reference may be had to that application for details, although said means may be described briefly as including a by-pass valve *b'*, a metering valve *b''*, and valves that are automatically actuated by thermostatic elements *b³* and *b⁴* which are in the nature of bi-metal strips, and with which are associated the respective electrical resistance heaters *b⁵* and *b⁶*. These heaters are in circuit with a thermostatic switch or so-called room thermostat C, and the secondary winding *d* of a transformer D. The primary winding *e* of the transformer is included in the house circuit that is represented by conductors E and F, the latter being shown as including a switch *f*. One side of the secondary winding *d'* is connected, through a conductor *d²* with the movable element *c* of the room thermostat, and in case of a drop in temperature below that for which the room thermostat is set, the element *c* swings into engagement with the contact *c'* that is connected, through a conductor *c²*, with the heater *b⁶*, supplying current thereto that returns to the opposite end of the secondary winding *d'* through a branched conductor *d³* that is common to both heaters *b⁵* and *b⁶*.

Under the conditions just described, the high temperature of the energized heater *b⁶* is transmitted to the thermostatic element *b⁴*, causing the same to warp in a direction to lift a valve, shown in part at *b'*, and thus increase the fuel supply to the burner so as to cause the combustion apparatus to operate at a higher fire until the heat generated thereby so influences the room thermostat as to cause it to resume neutral condition and open the circuit. This latter condition results in de-energization of the heater *b⁶* and allows the thermostatic element *b⁴* to resume normal condition thereby to return the valve *b'* to its former position under which only sufficient

fuel is fed to the burner to sustain medium fire and maintain, under normal conditions, a room temperature corresponding to that for which the thermostat C is set.

In case of a rise in the temperature affecting the room thermostat so as to cause the movable element *c* to swing into engagement with contact *c³*, current will flow from the secondary winding of the transformer through the conductor *d²* and element *c* to contact *c³* and thence through a conductor *c⁴* to the heater *b⁵*, the current returning therefrom to the secondary winding through the previously mentioned conductor *d³*. Upon the heater *b⁵* being energized, heat will be transmitted to the thermostatic element *b³* causing it to warp in a direction to lower the valve that is operatively connected to it and shut off the flow of fuel to the burner excepting such as is permitted by the adjustment of the by-pass valve *b'* which is sufficient to sustain operation of the pilot burner. The maximum flow is controlled by the metering valve *b''*, which may be manually adjusted through a stem *b⁸*. Also by means of this metering valve the flow may be entirely shut off during seasons in which it is desired the combustion apparatus shall be inactive.

The previously mentioned air tube 45 is open at its upper end; and surrounding said tube, and desirably removable from it, is an air distributor 50. For details of the tube and distributor, reference may be had to the beforementioned application Serial No. 284,544.

Surrounding the air distributor is a wall or partition designated generally by the reference numeral 55, and shown as made up of two frusto-conical sections 56 and 57. The upper section 56 is of a relatively slight taper, and its lower end is fitted over the flanged upper end of the section 57, the latter being comparatively shallow and flaring downwardly at a considerably greater angle than the former section to where it terminates in a substantially vertical flange 58. The wall or partition 55 is provided with openings 60 and it encloses what may be termed the pilot burner space and separates said space from the surrounding interior portion of the burner bowl. The wall 55 is held in position by a suitable number of fingers that extend radially inwardly from the wall and engage the air distributor 50. One such finger is shown in Fig. 1, where it is designated 62 and is a part of a member 65 that is welded or otherwise secured to the outer side of the section 56 and has its lower end flared outwardly, as indicated at 66, the finger 62 being extended inwardly through a slot in said section 56.

During low or pilot fire, when a very small quantity of fuel is being fed, the fuel spreads within the bottom of the pilot burner space enclosed by the wall 55 and is vaporized by the heat given off by the surrounding parts of the burner and by the flame that occupies said space. Under the conditions now prevailing, the pilot burner (comprised of the air distributor 50 and the surrounding upstanding perforated wall or partition 55) functions in much the same way as the complete burner operates at higher fire. The surrounding interior portion of the burner bowl serves the pilot burner, at low fire, in substantially the same way as the air compartment 20 serves the burner bowl 10 at higher fire. When the burner is operating at low or pilot fire, primary air is admitted to the pilot burner space through the lower openings 60 producing, with the fuel vapors, a mixture to which secondary air

is added through the more elevated openings 60 and through the openings of the air distributor 50. Practically complete combustion of the fuel at low fire is thus effected.

When the control means is operated to increase the fuel supply, the amount of fuel in excess of that fed for pilot fire purposes flows to the surrounding portion of the burner bowl; and in this connection it should be explained that, if desired for any reason, separate means may be employed for feeding the fuel to the pilot burner space and the portion of the bowl surrounding the pilot burner. As the supply is increased and fuel starts to accumulate within the space surrounding the pilot burner, the flame of the pilot burner is instantly communicated to said fuel through the mediums of my invention, one form of which is illustrated in Figs. 1 to 6, and which may be described as follows:

70 is the wick, proper, shown as rectangular in shape, preferably of ceramic material that is sufficiently porous to serve effectively as a capillary conveyor or diffuser of the liquid fuel. The wick is attached to the wall 55 by a shield and supporting member designated generally by the reference numeral 75. This member consists of a U-shaped attaching element 76, and a shield and supporting member 77, both being constructed of sheet metal of an appropriate thickness. The member 77 is welded or otherwise secured to the central portion of the element 76, with the latter in transverse relation to the former, and at its ends the member 77 is provided with inturned lugs 78 and 79. The shield and supporting member is considerably wider than the body 70, as appears from Figs. 3 and 6, and its lateral edge portions are inclined outwardly and away from the attaching element 76. The ends of the attaching element terminate in tongues 80. With the wick 70 confined between the lugs 78 and 79 and the side branches of the attaching element 76, the tongues 80 are projected through slots 81 in the wall 55 and are turned over therebeyond to secure the wick shield and supporting member to the pilot burner, the angular relation of the shield and supporting member to the wall 55 being determined by the inclination of the ends 82 of the attaching element 76. While the shield and supporting member 75 is thus fixedly attached to the wall of the pilot burner, the wick 70, fitting loosely therein, assumes the position shown especially well in Fig. 2 where it engages the wall 55 at vertically spaced points and rests upon the lower lug 78 in close proximity to the bottom wall of the burner bowl so that when a very small amount of fuel is in the space surrounding the pilot burner it will touch the wick 70 and, through capillary attraction, be transmitted upwardly through the wick and generally diffused throughout the same from end to end.

It will be remembered that the oil level in the burner bowl is prevented from rising higher than the maximum elevation indicated by the dot-and-dash lines *a* in Fig. 1 by the float mechanism *b*, shown in dotted lines in Fig. 6, although it will be understood that during operation of the burner the oil level seldom if ever reaches this elevation because of the continuous consumption of the fuel.

In the embodiments of the invention illustrated in the drawings, a relatively large lighting aperture 85 in the wall 55 establishes free communication between the pilot fire space and the space adjacent and beneath the upper end

of the wick 70. Now when any perceptible amount of fuel occupies the portion of the burner bowl surrounding the wall 55 it will be conveyed upwardly by the wick 70 and will be vaporized by the heat thrown off from the surrounding metal parts creating a gas in the region of the aperture 85 which is immediately ignited by the pilot flame, causing instantaneous communication of combustion from the pilot flame downwardly along the wick to the surrounding body of fuel.

The burner bowl may be cleaned by extending a suitable implement into it and moving the implement about, and for a more thorough job, the wall 55, as well as the distributor 50, may be removed from the bowl. To remove said wall, a suitable device may be engaged beneath the end 86 of the member 55. In either event, the relatively fragile ceramic wick 70 is protected from injury by the shield and supporting member 75, the flared edges of which project well beyond the sides of said wick. However, being flared, said projecting edge portions of the shield and supporting member do not interfere with the free functioning of the wick.

In the form of the invention illustrated in Figs. 7 to 10, a wick 90, preferably a ceramic material, is enclosed within a metal shield and supporting member 91 that is desirably constructed of one piece of sheet metal to provide a bottom 92 and sides 93 having perforations 94. Flanges 95 rise from the edges of the bottom, and flanges 96 project inwardly from the rear edges of the sides 93. Extending forwardly from the sides 93 are tongues 97, while the top edges of the sides are provided with notches 98.

The pilot burner wall 55^a with which the present form of the invention is associated has a relatively large rectangular opening 100 within the region of the joint between the upper and lower sections of the wall, and the shield and supporting member 91, with the wick 90 therein, is adapted to be projected upwardly within the opening 100 from inside said wall and arranged with the notches 98 engaged over the edge of the wall immediately above the opening 100. The parts are held in this position by the tongues 97 that are turned abruptly outwardly against the surface of the adjacent portions of the wall 55^a. Immediately above the opening 100, the wall 55^a is provided with a lighting aperture 101, and applied to the outer side of the wall above said aperture is a baffle 102.

When fuel is present in the bottom of the pilot burner space that is enclosed by the wall 55^a in sufficient amount to reach the wick 90, it will be conducted upwardly therealong by capillary attraction and thoroughly diffused over the surface of the wick. When the parts are hot, this fuel will be vaporized and ignited from the pilot flame through the lighting aperture 101, the baffle 102 assisting in bringing about this result. Now, as soon as fuel is fed to the burner bowl beyond the confines of the wall 55^a it will be practically instantaneously ignited from the wick 90.

In Figs. 11 and 12 there is shown a form of the invention in which a wick 105 of flexible non-inflammable material, such as woven asbestos, is clamped to the outer surface of the pilot burner wall 55^b by a metal strap 106, and bolts 107 that project through said wall and the superimposed parts and have nuts 108 applied to their inner ends. The wick 105 extends from the very bot-

tom of the wall upwardly therealong to a lighting aperture 109 through which combustion is communicated from the pilot flame inside said wall to the fuel vapors about the top of the wick, such condition existing as soon as sufficient fuel has accumulated about the exterior of the pilot burner wall to saturate the wick.

According to the invention as illustrated in Figs. 13 and 14, the wall 55^c of the pilot burner is provided with a lighting aperture 110 in the form of a relatively wide slot through which a wick 111 of flexible non-inflammable material, such as that above described in connection with the wick 105, is engaged. The end portions of the wick are extended downwardly along the inner and outer sides of the wall 55^c to the lower edge of said wall and are clamped in this position between a metal strip 112 on the outside and members or washers 113 on the inside through the medium of bolts 114 to which nuts 115 are applied.

In the present case, the wick becomes saturated from end to end when sufficient fuel is present within the pilot burner space to reach the inner end of the wick, and when conditions are such that the fuel on the wick is vaporized, combustion will be communicated from the flame of the pilot burner through the aperture 110 and along the outer end portion of the wick to fuel within the surrounding part of the bowl.

Although I have shown, in the illustrative embodiments of the invention, a lighting aperture in the pilot burner wall, it is to be understood that one or more of the perforations 60 of said wall may serve the purpose, thus making unnecessary a special lighting aperture; or by proportioning the parts differently, the vapors from the wick may be ignited from the pilot flame above the wall, all of which is obvious and accordingly specific illustration thereof is deemed unnecessary.

Having thus described my invention, what I claim is:

1. In combination with a burner bowl, a wall dividing the interior thereof into a pilot fire space and a higher fire space, there being means associated with the bowl for feeding liquid fuel to the pilot fire space and occasionally to the higher fire space and for establishing a maximum liquid level adjacent the bottoms of said spaces, the fuel being adapted to be vaporized from the surface of liquid pools in said spaces, the unobstructed upper surface of the bottom of the bowl defining the lower limits of both said spaces, said wall having a lighting aperture a substantial distance above said maximum liquid level, a wick of absorbent non-inflammable material, and a supporting member therefor attached to the wall and serving to sustain the wick with its lower end adjacent the bottom of the wall appreciably below said maximum liquid level and its upper end in proximity to the lighting aperture, said wick having a small cross sectional area relative to that of either of said spaces.

2. In combination with a burner bowl, a wall dividing the interior thereof into a pilot fire space and a higher fire space, there being means associated with the bowl for feeding liquid fuel continuously during operation to the pilot fire space and occasionally to the higher fire space and for establishing a maximum liquid level adjacent the bottoms of said spaces, the fuel being adapted to be vaporized from the surface of liquid pools in the said spaces, the unobstructed

upper surface of the bottom of the bowl defining the lower limits of both said spaces, said wall having a lighting aperture a substantial distance above its lower edge, a shield and supporting member attached to the outer side of said wall, and a wick of ceramic material sustained by said member with its lower end adjacent the bottom of said wall appreciably below said maximum liquid level and its upper end in proximity to the lighting aperture, said wick having a small cross sectional area relative to that of either of said spaces.

3. In combination with a burner bowl, a wall dividing the interior thereof into a pilot burner space and a higher fire space, there being means associated with the bowl for feeding liquid fuel to the pilot burner space and occasionally to the higher fire space, said wall having a lighting aperture a substantial distance above its lower edge, a shield and supporting member comprising a U-shaped element having its ends secured to the wall and its central portion spaced outwardly therefrom, and a second element secured to the central portion of the first element and extending above and below the same and provided at its upper and lower ends with lugs directed toward said wall, and a ceramic wick confined between said lugs and the side branches of the first mentioned element, the lower end of the wick being disposed adjacent the bottom of the wall and the top end of the wick in proximity to the lighting aperture, the lateral edges of the second mentioned element being flared outwardly away from, but in protective relation to, the sides of the wick.

4. In combination with a burner bowl, a wall dividing the interior thereof into a pilot burner space and a higher fire space, there being means associated with the bowl for feeding liquid fuel to the pilot burner space and occasionally to the higher fire space, said wall having a lighting aperture a substantial distance above its lower edge and being flared outwardly from a point below said aperture, a shield and supporting member applied to the outer side of said wall and comprising a substantially U-shaped element whose ends are attached to the wall near the aforesaid point, and a second element secured to the central portion of the first element and extending above and below the same and terminating at its ends in lugs directed toward the wall, and a ceramic wick loosely held between the aforesaid lugs and the side portions of the first mentioned element with its lower end against the bottom portion of the wall and its upper end against the wall in proximity to the lighting aperture, the lateral edges of the second mentioned element flaring outwardly away from and beyond the sides of the wick.

5. In combination with a burner bowl, a wall dividing the interior thereof into a pilot burner space and a higher fire space, there being means associated with the bowl for feeding liquid fuel to the pilot burner space and occasionally to the higher fire space, said wall having a lighting aperture a substantial distance above its lower edge and being flared outwardly from a point below said aperture, the wall having a relatively large opening extending from a point immediately below the lighting aperture downwardly into the flared portion of the wall, a support extended upwardly through said opening and held in substantially fixed relation to said wall, and a ceramic wick confined within the support with its lower end adjacent the bottom plane of the

wall and its upper end within the top portion of said opening.

6. In combination with a burner bowl, a wall dividing the interior thereof into a pilot burner space and a higher fire space, there being means associated with the bowl for feeding liquid fuel to the pilot burner space and occasionally to the higher fire space, said wall having a lighting aperture a substantial distance above its lower edge and being flared outwardly from a point below said aperture, the wall having a relatively large opening extending from a point immediately below the lighting aperture downwardly into the flared portion of the wall, a support extended upwardly through said opening and notched to receive the edge portion of the wall above the opening, the sides of the support being provided with tongues that extend outwardly against the outer surface of the wall adjacent the sides of the opening thereby to secure the support in place, and a ceramic wick confined within the support with its lower end adjacent the bottom plane of the wall and its upper end within the top portion of said opening, and a baffle secured to and extending outwardly from the wall and having a part in such relation to the lighting aperture as to deflect the flame projected there-through toward the wick.

7. In combination with a burner bowl, a wall dividing the interior thereof into a pilot burner space and a higher fire space, there being means associated with the bowl for feeding liquid fuel to the pilot burner space and occasionally to the higher fire space, said wall having a lighting aperture a substantial distance above its lower edge, and a wick of flexible non-inflammable material engaged through the lighting aperture and having its end portions extended downwardly along the inner and outer sides of the wall, and means clamping the end portions of the wick to the wall.

8. In combination with a burner bowl, a wall dividing the interior thereof into a pilot burner space and a higher fire space, there being means associated with the bowl for feeding liquid fuel to the pilot burner space and occasionally to the higher fire space, said wall having a lighting aperture a substantial distance above its lower edge, and a wick of flexible non-inflammable material engaged through the lighting aperture and having its end portions extended downwardly along the inner and outer sides of the wall and terminating adjacent the bottom of the wall, and means clamping the end portions of the wick to the wall, said means including a clamping member that extends along and gives shape to the outer end portion of the wick.

9. In combination with a burner bowl, a pilot burner consisting of a wall removably supported by and upon the bottom of said bowl and enclosing a pilot fire space that is thus set off from the remaining interior portion of the bowl

that constitutes a higher fire space, the lower limits of said spaces being defined by the unobstructed upper surface of the bottom of the bowl, there being means associated with the bowl for feeding liquid fuel to the pilot fire space and occasionally to the higher fire space and for preventing the fuel from rising above a level adjacent the bottom of the bowl, the fuel being adapted to be vaporized from the surface of liquid pools in said spaces, and a wick of absorbent non-inflammable material carried by and removable with said wall, the wick being of small cross section relative to that of said spaces and arranged with its lower end adjacent the bottom of the wall below the aforesaid level and its upper end above said level in such relation to the pilot fire space as to cause fuel conducted upwardly by the wick to be ignited from the pilot flame.

10. In combination with a burner bowl, a pilot burner consisting of an annular wall removably supported by and upon the bottom of said bowl and dividing the interior of the bowl into a pilot fire space and a higher fire space, the lower limits of said spaces being defined by the unobstructed upper surface of the bottom of the bowl, there being means associated with the bowl for feeding liquid fuel to the pilot fire space and occasionally to the higher fire space and for preventing the fuel from rising above a level adjacent the bottom of the bowl, the fuel being adapted to be vaporized from the surface of liquid pools in said spaces the aforesaid wall having a lighting aperture a substantial distance above its lower edge, and a wick of absorbent non-inflammable material carried by and removable with said wall, the wick being of small cross section relative to that of said spaces and arranged with its lower end adjacent the bottom of the wall below the aforesaid level and its upper end in proximity to said lighting aperture.

11. In combination with a burner bowl, a pilot burner consisting of an annular wall removably supported by and upon the bottom of said bowl and dividing the interior of the bowl into a pilot fire space and a higher fire space, the lower limits of said spaces being defined by the unobstructed upper surface of the bottom of the bowl, there being means associated with the bowl for feeding liquid fuel to the pilot fire space and occasionally to the higher fire space, said wall having a lighting aperture a substantial distance above its lower edge, a supporting member attached to the side of and removable with said wall, and a wick of absorbent non-inflammable material sustained by said member with its lower end adjacent the bottom of said wall below the aforesaid level and its upper end in proximity to the lighting aperture, said wick being of small cross section relative to that of each of said spaces.

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