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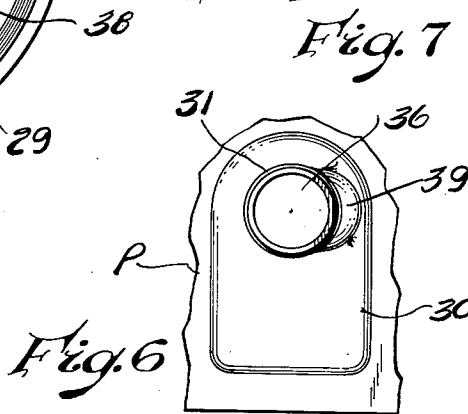
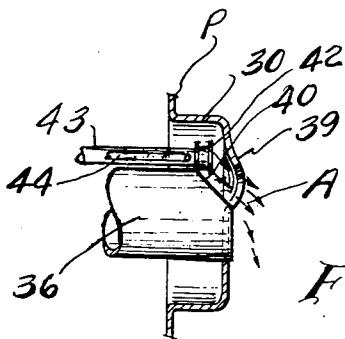
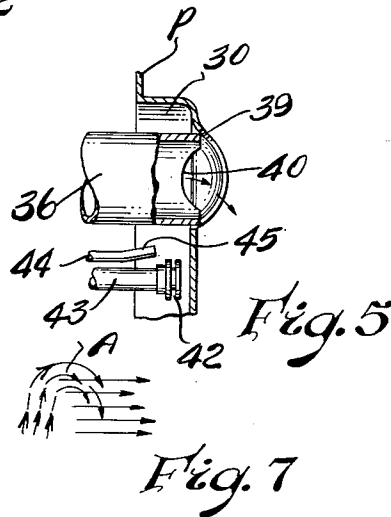
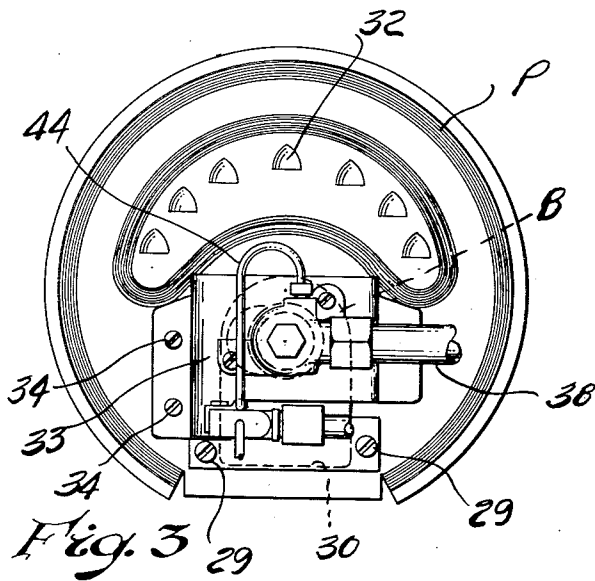
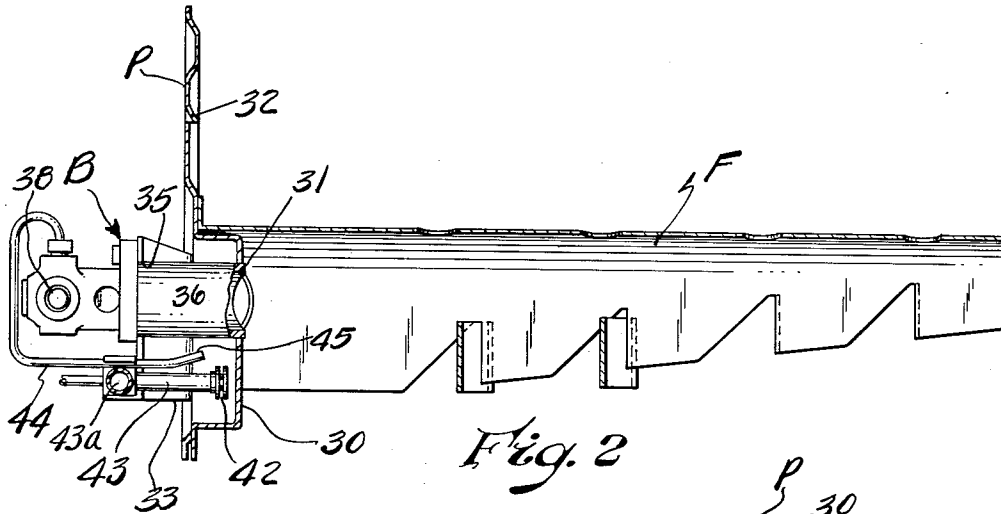
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3,035,533

BURNER SHIELD AND PILOT ASSEMBLY

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2 Sheets-Sheet 2



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BURNER SHIELD AND PILOT ASSEMBLY

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7 Claims. (Cl. 110—8)

This invention relates to refuse incinerators for burning combustible refuse, trash, and garbage of all kinds, and more particularly to an incinerator using gas as a fuel medium.

Gas fired incinerators for domestic use have an automatically controlled burner assembly with a hook-up to a convenient source of gas supply, and the burner assembly usually includes a pilot member supplying a small flame which normally ignites the gas as it is turned on at the beginning of each burning cycle.

Such incinerators are usually connected to the house chimney and are of limited cubical area. The opening and closing of a charging door of an incinerator of this type creates sudden drafts during the charging of refuse to the incinerator, and inasmuch as all types of trash, paper, and garbage usually are burned in domestic incinerators, considerable fly ash and other fine ash is formed which floats in the incinerator as does also the fine ash periodically agitated by the grate shaking and dumping operation. This fly ash and fine ash which circulates in the incinerator, oftentimes plugs or clogs the pilot burner opening so that the pilot flame will be very weak or may be extinguished entirely.

One of the major service complaints in connection with home incinerators has been "pilot outage" caused by impact or concussion when the incinerator door is dropped, or when a momentary downdraft condition occurs in the chimney on certain days. Such downdraft conditions are caused by atmospheric conditions, or when winds from certain directions hit nearby trees, buildings, or other high objects and a positive pressure condition is created in the chimney. Conventional gas pilots will often extinguish under these conditions because they do not have the protection or displacement to avoid downdraft pressures which may be exerted on the combustion chamber.

One of the prime objects of the invention is to design a burner and pilot assembly which is not disadvantageously affected by a pressure build up in the combustion chamber.

Another object is to design a burner-pilot assembly which will effect immediate ignition of the burner, regardless of improper pilot adjustment or low gas line pressure. The gas line pressure is lower on cold days when gas consumption is high, but applicants' device overcomes this difficulty by the use of a high pressure injector connected to the fuel supply, and which acts as a high velocity supplement or booster gas supply and forces the pilot flame through a passage and across the face of the burner nozzle to effect positive and immediate ignition.

Still another object is to provide a housing in the burner panel for protecting the pilot flame from a sudden, heavy, up or down draft caused by sudden opening and closing of the charging door, and which also protect the pilot flame and interior of the housing from fine ash or fly ash which would tend to clog the pilot chamber and block the pilot flame orifice.

Still a further object is to design a burner and pilot assembly of simple, practical, and economical construction which can be readily manufactured and on which the main burner and pilot burner may be easily assembled and secured.

Still a further object is to provide a passage in a housing for said assembly open to the discharge end of the main burner nozzle with a high pressure injector con-

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nected to the fuel supply with its discharge end in igniting relation with the pilot burner for enlarging the pilot flame and forcing it through said passage and across the path of travel of the fuel supply from the burner nozzle.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts, hereinafter more fully described, illustrated in the accompanying drawings and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportions and other details of construction, without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

FIG. 1 is a part-sectional, side elevational view of an incinerator with parts broken away to show our improved burner and pilot arrangement.

FIG. 2 is an enlarged, sectional, side elevational view of the burner panel, main burner, pilot, and shield arrangement.

FIG. 3 is a front end elevational view thereof.

FIG. 4 is a fragmentary plan view showing the panel and burner nozzle assembly, the arrows indicating the path of travel of the pilot flame.

FIG. 5 is a fragmentary, sectional, side elevational view showing also the panel, nozzle, pilot and surge jet.

FIG. 6 is a fragmentary, rear elevational view of the panel and the pressed section which forms the passage for the pilot flame.

FIG. 7 is a diagrammatic view, the arrows indicating the gas flow from the burner nozzle and the flame flow from the pilot.

Referring now to the accompanying drawings in which we have shown a preferred embodiment of our invention, the letter I indicates an incinerator of down draft type which includes an insulated outer casing O, having an inner casing C mounted therein and spaced from the side, front and back walls 10, 11 and 12 thereof respectively, to define a perimetral air passage 13 therebetween. The upper rear wall of the inner casing C is also spaced from the top wall of the outer casing O. The bottom of the casing O has openings 15 connecting with the passages 13 to permit a flow of air into the passage 13 from outside the casing.

The inner casing C has a door frame provided with openings 16 to pass air from between the casings O and C to the interior of casing C, and a charging door 17 is provided in the top wall of casing O to permit charging the incinerator as usual.

Provided within the inner casing C and separating it into primary and secondary combustion chambers 18 and 19, is a partition wall 20, and hooks 21 are provided at the upper end of said partition wall to support a perforate member or screen 22 which normally inclines outwardly to provide a smoke collection chamber 23 within the primary combustion chamber 18. The perforate member 22 terminates short of the bottom of chamber 18 and connects with an imperforate bridge wall 24 therethrough and for a purpose to be presently described.

The incinerator is also provided with a grate structure G mounted directly above the ash pan 26 and we will not further describe the incinerator structure, excepting the burner panel, burner, and burner pilot assembly to which the invention is broadly directed.

A removable panel or door 27 is provided in the front wall of the casing to permit insertion and removal of the burner assembly, and a smaller opening 28 is provided in the inner casing, a burner panel which serves as a base for the assembly forming a closure for the opening 28 and being secured in position by screws 29. The lower portion of the panel 28 is formed with an inwardly pressed section 30 forming a housing having an aperture 31 therein for passing the nozzle end of the burner B, the upper

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portion having a plurality of louvers 32 for admitting air to the primary combustion chamber.

The burner B is held in position by means of a U-shaped bracket 33 secured to the panel P, the bracket 33 being formed with an opening 35 in horizontal alignment with aperture 31 to accommodate the nozzle 36 of the burner B, and screws 37 securing the bracket in proper position so that the end of the nozzle 36 terminates flush with the outer wall of the housing section 30. The burner B is connected to a source of fuel supply by means of line 38 as usual.

A burner shield F is welded over the housing section 30 of the burner panel P. Shield F is generally semi-cylindrical in shape, and open at the bottom, and has its inner free end supported by the bridge wall 24 provided in the primary combustion chamber.

A section 39 of the marginal rim of aperture 31 is pressed inwardly as shown in FIG. 4 of the drawings, and the end of the burner nozzle 36 is cut off at an angle as at 40. When the burner B is in assembled position, the cut off section is directly adjacent the outwardly pressed portion 39, thus providing an angularly disposed path A through which the pilot flame is directed into the path of the gas issuing from the burner nozzle 36. A pilot nozzle 42 is provided on the end of the pilot gas line 43 which extends into the housing 30 formed in the panel and gas is fed to the pilot nozzle at all times through line 43a.

A flexible conduit 44 is connected to the main gas line 38 and leads downwardly and inwardly to a point just above the pilot nozzle 42 with the end section 45 turned upwardly and terminating just short of the pilot burner. When the gas is turned on in the conventional manner to consume a charge of garbage, and refuse, and gas flows through the main burner nozzle, a surge of gas will simultaneously flow through the duct 44 to be ignited by and merge with the pilot flame, the surge forcing the flame along the path A and across the path of travel of the gas from the nozzle 36, all as shown in FIGS. 4 and 7 of the drawings. This surge of flame ignites the stream of gas from the main burner B so that a torch like flame projects through the shield F, all as shown and described in our application for Incinerators, filed March 24, 1958, Serial No. 723,470.

When the burning cycle is completed, the gas to the main burner is cut off as is also the supply to duct 44, the pilot burner, of course, remaining burning to ignite the gas from the main burner B at the start of the next burning cycle when the burner B gas supply is again turned on.

Whereas the drawings and accompanying description show but one embodiment of our invention, it should be apparent to those skilled in the art that various changes may be made in the form of the invention without affecting the scope thereof.

From the foregoing description, it will be obvious that we have perfected a very simple, practical and economical burner and pilot assembly which protects the pilot flame from sudden drafts, which prevents clogging of the pilot orifice with fine ash, and which provides a line for forcing an enlarged surge pilot flame across the open end of a burner nozzle which releases a torch-like flame to the primary combustion chamber when the gas is turned on.

What we claim is:

1. The combination with an incinerator combustion chamber, of a support section of the wall thereof formed with an inwardly recessed area having an aperture extending therethrough, a longitudinally extending burner shield extending longitudinally of the support section generally axially of the aperture connected thereto, a section of the outer face of the edge of the marginal rim of said aperture being disposed inwardly beyond the outer face of other portions of the said area, a high pressure burner member having a nozzle adapted to be connected to a source of fuel supply, with the nozzle extending into said aperture, the nozzle forming, with the said

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inwardly disposed section of the marginal edge of the aperture, an angularly disposed passage through said support section into said burner shield, pilot burner means supported adjacent the outer face of said section and connected to a source of fuel supply, and means incorporated with said pilot burner means connected to the source of fuel supply for supplying a surge of fuel to the pilot flame and to force it through said angularly disposed passage and across the open end of said burner nozzle when fuel is fed to the burner member.

2. The combination set forth in claim 1 in which the means for supplying the surge fuel comprises a duct connected to the fuel line and leading into said area with the open end of said duct near said pilot burner.

3. The combination set forth in claim 1 in which the inwardly disposed section of the marginal edge of the aperture comprises an outwardly pressed, trough shaped section bordering the aperture, and the end of the nozzle is cut away at an angle directly adjacent and outward of said outwardly pressed area, to form with said trough-shaped section an angularly disposed passage for directing fuel across the open end of the nozzle.

4. In combination with a burner panel formed with an area having an aperture extending from its outer face to its inner face, a main burner adapted to be connected to a source of fuel supply, and having a nozzle mounted to extend angularly to said panel, with the anterior end of the burner nozzle extending axially into said aperture, a section of the said anterior end of the burner nozzle being shaped to provide a passage in the nozzle between itself and the panel through said area; pilot burner means behind the outer face of said panel adjacent the anterior end of the burner nozzle and the passage formed, said passage being angularly disposed relative to the axis of said burner nozzle to permit direction of a pilot flame across the anterior end of the burner nozzle as fuel flows therethrough, the wall of the said area having an inwardly pressed angularly disposed section forming one side of said passage.

5. In combination with a burner panel formed with an area having an aperture extending from its outer face to its inner face, a main burner adapted to be connected to a source of fuel supply, and having a nozzle mounted to extend angularly to said panel, with the anterior end of the burner nozzle extending axially into said aperture, a section of the said anterior end of the burner nozzle being shaped to provide a passage in the nozzle between itself and the panel through said area; a pilot burner behind the outer face of said panel adjacent the anterior end of the burner nozzle and the passage formed, said passage being angularly disposed relative to the axis of said burner nozzle to permit direction of a pilot flame across the anterior end of the burner nozzle as fuel flows therethrough, a gas line connected to a pressurized source of fuel supply, with the open end positioned in igniting relation with said pilot burner flame and cooperating therewith to direct pilot flame toward said passage and force said pilot flame through said passage and angularly across the anterior end of the burner nozzle when the main burner is turned on.

6. In combination with a burner panel formed with an area having an aperture extending from its outer face to its inner face, a main burner adapted to be connected to a source of fuel supply, and having a nozzle mounted to extend angularly to said panel, with the anterior end of the burner nozzle extending axially into said aperture, a section of the said anterior end of the burner nozzle being shaped to provide a passage in the nozzle between itself and the panel through said area; a pilot burner behind the outer face of said panel adjacent the anterior end of the burner nozzle and the passage formed, said passage being angularly disposed relative to the axis of said burner nozzle to permit direction of a pilot flame across the anterior end of the burner nozzle as fuel flows therethrough, a bracket secured to the outer face of the

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panel having an aperture provided in alignment with said aperture in the said area of the panel for accommodating the burner nozzle and securing said burner in alignment with the aperture in the panel.

7. In combination with a burner panel formed with an area having an aperture extending from its outer face to its inner face, a main burner adapted to be connected to a source of fuel supply, and having a nozzle mounted to extend angularly to said panel, with the anterior end of the burner nozzle extending axially into said aperture, a section of the said anterior end of the burner nozzle extending behind said area being cut off angularly to the axis of the anterior end of the burner nozzle to provide an enlarged passage in the nozzle between itself and the edge of the aperture through said area; pilot burner means behind the outer face of said panel adjacent the anterior end of the burner nozzle and the passage formed

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for directing a pilot flame toward said aperture, said passage being angularly disposed relative to the axis of said burner nozzle to permit direction of said pilot flame across the anterior end of the burner nozzle as fuel flows therethrough.

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