

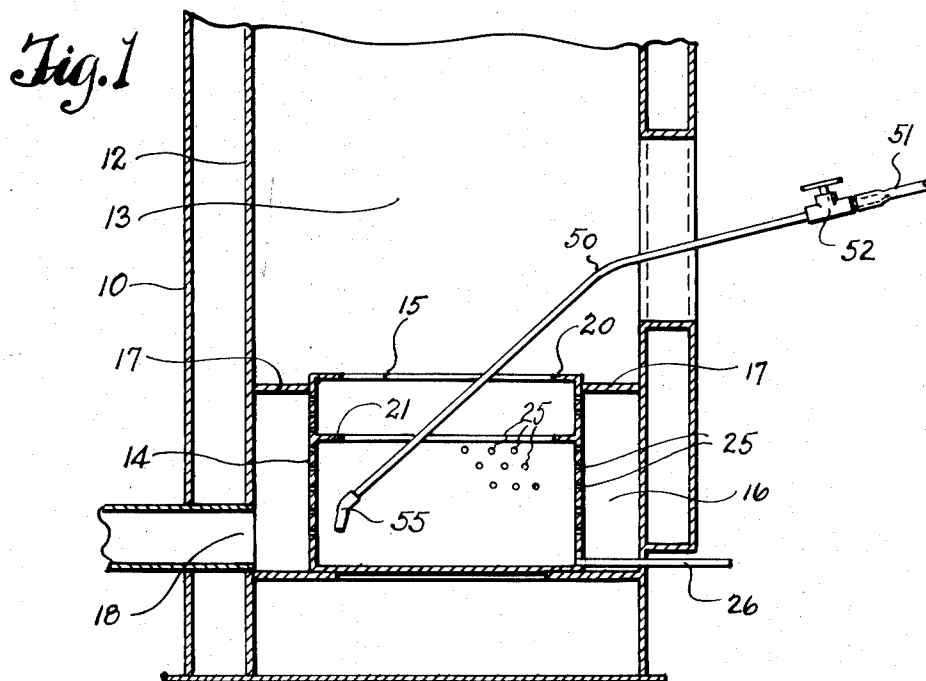
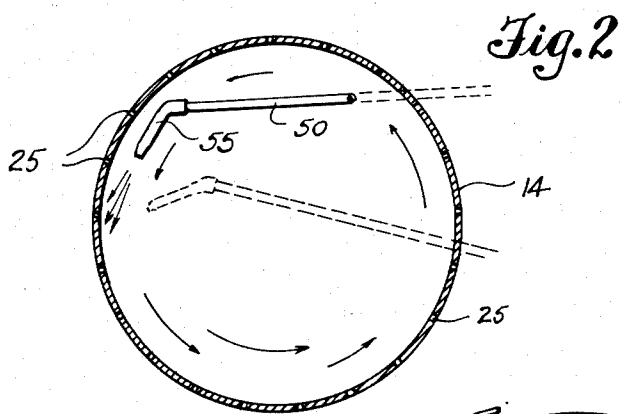
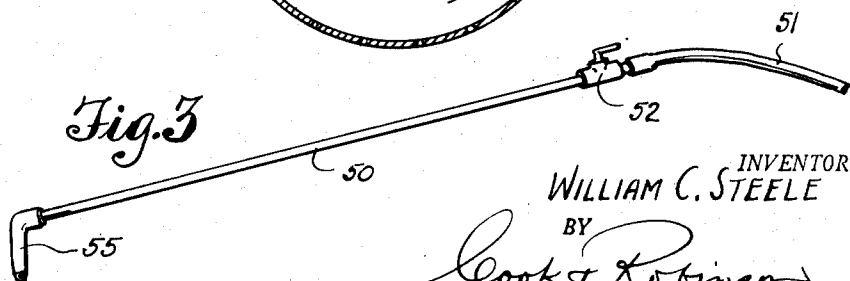
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METHOD OF DECARBONIZING A BURNER POT

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METHOD OF DECARBONIZING A
BURNER POT

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3 Claims. (Cl. 134—2)

1

This invention relates to the cleaning of oil burning heaters of those types comprising an open top pot into which fuel oil is admitted and burned. More particularly, the invention relates to a method for the burning off and removal of the carbon deposit that forms on the surfaces of side and bottom walls of the burner pot incident to the normal burning of oil therein.

The types of burners to which this invention pertains have gone quite extensively into use for residence heating. The burner unit includes a burner pot with a basin or depression in its bottom into which fuel oil is permitted to flow under automatic control. The pot is cylindrical and vertically disposed, and the side walls thereof are generally formed with a multiplicity of small ports through which fresh air is admitted to the interior of the pot to facilitate burning and combustion of gases produced by the burning fuel. The top of the pot is open and in direct communication with a combustion chamber. The specific design or shape of such pots may vary, but regardless of specific design, when the inside surfaces of walls and the perforations therein become covered with carbon, the heating efficiency of the burner is greatly reduced.

To maintain maximum heating efficiency and most satisfactory operation by use of such pots, it is required that the wall surface and perforations therein be kept clear of carbon deposits, and it is the principal object of this invention to provide a novel, simple, expeditious method for cleaning the interior of the burner pot, and the wall perforations of carbon deposits; this invention being a divisional part of my invention filed on December 6, 1943, under Serial No. 513,156, to issue as U. S. Patent 2,538,057 on January 16, 1951.

In the above identified application, I described more particularly the use of a plurality of independently controlled air jet nozzles for causing the flame and heat of burning oil in the pot to be intensified and so directed against the pot walls as to cause the burning off of carbon deposits. In the present application, I will describe the invention as it is carried on by the use of a single air jet nozzle, and it is in the mode of use of this single jet of air that the present invention is based.

In carrying out the present method, I preferably employ apparatus which has been illustrated in the accompanying drawings, wherein—

Fig. 1 is a vertical section of a portion of an oil burning heater, illustrating an application of the air jet nozzle to the pot for burning carbon from the pot walls and wall perforations.

Fig. 2 is a horizontal section of the pot, illustrating a directional position and manipulation of the nozzle in a cleaning operation.

Fig. 3 is a perspective view of an air nozzle

2

suitable for carrying on the present method of cleaning a burner pot.

Referring more in detail to the drawings:

A typical heater as herein partly shown, comprises an outside, air tight housing 10 that encloses housing 12 forming a combustion chamber 13. Within the base of the housing 12 is a burner pot 14 formed with a top opening 15 that is in direct communication with the combustion chamber 13. Between the walls of the burner pot 14 and the housing 12 is an air chamber 16 that is closed off from the combustion chamber by the annular partition plate 17. Fresh air is admitted into chamber 16, as through a tube 18.

The particular pot 14 here shown has a peripheral, inturned flange 20 about its upper end opening, and it has an inwardly directed flange 21 spaced somewhat below the top opening. The side walls of the pot are vertical and are provided with a multiplicity of small air ports or perforations 25 for admittance of air to the pot.

It is here shown that the pot is equipped with an oil supply pipe 26 through which oil is delivered in a regulated amount for burning in the base of the pot.

In view of the fact that, in the use of such a heater, combustion is incomplete in the pot 14, operation over a period of time invariably causes a scale of carbon to be formed on the inner surfaces of the pot walls, and also in the air ports 25. Usually a very thick deposit of carbon will form on the bottom which is very undesirable.

The present invention anticipates the forcible injection of fresh air into the pot to intensify the flame and increase the heat of burning oil to a very high degree, and by a directional application of air, as injected by an air jet nozzle, to cause the mass of flame to whirl circumferentially in the pot and to be pressed outwardly against the pot walls, and to burn off the carbon deposits. Furthermore, by the proper directional application of the air jet, to cause a concentration of high heat at any specific surface area, and also to supply oxygen directly to the carbon to cause it to be quickly consumed by the flame.

The present apparatus, used in the cleaning operation comprises a nozzle 50, in the form of an elongated tube of small diameter, adapted for projection into the burner housings 10 and 12 through the front opening, and then extended downwardly into the pot 14 through the top opening thereof as shown in Fig. 1. Attached to the outer end of the nozzle, is an air supply hose 51, extended thereto from a suitable source of supply of air under pressure, not shown. Also, it is desirable that the hose be attached to the nozzle through the mediacy of an adjustable control valve 52. The nozzle tube 50 may be straight, curved or angularly bent as may be desired or required for most satisfactory use. It is antici-

3

pated that the nozzle be handled in use by grasping its outer end portion, which would be outside the heater, and the air delivery controlled by adjustment of the valve.

It is preferred that the inner end of the air tube be equipped with a nozzle that will suitably direct the air stream. In the present instance, the nozzle comprises a short length of tubing 55 such as an elbow, that is threaded onto the end of tube 50 and which is curved through an arc of about 90°. This may be adjusted on the tube 50 in various ways to meet any desired directional application of the air jet. Also, it is anticipated that the tube 50 may be of a more or less flexible nature to permit a ready bending thereof for the most expeditious use of the device for cleaning any portion of the pot. Such a flexible tube might be employed without the application of a fitting 55 thereto, and bent at its inner end to discharge the air therefrom in any desired direction.

For a pot cleaning operation, fuel oil is supplied in proper amount to the pot and is ignited. Generally, oil is supplied in the usual way through pipe 26. The nozzle is then extended into the pot as shown in Fig. 1 and the air valve opened. By the direct application of auxiliary air into the pot in this way, the flame of burning oil will be intensified and a very high heat produced therefrom. The gist of the invention, however, resides in the placing of the nozzle in position that the discharged air will cause the mass of flame to whirl axially in the pot, to form a wall of flame that by reason of its whirling will be pressed against the side wall surfaces of the pot to cause the ignition and burning of the carbon deposit thereon. Furthermore, by a proper positioning of the nozzle and directional application of the air jet from the nozzle, the heat can be concentrated on any specific wall area and air delivered directly to the carbon at that area to insure quick burning.

To cause the flame to be increased and intensified in the bottom of the pot, it is only necessary that the air from the nozzle be directed downwardly into the flame as produced by the burning oil. The mass of flame, as intensified by the additional air can be caused to whirl by causing the nozzle to direct the air into tangential contact with the side wall of the pot as indicated by the full line position of the nozzle in Fig. 2. If it is desired to concentrate heat at any specific area of the wall surface, the angle of the nozzle relative to the wall is adjusted, as from the full line position of the nozzle, in Fig. 2, to the dotted line position. This latter directional application of air causes the mass of flame to continue to whirl in the pot, but by keeping the nozzle end relatively close to the wall, will result in fresh air being blown through the wall of flame into intimate contact with the wall surface and carbon deposit thereon, thus to cause the carbon to quickly burn up. This angle of application of air may be increased or decreased as may be required to get a higher or lower temperature at that point. By moving the nozzle end nearer to or farther from the flame, the heat as applied to the wall will be increased or decreased accordingly.

The height of the whirling band of flame in the pot can be controlled by the angular position of the nozzle relative to the side walls of the pot and by the location and direction of its outlet relative to the bottom wall. By directing the stream of air from the nozzle downwardly and tangentially against a side wall, the whirling mass

4

of flame, as an annular band, will be caused to be pressed against the wall surfaces as it whirls. By placing the nozzle end close to the bottom of the pot, the band of flame will be lifted. Then by slowly raising the nozzle, the band of flame will be raised accordingly and by adjusting its directional application the band can be caused to whirl more or less violently.

A feature of the method resides in the fact that by the use of this single air jet nozzle, the band of flame can be maintained in a whirling condition, and also heat can be caused to be concentrated to more or less extent at any specific location.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent, is:

1. The method of decarbonizing a cylindrical pot burner having perforated walls; comprising causing a fuel to be burned in the base of the pot, directing an air jet under pressure into the pot in a direction substantially tangential to the pot side wall to increase the flame and heat intensity from burning fuel, and to cause the mass of flame thus produced to whirl axially in the pot and to be centrifugally pressed against the pot walls and into the wall perforations.

2. The method of decarbonizing a pot burner of cylindrical form, with bottom wall, and having its side walls perforated; comprising causing fuel oil to burn on said bottom wall, directing a jet of air under pressure into the pot in a direction tangential to said side walls to increase the flame and heat intensity of burning fuel, and to cause the mass of flame as thus produced to move as an axially whirling band, closely pressed against the pot walls, then effecting the concentration of carbon burning heat on a selected surface area by so adjusting the angle of direction of the air jet as to pass through the whirling mass of flame against said selected area, while maintaining sufficient tangential direction of the jet as to cause the flame mass to continue to whirl in the pot.

3. The method of decarbonizing a pot burner of cylindrical form, with bottom wall, and having its side walls perforated; comprising causing fuel oil to burn on said bottom wall, directing a jet of air under pressure into the pot in a direction tangential to said side walls to increase the flame and heat intensity of burning fuel, and to cause the mass of flame as thus produced to move as an axially whirling band, closely pressed against the pot walls, then effecting the concentration of carbon burning heat on a selected surface area by so adjusting the angle of direction of the air jet as to pass through the whirling mass of flame against said selected area, while maintaining sufficient tangential direction of the jet as to cause the flame mass to continue to whirl in the pot, and controlling the height of the flame in the pot by controlling the height of the jet nozzle above the bottom of the pot.

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