March 9, 1954 P. BREVARD 2,671,506

IGNITER FOR POT TYPE OIL BURNERS

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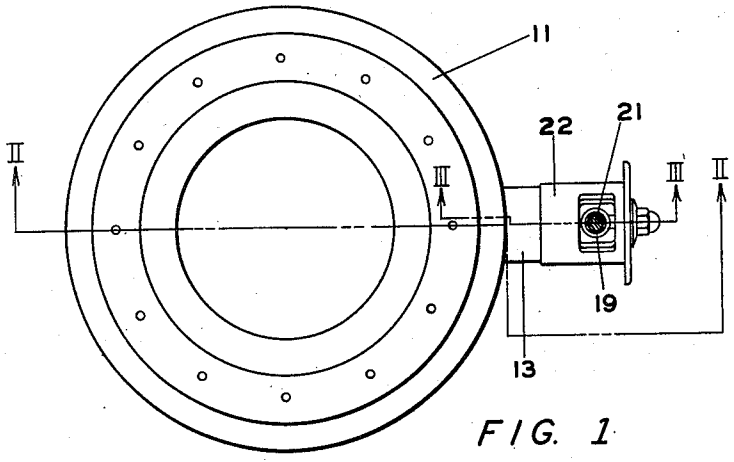


FIG. 1

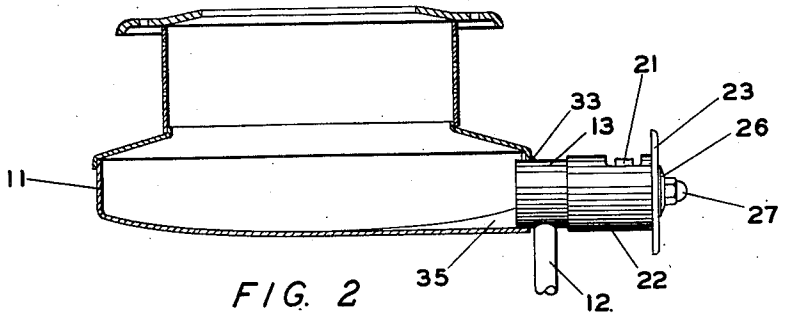


FIG. 2

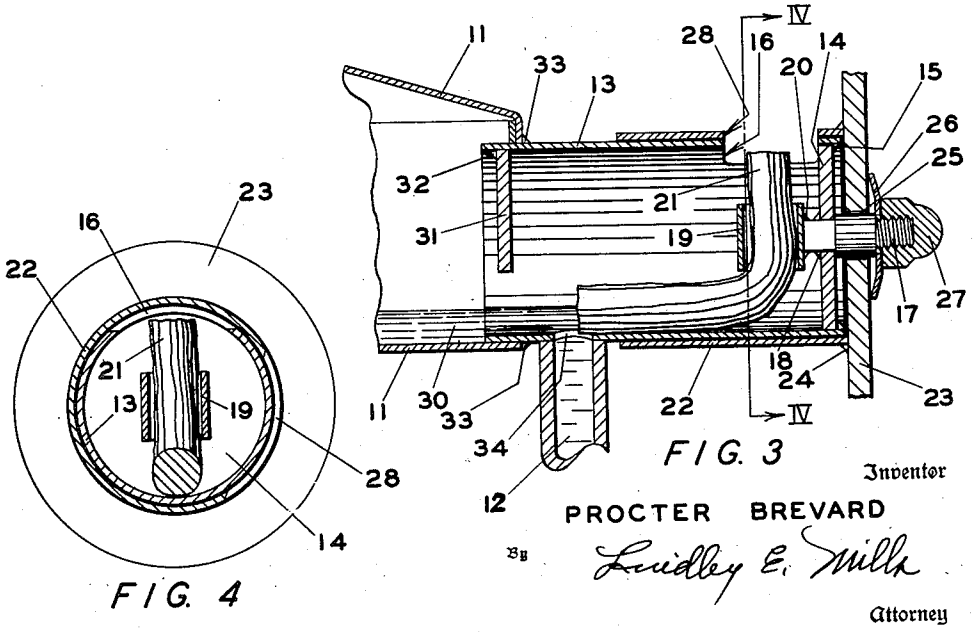


FIG. 3

FIG. 4

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IGNITER FOR POT TYPE OIL BURNERS

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3 Claims. (Cl. 158—91)

1

This invention relates to a device for igniting oil in the burner of an oil-burning stove.

Many oil-burning stoves have burners of the type generally known as, and hereinafter referred to as, the "pot type" of burner. In the pot type of burner, the oil flows by way of a supply pipe into an oil pot or reservoir at the bottom of the burner where it forms a pool from which it is vaporized for burning. Most such burners have an oil reservoir, usually circular, with a somewhat concave bottom so that the area of oil exposed for burning is greater the greater the amount of oil in the reservoir, the rate of burning being regulated by regulating the rate of flow of oil to the reservoir. When oil is caused to enter the reservoir only slowly, the pool of oil is relatively small and only a relatively small flame is produced. When, on the other hand, oil is caused to enter the reservoir more rapidly, the oil forms a larger pool and a larger flame is produced. The sides of the burner above the highest level attained by the oil are generally perforated and otherwise formed to permit air to be drawn into the rising column of hot gases and thus to promote better and more complete combustion of the oil vapors. Heating and vaporization of fresh oil flowing into the reservoir when the burner is in operation, is caused by a combination of radiant heat from the burning vapors in the upper part of or above the burner and by conduction of heat through the metal parts of the burner from the region of burning to the walls and bottom of the reservoir.

The conventional pot type of burner, such as that just described, has several serious disadvantages, a chief one of which is the difficulty of generating a flame in the burner when it is cold so that the oil will continue to burn. The usual method for generating or starting the burner is to open the valve in the oil supply pipe sufficiently to produce a pool of oil of more or less extent in the reservoir and then to ignite it by placing burning paper or other combustible kindling material in the pool of oil. Inasmuch as the oil generally used in such stoves often has an ignition or fire temperature considerably higher than ordinary room temperature, and since it is in contact with a relatively large mass of cold metal, it is necessary to generate considerable heat within the burner before the oil and the various metal parts of the burner become hot enough for the combustion of the oil to proceed and the burner to begin to operate.

Not only is the procedure described unhandy, inconvenient and time consuming, often requiring from 10 to 30 minutes to generate even a small burner, but there is generally no way of removing the ash and residues left by the kindling material without first shutting off the burner entirely and allowing it to cool. The kindling material is generally not burned completely but remains as an oil-soaked, carbonaceous mass in the bottom of the burner. Prolonged heating of the oil trapped in the mass promotes carbonization of the oil and eventually the stove must be shut down and the carbonaceous residues removed. The presence of such residues in the pot also interferes seriously with the clean burning of the oil and tends to promote the formation of a smoky flame. These effects are all highly undesirable.

2

It is, therefore, an object of the invention to provide apparatus for overcoming the disadvantages inherent in heretofore known procedures for igniting oil in a pot type oil burner.

An additional object is to provide apparatus whereby oil in a pot type oil burner can be ignited readily and conveniently.

An additional object is to provide apparatus whereby oil in a pot type oil burner can be ignited without the introduction of residue-forming kindling material into the burner.

An additional object is to provide apparatus whereby oil in a pot type oil burner can be ignited quickly.

An additional object is to provide apparatus whereby the generating period for kindling a flame in a pot type oil burner can be shortened greatly and the burner brought quickly to full normal operation.

These and related objects are accomplished readily by providing an igniter tube, preferably substantially horizontal, of convenient length and cross-section which can be suitably secured to the pot or oil reservoir of a pot type oil burner and in comunication therewith in a position to permit free flow of oil between the reservoir and the inside of the tube. The outer end of the tube is sealed liquid-tight and an igniting port, herein referred to as a "tube port" is provided above the level of the oil therein and removed a convenient distance from the pot. A cover or other closure means is provided for the tube port so that it can be opened or closed at will.

To ignite the oil in the burner, it is then only necessary to ignite the relatively small amount of oil lying in the bottom of the tube. This can be accomplished in a number of ways and without leaving any foreign residue in either the tube or the burner. If desired, a piece of asbestos or

other suitable wicking material can be mounted on the end of a rod or wire and soaked in oil and ignited and then plunged into the oil in the tube through the open tube port. Since the draft created by the stove chimney is downward through the open port and over the surface of the oil in the igniter tube into the oil pot, and since there is only a relatively small amount of oil and metal in the tube which must be heated before the ignition temperature of the oil in the tube is reached, ignition of the oil in the tube is accomplished in a very short time. The flame is then projected with considerable force and velocity from the tube across the surface of the oil in the pot by the natural air draft through the tube and pot. The wick can then be withdrawn and saved for future use and, when the oil in the pot is burning freely the tube port can be closed to prevent further draft through the igniter tube and burning of the oil therein. The entire operation occupies only a fraction of the time required when the oil is ignited directly in the pot as heretofore practiced and no foreign material is introduced into the pot to form residues therein.

The igniter tube can be of any convenient cross-section, e. g. circular, oval, square or rectangular, and the tube port cover can be of any convenient design, e. g. a spring hinged metal sheet, a rotatable sleeve or even a threaded plug. In a preferred modification of the invention, the outer surface of the igniter tube is circular in cross-section and a rotatable sleeve, the inner surface of which is also circular in cross section, is provided which fits closely over at least the section of the tube containing the tube port so as to provide a cover for the latter. The sleeve fits the tube closely enough to prevent undue passage of air therebetween, but not so tightly that it cannot be rotated readily. The sleeve is also provided with a sleeve port which can be brought alternately into and out of register with the tube port by rotating the sleeve. The igniter tube can be long enough to project through the outer wall of the stove, if desired, thus enabling the entire operation to be carried out without opening the stove.

In a further preferred modification, a wick holder is provided inside the tube to support a wick in a position such that its lower end dips into the oil in the tube and its upper end is held just inside the tube port. It is then only necessary to open the port and ignite the oil on the upper end of the wick with a match and, when combustion of the oil in the pot is proceeding, to close the port. In a further modification, a flame-deflecting baffle is provided across the upper portion of the tube adjacent the pot to deflect the flame and hot gases issuing from the tube downward onto the surface of the oil in the pot and thus to hasten its heating.

The invention can be better understood by reference to the accompanying drawing wherein, in the interest of clarity, certain features are shown on a somewhat exaggerated scale and wherein:

Figure 1 is a plan view of a pot type burner having an igniting device of the invention mounted on the side thereof;

Figure 2 is a side elevation, partly in section, taken along the line II—II of Figure 1;

Figure 3 is a sectional view, partly in elevation, taken along the line III—III of Figure 1; and

Figure 4 is a sectional view, partly in elevation, taken along the line IV—IV of Figure 3.

Referring now to the drawing, a burner of the conventional pot type, as shown in Figures 1 and 2, is provided near the bottom thereof with a horizontal igniter tube **13** positioned at a height such that oil, **30** of Figure 3, will flow between the burner pot **11** and the tube **13** at all times when there is oil in either. The tube **13** should be of such diameter that it does not become filled with oil, even when the burner is operating at peak capacity. An oil trough or groove, **35** of Figure 2, can be provided in the bottom of the burner pot connecting the lowest part of the pot with the tube to insure there being at all times a supply of oil in the tube. The tube **13** can conveniently be welded, as shown at **33**, to the pot or it can be secured thereto in any other convenient and suitable oil-tight manner.

The igniter tube **13** is closed at its outer end, suitably by an igniter tube end plate **14** which can be welded or otherwise secured within or across the end of the tube. A tube port **16** is also provided in the top of the tube, preferably near its closed outer end.

A preferred opening and closing means for the tube port **16** comprises a rotatable sleeve **22** adapted to rotate easily on its longitudinal axis around and in surface contact with the outer surface of the igniter tube **13**. The sleeve is also provided with a sleeve port **28** which can be moved into and out of register with the tube port **16** by rotating the sleeve.

In the preferred modification, as shown in Figure 3, the sleeve **22** is secured in convenient manner, as by a weld **24**, to a bearing plate **23** which bears on and rotates around a bearing post **17** longitudinally co-axial with the igniter tube **13** and which is in turn secured to the tube end plate **14** in convenient manner, as by a weld **18**. A bearing plate retaining washer **26** and retaining nut **27** adapted to engage the threaded end of the bearing post **17** can be provided to retain the bearing plate **23** on the bearing surface **25** of the bearing post **17**. The tube port **16** can then be opened and closed by rotating the bearing plate **23** and the sleeve **22** secured thereto to bring the sleeve port **28** into and out of register with the tube port without danger of the sleeve moving longitudinally with respect to the igniter tube.

A wick holder **19**, suitably a short metal cylinder of convenient diameter, welded as at **20**, or otherwise secured to an extension of the bearing post **17** projecting through the tube end plate **14** into the igniter tube **13**, can be provided to hold a wick **21** in a position such that its lower end dips into oil **30** in the igniter tube and its upper end is in a position where oil thereon can be lighted easily through the tube port **16**. Other convenient means for holding the wick in a convenient position can be employed, if desired.

In a further modification, a flame-deflecting baffle, **31** of Figure 3, is welded, as at **32**, or otherwise secured across the upper part of the igniter tube **13** near its inner end in a position such that it directs the flame and hot gases issuing from the igniter tube across the surface of the oil in the oil pot **11**.

Oil is introduced into the burner by way of a supply pipe **12** which can communicate either with the igniter tube **13** as shown in Figures 3 and 4, or directly with the oil pot **11** in a conventional manner not shown. It is preferable that the oil supply pipe deliver the oil to a point **34** as near the lower end of the wick as convenient to facilitate rapid transmission of the oil through the wick so that it can be lighted without undue

delay after admission of the oil. The rate of supply of oil to the burner can be regulated by thermostatic means in conventional manner.

I claim:

1. Oil burning apparatus including: a tube closed at one end and mountable with its lower wall in a substantially horizontal position; means to admit oil to the bottom of the tube; an adjustable port for admitting air into the closed end of the tube above the highest level of oil attainable therein; a flame directing baffle extending across and closing the upper portion of the other end of the tube but removed from the lower wall of the tube by a distance greater than the maximum depth of oil attainable in the tube to permit free flow of both oil and gases through the tube beneath the baffle; and oil-absorbent material wholly within the tube contacting the bottom wall thereof and extending to a point adjacent the said adjustable air port.

2. In apparatus for igniting oil in a pot type oil burner, the combination including: a pot type oil burner; a substantially horizontal igniter tube closed at its outer end and securable at its inner end in communication with the oil reservoir of a pot type oil burner in a position to permit free flow of oil between the reservoir and the inside of the tube; a tube port in the igniter tube removed from its inner end; means to close and open the tube port; a flame-directing baffle adjacent the inner end of the igniter tube and removed from the lower wall of the tube to direct flame issuing therefrom horizontally; a wick positioned inside the igniter tube and so arranged that its lower end is adapted to dip into oil in the tube and its upper end is adjacent the tube port; and means to hold the wick in the said position.

3. In apparatus for igniting oil in a pot type oil burner, the combination which includes: a pot type oil burner; a substantially horizontal igniter tube closed at one end with an igniter tube end plate and secured at its other end in communication with the oil reservoir of the oil burner; a tube port in the igniter tube removed from its inner end; a bearing post longitudinally coaxial with the igniter tube transversing and secured to the end plate in liquid-tight relationship and having a bearing surface thereon outside the tube; a bearing plate adapted to rotate on said bearing surface; a sleeve fitting closely at least the section of the tube containing the tube port secured to the bearing plate and adapted to rotate therewith; a sleeve port in the sleeve adapted to be alternately in and out of register with the tube port when the sleeve is rotated; a wick positioned inside the igniter tube and so arranged that its lower end is adapted to dip into oil in the tube and its upper end is adjacent the tube port; and means secured to the bearing post inside the igniter tube to hold the wick in said position.

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