Jan. 12, 1937. J. JUNGERS 2,067,666

LIQUID FUEL BURNER

Filed April 19, 1934

FIG. 1

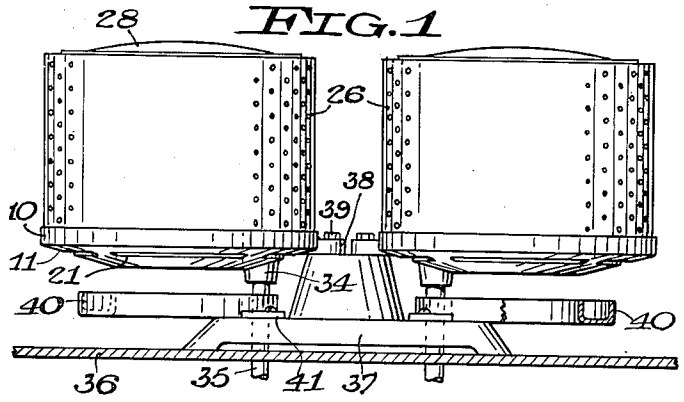


FIG. 4

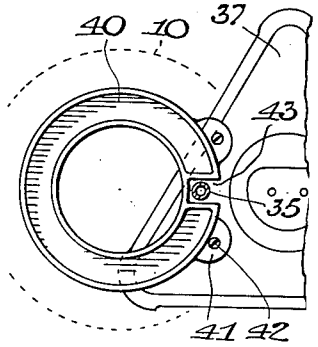


FIG. 2

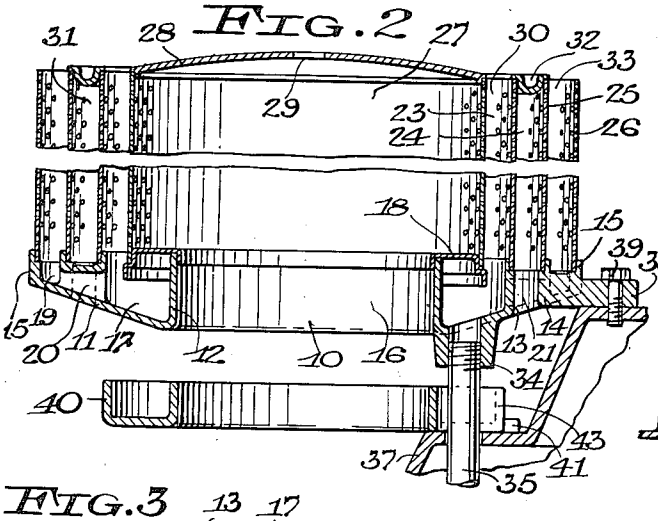


FIG. 6

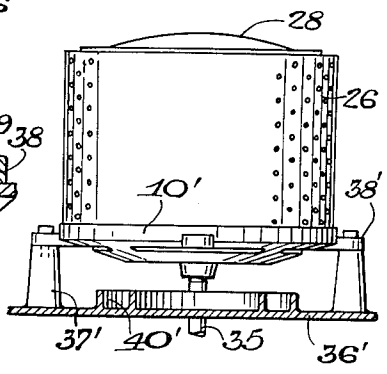


FIG. 3

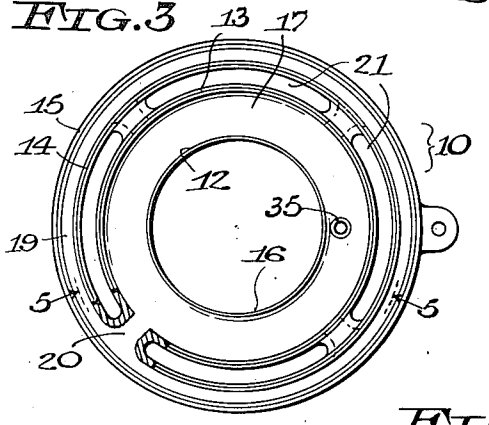


FIG. 7

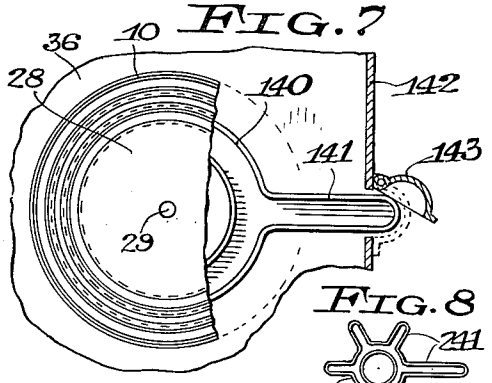
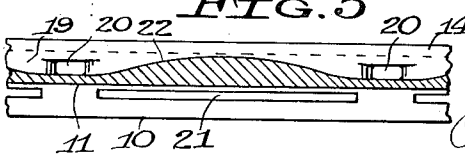


FIG. 8

FIG. 5



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LIQUID FUEL BURNER

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3 Claims. (Cl. 158—87)

The invention relates to oil burners of the combustion tube type, and has for an object the provision of an oil burner of this type which avoids the use of wicks, which can be easily lighted, which does not require leveling, and which is so arranged as to facilitate manufacture.

The invention further consists in the several features hereinafter described and claimed.

In the accompanying drawing,

Fig. 1 is an elevation of a pair of associated oil burners embodying the invention;

Fig. 2 is a sectional elevation of one of the burners;

Fig. 3 is a top plan view of a burner body or base, parts being shown in section;

Fig. 4 is a top plan view of a burner lighter and generator;

Fig. 5 is a sectional developed view taken on the line 5—5 of Fig. 3;

Fig. 6 is an elevation of another form of oil burner;

Fig. 7 is a top plan view of a modified form of burner lighter, parts being broken away and parts being shown in section, and

Fig. 8 is a top plan view of a modified form of lighter.

In that form of the invention shown in Figs. 1 to 5, 10 designates a cast metal burner body or base of annular shape having a conically formed bottom wall 11 sloping upwardly toward the outer edge. The bottom wall 11 has integrally formed thereon a plurality of upstanding concentric flanges 12, 13, 14, and 15, the flange 12 being at the inner edge of the bottom wall and forming a central downwardly opening air passage 16. A vaporizing chamber 17 is formed between the flanges 12 and 13 and is partially closed at the top by an annular sheet metal plate 18 downwardly flanged at its inner and outer edges and fitting over the upper edge of the flange 12, as seen in Fig. 2, the outer edge of the plate 18 being spaced inwardly from the flange 13. An annular vapor channel or groove 19 is formed between the two outer flanges 14 and 15 and communicates with the vaporizing chamber 17 by way of a plurality of radially extending vapor ducts or ports 20 extending between the spaced flanges 13 and 14, the lower walls of these ducts being formed by the sloping bottom wall 11 of the burner body. Between the flanges 13 and 14 are formed arcuate air slots 21 opening at the bottom of the burner body. The outer ends of the vapor ducts 20 are flaring, as seen in Fig. 3, and the bottom wall 22 of the vapor channel 19 is longitudinally arched or sloped between each two adjacent vapor ducts, as seen in Fig. 5, so as to deflect the incoming vapor upwardly and to return any condensate to the vaporizing chamber. The slope of the arched bottom wall of the vapor channel may be either variable or uniform, as desired.

Mounted on the burner body are upstanding concentric cylindrical perforated sheet metal shells or tubes 23, 24, 25, and 26, the inner shell 23 being carried on the flanged outer edge of the plate 18, and the shells 24, 25 and 26 being carried on the flanges 13, 14, and 15, respectively, of the burner body. The shells are frictionally retained in position. The inner shell 23 forms an air chamber 27 therein communicating with the passage 16 in the burner body, and is surmounted by a crowned cover plate 28 having, if desired, a small central opening 29. Between the shells 23 and 24 is formed a vapor chamber 30 open at its upper end and communicating at its lower end with the vaporizing chamber 17. Between the shells 24 and 25 is formed an air chamber 31 communicating at its lower end with the air slots 21 and closed at its upper end by a cover ring 32. Between the shell 25 and the outermost shell 26 is formed another vapor chamber 33 open at its upper end and communicating at its lower end with the vapor channel or groove 19.

The burner body 10 has a downwardly projecting tubular boss 34 communicating with the lowest part of the vaporizing chamber 17 and having screwed therein a vertical oil supply pipe 35 which passes through the bottom wall or floor 36 of a heater casing or the like in which the burner is placed. Liquid fuel, such as kerosene or distillate, is conducted to the vaporizing chamber of the burner body through the conduit formed by the pipe 35 and tubular boss 34 and is controlled by the usual valve means, not shown.

The burner is supported from the bottom wall or floor 36 of the heater casing in any suitable manner, as by means of a pedestal 37 resting on the bottom wall, a lug 38 on the burner body being secured by a screw 39 to the upper portion of the pedestal. The pedestal here indicated is arranged to support two burners and is apertured to pass the oil supply pipes 35.

An annular lighting pan 40 is spaced downwardly from the burner body in concentric relation to the burner body and above the casing bottom wall 36. The lighting pan is provided with a pair of ears 41 by which it is secured to the pedestal 37 by screws 42, and has a notch 43 to admit the fuel pipe 35. The central space within the pan forms an air passage of about the

same size as the passage 16 in the burner body. The pan is of channel-shaped cross-section to form a receptacle for a suitable lighting liquid, such as alcohol.

To set the burner in operation, the flow of liquid fuel is shut off and a small quantity of alcohol, say two or three ounces, is introduced into the lighter pan, as by a syringe, and then ignited, as by a match. The alcohol then burns freely, heating the burner body to a generating temperature within a few minutes. Liquid fuel is then admitted to the burner body through the pipe 35 and is immediately vaporized in the chamber 17 and ignited by the alcohol flame, after which the burner remains in normal operation until the control valve is shut off. The liquid fuel enters the vaporizing chamber at the lowest part of the conical bottom wall and is completely vaporized after flowing a short distance from the inlet. Because of the slope of the conically formed bottom wall of the burner body and the junction of the bottom wall with the upstanding inner flange 12, the liquid fuel flows in a narrow stream or trickle close to the inner flange 12, even if the burner is tilted to some extent in any direction, thus avoiding the necessity for leveling the burner and facilitating fine and even regulation of the flame. The fuel vapor flows outwardly and upwardly along the sloping bottom wall and passes upwardly into the vapor chambers 30 and 33 between the perforated shells or tubes, whereupon the vapor mixes with air and is completely burned. The ducts 20 in the burner body pass the vapor from the vaporizing chamber to the outer vapor channel 19, the sloping floor of the conically formed bottom wall 11 facilitating the outward flow of the vapor to the vapor channel.

In the modified form of the invention shown in Fig. 6, the annular lighting pan 40' is cast integral with the bottom wall or floor 36' of the heater casing, and the burner body 10' is provided with lugs 38' resting on pillars 37' cast with the bottom wall. The burner body may either set loosely on these pillars or be fastened thereto.

In the modified form of the invention shown in Fig. 7, the lighter pan 140 below the burner body is provided with a substantially horizontal extension 141 to facilitate filling and lighting. The extension is here shown to project through an opening in a side wall 142 of the heater casing, the opening being normally covered by a hinged door 143.

In the modified form of lighting pan shown in Fig. 8, an annular trough 240 is provided with radial extensions 241 adapted to register with the radial vapor ducts (corresponding to the ducts 20) of a larger type of burner. One of the extensions 241 is longer than the others to facilitate filling and lighting.

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

1. A liquid fuel burner having an annular base comprising an upwardly and outwardly sloping bottom wall, having thereon spaced, upstanding flanges forming an annular outer vapor channel and an inner vaporizing chamber and spaced ducts laterally connecting said chamber and channel for admitting fuel vapor to said channel, the innermost flange defining a side wall of the vaporizing chamber, a liquid fuel supply conduit having at its upper end a discharge opening in the lower portion of said sloping bottom wall and adjacent said innermost flange to furnish said vaporizing chamber with liquid fuel, and perforated combustion tubes on said base forming a combustion chamber opening from said vapor channel, the bottom of said vapor channel being longitudinally arched intermediate said ducts to deflect incoming fuel vapor upwardly into said combustion chamber and to return condensed fuel vapor to said ducts.

2. A liquid fuel burner having an annular base comprising a sloping bottom wall having thereon spaced, upstanding flanges forming an annular vapor channel and a vaporizing chamber and spaced ducts laterally connecting said chamber and channel for admitting fuel vapor to said channel, said vapor channel and vaporizing chamber being arranged one about the other, and said bottom wall sloping upwardly to said vapor channel, a liquid fuel supply conduit having at its upper end a discharge opening in said sloping bottom wall and at the lowest portion of said vaporizing chamber to furnish said vaporizing chamber with liquid fuel, and perforated combustion tubes on said base forming a combustion chamber opening from said vapor channel, the bottom of said vapor channel being longitudinally arched intermediate said ducts to deflect incoming fuel vapor upwardly into said combustion chamber and to return condensed fuel vapor to said ducts.

3. A liquid fuel burner having an annular base comprising an upwardly and outwardly sloping conically formed bottom wall having thereon spaced, upstanding annular flanges forming an annular outer vapor channel and an inner vaporizing chamber and spaced ducts laterally connecting said chamber and channel for admitting fuel vapor to said channel, said vapor channel and vaporizing chamber being arranged one about the other, a liquid fuel supply conduit having at its upper end a discharge opening in said sloping conically formed bottom wall and at the lowest portion of said vaporizing chamber to furnish said vaporizing chamber with liquid fuel, and perforated combustion tubes on said base forming a combustion chamber opening from said vapor channel, said ducts having bottom surfaces presented by said conically formed bottom wall sloping upwardly to said vapor channel, and the said sloping conically formed bottom wall and innermost flange confining the flow of incoming liquid fuel from said conduit to a narrow path adjacent said innermost flange.

JOHN JUNGERS.