Nov. 5, 1935. J. BARBARO 2,019,645

ELECTRICALLY IGNITED LIQUID FUEL BURNER

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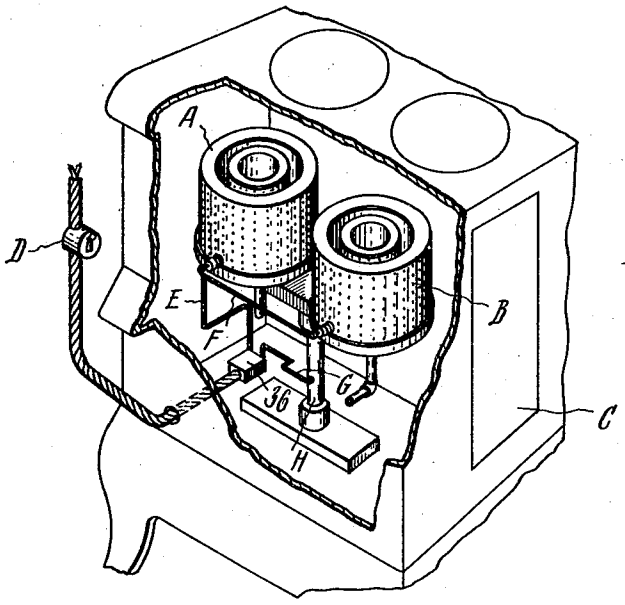


Fig. 1.

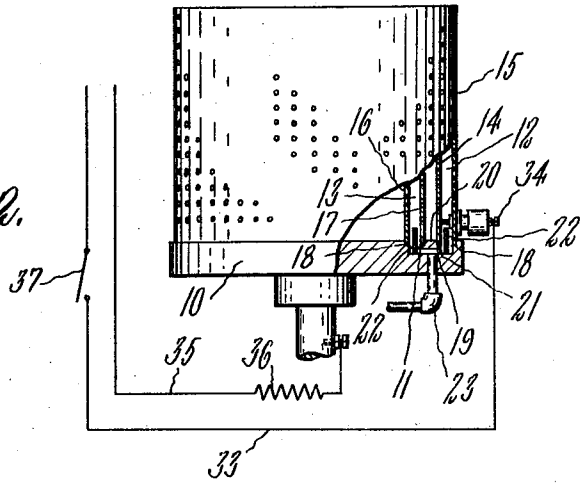


Fig. 2.

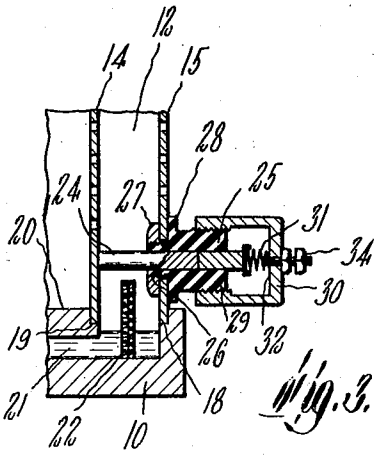


Fig. 3.

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ELECTRICALLY IGNITED LIQUID FUEL BURNER

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5 Claims. (Cl. 158—86)

This invention relates to electrically ignited liquid fuel burners, being more particularly concerned with the system employed to effect the ignition of burners of this class installed as single or multiple units in stoves or ranges used for heating and/or cooking purposes.

The ignition system of the present invention is adapted to be installed economically in combination with that type of liquid fuel burner whose base is provided with an annular fuel-receiving channel and which is equipped with cylindrical combustion shells upstanding from the base and defining annular combustion spaces therebetween. Once installed, the igniting system of the present invention can function for a long period of time; and the igniting element therein is not only inexpensive but easily accessible and removable from outside the outer shell of the burner without disturbing the burner parts proper so that upon being burned out it can be readily renewed without the need of a mechanic. More specifically, the igniting system of the present invention comprises an igniting element in the form of an electrical resistor adapted to glow under the influence of electric current at a point of electrical contact and removably secured to the outer shell from the outside but electro-insulated therefrom, the resistor projecting across the combustion space to the inner shell and making electrical contact therewith immediately above the fuel wick of the burner serving such combustion space. The ignition system further includes means for temporarily causing electric current to pass through the resistor and thus to generate a glow at the point of contact with the inner shell, thereby igniting the wick and starting the entire burner.

With the foregoing and other features in view, the present invention will now be described in greater detail with reference to the accompanying drawing, wherein,—

Figure 1 illustrates two of such burners installed in a kitchen range, the casing of the range being partly broken away to reveal the burners.

Figure 2 is a front elevation, partly in section, of a single burner, showing diagrammatically its electric circuit.

Figure 3 is an enlarged fragmentary section through the burner at its igniting zone.

As shown in Figure 2, the burner comprises a base 10 having an annular fuel-receiving channel or groove 11 in its upper face. The liquid fuel, for instance, hydrocarbon oil, received in the channel 11 may be burned in two combustion spaces, namely, an annular outer combustion space 12 and an inner annular combustion space 13. The space 12 may be defined by a pair of spaced perforated cylindrical combustion shells 14 and 15; and the space 13 may be similarly defined by a pair of spaced perforated cylindrical combustion shells 16 and 17. The shells are arranged concentrically in upstanding relationship to the base, the lower edges of the shells 15 and 16 being fitted into complemental recesses 18 in the side walls of the channel 11 and the lower edges of the shells 14 and 17 fitting into complemental recesses 19 in a ring 20 stationed in the channel. The ring 20 may be provided with lateral bores 21 therethrough permitting free circulation of liquid fuel in the channel 11 from one side of the ring to the other. One annular wick 22 is shown resting on the base of the channel 11 in between the shells 14 and 15 and another in between the shells 16 and 17. These wicks are constantly maintained partially submerged in liquid fuel fed into the channel by a supply pipe 23 from a suitable reservoir (not shown).

As best shown in Figure 3, the igniting element is preferably a carbon or graphite rod 24 passing through the outer shell 15 and terminating in electrical contact with the adjacent inner cylindrical shell 14. The rod 24 is insulated from the shell 15 by an electro-insulating bushing 25 which may be of generally cylindrical form and have an axial opening therethrough through which the rod may be readily inserted. The bushing is shown with a threaded inner end portion 26 of reduced diameter passing through an opening in the shell 15, a clamping nut 27 on such portion serving to fasten the bushing tightly to such shell. A suitable flange 28 shown on the bushing adjacent to its threaded end portion 26 may bear against the outer face of the shell 15. The outer end portion 29 of the bushing is provided with a screw cap 30 which can be turned to bring about the desired electrical contact between the inner end of the rod 24 and the shell 14. To this end, the outer end portion of the rod 24 extends into a cupped end portion of a compression spring 31 placed inside the cap so as to bear yieldingly against the outer end of the rod and the inner face 32 of the cap. The cap 30 and the spring 31 are electro-conducting, wherefore, electric current supplied to the cap will pass through the rod 24.

Electric current may be supplied to the rod 24 from a suitable source (not shown) by way of a wire 33 leading to a binding post 34 on the cap 30 so as to pass through the rod 24, the shell 14, the base 10, and a return wire 35, a suitable cur-

rent-reducing resistance 36 being included in the circuit, if necessary, to avoid current surge such as might blow the fuse in the usual household circuit. When a switch 37 in the circuit is closed, electric current causes the tip of the rod 24 to glow first by reason of the greatest resistance afforded at the point of contact with the shell 14, this glow quickly moving backward to the rest of the rod, igniting the wick 22, and starting the entire burner including the wick in the adjacent combustion space. The switch 37 may be of the push-button type so that the circuit may be closed while the operator maintains pressure on the button and may be automatically opened as soon as the pressure is removed. Thus, after the operator has started the burner, the circuit should preferably be opened so that the igniting element 24 may be used no longer than is necessary.

As shown in Figure 1, two burners A and B are installed in a kitchen range C and are included in the same circuit. The electric main may be provided with a switch D and may feed electric current by way of the wires E and F to the igniting elements of two burners arranged side by side, a return wire G being connected to the electro-conducting pedestal H on which both burners rest. In those instances when the stove is grounded, for instance when it heats hot water pipes, there is no need for a return wire in the circuit.

While various forms of igniting electrical resistors might be used, the virtue of the carbon or graphite electric igniting element hereinbefore described is that it serves for a very long period of time before it burns out and further that it does not become fouled or otherwise fail in service. When it is consumed, it is a simple matter to renew it, for it is inexpensive and is so readily accessible that a mechanically inexperienced person can promptly renew it himself.

I claim:—

1. The combination with a liquid fuel burner comprising a base having an annular fuel-receiving channel, wicking partially submerged by the fuel received in said channel, and inner and outer cylindrical combustion shells upstanding from said base and defining an annular combustion space therebetween served by said wicking, of an electrical igniting system comprising an electric resistor adapted to glow under the influence of electric current at a point of electrical contact removably secured to the outer shell from the outside but electro-insulated therefrom, said resistor projecting across said combustion space to the inner shell and making electrical contact with said inner shell immediately above said wicking, and means for temporarily causing electric current to pass through said resistor to generate a glow at said point of electrical contact with said inner shell and thereby to ignite said wicking.

2. The combination with a liquid fuel burner comprising a base having an annular fuel-receiving channel, wicking partially submerged in the fuel received in said channel, and inner and outer cylindrical combustion shells upstanding from said base and defining an annular combustion space therebetween served by said wicking, of an electrical igniting system comprising a carbon rod adapted to glow under the influence of electric current at a point of electrical contact projecting from outside said outer shell through said outer shell and across said combustion space to the inner shell and making electrical contact with said inner shell immediately above said wicking, an electro-insulating bushing fixed to said outer shell and encompassing said rod at the region where said rod passes through said outer shell, said bushing having an opening through which said rod is insertible from outside said outer shell, and means for temporarily causing electric current to pass through said rod to generate a glow at said point of contact with said inner shell and thereby to ignite said wicking.

3. The combination with a liquid fuel burner comprising a base having an annular fuel-receiving channel, wicking partially submerged in the fuel received in said channel, and inner and outer cylindrical combustion shells upstanding from said base and defining an annular combustion space therebetween served by said wicking, of an electrical igniting system comprising a carbon rod adapted to glow under the influence of electric current at a point of electrical contact projecting from outside said outer shell through said outer shell and across said combustion space to the inner shell and making electrical contact with said inner shell immediately above said wicking, an electro-insulating bushing fixed to said outer shell and encompassing said rod at the region where said rod passes through said outer shell, said bushing having an opening through which said rod is insertible from outside said outer shell, means on said bushing engaging the outer end of said rod and manually operable to bring the inner end of said rod into electrical contact with said inner shell, and means for temporarily causing electric current to pass through said rod to generate a glow at said point of contact with said inner shell and thereby to ignite said wicking.

4. The combination with a liquid fuel burner comprising a base having an annular fuel-receiving channel, wicking partially submerged in the fuel received in said channel, and inner and outer cylindrical combustion shells upstanding from said base and defining an annular combustion space therebetween served by said wicking, of an electrical igniting system comprising a carbon rod adapted to glow under the influence of electric current at a point of electrical contact projecting from outside said outer shell through said outer shell and across said combustion space to the inner shell and making electrical contact with said inner shell immediately above said wicking, an electro-insulating bushing fixed to said outer shell and encompassing said rod at the region where said rod passes through said outer shell, said bushing having an opening through which said rod is insertible from outside said outer shell, a cap threaded onto said bushing and manually turnable to bring the inner end of said rod into electrical contact with said inner shell, and means for temporarily causing electric current to pass through said cap and said rod to generate a glow at said point of contact with said inner shell and thereby to ignite said wicking.

5. The combination with a liquid fuel burner comprising a base having an annular fuel-receiving channel, wicking partially submerged in the fuel received in said channel, and inner and outer cylindrical combustion shells upstanding from said base and defining an annular combustion space therebetween served by said wicking, of an electrical igniting system comprising a carbon rod adapted to glow under the influence of electric current at a point of electrical contact projecting from outside said outer shell through said outer shell and across said combustion space to the inner shell and making electrical contact with said inner shell immediately above said

wicking, an electro-insulating bushing fixed to said outer shell and encompassing said rod at the region where said rod passes through said outer shell, said bushing having an opening through which said rod is insertible from outside said outer shell, a cap threaded onto said bushing, a compression spring located in between and bearing against the outer end of said rod and said cap, said cap being manually turnable to press the inner end of said rod yieldingly into electrical contact with said inner shell, and means for temporarily causing electric current to pass through said cap and said rod to generate a glow at said point of contact with said inner shell and thereby to ignite said wicking.

JOSEPH BARBARO.