Dec. 25, 1945. H. B. HAGER 2,391,567

OIL BURNER

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Fig. 1

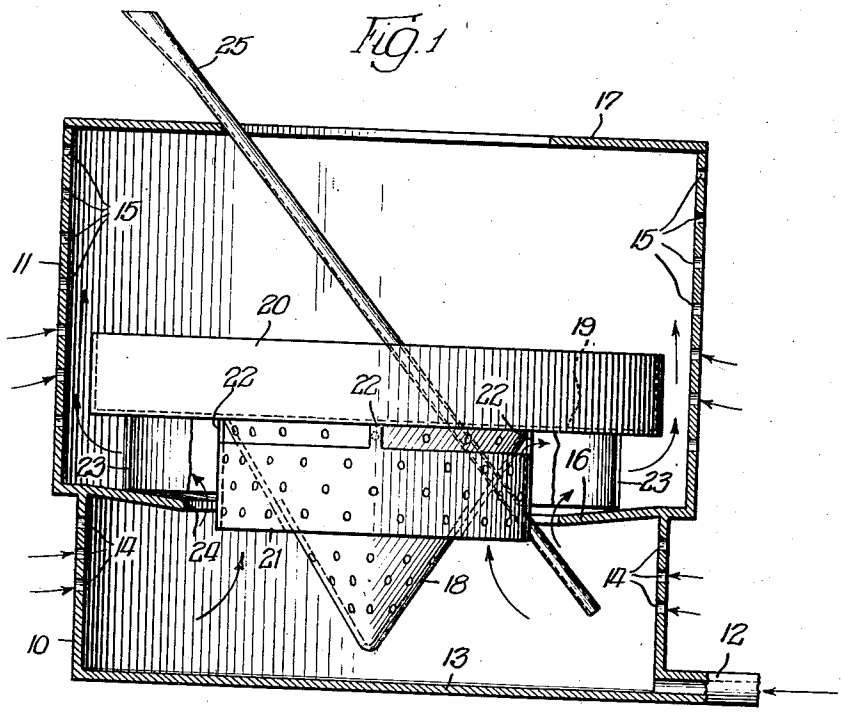
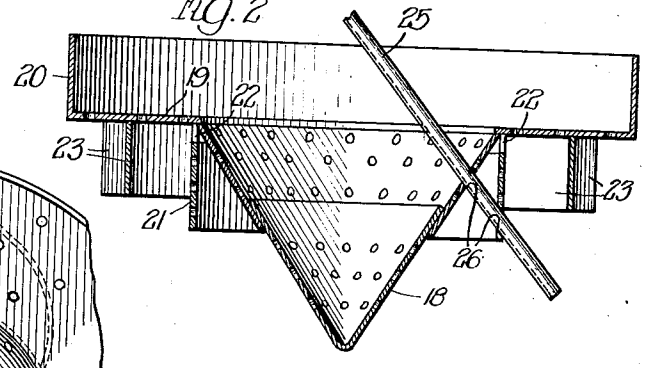


Fig. 2



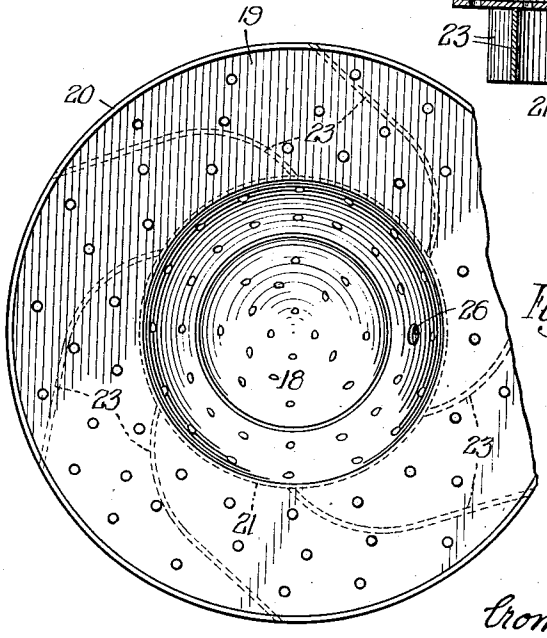


Fig. 3

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OIL BURNER

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5 Claims. (Cl. 158—91)

This invention has to do with oil burners of the type in which a constriction in the form of an inturned annular flange or baffle is employed between a lower fuel vaporizing chamber and an upper combustion chamber.

In burners of this type difficulty is frequently experienced in attempting to operate at a low range. A burner which is designed to operate efficiently at a high range is likely when turned down to foul up with carbon as well as go out.

The purpose of the present invention is to provide, for use with a burner of the type described, a new and useful control device, in the form of an insert at the location of the baffle. This improvement will cause the burner to operate efficiently at a low range as well as at a high range, will prevent the formation of any appreciable amount of carbon at a low range, insures a thorough mixing of the fuel vapor and the air within the burner, prevents the burner from being affected by down drafts, and keeps the burner from being extinguished as long as there is any flow of fuel at all into the same.

While the foregoing statements are indicative in a general way of the nature of the invention, other more specific objects and advantages will be apparent to those skilled in the art upon a full understanding of the construction, arrangement and manner of operation of the improved burner control device.

A preferred embodiment of the invention is presented herein by way of exemplification, but it will of course be appreciated that the invention is susceptible of incorporation in other structurally modified forms coming equally within the scope of the appended claims.

In the accompanying drawing:

Fig. 1 is a vertical diametric section through a burner of the type described, equipped with a control device constructed in accordance with the invention, with the control device shown in side elevation;

Fig. 2 is a vertical diametric section through the control device alone; and

Fig. 3 is a plan view of the control device.

The burner shown in the drawing is of a well known variety. It is characterized by a lower fuel vaporizing chamber 10 and an upper combustion chamber 11. The oil used as the fuel enters the lower chamber 10 through a small pipe 12, flowing over the bottom 13 of that chamber and, in the normal operation of the burner, immediately vaporizing under the heat within said chamber. The rate of flow of the oil is regulated by a valve (not shown) at some point in the pipe 12. The lower chamber 10 is provided in its side walls with air inlets 14, and the upper chamber 11, which is ordinarily of greater depth and greater height, is similarly provided in its side walls with air inlets 15, the size, number and spacing of the inlets 14 and 15 being such as to furnish sufficient air at the correct elevations for good combustion. An inturned annular flange or baffle 16 is located between the chambers 10 and 11, and an inturned annular flange 17 is located at the upper edge of the upper chamber 11.

The device which forms the subject matter of this invention may be constructed either as an original equipment part of the burner or as a separate accessory for application to an already existing burner. In the illustrative disclosure it is shown as a separate accessory, in the form of a readily applicable insert.

The new burner control device is constructed as a hollow upwardly opening sheet metal member. It is adapted to be centered within the burner, at the location of the baffle 16. The device includes a perforated center portion 18 of downwardly converging generally conical form; a perforated top portion 19 which extends outwardly from the upper edge of the center portion 18 and terminates in an upturned rim 20; a perforated collar portion 21 which surrounds the center portion 18 and is suspended by lugs 22 from the underside of the top portion 19 in vertically spaced relation to the latter; and a plurality of vertically disposed wing-like partitions 23 which extend outwardly in long gradual curves from the collar portion 21 along the underside of the top portion 19.

The device is supported within the burner on the baffle 16 by the lower edges of the partitions 23, which edges rest upon the baffle. The device is positioned with the collar portion 21 in spaced concentric relation to the center opening 24 in the baffle, with the upturned rim 20 in spaced concentric relation to the perforated side walls of the upper chamber 11 of the burner, and with the apex of the conical center portion 18 spaced somewhat above the bottom 13 of the lower chamber 10.

The oil entering the lower chamber 10 of the burner when the burner is first turned on may be ignited by dropping a lighted match into the upper end of a tube 25, which tube extends downwardly at an inclination within the burner through apertures 26 in the center portion 18 and collar portion 21 of the device. The lower discharge end of the tube is located just above the

bottom 13 of the chamber 10 at a point adjacent the delivery end of the pipe 12.

In normal operation, the air required for combustion enters the lower and upper chambers 10 and 11 through the inlets 14 and 15 and mixes with the fuel vapor generated in the lower chamber 10, producing an annular flame within the burner about the rim 20. When the burner is being operated at a medium or high range the combustion will take place about and above the rim 20. When it is operating at a low range the combustion will take place primarily within the lower chamber 10, about the perforated center portion 16 and the perforated collar portion 21, the heat to which such portions are subjected by the flame being conducted downwardly and acting upon the entering fuel to quickly vaporize the same.

The unique construction and arrangement of the burner control device at the location of the constructive baffle 16 prevents the formation of any appreciable amount of carbon within the lower portion of the burner when the latter is operating at a low range and insures sufficient preheating of the vapor to prevent extinguishment of the flame. The tortuous partitions 23 assist in effecting the desired pre-heating through conduction of the necessary heat back into the portions of the device projecting into the lower chamber 10, and also aid in bringing about a thorough mixture of the fuel vapor with the air at medium and high ranges. The combustion throughout all ranges takes place about the control device, as distinguished from within the same, the perforations in the various portions of the device serving primarily for the passage of air through the same.

I claim:

1. In an oil burner of the type characterized by a lower chamber having air inlets and a fuel inlet, an upper chamber having air inlets, which upper chamber is arranged above the lower chamber in communication with the same, and a constriction in the form of an inturned annular flange or baffle between the chambers; the provision of a control device at the location of the baffle, said device comprising a hollow upwardly opening perforated insert which is centered within the burner in inwardly spaced concentric relation to the baffle to provide an annular passage therebetween and extends from a point above the baffle to a point a substantial distance below the same in spaced relation to the sides of the burner, and said insert terminating downwardly in close proximity to the bottom of the lower chamber.

2. In an oil burner of the type characterized by a lower chamber having air inlets and a fuel inlet, an upper chamber having air inlets, which upper chamber is arranged above the lower chamber in communication with the same, and a constriction in the form of an inturned annular flange or baffle between the chambers; the provision of a control device at the location of the baffle, said device comprising an insert which is carried by the baffle centrally of the latter and extends from a point above the baffle to a point a substantial distance below the same, said insert being a hollow upwardly opening sheet metal member having a perforated center portion of downwardly converging generally conical form, which center portion projects downwardly from the baffle into the lower chamber in proximity to the bottom of the latter.

3. In an oil burner of the type characterized by a lower chamber having air inlets and a fuel inlet, an upper chamber having air inlets, which upper chamber is arranged above the lower chamber in communication with the same, and a constriction in the form of an inturned annular flange or baffle between the chambers; the provision of a control device at the location of the baffle, said device comprising an insert which is carried by the baffle centrally of the latter and extends from a point above the baffle to a point a substantial distance below the same, said insert being a hollow upwardly opening sheet metal member having a perforated center portion of downwardly converging generally conical form, which center portion projects downwardly from the baffle into the lower chamber in proximity to the bottom of the latter, a plurality of wing-like partitions which extend outwardly above the baffle within the upper chamber, and a perforated top portion above the partitions.

4. In an oil burner of the type characterized by a lower chamber having air inlets and a fuel inlet, an upper chamber having air inlets, which upper chamber is arranged above the lower chamber in communication with the same, and a constriction in the form of an inturned annular flange or baffle between the chambers; the provision of a control device at the location of the baffle, said device comprising an insert which is carried by the baffle centrally of the latter and extends from a point above the baffle to a point a substantial distance below the same, said insert being a hollow upwardly opening sheet metal member having a perforated center portion of downwardly converging generally conical form, which center portion projects downwardly from the baffle into the lower chamber in proximity to the bottom of the latter, a plurality of wing-like partitions which extend outwardly above the baffle within the upper chamber, and a perforated top portion above the partitions, which top portion is provided about its margin with an upturned annular rim in spaced concentric relation to the side walls of the upper chamber.

5. In an oil burner of the type characterized by a lower chamber having air inlets and a fuel inlet, an upper chamber having air inlets, which upper chamber is arranged above the lower chamber in communication with the same, and a constriction in the form of an inturned annular flange or baffle between the chambers; the provision of a control device at the location of the baffle, said device comprising an insert which is carried by the baffle centrally of the latter and extends from a point above the baffle to a point a substantial distance below the same, said insert being a hollow upwardly opening sheet metal member having a perforated center portion of downwardly converging generally conical form, which center portion projects downwardly from the baffle into the lower chamber in proximity to the bottom of the latter, a plurality of wing-like partitions which extend outwardly above the baffle within the upper chamber, a perforated top portion above the partitions, which top portion is provided about its margin with an upturned annular rim in spaced concentric relation to the side walls of the upper chamber, and a perforated collar portion which extends downwardly about the perforated center portion in spaced concentric relation to the latter and in vertically spaced relation to the perforated top portion.

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