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LIQUID FUEL VAPOR BURNER

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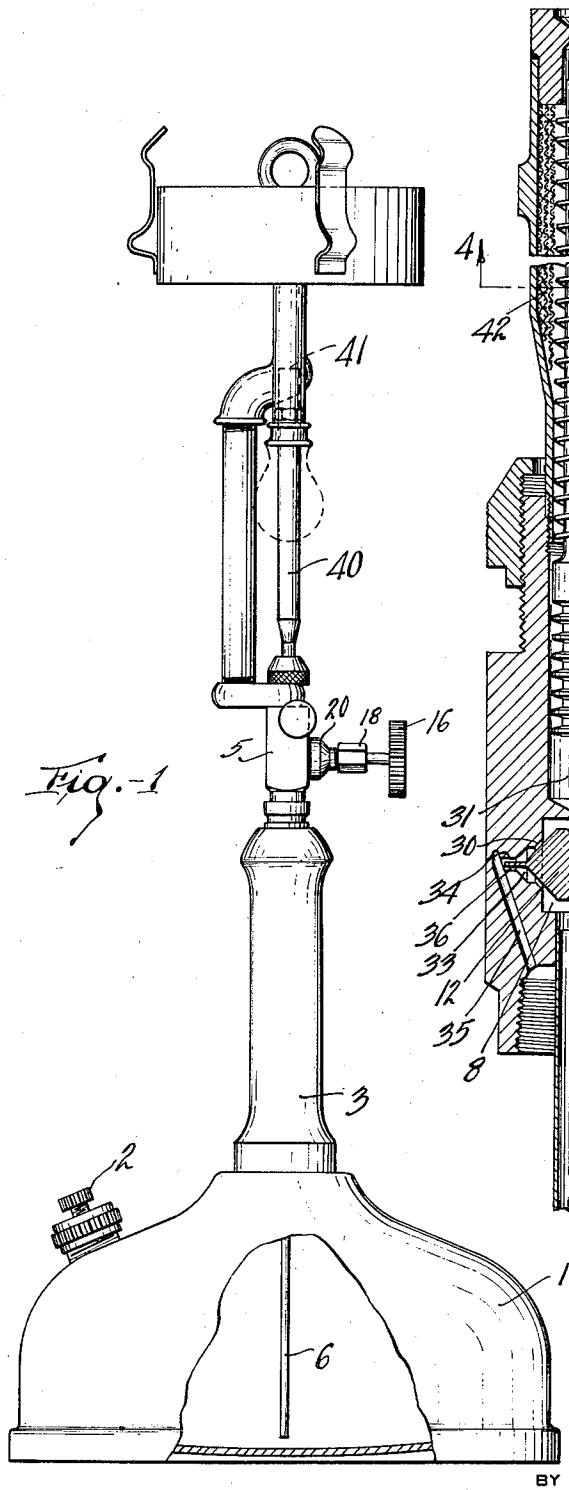



Fig.-1

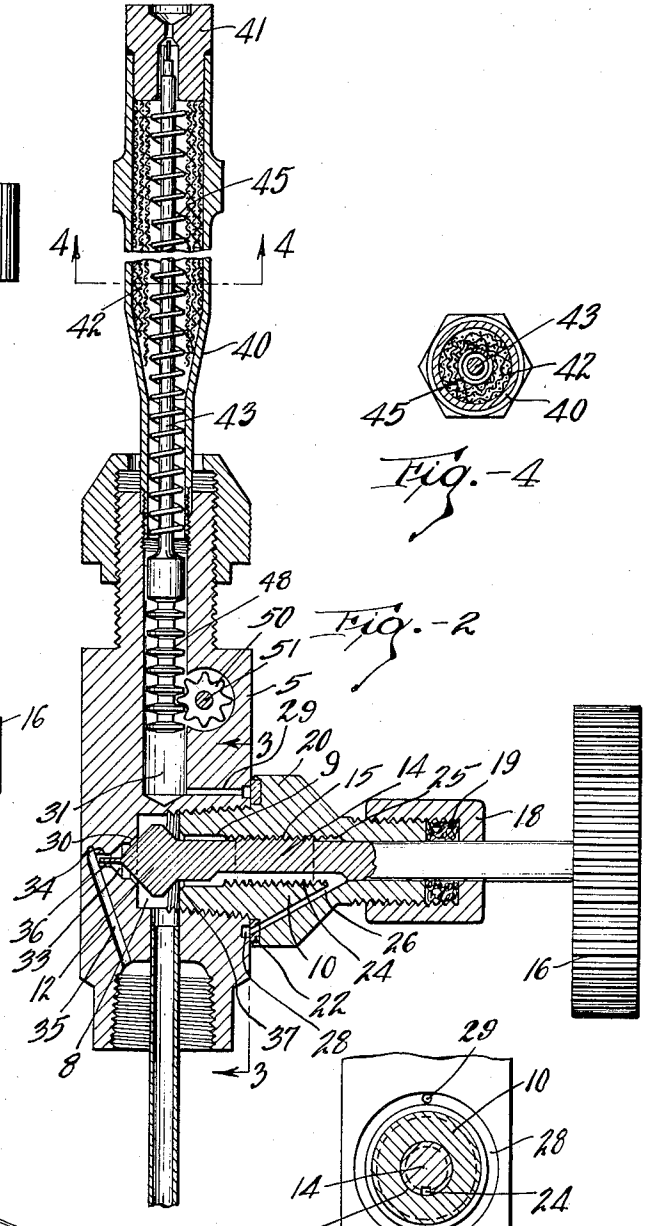



Fig.-2




Fig.-4




Fig.-3

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## LIQUID FUEL VAPOR BURNER

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Application January 11, 1930. Serial No. 420,040

6 Claims. (Cl. 67—41)

The present invention relates to burner constructions and particularly to burners for the combustion of liquid fuel in vapor or gaseous form. Devices of this general nature are usually intended for the combustion of a liquid fuel such as gasoline, which will vaporize under proper conditions, the fuel being supplied from a reservoir in which it is held under air pressure, being forced by the pressure into a vaporizing tube, from which it is conducted to the burners where it is commingled with air to form the proper combustible mixture.

The invention is specifically shown and described as applied to a vapor lamp, although it may be applied to other devices of a similar character. The object of the invention is to provide a simple and effective means by which the lamp may be ignited immediately without requiring pre-heating to vaporize the fuel.

The present invention is in the nature of an improvement over and upon the mechanism shown and described in my prior application Serial No. 335,006, filed January 25, 1929, and while it operates upon the same principles as my prior device, certain specific improvements are made in the present invention which give a superior action.

Although the apparatus of my prior application is operative, the improvements which have been shown and are claimed herein, simplify the construction and give better results. Specifically, the arrangement shown herein will not get out of order and is more easily cleaned than the former construction.

It is also an object of the invention to combine with the starting or lighting features in the present type of burner, a large vaporizer tube, which is more efficient in action than the smaller tubes used in prior construction.

The invention is intended for burners of various types such as used in connection not only with lamps, but in heaters, stoves, sadirons, and all other gasoline appliances. It will be understood that while the description and drawing are detailed and show a lamp, the invention is not limited to details referred to herein but may be extended and improved.

In the drawing in which the best known or preferred form of the invention is shown and described;

Figure 1 is a side elevation of a lamp embodying the features of the invention;

Figure 2 is a vertical central section through the burner and the control mechanism;

Figure 3 is a vertical section on the line 3—3 of Figure 2; and

Figure 4 is a horizontal section on the line 4—4 of Figure 2.

In the drawing, 1 is the hollow base or reservoir of the lamp which is adapted to hold the liquid fuel under pressure of air in the upper part of the base, the air being admitted through a valved opening 2 in the upper part of the base, a small hand pump being usually provided for this purpose. The base is surmounted by a hollow pillar 3 to the upper end of which is secured the valve mechanism supported and contained within a valve housing 5. The fuel feed pipe 6 for the liquid fuel extends from the housing to a point close to the bottom of the reservoir.

The pipe 6 communicates with and conducts the liquid fuel into a mixing chamber 8 located in the center of the housing 5 from which extends the lateral passage 9 which is formed in a removable screw-threaded plug 10, set into the housing. Located in the mixing chamber 8 is the double-faced valve 12 which is carried upon the end of a screw-threaded shaft 14 which extends through the passage 9 and is in engagement with the screw-threaded bore 15 at the rear of the passage 9. The shaft 14 extends outwardly of the plug and is provided with an operating handle 16, a cap nut 18 and compressible packing 19 preventing leakage of the fuel about the shaft. The plug 10 is also provided with an overhanging flange 20 between which and the face of the casing is located the soft metal gasket 22. The plug 10 and the parts carried thereby can be readily removed so that the interior of the casing and the parts carried by the plug are accessible for cleaning.

Cut into the surface of the shaft 14 along the screw threads is the passage 24 which conducts the fuel from the passage 9 to a chamber 25 within the plug from whence extends the diagonal passage 26 which opens on the surface of the flange 20 through the gasket 22. In the surface of the housing and communicating with the passage 26 is the circular channel 28 from which extends the lateral passage 29 leading to the chamber 31 at the base of the vaporizer tube.

Located in the casing opposite the plug 10 is a port 33 which communicates by a minute passageway 34 with a passage 35 extending from the underside of the housing, through which compressed air from the interior of the reservoir is conducted to the chamber 8. The passage 34 which is enlarged in the drawing for the purpose

of making the construction clear, is in practice approximately .015 of an inch in diameter, although its dimensions may be varied. The successful use of the device is dependent in some measure upon the size of this opening. On the head of the valve 12 is located the fine pin or needle 36 which enters the passage 34 and serves not only to break up the stream of air entering the chamber but also the passage, a slight off-center position of the pin being advantageous but not essential.

It will be observed that the valve 12 is movable between a valve seat 30 formed at the mouth of the port 33 and a valve seat 37 at the mouth of the passage 9 in which positions it closes the respective passages and is also adapted to be placed in an intermediate position in which both ports and passages are open.

When the lamp is shut off the shaft is moved to its extreme right position, whereupon the valve 12 closes the passage 9. In starting, the valve is moved to the intermediate position shown in the drawing, whereupon the air under pressure flows through the passages 34 and 35 and port 33 to the mixing chamber 8 where it mingles with the gasoline flowing upward through the pipe 6. The air and gasoline together are carried through the passages 9 and 24 to 26 and thence to the channel 28 and into the base of the vaporizer tube 40. The tortuous passage for the air and gasoline thoroughly mixes the two elements and gives a combustible combination thereof. From the tube 40 they are conducted to the burner 41 where they can be ignited. The mixture of air and gas will burn until the vaporizer tube is heated, whereupon the flame will diminish. At this point the operator moves the valve 12 over to the valve seat 30, closing the passage of air into the chamber with the result that the liquid fuel is conducted directly to the vaporizer tube, at which point it will be heated sufficiently to support combustion.

The particular form of igniting apparatus is particularly useful as it is easy to clean and accessible. One advantage over the prior construction referred to lies in the fact that the air passage 34 which must necessarily be very minute is located opposite the removable plug so that it can be cleaned, and the valve itself may be provided with the cleaning pin 36. The plug itself may be easily disassembled and cleaned.

The vaporizer tube 40 which is inserted in the upper end of the valve housing is enlarged as shown for the reception of a coil or roll of screen 42 which surrounds the valve pin 43. A light spiral or coil of wire 45 may also be located in the tube. The arrangement which has been shown effectively divides and breaks up the stream of gasoline so that it readily vaporizes. In addition, the increased area of the tube tends to reduce carbonization in the tube and the whole device may be easily cleaned.

The lower end of the valve pin is provided with the circular grooves 48 which mesh with the pinion 50 on the shaft 51 as described and for the purposes set forth in the earlier application referred to.

The advantages of the present invention may be embodied in still further forms and modifications and it is not intended that the claims should be restricted to exact copies of the device as shown.

What is claimed is:

1. In a vapor burner, the combination with a reservoir adapted to hold liquid fuel under air pressure, a housing above the reservoir and having a mixing chamber, a fuel pipe, an air pipe leading from the reservoir and discharging into the mixing chamber, an outlet from the mixing chamber to the burner and a single valve movable to close the air pipe or the outlet selectively, and means carried by the valve and entering the air pipe and cleaning the outlet therefrom.

2. In a vapor burner, the combination with a reservoir adapted to hold liquid fuel under air pressure, a housing above the reservoir and having a chamber, a fuel pipe and an air pipe leading from the reservoir and discharging into the chamber, a removable plug in the chamber, a valve carried by the plug, a discharge passage from the chamber located in the plug, said valve being movable to close the air pipe and the discharge passage selectively of the chamber.

3. In a vapor burner, the combination with a reservoir adapted to hold liquid fuel under air pressure, a housing above the reservoir and having a chamber, a fuel pipe and an air pipe leading from the reservoir and discharging into the chamber, a removable plug in the chamber, a valve carried by the plug, a discharge passage from the chamber located in the plug, said valve being movable to close the air pipe and the discharge passage selectively and having an intermediate position in which both passages are open.

4. In a vapor burner, the combination with a reservoir adapted to hold liquid fuel under air pressure, a housing above the reservoir and having a chamber, a fuel pipe and an air pipe leading from the reservoir and discharging into the chamber, a removable plug in the chamber, a valve carried by the plug, a pin carried by the valve and adapted to enter the air pipe, a discharge passage from the chamber located in the plug, said valve being movable to close the air pipe and the discharge passage selectively.

5. In a vapor burner, means for starting the burner comprising a mixing chamber for air and liquid fuel, a tortuous passage from the chamber to the burner, and means to admit air to the chamber comprising a valve adapted to cooperate with a capillary port in the wall of the chamber for the admission of air thereto and having a needle for entering the port.

6. In a vapor burner, a reservoir for liquid fuel under air pressure, a valve housing having a chamber therein, conduits for liquid fuel and for air under pressure leading from the reservoir to the chamber, the air conduit having a restricted opening in a wall of the chamber, a removable plug in the opposite wall of the chamber, a tortuous passage in the plug leading to a burner, and a valve in the plug adapted in one position to close the air opening and in another position to close the passage and in an intermediate position to open both the opening and the passage.

CHESTER A. HOFF.