

J. A. SEAVERNS.
LIQUID FUEL BURNING APPARATUS.
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1,008,740.

Patented Nov. 14, 1911.

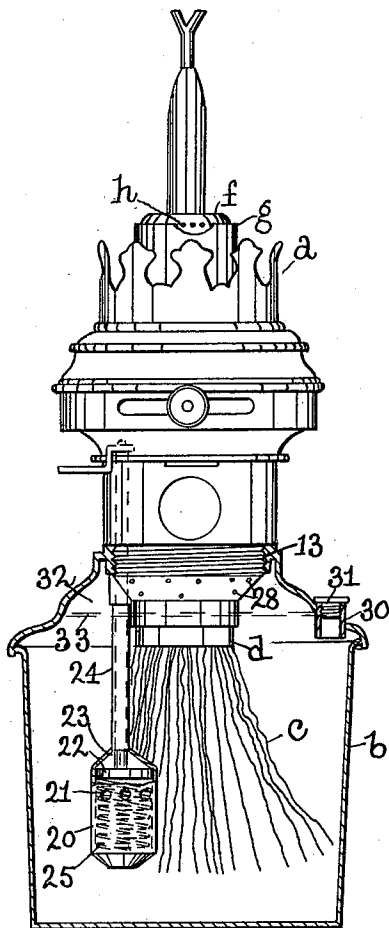


Fig. 1.

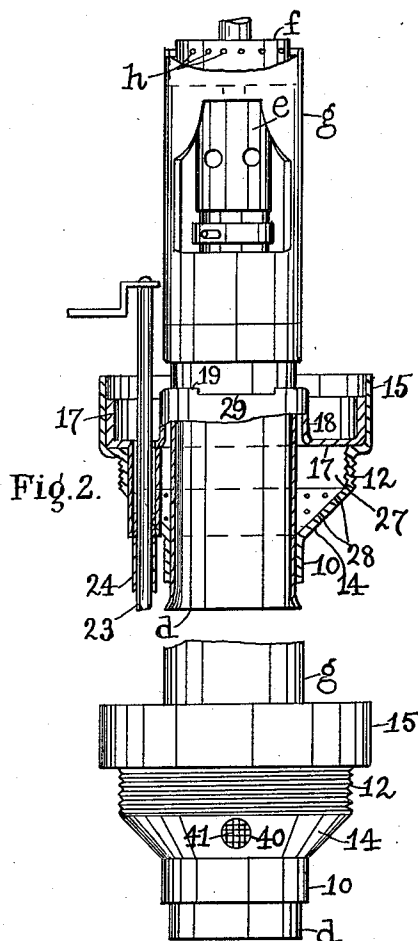


Fig. 2.

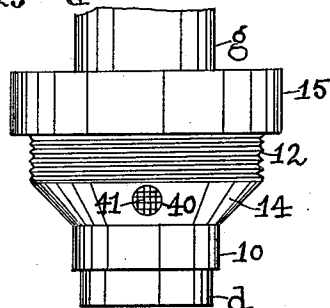


Fig. 3.

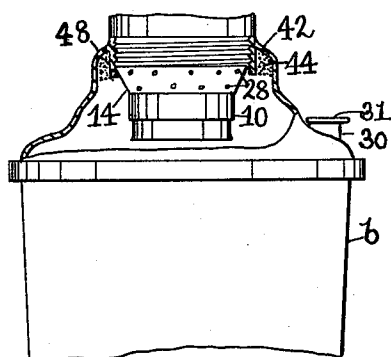


Fig. 4.

Witnesses.
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LIQUID-FUEL-BURNING APPARATUS.

1,008,740.

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To all whom it may concern:

Be it known that I, JOHN A. SEAVERNS, a citizen of the United States, residing in Jamaica Plain, county of Suffolk, and State of Massachusetts, have invented an Improvement in Liquid-Fuel Burning Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to an apparatus for burning liquid fuel and has for its object to render the same safe against explosion either while the apparatus is in its normal condition of use or in an abnormal condition.

The invention is herein shown as embodied in a lamp for burning alcohol or other liquid fuels, in which the liquid-containing font or receptacle is provided with a pump.

In accordance with this invention, the font or receptacle containing the liquid fuel, such for instance as alcohol, is provided with a fuel inlet normally closed by a suitable cap or cover, and with an opening for the reception of the burner, said fuel inlet being located below the burner opening so as to leave a vapor space or chamber in the font above the level of the maximum height of the fuel in the font.

Provision is made for venting the space or chamber referred to, so that vapor arising from the liquid fuel in the font due to heat while the lamp is in its normal condition of use may escape therefrom and thereby prevent explosion, and so that in case the lamp should be overturned and thereby assume an abnormal condition, liquid fuel may escape through the vent openings and be ignited without danger of the flame reaching the interior of the font.

The vent openings may be made in the burner or in the font as will be described.

These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a section and elevation of a lamp embodying this invention. Fig. 2 an enlarged section and elevation of the burner shown in Fig. 1. Fig. 3, a detail of the burner showing a modified form of vent, and Fig. 4, an elevation of a portion of a lamp showing a modified form of vent.

In the present instance, the invention is shown as embodied in a lamp for burning

alcohol in which a burner *a* is supplied with alcohol from a font *b* by means of a wick *c* inserted into a wick tube *d*, which is provided at its upper end with a vapor outlet nozzle, not shown, but which extends into a vaporizer tube *e* secured to the bottom of a chamber *f* fitted within a burner tube *g* and provided at its upper end with vapor outlet ports *h*. The parts as thus far described are and may be of any usual or suitable construction, such as now commonly employed in liquid fuel lamps.

In accordance with this invention, the wick tube *d* has soldered or otherwise secured to it, the lower end of a shell or sleeve 10 provided with a screw-threaded cylindrical portion 12 of substantially the diameter of the threaded opening 13 in the top of the font *b* and into which said cylindrical portion is screwed to secure the burner to the font. The screw-threaded cylindrical portion 12 is connected with the cylindrical lower portion of the sleeve by a conical section 14, and said sleeve may and preferably will be provided above the threaded section 12 with a larger cylindrical portion 15, which forms with the threaded section 12 a shoulder upon which an annular trough or cup 17 is supported at its outer circumference, the inner wall 18 of said trough having an inturned flange 19, which extends over the upper end of the wick tube and is supported thereby.

The cup or trough 17 is designed to hold liquid fuel for initially heating the burner tube *g* and the parts attached thereto, and may be supplied with the liquid fuel from the font by a pump comprising a cylinder 20 closed at its bottom and provided with inlet ports 21 at its upper end, and with a plunger or piston 22 having its stem or rod 23 extended up through an outlet tube 24, which communicates at its upper end with the cup or trough 17, the said piston being normally elevated in the cylinder above the inlet ports 21, by a spring 25 in the pump cylinder 20 below the piston.

The conical portion 14 of the sleeve or shell 10 coöperates with the cup or trough 17 and the wick tube *d* to form a chamber 27 (see Fig. 2), which, in accordance with this invention is in communication with the font *b* by preferably a plurality of minute holes or perforations 28, which permit any vapor generated in the upper part of the font to pass into the chamber 27, from which it may

escape through an opening 29 in the flange 19 adjacent to the wick tube. The font *b* is provided with a fuel inlet port or opening 30, normally closed by a cap or cover 31 and located below the burner opening 13 a sufficient distance to form a vapor space or chamber 32 above the level of the maximum height of the liquid fuel, namely above the level of the fuel inlet port or opening 30, so that under normal conditions of use and with the font filled to the level of the maximum height of the liquid fuel indicated by the dotted line 33, opportunity is afforded for the accumulation of vapor in the font above the liquid. The vapor outlets 28 in the shell or sleeve are made sufficiently small to prevent flame passing back into the font, in case the lamp should be overturned and the liquid flowing through the outlets 28 should be ignited.

It may be preferred to provide the section 14 of the sleeve or shell 10 with a plurality of fine or minute holes 28, but it is not desired to limit the invention in this respect, as a single substantially large hole 40 may be employed, which is covered by wire gauze 41 (see Fig. 3). So also it is not desired to limit the invention to the location of the vent opening or openings 28 in the shell or sleeve 10, as the font itself may in addition be provided with said openings above the level of the fuel inlet port 30, as shown in Fig. 4, and if desired the font may be made so as to leave an annular space 42 around the burner opening (see Fig. 4), which space is provided with one or more vent openings 48 and contains asbestos or other packing 44.

From the above description, it will be seen, that the danger of explosion is prevented while the lamp is in use in its normal condition, and also if the lamp should be overturned, for in the first case, excessive vapor pressure within the font is prevented by the vapor outlets 28, which permit the escape of the vapor generated in the font by heat from the burner, and in the second case, the vapor outlets 28 when used alone are sufficiently small or minute to prevent the flame created by the burning of the fuel which escapes through the said openings passing back into the font.

When auxiliary means are employed with the vent openings, such as the wire gauze 41 or the packing 44, the said openings may

be made of material size, inasmuch as the auxiliary means prevent the flame passing back into the font.

The invention is herein shown as embodied in one form of apparatus for burning liquid fuel, but it is not desired to limit the invention in this respect.

By means of the vent for the vapor space in the font, the danger of the liquid fuel therein being displaced and forced up into the wick tube by the accumulation of pressure is avoided.

Claims:

1. In an apparatus of the character described, in combination, a liquid fuel font provided with a burner opening and with a liquid fuel inlet located below the said burner opening to form a vapor chamber above the level of maximum height of the liquid fuel in the font, a vapor burner provided with a wick tube having a sleeve secured thereto and inserted into the burner opening in said font, and a cup interposed between said wick tube and sleeve and forming therewith a vapor chamber around said tube, said sleeve having a vent opening in it to connect the vapor chamber in the font with the vapor chamber formed by the said sleeve, cup and wick tube, substantially as described.

2. In an apparatus of the character described, in combination, a liquid fuel font provided with a burner opening and with a liquid fuel inlet located below the said burner opening to form a vapor chamber above the level of maximum height of the liquid fuel in the font, a vapor burner provided with a wick tube, a sleeve secured to said wick and extended into said font through said burner opening, and a cup interposed between said wick tube and said sleeve and forming therewith a vapor chamber around said tube, and a pipe extended from said cup down through said sleeve, said sleeve having a vent opening which connects the said chamber with the vapor chamber in the font, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN A. SEAVERNS.

Witnesses:

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