

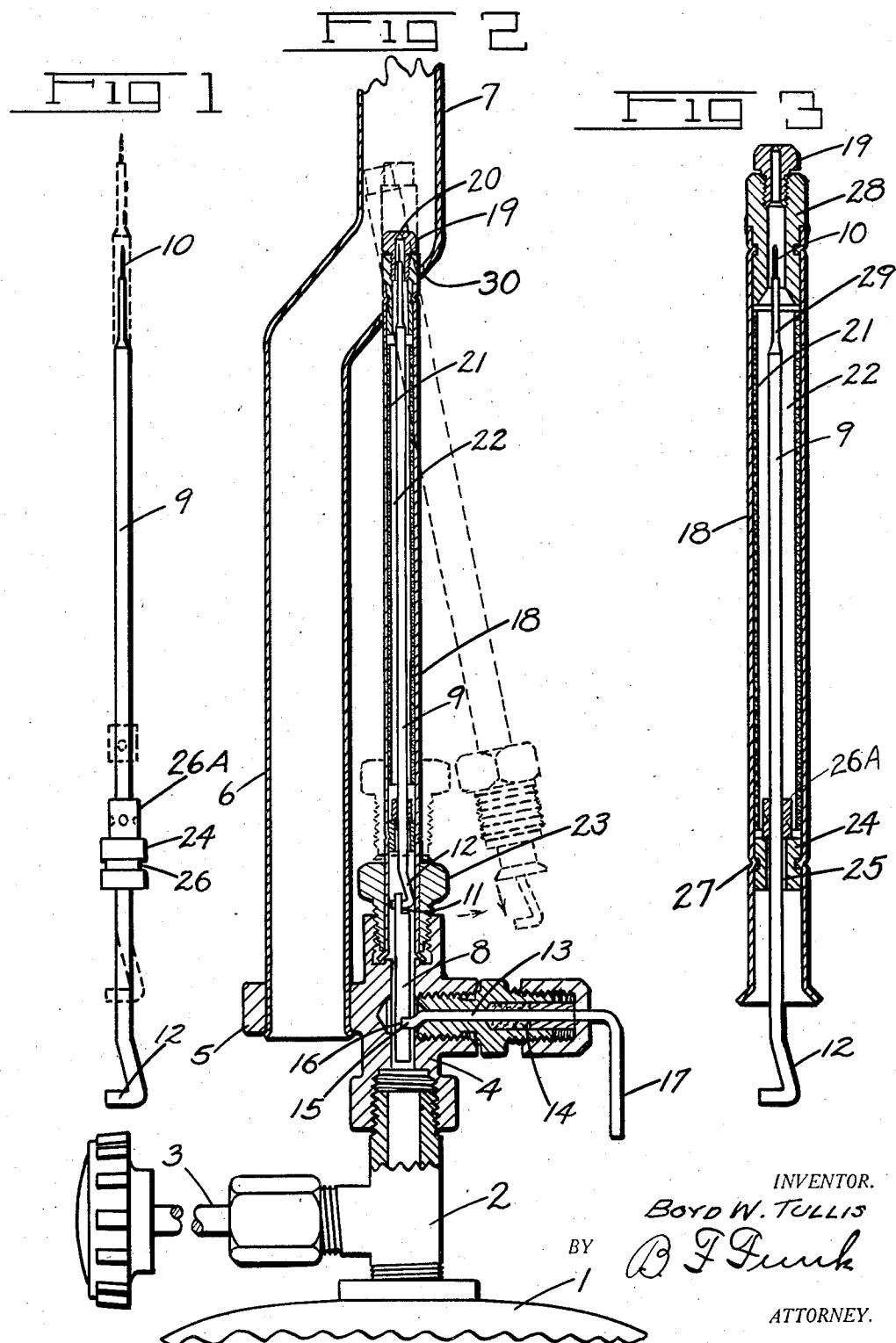
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VAPORIZING GENERATOR

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## VAPORIZING GENERATOR

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This invention relates to vaporizing generators for hydrocarbon fuel burning devices and it is particularly designed for use in connection with lamps, lanterns, stoves and the like and the primary object of the invention is to provide a more efficient, easily applied vaporizing generator than those now in general use. I have found that a vaporizing generator can be made more efficient if it is lined with a thin sheet of absorbent material, such as asbestos paper and the like, leaving a relatively large central space in the generator for the accumulation of carbon. This type of generator distinguishes from the so called packed type in which a coil wire or wick is employed, because by providing a relatively large carbon accumulating space in the generator danger of the generator becoming clogged will be avoided and vaporization of raw fuel in the generator will be enhanced.

With such a generator I prefer to employ a tip cleaning needle on a stem within and located longitudinally of the generator tube. Such generators require removal from time to time for inspection and repairs and unless some means is provided for holding the needle in operative relation with the generator tube the needle and stem will drop out of the tube and become misplaced. Therefore, I have provided means whereby the generator may carry a tip cleaning needle and stem loosely supported therein but held against accidental displacement.

The novelty of the invention will be better understood by reference to the following description in connection with the drawing in which,

Figure 1 is a detail view of the tip cleaning needle and its stem.

Figure 2 is a longitudinal, sectional, vertical view through a vaporizing generator constructed in accordance with my invention applied to a lamp or lantern.

Figure 3 is a vertical, longitudinal, sectional view through the valve and tip cleaning needle.

Referring now to the drawing by numerals of reference, 1 designates a font with a fitting 2 appropriately fastened thereto and having a tube not shown extending down into the font below the normal liquid level thereof as is common with such devices. The fitting is provided with a shut-off valve 3 as will be well understood. The fitting 4 is shown as carrying a fitting 4 provided with bracket 5 to support an air tube 6, the offset upper end 7 forming part of a burner not shown which supports the mantles or other fuel burning device. The mantle support or the burner tips 55 may be of appropriate construction so I have not

attempted to show these in the present application. The valve 6 is provided with a vertically movable actuator 8 for operating the stem 9 of the tip cleaning needle 10. The actuator 8 is shown as comprising a bar with an eye 11 at its upper end to receive a hook shaped end 12 of the stem 9 and the actuator is operated by a shaft 13 passing through a packing gland 14 on the fitting 4. The shaft 13 has a crank 15 engaging a transverse slot 16 in the actuator 8 and its opposite end is provided with a handle 17 whereby the shaft can be turned to move the actuator longitudinally of the fitting as will be apparent by reference to Figure 2.

The generator consists of an elongated tube 18 having a tip 19 at one end with a vapor orifice 20 through which vaporized fuel may pass to mix with air for combustion supplied by the tube 6 as is common to this class of devices. The generator tube 18 is provided with a relatively thin sheet 21 lining 21 which lies closely against the inner wall of the generator tube to provide a relatively large central space 22, the diameter of which is considerably larger than the stem 9 of the tip cleaning needle. The purpose of this is to permit the free flow of hydrocarbon liquid into the generator and permit the heat from the burner to quickly and evenly vaporize the raw fuel so that it will be in condition to afford a suitable fuel content to mix with the air passing through tube 6 and inasmuch as the central space is relatively large there can be a considerable accumulation of carbon in the tube before the efficiency of the generator begins to drop. With such a device, however, a tip cleaning needle stem is liable to become displaced when the generator tube 21 is removed upon loosening the jam nut 23 in the fitting 4 and unhooking the stem from its actuator. Therefore, I have provided a novel means for preventing accidental displacement of tip cleaning needle. This is accomplished by sliding a collar 24 on the stem the collar having a central opening 25 with a diameter considerably greater than the diameter of the stem so that fuel can pass up through the opening 25 into the generator. The collar is also provided with a circumferential groove 26. Another collar 26A is placed on the stem shown in Figure 1 and is fastened thereto by a punch or by upsetting with the collar or the stem in an appropriate manner instead of the collar the stem itself can be slightly upset so that the upset portion will overlap the end of collar 24. The stem with the two collars is now inserted in the generator tube and the tube is pinched into the groove as indicated at 27 so that the collar 24 serves as

a guide for the stem while the collar 26A acts as a stop to fix the amplitude of movement of the tip cleaning needle and stem. It will be noted that the tip 19 is carried by a guide 28 at one end of the tube and that the guide has a passage-way larger than the tip orifice to receive the constricted end 29 of the tip cleaning needle so that the needle 10 will be guided into the orifice 20 because it is centrally positioned at one end by the guide collar 24 and at the other by the walls of the guide 28. Therefore, the liability of the needle striking the bottom of the tip and becoming bent will be eliminated even though the generator is removed from the fitting. It will also be observed that the retractable longitudinal movement of the tip cleaning needle stem is limited by the collar 24 so when the parts are in the position shown in Figure 3 the liability of the needle dropping out of the generator tube will be eliminated. This is an important feature, because generators, together with their tip cleaning needles are sold as renewals for use in hydrocarbon fuel burning devices and obviously the adaptability of a tip cleaning needle to become accidentally separated from its tube is a disadvantage but the structure in which the needle and tube is held in cooperative relation at all times simplifies the renewal and handling of the generator.

It will be understood, of course, that when the generator is to be removed the jam nut 23 is unscrewed from the fitting to expose the connection between the hook 12 and the actuator so that if the jam nut is now removed to dotted line position shown in Figure 2 the generator can be swung out to dotted line position and easily removed from engagement with the opening 30 in the air tube 6 and that when it is desired to supply a new generator the new generator can be moved up through the opening 30 and swung over to full line position shown in Figure 2, whereupon the hook can engage the eye in the actuator and the jam nut can be screwed down to fasten the generator in place. Of course, in order to detach the tip cleaning needle from the actuator the tube must be slid longitudinally on the stem 9 to expose the connection and it will also be observed that when the tube is back in place it tends to hold the hook against displacement with respect to its actuator.

50 What I claim is:

1. A replacement part for liquid hydrocarbon fuel burning devices comprising a liquid hydrocarbon vaporizing generator including an elongated vaporizing tube having a guide at its discharge end, a tip at the outer end of the guide having a constricted discharge orifice, a stem in the tube having a reduced end provided with a tip cleaning needle, the reduced end of the stem being movable in the guide with the needle projectable into the orifice and a stop means within the tube to limit the outward longitudinal movement of the stem and to permanently prevent withdrawal of the needle stem from the generator tube.
- 60 2. A replacement part for liquid hydrocarbon fuel burning devices comprising a liquid hydrocarbon vaporizing generator, including an elongated vaporizing tube having a guide at its discharge end, a tip at the outer end of the guide having a constricted discharge orifice, a stem in the tube having a reduced end provided with a tip cleaning needle, the reduced end of the stem being movable in the guide with the needle pro-

jectable into the orifice and stop means within the tube to limit the outward movement of the stem so that the outward movement of the stem will be less than the length of the guide.

3. A replacement part for liquid hydrocarbon fuel burning devices comprising a liquid hydrocarbon vaporizing generator, including a vaporizing tube having a discharge tip at one end with a constricted outlet orifice, a stem in the tube having a reduced end provided with a tip cleaning needle a plug in the tube through which the stem slides and a stop on the stem to contact the plug.

4. A replacement part for liquid hydrocarbon fuel burning devices comprising a vaporizing generator for liquid hydrocarbon fuel including a vaporizing tube, a discharge tip at one end of the tube having a constricted orifice, a needle carrying stem in the tube in spaced relation with the tube, providing a relatively large carbon accumulating space, guide means in the tube for maintaining the stem coaxial therewith and means for limiting the outward movement of the stem with respect to the tube.

5. A replacement part for liquid hydrocarbon fuel burning devices comprising a detachable liquid hydrocarbon vaporizing generator including a tube of relatively thin material having an end releasably attachable to a fuel supply member and having its upper end freely associable with a burner part so that when the first named end is detached the generator can be removed, the second mentioned end of the tube being provided with a restricted outlet orifice, a reciprocating needle stem in the tube provided at one end with a cleaning needle for the orifice, a stop means in the tube and means on the stem for contacting the stop means to permanently prevent withdrawal of the needle stem from the generator tube.

6. A replacement part for liquid hydrocarbon fuel burning devices comprising a hydrocarbon vaporizing generator consisting of a tube having an open end to be attached to a liquid fuel supply pipe and provided at its opposite end with a tip orifice, a stem in the tube, a tip cleaning needle at one end of the stem the other end of the stem projecting through the open end of the tube and provided with a hook shaped end to engage a manually operated actuator, and stop means within the tube to limit the outward movement of the stem when the generator is detached from its support and the hook shaped end is free of its actuator so that the stem will be retained within the tube when the generator is separated from its support and whereby the tube and stem at all times will be maintained as a unitary structure.

7. A replacement part for liquid hydrocarbon fuel burning devices comprising a detachable liquid hydrocarbon vaporizing generator comprising a tube having an open end attachable to a fuel supply member and its other end free to be loosely associated with a burner part, the free end being provided with a restricted outlet orifice, a reciprocating stem in the tube provided with a cleaning needle for the orifice, a hook shaped end on the stem outside the tube for engagement with a part to actuate it and means for holding the stem within the tube so that the stem and tube are inseparably associated.