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STARTING TORCH FOR LIQUID FUEL BURNER

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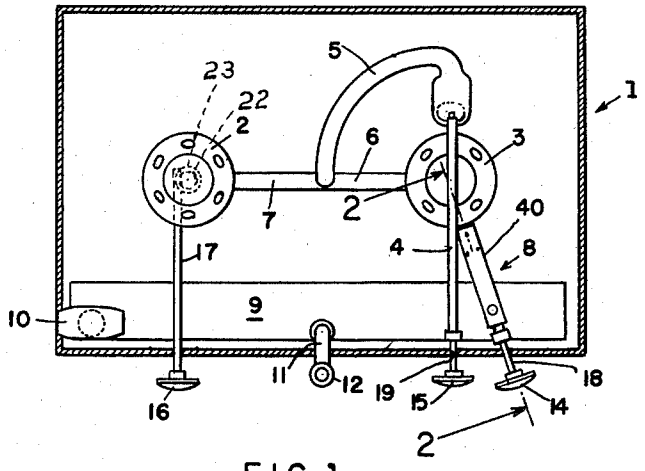


FIG. 1

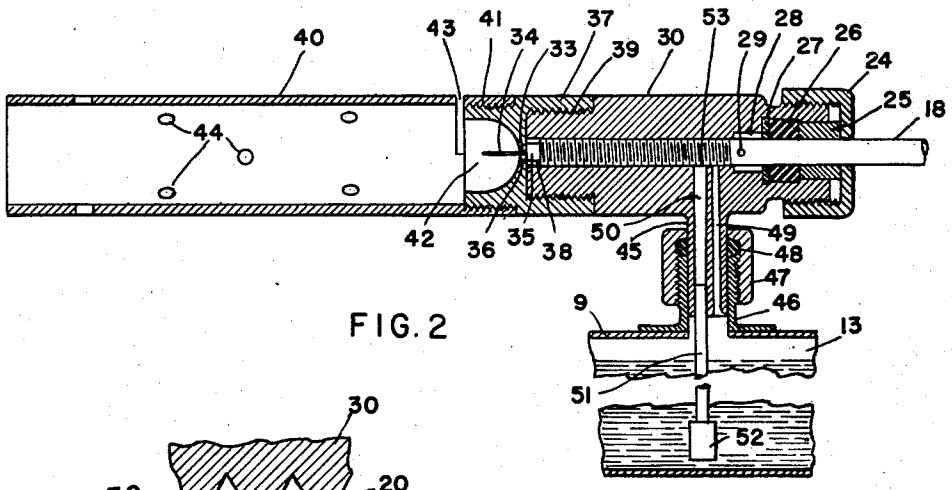


FIG. 2

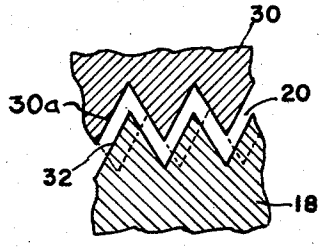


FIG. 3

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STARTING TORCH FOR LIQUID FUEL BURNER

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3 Claims. (Cl. 158—76)

My invention relates to apparatus for burning liquid fuel and more particularly to providing starting torch means particularly for stoves, heaters and furnaces wherein it is desirable to avoid smoke and smell yet to use liquid fuel less expensive than gasoline, alcohol etc.

Among the purposes and objects of my invention are to provide a torch wherein a small quantity of kerosene or furnace oil is vaporized and ignited by a match or the like which in turn heats a larger generator or vaporizing means to supply gas or vapor to one or more burners all as more particularly disclosed and claimed in my co-pending patent application Serial Number 450,723, filed August 18, 1954, now abandoned.

An object is to provide a torch for fuel oil which uses a mixture of air and oil for atomization so that the torch is instantly started, when cold, by a lighted match.

I accomplish these and other objects by the construction herein described and shown in the drawings, which form a part of this, my disclosure.

In the drawings:

Fig. 1 is a top plan view of my oil stove, from which the top has been removed to show the interior parts.

Fig. 2 is a vertical section through my torch, as at 2—2, Fig. 1.

Fig. 3 is an enlarged sectional detail of the oil and air helical channel or passage of the torch.

The torch surround is threaded and the torch valve stem is threaded sufficiently less in diameter to provide a helical passage.

Igniting cold fuel, or heating the fuel oil and mixing it with air to provide a spray which may be ignited is accomplished by my starting torch. Heat is instantly supplied by a match and the parts are of a size and shape as well as made of material of high conductivity so that the match provides enough heat to start the torch, which once started provides sufficient heat to keep generating gas from oil, in much the manner gasoline is started and burned in a gasoline blow torch. A mixture of air and oil is passed through a passage having a helical form and the mixture is atomized by being forced at high velocity through the needle valve at the opposite end of said passage from whence the oil and air enter.

A fuel tank and air pump provide both air and oil under pressure, the air and its passage are connected to the top of the tank and the oil and its passage are connected through a strainer at the bottom of the tank; the oil passage and the air connection communicate with the helical passage to provide a mixture of air and oil for movement in said passage toward the tip of the torch. The torch may be directed against the side of a generator tube to heat it to a degree required for generating the quantity of vapor required for operation of one of several burners. The burner may in turn supply the heat required to heat said generator tube for continuous operation, thus permitting the torch to be shut off.

As shown in Fig. 1, a stove 1 having burners 2, 3 is supplied with combustible vapor from a generator 4 by way of a gas tube 5 and branch gas tubes 6, 7.

The torch 8 is supplied with oil and air from the pressure fuel tank 9 which also supplies oil to the generator 4. Air pressure is produced by the pump 10 to force air and oil to the generator 4 and the torch 8.

At the front of the stove I have provided the filling pipe 11, which is provided with a safety valve and closure 12 for relieving excess pressure and for filling the tank with oil, space being provided at the top of the tank for air as at 13. The torch control valve handle 14, the generator control valve handle 15, and the gas burner control valve handle 16 are secured to their respective valve stems 18, 19 and 17. Each of the valve stems are regulated by rotating their respective valve handles as operators. The valve stem 18 is threaded as at 32 for the purpose, hereinafter more fully described. The valve stem 17 controls the amount of gas supplied to burner 2 by the valve 22 which is raised or lowered with respect to the seat at the end of the respective branch pipe 7 by bellcrank connection 23.

Referring particularly to Fig. 2 I have shown the valve stem 18 of the torch as passing through the packing nut 24, gland 25, packing 26, stopwasher 27 and into the chamber 28 which is counterbored to receive the projecting ends 29 of the travel stop pin which is transversely fixed tightly in the valve stem and which engages the washer 27 to limit the outward travel of the valve stem as when the valve is opened; however by removing the packing nut 24 as well as the other parts, including the washer 27, the valve stem may be further unscrewed and removed entirely from its surround and inlet fitting or tubular body 30, which is threaded internally for a substantial part of its length as at 30*a* to receive the threaded portion 32 of the valve stem 18.

It will be apparent from Fig. 3 that the threads 30*a*, 32 of the fitting 30 and the valve stem 18, respectively, are sufficiently loose to provide the helical channel or passage 20, yet serve to feed the valve stem axially to control the oil and air to the fine atomizing orifice 33 which receives the needle 34 which is secured to the valve stem 18 at the center of the valve 35 which seats around the needle against the seat 36 in the atomizer 37. Around the valve 35 is the mixing chamber 38 into which the end of the helical channel 20 terminates, whirling the mixture of oil and air or gas mixture as it enters the orifice 33 under pressure.

The atomizer 37 is secured at one end to the fitting 30 by the threads 39 and at its opposite end to the ignition tube 40 by the threads 41 and is provided with the atomizing chamber 42 which is adjacent the slit 43 of the ignition tube, which also is provided with other air openings 44 and the open end as is customary with blow torches.

The fitting 30 is provided with the inlet extension 45 which is connected to the top of the tank 9 by the fitting 46 which is threaded to engage the compression nut 47 and ring 48. The inlet extension 45 is provided with the air inlet duct 49 which connects the top of the tank with the helical passage and channel 20 and also with the oil inlet duct 50 into which is secured the oil tube 51 and strainer 52 which connects the bottom of the tank with the helical channel and passage 20 at a position as at 53 ahead of the air connection. Thus, the air will mix with the oil in its travel to the mixing chamber 38, valve seat, needle, atomizing chamber and on out of the ignition tube 40 as a flame, directed to heat the generator.

The threads on the spindle or valve stem 18 and in the surround or fitting 30 may be a single thread or multiple threads and the degree of looseness may vary to suit the size of the channel desired. As the stem is rotated the threads of one of the parts may engage and rub the threads of the other part, as shown by the broken lines and thus may be seldom in the central position as shown in full lines; the relative space which provides the long helical

passage 20 also may be smaller than the relationship shown in the drawing.

Having thus described a preferred embodiment of my invention what I claim as new and desire to secure by Letters Patent is set forth in the following claims:

1. A burner adapted for use with liquid fuels such as kerosene having a relatively high flash point comprising a tubular burner body having an elongated internally threaded wall portion, an elongated rod received in said wall portion and provided with a shallow helical groove on the exterior thereof having a relatively small pitch and extending coaxially of the rod, said rod being in threaded engagement with the threaded wall portion of said body, said body being provided with a pair of passageways communicating at one end with said groove adjacent one end thereof and being adapted to be connected respectively at their other ends to a source of fuel and air under pressure, the threaded portions of said body and rod forming an elongated helical passageway having a cross section sufficiently small to effect vaporization of fuel introduced through one of said pair of passageways as the fuel is forced through said helical passageway along with air introduced under pressure through the other of said pair of passageways, said rod being rotatable relative to said body, and an atomizing head on said body having an orifice in flow communication with the other end of said groove.

2. A burner adapted for use with liquid fuels such as kerosene having a relatively high flash point comprising a burner body having an elongated internally threaded wall portion, an elongated rod having an externally threaded portion of relatively small pitch in threaded, rotatable relation to the threaded wall portion of said body, said threaded portions forming an elongated helical passageway, said body having a pair of passageways communicating at one end with said helical passageway adjacent one end thereof and being adapted to be connected at their other ends respectively to a source of fuel and air under pressure, an atomizing head on said body having an orifice in flow communicaiton with the other

end of said helical passageway and means on said rod receivable in said orifice for regulating the size thereof upon axial movement of said rod.

3. A burner adapted for use with liquid fuels such as kerosene comprising a burner body having an elongated internally threaded tubular wall portion, an elongated externally threaded rod loosely threadably engaged in said threaded wall portion to provide an elongated narrow helical passage, means between said rod and body sealing one end of said helical passage, said body having an air supply passageway communicating at one end with said helical passage adjacent said one end thereof and adapted to be connected at its other end to a source of air under pressure, said body further being provided with a fuel supply passageway communicating at one end with said helical passage adjacent said one end of the air supply passageway and intermediate said air supply passageway and the other end of said helical passage and adapted to be connected at its other end to a source of fuel under pressure, and an atomizing head on said body having an orifice in flow communication with said other end of said mixing passage.

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