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OIL BURNER NOZZLES

Filed Aug. 21, 1962

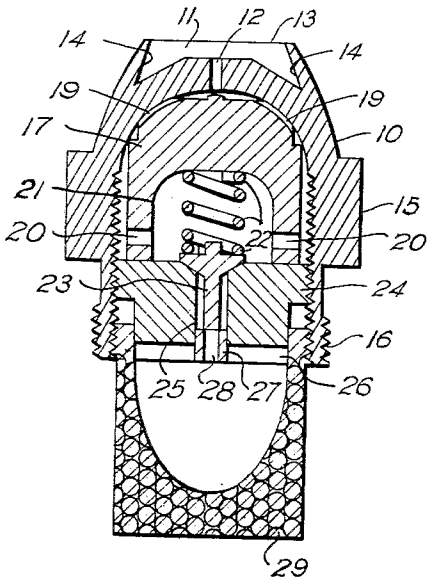


FIG. 1

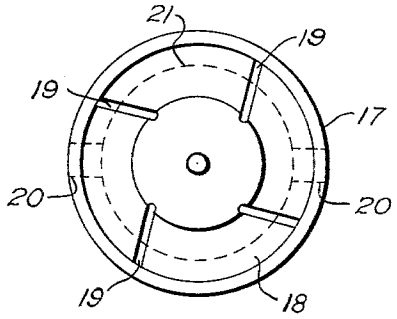


FIG. 3

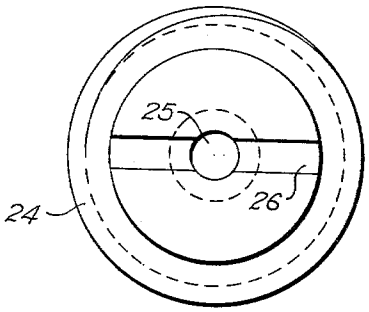


FIG. 4

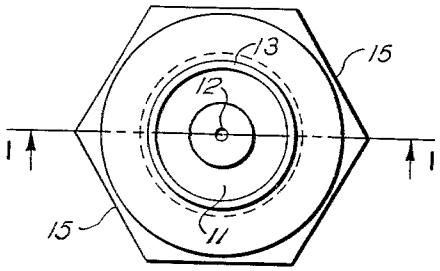


FIG. 2

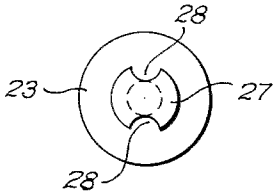


FIG. 5

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OIL BURNER NOZZLES

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My invention relates to oil burner nozzles for pressurized systems using all weights of fuel, whether such burners be of the gun type or vortex type.

One object of my invention is to provide an oil burner nozzle which has a drip reservoir externally of the nozzle orifice.

Another object of my invention is to provide a nozzle equipped with a spring-tensioned valve internally thereof which controls the fuel flow within the nozzle.

A further object of my invention is to provide a nozzle equipped with both a reservoir externally of the nozzle orifice and a spring-tensioned valve internally thereof to control fuel flow and drip.

A still further object of my invention is to provide a nozzle which will be more efficient in the conservation of fuel and which will eliminate the smoke and fire hazard caused by post burning cycle drip.

Still another and further object of my invention is to provide a nozzle incorporating the foregoing features which is readily interchangeable with conventional oil burner nozzles now in use.

Still other and further objects of my invention will be apparent from the drawings, specification and claims herein.

Referring to the drawings:

FIG. 1 is a sectional elevation view of my improved nozzle taken along line **1**—**1** of FIG. 2 in the direction of the arrows, showing the exterior reservoir at the nozzle tip, the recessed inner nozzle core, the spring within the core, the poppet valve, the valve seat and core retainer, the fuel grooves in the lower end of the poppet valve and a conventional, porous type filter for said nozzle.

FIG. 2 is a top view of the nozzle.

FIG. 3 is a top view of the inner core, showing four fuel feed and spinner grooves on the top thereof.

FIG. 4 is a bottom view of the valve seat and core retainer showing the concentric passageway therethrough and the kerf thereof.

FIG. 5 is a bottom view of the poppet valve, showing diametrically opposed fuel passage grooves in the enlarged lower end of said valve.

Referring further to the drawings:

The nozzle head **10** of my invention is generally of conventional design and configuration. My nozzle, however, is provided with a reservoir **11** at its tip, externally of the orifice, which is so dimensioned that it will not interfere with any angle of flame but will catch fuel dribbles emitting from the orifice **12** whether the nozzle is used on a vertical or horizontal type system. The lip **13** of the nozzle reservoir **11**, as best seen in FIG. 1 of the drawings, is extended beyond the orifice at the tip of the nozzle head **10** with the walls **14** of the reservoir **11** being carried a considerable distance rearwardly of the said orifice and being flared slightly so as to have a greater circumference at their inner ends than at their outer ends to intercept and retain thereby any fuel dribbling from the orifice **12** regardless of whether the nozzle is positioned horizontally or vertically. The nozzle head is provided with conventional polyhedronal sides **15** medially thereof with a conventionally threaded portion **16** at the end thereof opposite from the orifice **12**. The nozzle head **10** is hollow and is further provided with threads internally thereof. An inner core **17** is slidably positioned with the nozzle head **10** immediately in back of the orifice **12** therethrough. The inner core **17** is so shaped and

designed as to allow fuel to flow between it and the inner surface of the nozzle head **10**. The upper surface **18** of the inner core is preferably provided with means, such as fuel feed and spinner grooves **19** to facilitate the passage of fuel to the orifice **12** of the nozzle head **10**. The inner core **17** is also provided with a diametrical passageway **20** disposed therethrough near its lower edge and with a recess **21** extending longitudinally from its lowermost edge. A spring **22** is positioned with the recess **21** and tensions a poppet valve **23**, or other suitable valve, such as a ball check valve, and holds said valve in firm engagement with the upper surface of valve seat and core retainer **24** to prevent fuel passage. The said element **24** is provided with threads on its peripheral surface complementary to those disposed on the inner surface of the nozzle head **10**, and it is also provided with a concentric passageway **25** therethrough shaped to accommodate the head and stem of valve **23**. A diametrically disposed slot, or kerf, **26** may be placed on the lower surface of said valve seat and core retainer **24** to facilitate its positioning in or withdrawal from the nozzle head **10**. The lower end **27** of the valve **23** has an enlarged diameter which is complementary to and slidably movable within the concentric passageway **25** through the valve seat and core retainer **24**. One or more grooves **28** extend throughout the entire length of the enlarged lower end **27** of the valve **23** and permit the flow of fuel therethrough. A conventional filter **29**, such as a porous or screen type, is threadedly engaged with nozzle head **10** below the valve seat and core retainer to complete my fuel nozzle.

In operation the pump of the system in which my nozzle is installed forces fuel through the filter **29** and the grooves **28** of the valve **23** and into the concentric passageway **25** of the valve seat and core retainer **24**. The fuel, while being pumped, will attain sufficient pressure to open the valve **23** by compressing the spring **22**, continue on through the opening **25**, by the valve **23**, and out through the diametrical passageway **20** of the inner core **17**, between the outer surface of the inner core **17** and the interior surface of the nozzle head **10** via the fuel feed and spinner grooves **19** and out through the orifice **12** of the nozzle head. The pressurized fuel breaks into a fine spray upon striking the atmosphere and fans out into the predetermined angle to be ignited by the electrodes, or other means, of the burning system. The length of lip **13** of reservoir **11** is so dimensioned that it will not interfere with any desirable angle of flame and will still be sufficient to catch dribbles of fuel trickling out of the nozzle orifice **12** at the beginning and ending of a burning cycle. The spring-tensioned valve minimizes any fuel dribble at either the beginning or end of the burning cycle. Its cooperation with the reservoir eliminates fuel drippage since the valve will close off fuel flow within the nozzle as soon as the pressure diminishes by reason of cessation of the pump at the end of a burning cycle. It thereby prevents fuel from being forced out of the nozzle after the burning cycle has been completed. The small amount of fuel which may get by the valve will be intercepted by the reservoir at the nozzle tip and effectively prevent it from dripping from the nozzle. The fuel which is intercepted by the reservoir **11** will either dissipate by evaporation between burning cycles or will be gathered into the spray of fuel and ignited when the burning cycle again starts.

It is to be understood that a ball, or other suitable type, valve may be substituted for the poppet valve shown in the embodiment disclosed herein and that the spring, tensioning the valve, may be one of any predetermined strength suitable for the desired pressure or that developed by the particular system in which the nozzle is installed,

so as to effect a proper fuel flow and combustion within the operational limits of said system. It is further to be understood that the embodiment disclosed herein is merely a preferred version of my invention, primarily adapted to hydrocarbon burners, and that many variations thereof are feasible without departing from the spirit and scope of my invention as described and claimed herein.

Having thus described my invention, I claim:

1. An oil burner nozzle consisting of: a nozzle head having an orifice through one end thereof; a lip circumscribing the orifice end of said nozzle head, said lip extending forwardly and rearwardly from said orifice a substantial distance and having a greater inner diameter at its rearward end than at its forward end, thereby forming an exterior reservoir on said nozzle head; a core, recessed at its rearward end, disposed within said nozzle head, said core being provided with fuel passing means communicating its recessed interior with said nozzle orifice; core retaining means engaging with said nozzle head and the recessed end of said core, retaining said core within said nozzle, said retaining means having a passageway therethrough; a valve seated at said passageway through said core retaining means; and a spring positioned within said core engaging with and tensioning said valve.

2. An oil burner nozzle of the character described in claim 1 in which said fuel passing means is one set of passageways.

3. An oil burner nozzle of the character described in claim 1 in which said valve is a poppet valve with its stem positioned in said core retaining means passageway, said stem havng an enlarged lower end complementary to said core retaining means passageway and said enlarged lower end having a longitudinal passageway disposed at its peripheral edge.

4. An oil burner nozzle of the character described in claim 1 in which said fuel passing means is one set of passageways and in which said valve is a poppet valve with its stem positioned in said core retaining means passageway, said stem having an enlarged lower end complementary to said core retaining means passageway and said enlarged lower end having a plurality of longitudinal passageways disposed in spaced relation at its peripheral edge.

5. An oil burner nozzle consisting of: a nozzle head having an orifice through one end thereof; a lip circumscribing the orifice end of said nozzle head, said lip extending forwardly and rearwardly from said orifice a substantial distance and having a greater inner diameter at its rearward end than at its forward end, thereby forming an exterior reservoir on said nozzle head; a core, recessed at its rearward end, disposed within said nozzle head, said core being provided with fuel passing means communicating its recessed interior with said nozzle orifice; and core retaining means engaging with said nozzle head and the recessed end of said core, retaining said core within said nozzle, said retaining means having a passageway therethrough.

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