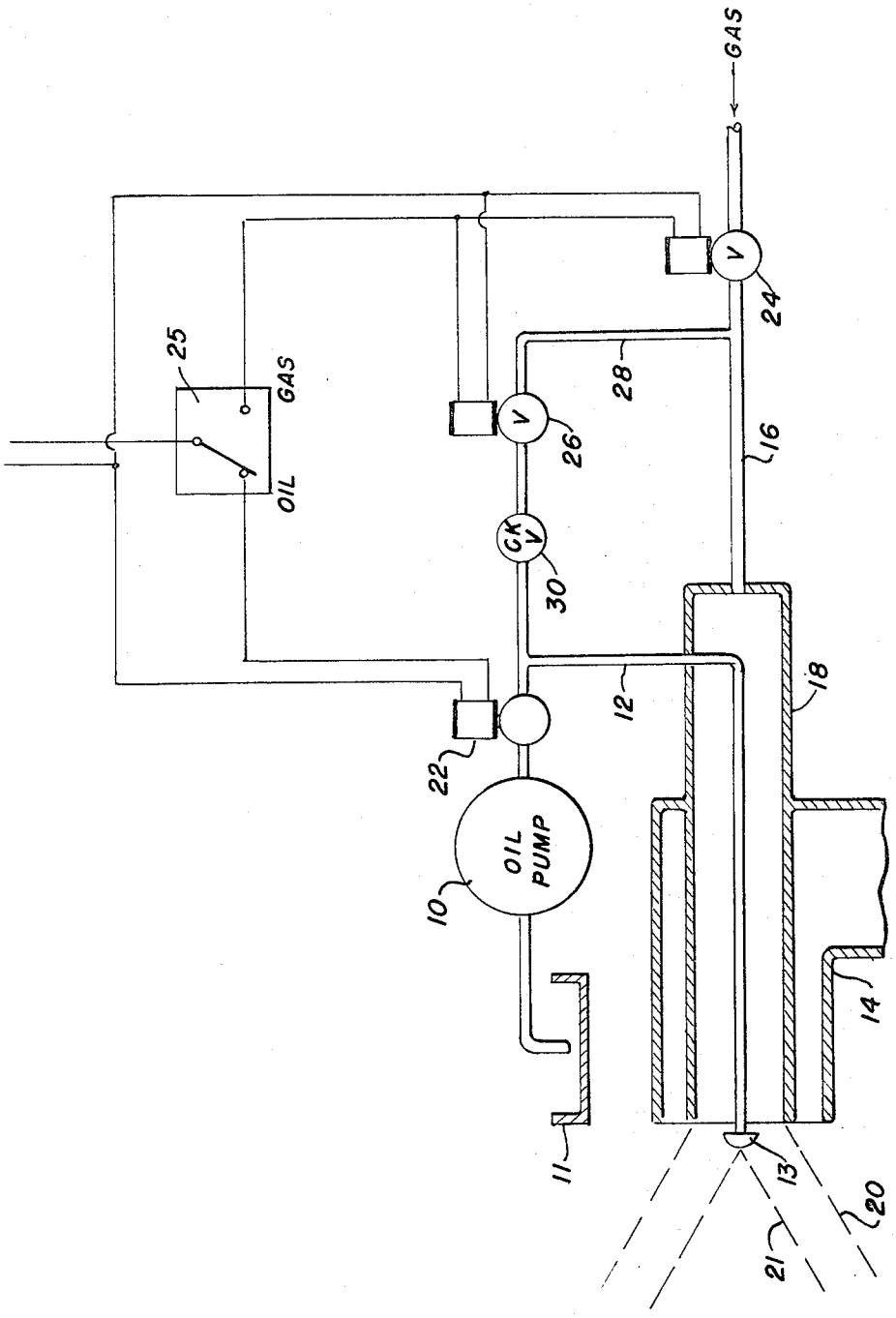
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SYSTEM FOR PURGING NOZZLES IN DUAL FUEL BURNERS

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SYSTEM FOR PURGING NOZZLES IN DUAL FUEL BURNERS

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ABSTRACT OF THE DISCLOSURE

A system for use with burners in furnaces or boilers which operate on either oil or gas to overcome the problem caused by oil which remains in the nozzle and the line leading thereto when operation on oil is terminated and operation on gas is commenced which includes means for directing gas through the oil line and the nozzle.

The heat from a gas burner operating in the vicinity of an oil nozzle causes pyrolysis which produces a congealed or carbonized residue tending to clog the very small orifice through which the oil is forced under high pressure to produce a spray.

The oil could be forced out with compressed air or the like but often dual fuel burners are automatic in that they operate on gas when it is available and with oil as a standby which is brought in and out of use automatically in response to the availability of gas.

Consequently oil remains in the line between the pump and the nozzle and even though some oozing may occur, the small size of the nozzle orifice causes retention of enough oil to cause clogging when the heat from the gas flame causes pyrolysis.

It is, therefore, the object of the present invention to provide dual fuel burners with means to purge the oil nozzle and adjacent passages instantly and automatically upon changeover from oil firing to gas firing. The manner of accomplishing this object as well as further and more specific objects and advantages of the invention will be made apparent in the following specification wherein reference is made to the accompanying drawing.

The drawing is a schematic illustration of a dual fuel burner embodying the nozzle purging system of the present invention. The oil fuel portion of the system includes a pump **10** which withdraws oil from a suitable reservoir **11** and directs it through a line **12** to a burner nozzle **13** which has a customary very small orifice to cause spraying of the oil into the firebox when it is forced through the orifice under high pressure. Air to support combustion of the oil is admitted through an air manifold represented at **14**.

Gas is provided from a source of supply (not shown) to a line **16** and through a gas manifold or burner tube **18** to create a gas flame, the pattern of which is represented at **20**. This flame burns when the oil flame represented at **21** is not present and creates a high temperature in the vicinity of the nozzle **13**. The flow of oil to the burner is controlled by a main oil valve **22** and the flow of gas to the burner is controlled by a main gas valve **24**. These are both solenoid valves under control of the switch **25** in the circuit schematically illustrated so that upon closing the switch in one direction, the oil valve is opened and the gas valve closed and in the other direction reverse operation occurs. This circuit is simplified for the purpose of illustration and no attempt has been made to illustrate means for automatically actuating the switch **25** in response to the availability of gas.

In accordance with the present invention, an oil nozzle purge line is provided at **28** to form communication between the gas line on the downstream side of the valve **24** and the oil line **12** on the downstream side of the oil valve **22**. The normally closed purge valve **26** controls flow through the purge line and is opened by solenoid means automatically when the circuit to open the gas valve **24** is energized. Consequently each time the oil valve **22** is closed and the gas valve **24** is open, gas is admitted through line **28** and valve **26** to the oil line at a point where it will force the oil therein outwardly through the nozzle and purge the line to prevent the formation of undesirable residue therein.

It is preferable that the line **28** communicate with the oil line **12** at the highest point in line **12**. Thus gas pressure is applied behind or upstream of practically all of the oil in the line. Furthermore since gas is often supplied at very low pressures, it could be that a column of oil in the line **12** could have sufficient pressure head to be equal or greater than that of the gas and this could prevent the desired purging.

A check valve illustrated at **30** is desirable, though not necessary, and prevents escape of oil into the gas system through the purge valve when the burner is operating on oil. While the purge line is shown as communicating with the gas line **16** downstream of the main gas valve, it could as well communicate with this line upstream of the valve so that the purge line would be under pressure at all times and controlled only by the purge valve **26**.

Only a small volume of gas is required to cause purging and can flow through the purge line continuously during gas firing. The gas issuing from the oil nozzle will obviously be consumed in the greater flame at the burner.

I claim:

1. The combination with a dual fuel burner for alternately burning oil and gas fuel, an oil supply line to a burner nozzle, a gas supply line to a burner tube, and means operable when gas is flowing to the burner tube to direct some gas through the oil supply line upstream of the nozzle and through the nozzle to purge them of oil remaining from a previous oil burning operation.

2. The combination of claim **1** with a valve in the oil line remote from the nozzle, and means to introduce the purging gas at the highest point in the line between the valve and the nozzle.

3. The combination of claim **1** with a valve in the oil line, a valve in the gas line, a purge line between the gas and oil lines, a valve in the purge line, and means operable simultaneously to open the gas and purge valves and close the oil valve or simultaneously to close the gas and purge valves and open the oil valve.

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