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GAS IGNITION MEANS FOR LIQUID FUEL BURNERS

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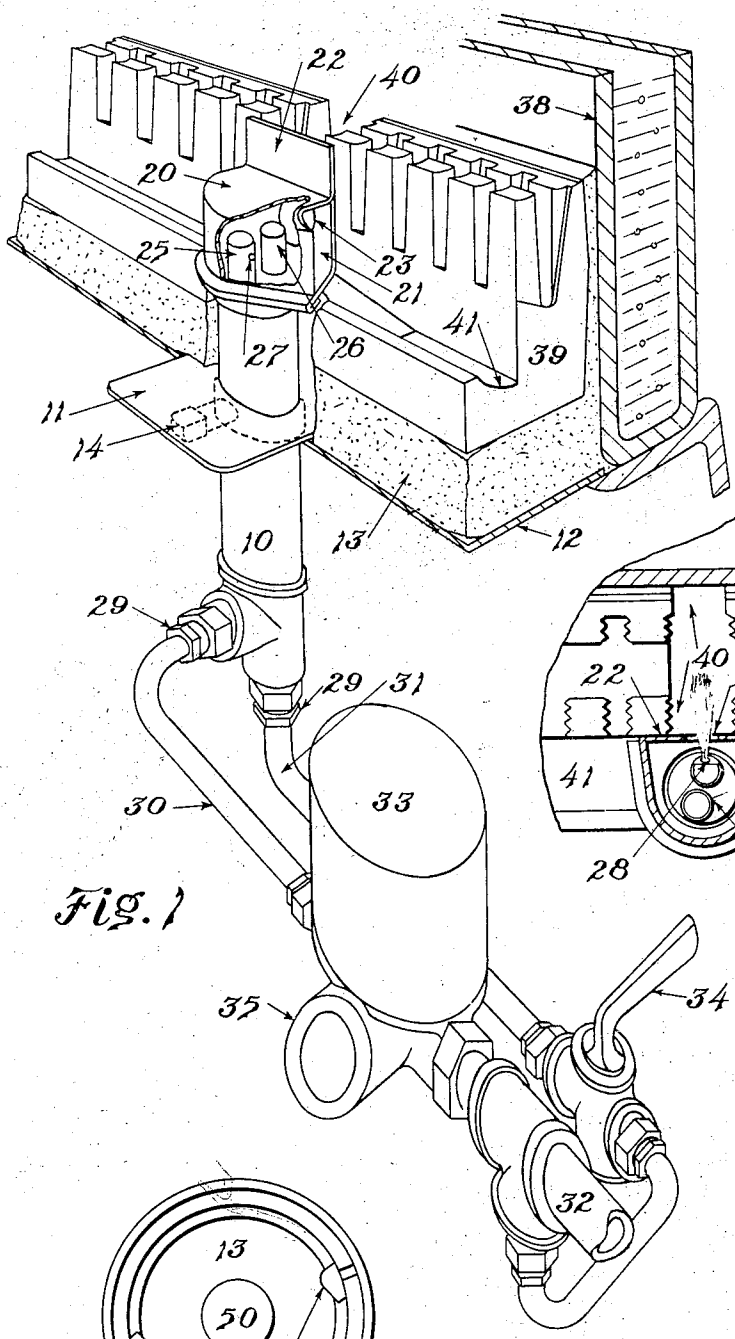


Fig. 1

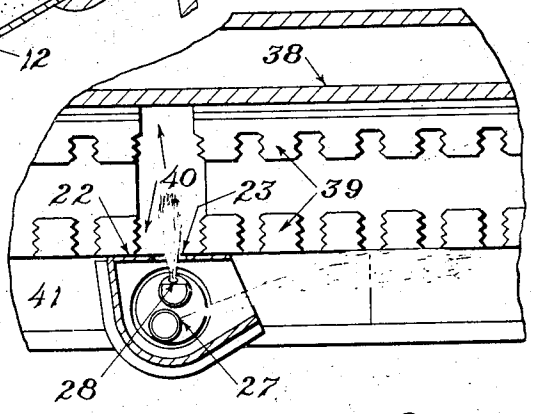


Fig. 2

Fig. 3

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GAS IGNITION MEANS FOR LIQUID FUEL BURNERS

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The present invention relates to gas ignition for the fuel-air mixture discharged from liquid fuel burners.

Among the objects of the invention is to increase the reliability of gas pilots used for ignition purposes.

Another object is to decrease the liability of extinguishment of such pilots.

Another object is to accomplish ignition with a constantly burning, uniformly small flame of low gas consumption.

Another object is to protect such flame against the blast of the projected fuel-air mixture.

Still other objects will readily occur to those skilled in the art upon reference to the following description and the accompanying drawing, in which

Fig. 1 is a perspective view of one of the pilot devices with parts broken away and also shows an adjacent portion of a furnace within which is mounted a liquid fuel burner.

Fig. 2 is a sectional plan view of the device of Fig. 1, showing the flame travel during an igniting period, and

Fig. 3 is a plan view of a furnace combustion chamber showing the preferred relative location of the burner and ignition means.

In the drawing the igniting device is shown as comprising a tubular member (10) supported in adjusted position in a metal plate (11) which in turn is supported upon a metal plate (12) upon which is formed a hearth (13) of refractory material. The tubular member (10) may be fixed in position by means of a set screw (14).

At its upper end the member (10) is provided with a hood (20) having a narrow slot like opening (21) at one side and at its back is covered by a plate (22) provided with a small hole (23). Inside of the member (10) are two small tubes (25) and (26) closed at their upper ends and each provided with a lateral opening as at (27) and (28), respectively. At their lower ends, the tubes (25) and (26) connect through suitable nipples (29), to supply pipes (30) and (31), respectively, and the latter are in turn connected to a main supply pipe (32), through their respective valves (33) and (34).

The valves (34) may be any ordinary form of hand operated valve as, once adjusted, it requires no more attention. The valve (33), however, is shown as an electrically operated valve, although a suitable form of mechanically operated valve may be used, and opens and closes in response to suitable controls which determine operation of the burner. This valve is a well known form of valve and contains a magnetic element which opens the valve when energized allowing it to be spring closed when deenergized. The tubular boss (35) provides means for supporting the valve and also means through which the current leads extend.

In Figure 3 is indicated a typical installation showing a burner device for spraying into a combustion chamber a fuel-air mixture, the burner device being indicated at 50 in the center of a combustion chamber with the igniters at 60.

The igniting device is preferably mounted in the hearth (13) near the periphery when used with the centrifugal type of burner and, when such hearth is provided with a peripheral mixing and flame controlling refractory element (39), which is the case in the form shown, the device is preferably placed immediately in front of such element and a portion of the element omitted directly behind, so as to form a small open top chamber or flue (40) between adjacent ends of the elements (39) and between the wall (38) of the furnace water leg and the plate (22).

The jet (28) of tube (26) is so located as to be directed thru the opening (23) in plate (22) into the flue (40) while the jet (27) in tube (25) is so located as to be directed thru opening (21) in the hood (20), which opening lies in front of the element (39) and preferably in line with the groove (41) which, in the form shown, constitutes a flame propagation groove.

In the operation of liquid fuel burners of the intermittent, automatic type, there is usually if not always, a mechanical production of a blast of fuel-air mixture into the combustion chamber which must be ignited. This blast is sufficient to extinguish a gas flame small enough to be economical when

left constantly burning. Therefore, precautions must be taken against such extinguishment. In some cases, means is provided for temporarily enlarging the pilot flame, by supplying more gas, to the point where it will not be extinguished by the blast.

In the present case, the small pilot flame is maintained constant, but used to ignite a temporary large pilot which in turn ignites the fuel-air mixture and the small constant pilot is so located as to be protected from the blast.

Referring to Figure 2, it will be noted that the jet (28) is directed into flue (40) and when the burner device is not in operation, burns quietly, the flue (40) aiding. When, however, the burner control apparatus is put into operation, the first thing that takes place is the opening of valve (33) and the consequent discharge of a large stream of gas through jet (27). This stream passing out through slot (21) entrains air from the hood (20) and causes thereby a draft from flue (40) through opening (23) into the hood. This results in the flame from jet (28) turning back into the hood (20), whereupon it ignites the large stream from jet (27) and the resulting large flame streams along in the groove (41) igniting any oil therein and also receives the blast from the burner device, the latter being started by the control apparatus a short interval of time after the opening of valve (33).

In ordinary operation, the valve (33) remains open a short time after the blast starts in order to insure ignition. It is then allowed to close and remain so until another starting operation occurs.

As soon as the valve (33) is closed, the flame from jet (28) again enters flue (40) and if it does not continue burning during burner operation, readily relights when the blast is discontinued. It is quite probable that jet (28) does not continue to burn when the burner is in operation as the atmosphere of oil vapor and air undoubtedly present would not be such as to support combustion. However, as soon as the burner blast ceases, the oil vapors are no longer present and the jet relights.

Now, having described the invention and the preferred form of embodiment thereof, it is to be understood that the said invention is to be limited, not to the specific embodiment herein described and set forth but only by the scope of the claims which follow.

We claim:

1. In a heater or furnace having a spray device for projecting a mixture of air and liquid fuel particles, a hearth having at its periphery a refractory element adapted to aid combustion, an ignition device in front of and adjacent said element and comprising a hood closed at its top and provided with a lateral opening, said hood also having an opening in its rear wall communicating with a suitable open top space in said element, a gas jet in said hood and directed thru the second opening into said space, a second jet in said hood directed thru said lateral opening and means for controlling said jets.

2. In a heater or furnace having a spray device for projecting a mixture of air and liquid fuel particles, a hearth having at its periphery a refractory element adapted to aid combustion, an ignition device in front of and adjacent said element and comprising a hood closed at its top and provided with a lateral opening, said hood also having an opening in the rear wall communicating with a suitable open top space in said element, a gas jet in said hood and directed thru the second opening into said space, a second jet in said hood directed thru said lateral opening means providing a fixed adjustment for said first jet and a normally closed electrically operated valve for said second jet.

In testimony whereof, we sign this specification.

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