

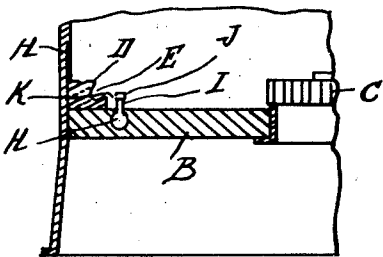
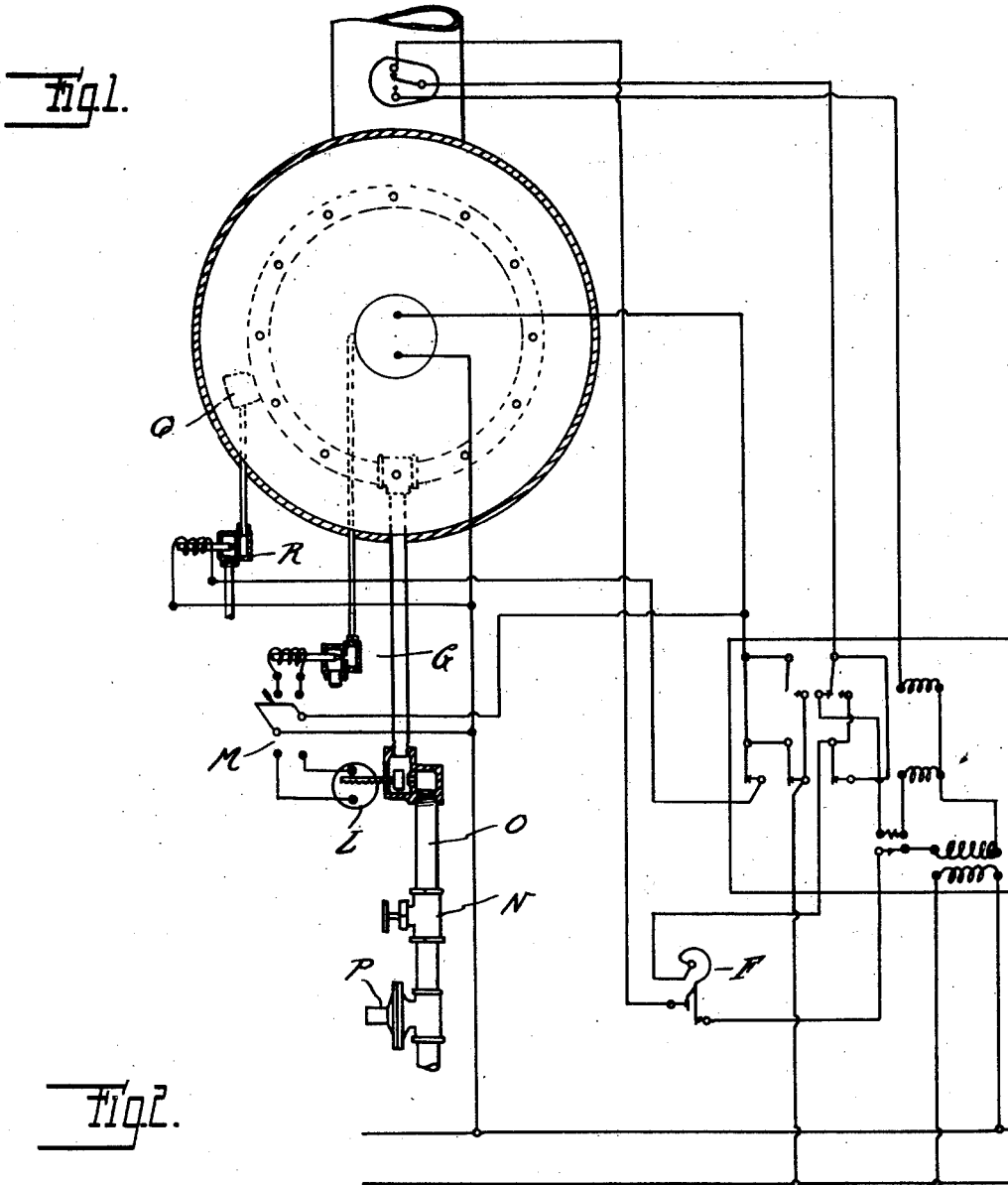
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COMBINED OIL AND GAS BURNER

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COMBINED OIL AND GAS BURNER

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The invention relates to fluid fuel burners of the intermittently operating type. Included within this general type are burners designed to operate with gaseous fuel and also burners designed to operate with liquid fuels, each of which has its own peculiar advantages. Thus the gaseous fuel is taken from a supply main and dispenses with the necessity of refilling tanks incident to the use of liquid fuel. On the other hand the cost of operating with liquid fuel is generally less than that with gaseous fuel and in very cold weather is generally more satisfactory, particularly in view of the fact that the gas pressure of supply mains is lowest in severe weather. To combine the advantages of both types of burner I have devised a construction which is adapted to use liquid or gaseous fuels alternatively and which requires no further adjustment than the mere throwing of a switch to change from one to the other. This enables the user to operate under liquid fuel during the season when the greatest amount of heat is required and to change to gaseous fuel during milder weather.

One difficulty to be overcome in the construction of such a combined unit is to secure efficiency in operation with both types of fuel. It is quite common with oil burners to employ a rotary nozzle or distributor which sprays the oil over a hearth. Such constructions are also provided with a fan or other means for propelling an air current supplying the necessary air to support combustion and also facilitating commingling of the air with the fuel spray. On the other hand, gas burners are of a different type of construction and one which can not be readily combined with an oil burner without interference. My improvement overcomes these difficulties by so arranging the elements of the gas burner as to in no way interfere with the efficient operation of the oil burner and at the same time to cooperate with elements of the oil burner to produce the highest efficiency when gaseous fuel alone

is used. The invention therefore consists in the construction as hereinafter set forth.

In the drawing:

Figure 1 is a diagrammatic view showing the arrangement of the combined gas and oil burner and the control device therefor;

Figure 2 is a cross section through a portion of a furnace in which my combined burner is installed.

As shown in Figure 2, A is the wall of the combustion chamber within a furnace of any type, B is a hearth suitably located within the chamber A, and C is a rotary oil nozzle or distributor arranged centrally of the hearth and operated by a suitable electric motor (not shown). The hearth B is provided near its periphery with a refractory ring D having a groove E therein into which is directed the spray of oil and current of air from the rotary member C. This is adapted to produce an effective vaporization of the oil and commingling of the same with the air so as to produce a radiant flame. The intermittent operation of the burner is controlled by the usual electrical devices including a thermostat F which controls the starting and stopping of the motor and the simultaneous opening and closing of an oil valve G. Thus whenever heat is required the operation of the thermostat will start the motor and open the valve G to supply air and oil.

The gas burner which is to be alternatively used comprises an annular conduit H which is imbedded in the hearth adjacent to the refractory ring D and which at suitable intervals is provided with upwardly extending nipples I which project a short distance above the hearth and opposite the groove E in the refractory ring D, but not so as to interfere with the free travel of the oil spray from the burner to said refractory ring. Each nipple has a cap J with a discharge orifice K directed towards the groove E so that whenever gas is discharged it will be distributed around the hearth in said groove.

The air for supporting combustion is supplied by the same fan which supplies the air when liquid fuel is used and the quantity of gas discharged from the nipples is so proportioned as to be proper for operation with the quantity of air. In actual practice the method of adjustment to accomplish proper proportioning of oil and gas for effective combustion in a given installation is as follows:

By a survey of the heating system the required rate of oil consumption for satisfactory operation is determined. The oil feed to the burner is set at this rate, the air supply is then varied until the proper quality of flame for efficient combustion is obtained at which time the air shutter is locked. Transfer is then made to gas in place of the oil and the gas rate adjusted until the best combustion is obtained at the previously fixed air rate. The same adjustment may, however, be effected by first setting the gas rate, adjusting the air relative to the same for proper combustion and then setting the oil for proper combustion with the air. This method has the double advantage first of obtaining an efficient heating flame with either gas or oil and second, that the number of heat units liberated at a given time with gas or oil is sufficiently close to produce the desired heat with either fuel. The difference in rate of heat release is automatically compensated for by the somewhat longer period of operation with the fuel having a reduced heating value.

The control of the gas supplied to the conduit H is through the medium of an electrically operated valve L which is opened simultaneously with the starting of the motor and is closed when the current of the motor is cut off. As the liquid and gaseous fuel are never used at the same time, I control their alternative use by a single switch M which when thrown in one direction will throw the electrically operated fuel valve G into circuit and when thrown in the opposite direction will cut out this valve and throw into circuit the electrically operated gas valve L. Thus in either position of the switch M the starting of the motor through the operation of the thermostat F will open the particular valve G or L which is in circuit while the cutting out of the motor will also cut out the circuit of this valve.

To provide for the proper proportion of quantity of gas to air, a regulated valve N is provided in the gas supply line O and a gas pressure regulator P may also be included in the line O to maintain substantially constant pressure at the burner. A suitable gas pilot Q is provided for ignition of either of the fuels and this may be controlled by a solenoid valve R or other suitable means for increasing the flame when the motor is started. However, these auxiliary devices and

the other electrical controls or regulators which usually form a part of the system may be of any suitable design and will not be described in detail.

In use, whenever it is desired to change from one fuel to another, this is accomplished by throwing the switch M and without the necessity of any adjustments of either the oil or the gas burner.

What I claim as my invention is:

1. A fluid fuel burner comprising a motor driven rotary member for spraying liquid and for supplying air to support combustion, a refractory ring against which said fuel and air is directed and means for alternatively supplying a proportionate quantity of gaseous fuel to said refractory ring and for cutting off the liquid fuel supply.

2. A fluid fuel burner comprising a hearth having an annular refractory ring at the peripheral portion thereof, a motor driven rotary member at the center of said hearth for spraying liquid fuel and supplying a proportionate quantity of air to support combustion, said air and fuel being directed against said refractory ring, a gas supply conduit imbedded in said hearth and having a series of discharge jets directed against said ring, and means controlling the liquid fuel and gas for alternatively supplying the same to said burner.

3. A fluid fuel burner comprising a hearth, a refractory ring above the peripheral portion of said hearth and provided with a groove or channel on its inner side, a motor driven rotary member at the center of said hearth for spraying liquid fuel towards the groove in said ring and for supplying a proportionate quantity of air to support combustion, a gas conduit imbedded in said hearth provided with a series of discharge jets extending above said hearth and directed into said groove, and means controlling the gas and liquid fuel for alternatively supplying the same only when said motor is in operation.

In testimony whereof I affix my signature.
MILTON A. POWERS.