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GAS BURNER

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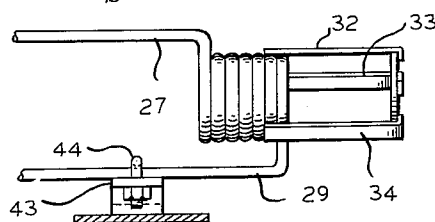
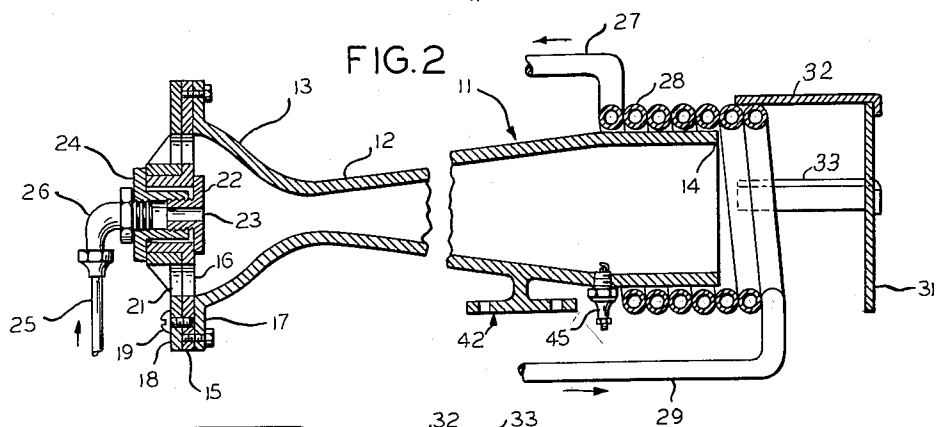
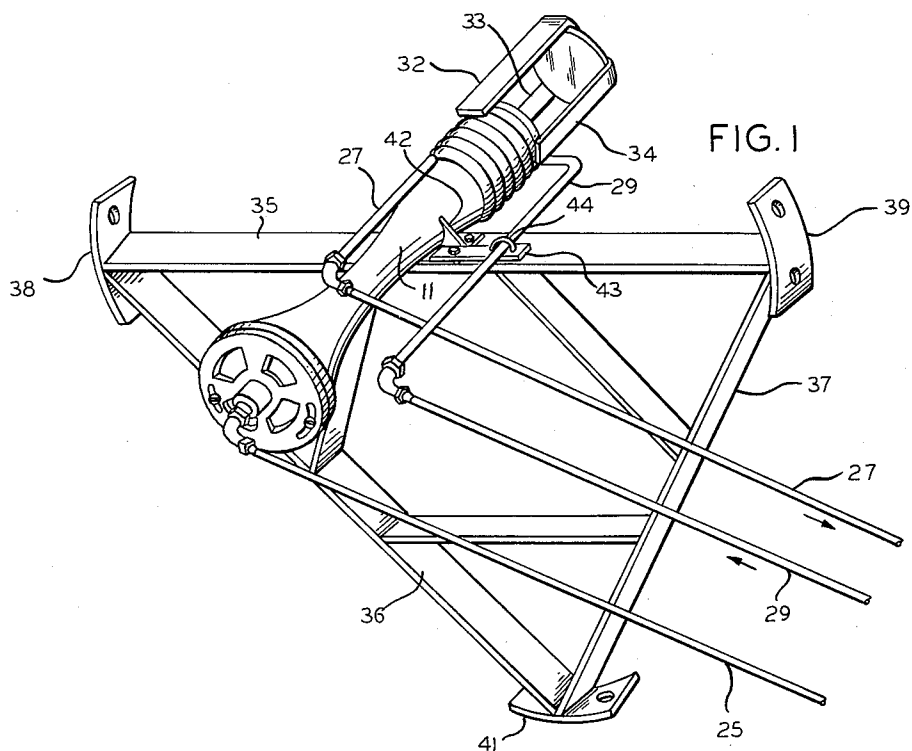


FIG. 3

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GAS BURNER

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1 Claim. (Cl. 158—79)

This invention relates to improvements in burners for combustion of fuel gases which are normally supplied from storage tanks of liquid fuel under pressure.

While other fuels may be used with this burner, it will simplify the discussion to refer, as an example, to propane which is normally supplied to the user in a liquid state and stored under pressure. The type of burner which we prefer to use belongs in the class of venturi type burners to which the fuel in gaseous form is fed through a small orifice in the nozzle, under pressure, and as it passes through the throat of the venturi it inspirates air for combustion and promotes one of the most efficient gas and air mixing actions known to science. When one of these burners is being fed from a liquid propane supply, reduction of pressure on the liquid before it is brought to the burner permits vaporization at such lowered pressure, but the heat of vaporization still must be supplied from some source to convert it from liquid to gas. The improvement in my device is directed to that purpose, i.e., the efficient and convenient supplying of heat to the liquid fuel so that it may be readily vaporized.

In addition to the above stated general purpose, it is an object of the invention to provide an economical fuel pre-heater and one which may be inexpensively mounted and conveniently adjusted to facilitate variation in the amount of pre-heat supplied to the fuel.

Other objects and advantages of the invention will be mentioned hereinafter, or will become apparent from a perusal of this specification.

Referring now to the drawing, in which a preferred form of the invention is illustrated, Figure 1 is a perspective view of the device shown mounted on a supporting frame of a type suitable for supporting the burner inside of a chamber into which the products of combustion are projected for admixture with other air.

Figure 2 is a longitudinal, cross-sectional view of the burner and pre-heater. Figure 3 is a side elevation of the pre-heater.

Referring further to the drawing, a conventional venturi burner tube is shown and generally designated as 11, having a throat 12, an inlet chamber 13, and an outlet 14. The stationary plate 15, having numerous perforations 16 for the inlet of air, is bolted as shown to the peripheral flange 17. A conventional perforated and rotatable plate 18 is secured to the plate 15 by means of screws such as 19, which extend through conventional arcuate slots to permit the adjustable plate 19 to be rotated to vary the total combined aperture of the slots 21 and 16, to vary the proportion of air admitted to the throat of the venturi. A replaceable spud 22 having an orifice 23 of suitable size is secured to the stationary plate 15 by means of the lock nut 24 and the gas fuel inlet pipe 25 is secured to the lock nut 24 by means of an elbow 26. This much of the burner is conventional.

The pre-heater consists of a pipe of suitable material such as copper or bronze, or other appropriate material, coiled as shown, mounted somewhat loosely about the outside cylindrical surface of the venturi tube outlet end.

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The liquid fuel is introduced into the coil through the pipe 29 and flows around the convolutions such as 28 of the coil, and eventually emerges in pre-heated condition through the return pipe 27. A baffle plate 31 is supported in fixed relation to the pre-heater coils by means of three legs 32, 33 and 34, by welding one end of these legs to the plate 31 and the other end to the coils as shown.

As an example of how this burner may be mounted axially in a chamber of cylindrical shape, there is shown a triangular frame consisting of the horizontal bar 35, two inclined bars 36 and 37, and at the junctures of these bars, shoes 38, 39 and 41, which may be secured to the interior surfaces of the cylinder by means of bolts, screws, or in any other suitable manner.

Formed integrally with the venturi tube is a supporting bracket 42, which may be bolted to the bar 35, while a plate 43 may be bolted either to the bracket 42 or to the frame bar 35 and adjustably secured to the pipe 29 by means of a U-shaped pipe clamp 44, as shown.

In order that the pre-heating coil may be shifted, the clamp 44 may be loosened sufficiently to permit the pipe 29 to be slid through it either to carry the coils further beyond the mouth of the venturi tube or back toward the mouth of the venturi tube. It will be recognized that when the burner is operating, the flames emitted from the mouth of the venturi tube will impinge against the baffle 31 and in part be deflected backwardly, whereby they will supply a large amount of heat directly to the pre-heater coil.

The exposure of a greater number of coils beyond the end of the venturi tube will cause more heat to be imparted to these coils, if it be necessary to raise the pre-heating temperature of the fuel flowing through the pre-heater coil.

It will be perceived that this pre-heater coil and its associated baffle, together with the means of adjusting it longitudinally of the venturi tube, provides an economical structure for the purpose, and one which is of the utmost simplicity so far as mounting and adjustability is concerned.

The valves which may be employed, such as pressure reduction valves, fuel throttling valves, and any other necessary valves, do not form a part of this invention and are therefore not disclosed.

In order to start the ignition of a burner of this type, it is necessary to supply an electrical spark, and for this purpose we provide that the spark plug 45 be mounted in approximately the location shown. Thus the flame formed by the burning fuel mixture will be beyond the position of the spark plug, which therefore is not subjected to the temperature and other ill effects of this burning flame.

While a preferred form of the invention is shown, to illustrate the nature of the invention and the manner of its use, it should be understood that the invention is susceptible to some modification without departure from the spirit and scope of the invention defined in the appended claim.

We claim:

In combination with a gas burner having an elongated burner tube open at its discharge end, a spiral pipe coil having its convolutions wholly exposed to the peripherally surrounding atmosphere arranged in a generally cylindrical contour disposed outside of and adjacent the open end of said burner tube with some of the coil convolutions surrounding the tube and some beyond the tube end, a baffle plate perpendicularly intercepting the flame path supported on said coil spaced at a fixed distance beyond the coil end adapted to intercept and reflect some of the products of combustion emerging from the tube back upon said coil, means for adjusting the position of

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the coil axially of the tube to selectively expose different numbers of said convolutions beyond the tube end, means for introducing a liquid fuel into one end of the coil, and means for withdrawing heated liquid fuel from the other end of the coil.

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