

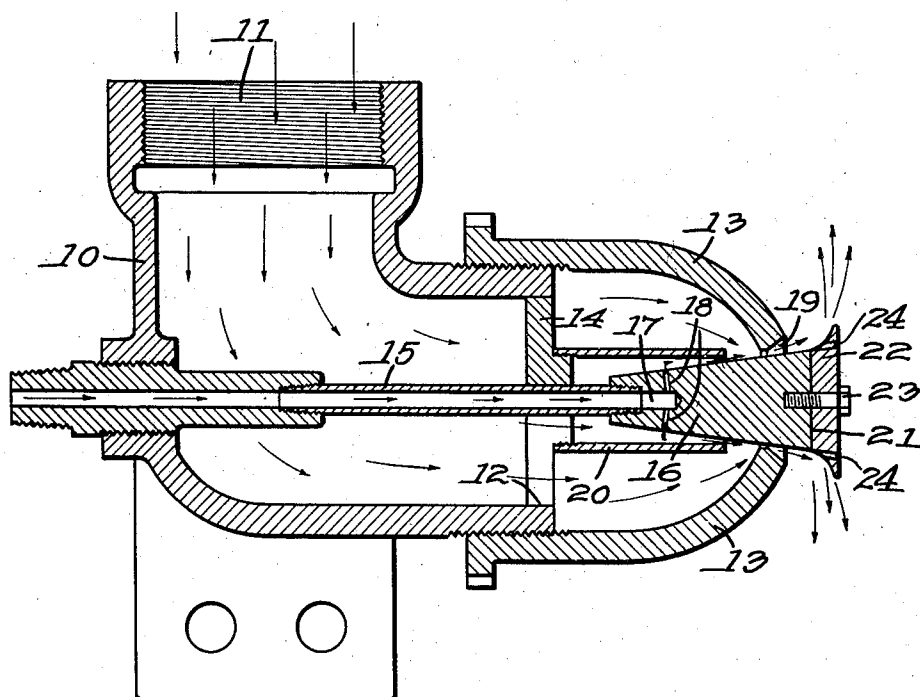
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BURNER

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BURNER.

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This invention relates to a device for distributing and atomizing liquid fuel. It is suitable for use as an oil burner or as a part of a carburetor for atomizing gasoline.

5 The principal objects of the invention are to provide a construction which will so distribute the liquid fuel at a certain point that it will be thoroughly atomized by the current of the atomizing medium with which
10 it is to be mixed and avoid the usual difficulty in making a current of air and a current of liquid fuel mix when they are moving in the same direction; also to provide means for forcing the liquid fuel to travel in a path at
15 first transverse to the direction of the atomizing medium as air or steam and then spread it along a surface as a film in a position to be impinged upon by the atomizing currents throughout its area until the liquid fuel is
20 taken up by the atomizing current; also to provide means for deflecting the mixture, if desired, so as to spread it and make a wide flame.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, which is a sectional view of an oil burner provided with a preferred embodiment of this invention.

30 Ordinarily both in the burning of oil and in the mixing of air and gas in the carburetor, the two streams are brought into contact when moving in practically the same direction and when the stream of liquid is in the form of a spray or current. Even when
35 it is sprayed the particles of liquid hang together and the air or steam merely moves along with it in the same direction so that it is well known that the atomization is very incomplete and part of the fuel is not only
40 wasted as far as production of heat is concerned, but it also produces deposits on the parts which necessitate their frequent cleaning in order to keep up the efficiency.

45 In order to overcome these defects I provide a burner having a casing 10 with an inlet 11 supplied with an air or steam current from a blower or otherwise. The air or steam is discharged from the casing
50 through its outlet 12 into a casing or nozzle 13 which has an opening 19 at the end to let it out. Across the opening 12 is a spider 14 in the present case for supporting other parts, as will appear, and not interfering
55 with the current of atomizing medium.

Extending through a part of this casing

10 is a pipe 15 connected with a supply pipe for conducting a current of oil. This pipe is held at the center by the hub of the spider 14 and is centrally located in the casing 10. It
60 is screwed into the end of a solid block or body 16 of metal or the like which has a passage 17 beyond the pipe for receiving the oil therefrom. From this passage extend
65 ports 18 to the exterior of the solid block 16 which I preferably make in the form of a cone with the large end extending out through the perforation 19 in the end of
70 the nozzle 13. Surrounding the inner part of the cone 16 and the end of the pipe 15 is a cylindrical tube 20 fixed to the spider 14 and centrally located therein so that its wall
75 may receive fuel from the ports 18. The end of this tube 20 is spaced from the cone 16 so as to provide a passage for the mixture. The end of the cone 16 may terminate in the
80 line 21 if desired, and in that case a long straight flame is secured but I have shown a deflector 22 which is a solid piece of metal secured to the block or cone 16 by a screw 23
85 and having an outwardly flaring circular surface to divert the mixture and spread it. Holes 24 are bored through the deflector to break the vacuum otherwise formed and thus increase the temperature of the flame.

The nozzle 13 is screw threaded on the out side of the outlet end of the casing 10 so that it can be removed after the cone 16 is taken out or adjusted to regulate the area of the nozzle opening at 19.

90 In operation, the oil flows into the space 17 and out through the ports 18 so as to be received on the outer surface of the block or cone 16. If any of it comes out with too much force to be spread on the surface, it
95 will come into contact with the tube 20, will be spread out as a film on said tube and finally impinged on body 16. Now the atomizing medium passing between the body 16 and tube 20 has only a thin film of oil to
100 take up and atomize. This film is mostly on the surface of the cone 16 but some of it may be on the interior of the tube 20. In either event the continuous fresh supply of air or
105 steam coming in and passing through this annular space will take up the film or films of oil on these surfaces and without any necessity of spraying the oil. It is found in
110 practice that substantially all of the oil is then taken up by the atomizing medium and finely atomized and carried along with the air or steam through the outlet 19 which,

on account of the cone is only a thin annular space. It can be ignited here and in the form illustrated in the figure, will spread a flame out all around in a circular manner which I have found in practice to provide maximum heat with a minimum quantity of oil so as to provide the highest degree of efficiency.

In this way it will be seen that with a very simple arrangement a burner is provided which can be attached to practically any type of oil and air or steam supply device to greatly increase the efficiency thereof.

The invention can be applied to the carburetting of gasoline for supplying it to an engine. In this case the gasoline runs in from the gas tank to the surface of the cone 16 and the tube 20 is provided for the same purpose as before. The nozzle 13 is omitted and the operation is exactly the same and with similar advantages.

Although I have illustrated and described really only one form of this invention and described it as applied for only two purposes, I am aware of the fact that other modifications can be made therein, and that it can be used for other purposes of an analogous nature, without departing from the scope of the invention as expressed in the claims.

Therefore I do not wish to be limited in these respects, but what I do claim is:—

1. In a device for mixing liquid fuel with an atomizing medium, the combination with a nozzle having an opening therein, and a conical body located in said opening its larger end projecting therethrough, and spaced from its edge all around to provide an outlet for the escape of the mixture, of means for introducing liquid fuel in a position to spread on the surface of said body, means for directing the atomizing medium along said surface toward the outlet to take up the fuel therewith as it passes out of the outlet, and a tube surrounding the smaller end of said body and extending a distance therealong open at both ends to receive and discharge a current of an atomizing medium,

and positioned to receive any fuel which is not deposited on the surface of the body and allow it to spread in a thin film on the tube for the same purpose, the larger end of the conical body being larger than said tube, whereby an annular escape passage is formed at the end of the tube.

2. In a liquid fuel burner, the combination with a nozzle having an opening, a tapering body in said opening spaced from the edges thereof, means for directing fuel into the interior of said body and from the interior to the surface thereof to spread the fuel in a thin film on said surface in the path of the current of atomizing medium, whereby the fuel is atomized before and in passing out of the space between the body and the edge of the opening, and a tube surrounding the body at the points at which the fuel passes to its outside surfaces for receiving any fuel against it that may be projected from the opening, whereby another film of fuel is formed on the tube and taken up by the atomizing medium in the same way, said tube being of a diameter inside equal to the diameter of said tapering body at a point about midway between its ends.

3. In a device for mixing liquid fuel with an atomizing medium, the combination with a nozzle having an opening therein, of a body located in said opening and spaced from its edge to provide an opening for the escape of the mixture, said body being provided with a spreading device on its end beyond the nozzle for directing the explosive mixture outwardly in a sheet around it, said spreading device having longitudinal perforations through it, means for introducing liquid fuel in a position to spread on the surface of said body, and means for directing the atomizing medium along said surface toward the outlet to take up the fuel as it passes out of the outlet.

In testimony whereof I have hereunto affixed my signature.

JOHN H. NELSON.