Feb. 22, 1938. E. J. McCULLOUGH 2,109,027

OIL BURNER

Filed March 25, 1937

Fig. 1

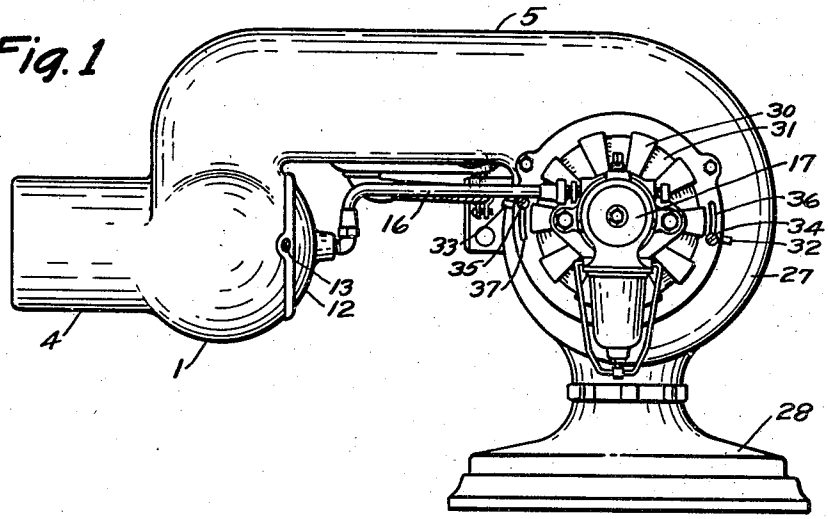


Fig. 2

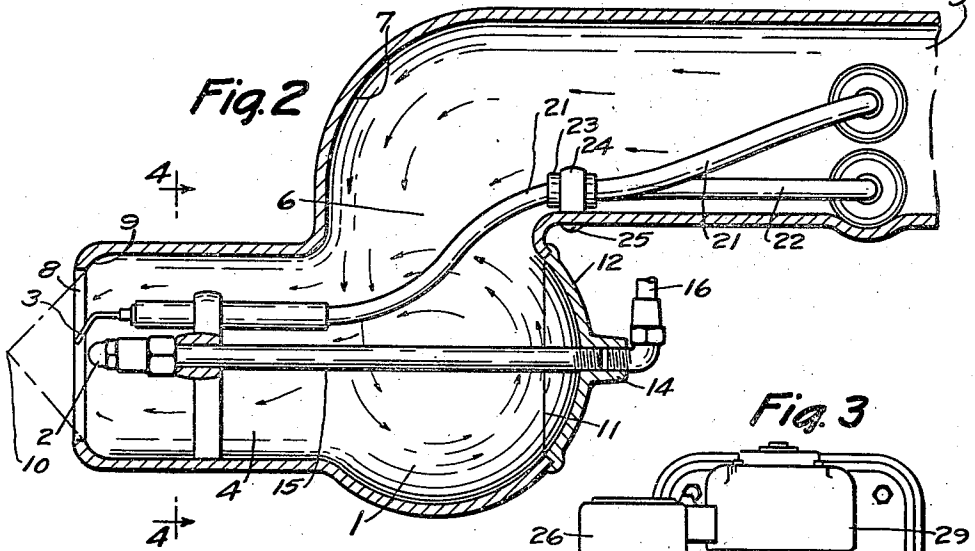


Fig. 3

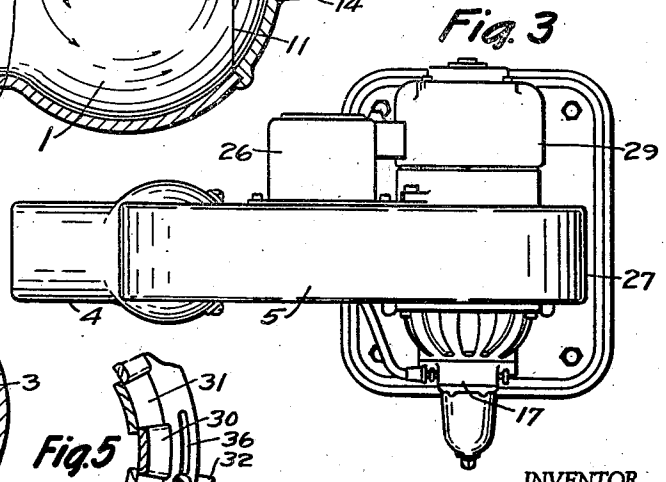


Fig. 4

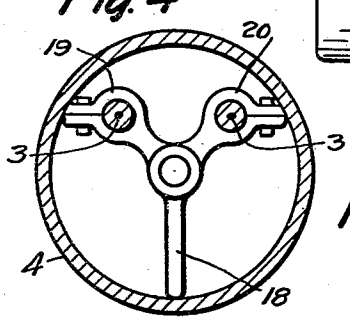


Fig. 5

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OIL BURNER

Edward J. McCullough, New York, N. Y.

Application March 25, 1937, Serial No. 132,930

1 Claim. (Cl. 158—76)

The purpose of the invention is to provide a mixing well or ball adjacent the nozzle of an oil burner for thoroughly breaking up the air before it passes over the nozzle in order to obtain more thorough mixing and more efficient burning.

The invention is an oil burner nozzle in which the nozzle is positioned in a tube or surrounding jacket and the surrounding jacket is provided with a ball or spherical chamber directly behind the nozzle, and the supply of air is forced through a chamber offset from the nozzle and opening into one side of said ball.

Many devices have been provided for mixing oil with air, or atomizing the oil, or breaking up the air, however, substantially all of these involve a mechanical mixer of some form or are in the form of vanes to deflect the air, however, it has been found desirable to provide means adjacent the nozzle whereby the air passes through a churning chamber in which the chamber is shaped to circulate the air through a sphere and then discharge the air through the incoming air.

The object of the invention is, therefore, to provide means adjacent the nozzle of an oil burner for thoroughly breaking up and re-mixing the air before it passes around the nozzle.

Another object is to provide means for thoroughly breaking up air passing through an oil burner without moving parts or deflecting vanes.

Another object is to provide means for thoroughly breaking up or atomizing air without obstructing the area of the passage through which the air passes.

A further object is to provide means for thoroughly breaking up air in which the breaking up action is obtained by the shape of the inner surface of a chamber adjacent the nozzle.

With these ends in view the invention embodies a passage connected with the exhaust of a fan, a spherical chamber positioned at one side of the passage and adapted to receive air from the passage, and an outlet connection extending from the spherical chamber and in which the nozzle and electrodes are positioned.

Other features and advantages of the invention will appear from the following description, taken in connection with the drawing, wherein:

Figure 1 is a view showing a side elevation of the complete burner.

Figure 2 is a cross section through the part of the casing showing the spherical chamber with arrows indicating the path of air passing therethrough.

Figure 3 is a plan view of the burner.

Figure 4 is a cross section on line 4—4 of Figure 2.

Figure 5 is a detail showing a section through a portion of the air inlet valve.

In the drawing the burner is shown as it may be made, numeral 1 indicating the spherical mixing chamber, numeral 2 the nozzle and numeral 3 the electrodes.

The chamber 1 is of a spherical shape and is made integral with a tubular outlet passage 4 and a supply tube 5 connected into one side of the chamber 1 through an opening 6. It will be noted that air passing forward through the tube 5 will be directed downward by the curved surface 7 at the end thereof, and the air will then pass into the chamber 1 and the spherical surface of the wall thereof will direct the air around in a spherical motion so that it will pass back through the incoming air and then pass out through the passage 4, and through the opening 3 around the nozzle, with the inner surfaces 9 of the passage 4 directing the air inward toward the center where it will again intermingle at a theoretical point 10. At the back of the chamber 1 is an opening 11 covered with a cover plate 12 having screws 13 holding it in place as shown in Figure 1, and at the back of the cover plate is a boss 14 through which the fuel is connected to the nozzle 2 through an internal pipe 15 and another pipe 16 which extends to an oil pump 17. It will be understood, however, that this connection may be formed in any other manner. The inner end of the pipe 15 is mounted in a spider or stand 18 and the upper part of the stand is formed with extensions 19 and 20 in which the electrodes 3 are also held. The connections 21 and 22 from the electrodes pass backward through a porcelain bushing 23, that may be held in a socket 24, as shown in Figure 2, and the socket may be held by a screw 25 extending through the casing. The electrode connections pass outward through the wall of the casing and into a transformer 26 at one side of the casing.

In the design shown the opposite end of the supply tube 5 extends backward and the end opposite the nozzle forms a fan chamber 27 which is mounted upon a stand 28 and a motor 29 is also mounted on this stand and directly connected to a fan or turbine in the housing 27, and also to the fuel pump 17. It will be understood, however, that the arrangement of the motor pump and transformer is immaterial as the fan or turbine, which may also be of any type

or design, and the pump, may be operated in any manner or by any means.

The volume of air passing into the device may be controlled by a valve formed of stationary ribs 30 and movable plates 31 positioned at one side of the housing 27 and these may be adjusted by lugs 32 and 33 in order to admit any amount of air desired. The plates 31 are held by screws 34 and 35 in slots 36 and 37, and it will be noted that they may be moved around the center to obtain any opening between the members 30 that may be desired. It will also be understood that this is only a typical arrangement of the valve, as any other means may be provided for controlling the amount of air admitted.

It will be understood that other changes may be made without departing from the spirit of the invention. One of such changes may be in the use of other means for connecting the ball or spherical casing of the nozzle mounting in order to cause the air to pass around in a spherical motion and thereby mix or break up the air as it enters the nozzle, another may be in the use of other means for mounting the nozzle and electrodes in combination with a spherical mixing chamber and still another may be in the use of other means for supplying air and fuel to said chamber and device.

The construction will be readily understood from the foregoing description. In use this device may be provided as shown and described, and although the supply tube 5 may be positioned at any angle, it is preferred to locate this tube directly above the spherical chamber 1 so that the air passes directly downward into the interior thereof, and it will be noted that with air supplied under pressure it will circulate around the wall and, as hereinbefore stated, pass back through the incoming air so that a very thorough mixing and breaking up of the air is obtained.

This mixing action is accentuated by the fact that the chamber is spherical, or curved in all directions as the air passing downward at the sides and at every point, also is churned around a sphere, as well as the air indicated by the arrows at the front, thereby increasing agitation and producing more thorough mixing or breaking up thereof.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent, is:

In an oil burner of the type having a horizontally positioned nozzle at the end of an air tube, one end of which is connected to a blower for supplying air under pressure, and the opposite end of which extends to a point adjacent the fire and in which the nozzle is positioned, and also in which said air tube is offset providing two sections the axes of which are parallel, and with the axis of the section connected to the blower above the axis of the section in which the nozzle is located; a ball-shaped casing positioned at the rear of the section in which the nozzle is located provided with an opening communicating with said section, and also provided with an opening in the upper side thereof communicating with the upper air supply tube section, the wall of said upper section of the said air tube terminating at a point corresponding with and tangent to the periphery of the said ball-shaped casing on the side adjacent the nozzle, and shaped to direct air currents passing through said casing downward at the front and sides of said ball-shaped casing, and then outward through the section in which the nozzle is placed, the air passing around the inner surface of the said ball-shaped casing, and passing through the current of air passing downward therein and across the first named opening from the upper section of said air tube.

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