Feb. 7, 1939. J. A. D'ELIA 2,146,250

OIL BURNER

Filed March 18, 1937

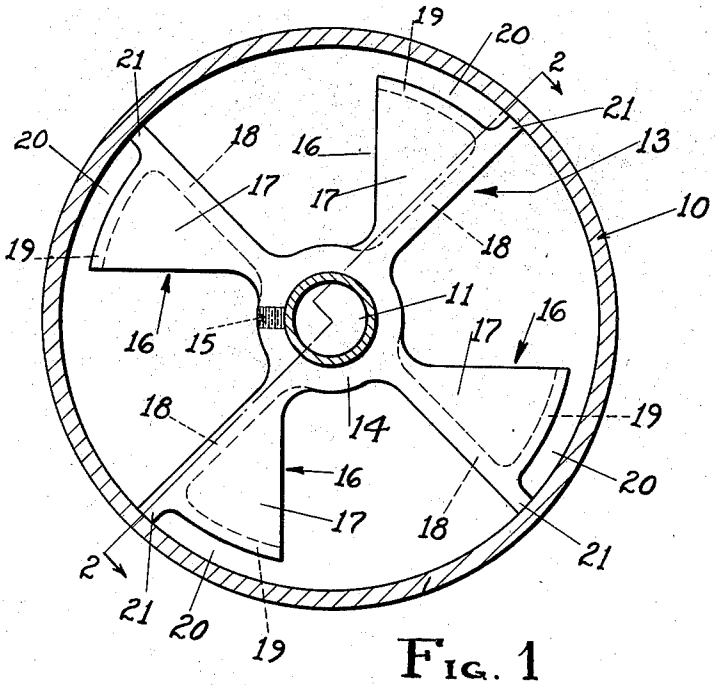


FIG. 1

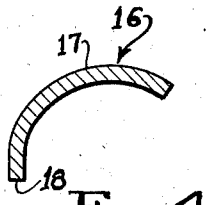


FIG. 4

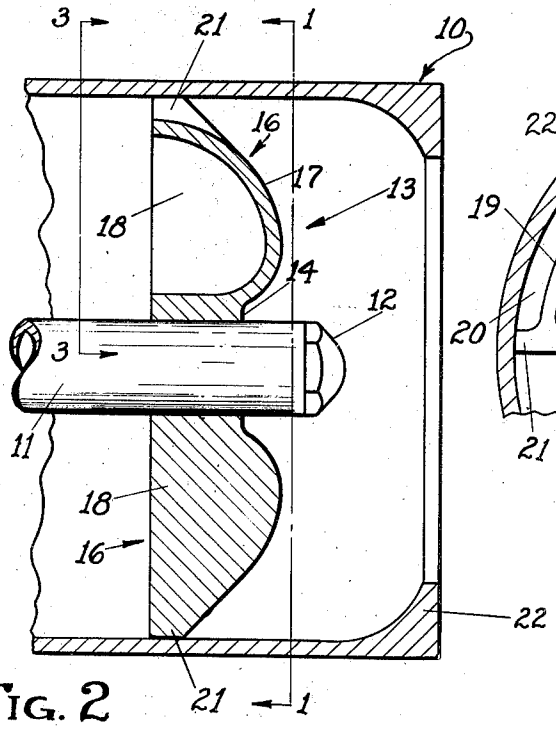


FIG. 2

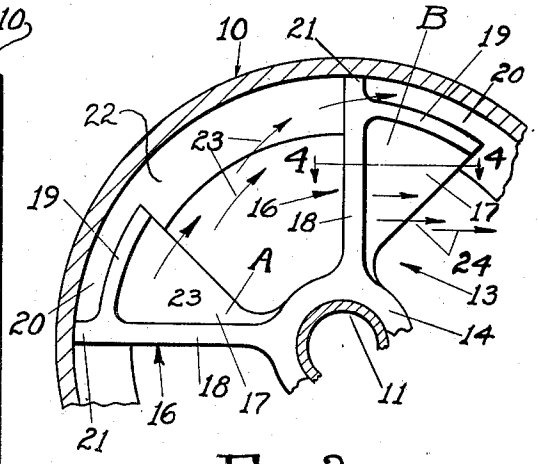


FIG. 3

INVENTOR.
JOSEPH A. D'ELIA
BY John A. Hanrahan
ATTORNEY

Patented Feb. 7, 1939 2,146,250

UNITED STATES PATENT OFFICE

2,146,250

OIL BURNER

Joseph A. D'Elia, Bridgeport, Conn.

Application March 18, 1937, Serial No. 131,560

3 Claims. (Cl. 158—76)

This invention relates to new and useful improvements in oil burners of the so called gun type and has for an object to provide means for imparting to the air being supplied through an air blast pipe or tube, an increased whirling or twisting motion whereby a more efficient flame is obtained.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawing wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawing:

Fig. 1 is an elevational view looking into the improved diffuser, the view being taken as along the line 1—1 of Fig. 2;

Fig. 2 is a longitudinal sectional view through the forward portion of the air blast tube, the view being taken as along the line 2—2 of Fig. 1;

Fig. 3 is a detail sectional view taken as along the line 3—3 of Fig. 2; and

Fig. 4 is a similar view taken as along the line 4—4 of Fig. 3.

Referring in detail to the drawing, at 10 is shown a portion of an air blast pipe substantially circular in transverse section and through which extends an oil supply tube 11 for supplying fuel oil to a nozzle 12. Disposed on the oil supply tube 11 is an air diffuser or whirler generally designated 13 and including a hub portion 14 which may be fixed to the oil supply pipe or tube 11 as with a set screw or the like 15.

The whirler or diffuser 13 is located slightly inwardly of the nozzle 12 and includes a plurality of vanes 16 each transversely curved as best shown in Fig. 4 and each also longitudinally curved as shown in Fig. 2. With this construction each vane includes a front wall 17, a side wall 18 and an end wall 19. The outer ends or walls 19 of the vanes are spaced from the inner surface of the air blast pipe 10 whereby there is an air passage 20 between the end wall of each vane and the adjacent inner surface portion of the air blast pipe.

As here shown lugs or extensions 21 at the outer ends of the various vanes engage the inner surface of the air blast pipe and thus support the whirler and the oil supply tube 11 and nozzle 12 centrally in the air blast pipe. Slightly forwardly of the whirler the air blast pipe is shown as formed with a reducer 22 the same comprising an annular inwardly directed bead or flange. While the reducer 22 is here shown as integral with the pipe 10 it is to be understood that the reducer might be formed separate and secured in place in any desired manner.

Air from any suitable blower (not shown) passing through the pipe 10 engages against the various vanes and is directed along twisting paths. A portion of the air will move along the path indicated by the arrows 23 Fig. 3. This air before leaving the whirler 13 has a considerable twisting movement imparted to it since being deflected by the vane A its twisting movement is not stopped by the next vane as the vane B but continues on across the outer end of the latter to pick up oil being discharged by the nozzle 12.

With this arrangement wherein the outer end walls of the vanes of a whirler are spaced from the inner surface of the air blast pipe, the currents of air passing across such end walls of the vanes pick up outwardly directed streams of oil from the nozzle. Another portion of the air being blown to the diffuser or whirler passes as indicated by the arrows 24 in Fig. 3, moving off one vane, as vane B and passing through the whirler between the mentioned vane and the next vane to the right thereof. The air currents moving as indicated by the arrows 23 engage those moving as suggested by the arrows 24 and beyond the nozzle such conflicting currents cause a thorough mixing of the air and fuel oil.

When the reducer 22 is present it serves to direct the various air streams inwardly toward the longitudinal center of the air blast pipe as will be understood. The spacing of the outer ends of the vanes from the inner surface of the air blast pipe results in a more efficient burner, a desirable soft flame being produced. The air currents or streams passing over the end walls of the vanes serve to pick up or collect and carry inwardly or toward the longitudinal center of the pipe 10, any oil thrown outwardly by the nozzle. With the disclosed arrangement the flame is prevented from spreading too much as the air currents passing over the end walls of the vanes tend thereafter to move toward the longitudinal center of the pipe 10. All oil fed by the nozzle is fully consumed and with the disclosed arrangement and construction it is possible to burn more oil than has been possible in the same size apparatus with the arrangements and constructions heretofore in use.

Having thus set forth the nature of my invention, what I claim is:

1. In an oil burner, an air blast pipe, an oil supply tube within and extending longitudinally of said pipe, a nozzle on the forward end of said tube adjacent the discharging end of the blast pipe, an air whirler including a hub about the tube inwardly of the nozzle, and spaced radially extending vanes carried by said hub, said whirler vanes stopping short of the inner surface of said blast pipe whereby air forced through the latter is divided by the whirler into two columns one passing through said vanes and the other passing across the outer ends of the vanes and about the column passing through the vanes.

2. In an oil burner, an air blast pipe, an oil supply tube within and extending longitudinally of said pipe, a nozzle on the forward end of said tube adjacent the discharging end of the blast pipe, an air whirler including a hub about the tube inwardly of the nozzle, and spaced radially extending vanes carried by said hub, said whirler vanes stopping short of the inner surface of said pipe whereby air forced through the latter is divided by the whirler into two columns one passing through the vanes and the other passing across the outer ends of the vanes and about the column passing through the vanes, and means reducing the internal diameter of the blast pipe forwardly of said whirler and nozzle.

3. In an oil burner, an air blast pipe, an oil supply tube within and extending longitudinally of said blast pipe, a nozzle on the forward end of said tube adjacent the discharging end of said blast pipe, an air whirler including a hub about the tube inwardly of said nozzle, spaced radially extending vanes carried by said hub, and lugs on and projecting radially beyond the outer ends of said vanes and engaging the inner surface of the blast pipe and supporting the whirler with the outer ends of its vanes spaced from the inner surface of the blast pipe, whereby air forced through the latter is divided by the whirler into two columns one passing through said vanes and the other passing across the outer ends of the vanes and about the column passing through the vanes.

JOSEPH A. D'ELIA.