

July 10, 1951

F. PIETRI

2,559,792

ROTARY ATOMIZING LIQUID FUEL BURNER

Filed Aug. 12, 1948

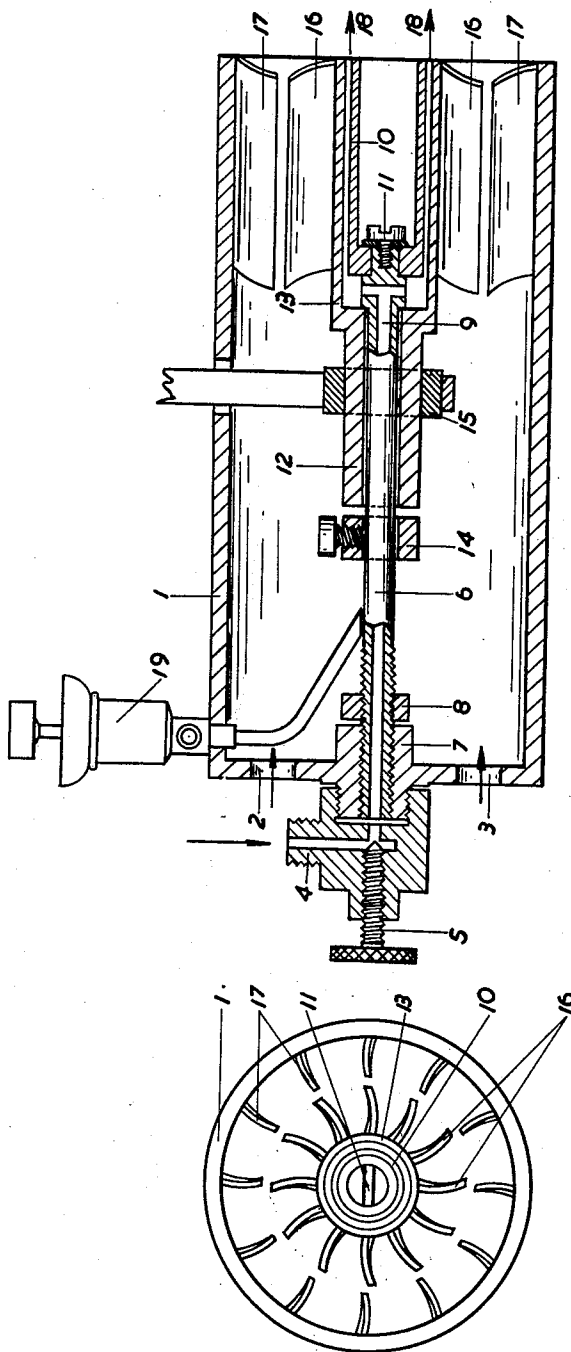


Fig. 1.

Fig. 2.

INVENTOR.  
FRANÇOIS PIETRI.

BY.

*Chetwin & Company*

ATTORNEYS

## UNITED STATES PATENT OFFICE

2,559,792

## ROTARY ATOMIZING LIQUID FUEL BURNER

Francois Pietri, Aubagne, France

Application August 12, 1948, Serial No. 43,843

In France August 13, 1947

1 Claim. (Cl. 158—77)

1

My invention has for its object improvements in the means used for ejecting liquid fuel chiefly fuel oil and admixing same with air in order to produce a turbulence bestowing a maximum efficiency for the mixture of the two constituents.

This result is obtained by means of structural embodiments that include chiefly the incorporation in a rotary diffuser of fins or blades rigid therewith and arranged at a predetermined angle along a helical or the like pitch; said arrangement produces through its mere rotation not only the ejection of the liquid fuel but also a turbulence without the assistance of any fan, which turbulence furthers the mixture and gives the flame a highly efficient adaptability.

The directing blades, fans and the like auxiliaries may thus be done away with which removes any causes of stoppage, inspection and upkeep. The atomization and blowing of air for combustion is obtained through the rotation of the diffuser itself and consequently the intensity of heating may be reduced without any reduction in efficiency, the amount of air required for combustion and its turbulence being adjusted in proportion to the amount of fuel ejected. The adjustment of this arrangement may be obtained either automatically or by hand.

In the accompanying drawings showing diagrammatically by way of example one of the forms of construction of my invention:

Fig. 1 is a longitudinal cross sectional view of the burner.

Fig. 2 is a diagrammatic front view of the same apparatus.

The fuel oil burner according to my invention includes an elongated casing 1 provided at its rear end with air intake apertures 2 and 3 together with means for feeding fuel including a channel 4 the flow through which is adjustable by operation of the needle valve 5. At the other end is an outlet for fuel and air.

The longitudinal fuel oil feeding pipe 6 fed by the channel 4 is held stationary by means of a sleeve 7 secured by a safety nut 8. The outer end of said pipe 6 carries a stationary radially opening distributing fuel outlet nozzle 9 beyond which is secured an inner diffuser member 10 held in position by the fastening screw 11. This diffuser member 10 may be locked or left free to move.

The front end of the stationary pipe 6 fed by the channel 4 serves as a shaft carrying rotatably the supporting sleeve 12 for the outer rotary diffuser member 13 having a widened portion surrounding the inner diffuser member 10 and en-

2

closing same throughout its operative diffusing surface to form an annular passage into which the outlet nozzle 9 opens. This supporting sleeve 12 is held in position by a thrust ring 14 at one end and by the distributing nozzle 9 forming a flange at the other end of the sleeve rigid with the rotary diffuser member. The rotation of the outer diffuser member is obtained through any suitable means such as a gear wheel or a pulley as shown at 15.

The rotary diffuser member 13 carries on its outer surface helicoidally-arranged blades or fins 16, the pitch of which is suitably chosen for producing an air sucking and propelling action. Said blades cooperate with other stationary helicoidally-arranged blades 17 arranged symmetrically and secured on the inner periphery of the outer end of the casing 1 in corresponding positions axially of the casing, to the rotating blades and spaced with a radial clearance therefrom. Consequently the liquid fuel fed by the stationary pipe 6 is distributed by the distributing nozzle 9 over the inner wall of the rotary diffuser 13 that forms in association with the stationary or free diffuser 10 an ejection duct promoting turbulence and opening annularly at 18. The fuel oil assumes a rapid rotation so that with the action of centrifugal force it receives a molecular eddying motion and is immediately thrown outwardly by centrifugal force and stirred inside the mass of air sucked in and projected by the air propelling and guiding blades 16. The latter stir the ejected fuel oil and produce thus an inflammable mixture producing a highly homogeneous flame and allowing a great adaptability of combustion. It is also possible to obtain an adjustment of the intensity and length of the flame through the speed of rotation whereby the ejection of the liquid will always be proportional to the turbulence imparted to the air. The diffuser member 13 may be adjusted by means of a brake acting either on the rotary surfaces and controlled through the inside of the pipe 6 or directly on the supporting sleeve 12. A lubricator 19 is provided for the lubrication of the movable members.

What I claim is:

A fuel oil burner comprising an elongated casing having inlet apertures at one end thereof and an outlet at the other end thereof, a stationary fuel oil feeding pipe longitudinally arranged in said casing, a stationary radially-opening fuel outlet nozzle in the outlet end of said pipe, a cylindrical inner diffuser member also arranged at the outlet end of the pipe and beyond

3

the said nozzle, a rotatable cylindrical outer diffuser member, carried on said pipe as a bearing, having a widened portion surrounding the said inner diffuser member and forming therewith an annular passage into which the fuel outlet nozzle opens, helicoidally-arranged rotating blades arranged along the length of and carried by the widened portion of the rotatable outer diffuser member, other stationary helicoidally-arranged blades secured on the inside of the outlet end of the casing in corresponding positions axially of the casing to the rotating blades and spaced with a radial clearance therefrom, whereby the rotating blades cause an axial air current through the casing towards the outlet end thereof, said air current having a rotary motion imparted to it and being made turbulent by the coaction one with the other of the stationary and rotating blades, the fuel emerging from the fuel outlet nozzle having a rotary motion imparted to it by the rotation of the outer diffuser member, whereby as the fuel emerges from the annular passage it is thrown outwardly by centrifugal force into the air current the tur-

4

bulence of which causes thorough mixing of the fuel with the air current.

FRANCOIS PIETRI.

#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

| Number    | Name          | Date           |
|-----------|---------------|----------------|
| 1,327,571 | Ray           | Jan. 6, 1920   |
| 1,595,931 | Fesler        | Aug. 10, 1926  |
| 1,820,758 | Miller        | Aug. 25, 1931  |
| 1,979,757 | Melot         | Nov. 6, 1934   |
| 2,108,872 | Swallow       | Feb. 22, 1938  |
| 2,214,027 | McClammy, Jr. | Sept. 10, 1940 |
| 2,214,568 | Thomas        | Sept. 10, 1940 |

#### FOREIGN PATENTS

| Number           | Country   | Date         |
|------------------|-----------|--------------|
| 2,964<br>of 1926 | Australia | July 8, 1927 |

#### OTHER REFERENCES

- Great Britain, No. 498,501, printed 1939 (un-accepted patent specification).