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E. A. WATSON ET AL
AIR DISTRIBUTION BAFFLING ABOUT THE FUEL NOZZLE
OF COMBUSTION CHAMBERS
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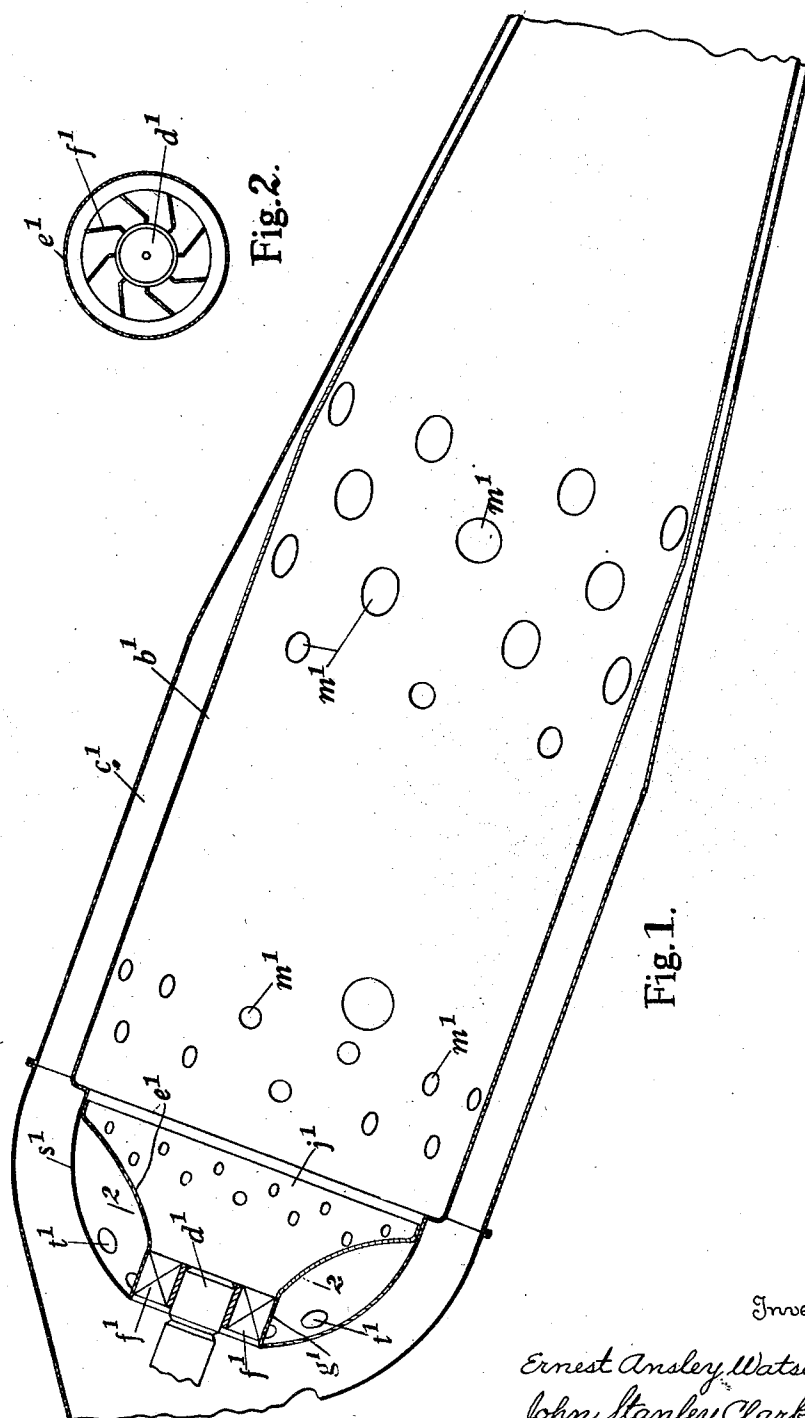


Fig. 2.

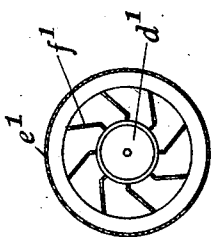


Fig. 1.

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UNITED STATES PATENT OFFICE

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AIR DISTRIBUTION BAFFLING ABOUT
THE FUEL NOZZLE OF COMBUSTION
CHAMBERSErnest Ansley Watson, Coventry, and John Stanley
Clarke, Burnley, England, assignors to
Joseph Lucas Limited, Birmingham, EnglandApplication January 16, 1945, Serial No. 573,113
In Great Britain September 29, 1943

1 Claim. (Cl. 60—39.65)

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This invention has for its object to provide improved liquid fuel combustion apparatus required to produce propellant gases for use as or in conjunction with prime movers.

In the accompanying sheet of explanatory drawing:

Figure 1 is a sectional side elevation of liquid fuel combustion apparatus constructed in accordance with the invention.

Figure 2 is a section on the line 2—2 of Figure 1.

In carrying the invention into effect as shown there is employed an outer cylindrical casing a^1 , and within this is arranged a cylindrical combustion chamber b^1 , the latter being separated from the casing by an annular air space c^1 to one end of which air can be supplied from a blower or other source. At one end (herein termed the entrance end) of the combustion chamber b^1 and coaxially therewith is mounted a nozzle d^1 whereby liquid fuel from a pump or other source can be delivered in the form of a spray into the said end of the combustion chamber. Surrounding the delivery end of the nozzle d^1 is an imperforate screen e^1 of truncated conical or bell shape having its larger end facing the combustion chamber b^1 . The screen e^1 serves to form a region of relatively quiescent or non-turbulent air in the immediate neighbourhood of the delivery end of the nozzle d^1 . Air from the annular space c^1 may be supplied to the said region past stationary guide vanes f^1 in a cylindrical extension g^1 of the smaller end of the screen e^1 , these guide vanes being adapted to impart a uniform rotary motion to the air.

The larger end of the screen e^1 is extended to form a perforated partition j^1 of truncated conical, hemispherical or other convenient form. This partition j^1 is adapted to serve the double purpose of admitting a restricted supply of air from the annular space c^1 to the combustion chamber b^1 , and of delivering this supply of air to the region e^1 and the portion of the combustion chamber b^1 immediately in front of the screen e^1 in the form of convergent streams which by their impact on each other produce a condition of energetic and disordered turbulence in the region of the combustion chamber ahead of that surrounded by the screen. The screen e^1 and partition j^1 are enclosed by an annular dome-shaped cover s^1 having near the cylindrical extension g^1 on the screen, large perforations t^1 through which air from the annular space c^1 can flow.

The additional air required in the combustion chamber b^1 is supplied from the annular space c^1 at appropriate positions through perforations as m^1 in the combustion chamber.

The air from the blower or other source may

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be supplied to the annular space c^1 at the end adjacent to the entrance to the combustion chamber b^1 , in which case the other end of the said space is closed.

For igniting the mixture of sprayed liquid fuel and air in the combustion chamber b^1 any convenient and ordinary electrical means is employed.

By this invention we are able to effect combustion of liquid fuel over a wide range of variation of the fuel-air ratio in a very simple and satisfactory manner.

Having thus described our invention what we do claim as new and desire to secure by Letters Patent is:

A liquid fuel combustion apparatus comprising in combination an outer casing, a combustion chamber formed by a hollow body arranged within the casing and separated therefrom by an air space, a liquid fuel nozzle situated at one end of the combustion chamber, stationary guide vanes arranged around the nozzle to impart rotary motion to air entering the combustion chamber past the vanes, an imperforate screen surrounding the region immediately adjacent to the delivery end of the nozzle, and a partition formed by an extension of the screen and surrounding a region in the combustion chamber adjoining that surrounded by the screen, the said partition being shaped, arranged, and formed with perforations, to serve the double purpose of admitting a restricted supply of air to the combustion chamber and delivering the said restricted supply of air in the form of convergent streams to the portion of the combustion chamber immediately in front of the screen.

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JOHN STANLEY CLARKE.

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