June 28, 1932. G. W. BOYD 1,864,795

LIQUID FUEL BURNER

Filed April 14, 1931

FIG. 1.

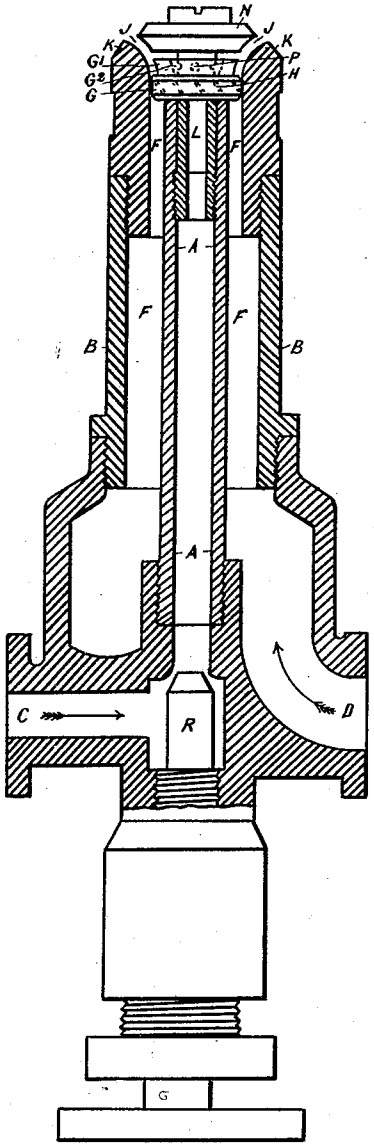


FIG. 2.

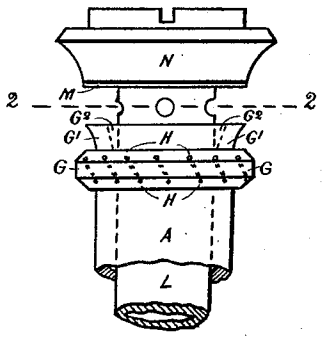
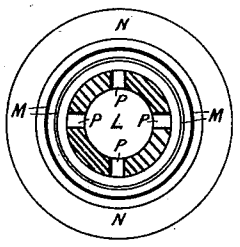


FIG. 3.



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UNITED STATES PATENT OFFICE

GEORGE WILLIAM BOYD, OF EDINBURGH, SCOTLAND

LIQUID FUEL BURNER

Application filed April 14, 1931, Serial No. 529,965, and in Great Britain May 5, 1930.

My invention relates to liquid fuel burners which may be used atmospherically, or in connection with a boiler or steam generator, of the type in which two concentric passages are provided, the oil issuing from the central passage, being atomized by air, or steam, from the outer passage, and has for its object to improve the construction and action of the orifices from which the oil, and air, or steam issue.

The burner comprises two concentric tubes, forming passages respectively for oil, and air or steam, that is to say, the inner tube forms a passage for the oil, whilst the space between the inner and outer tube forms a passage for the air or steam. According to my invention there is formed on, or fixed to, near the outer end of the inner tube an external collar having a number of inclined apertures for the admission of air to the oil. The usual tubular externally screwed plug, having a number of holes formed in it which serve as oil exits, is screwed into the outer end of the inner tube, but the underside of the head of the plug instead of forming a plain surface is corrugated for a purpose to be hereinafter referred to.

In order that my said invention and the manner of performing the same may be properly understood, I hereunto append a sheet of explanatory drawings to be hereinafter referred to in describing my invention.

Figure 1, is a sectional elevation of the improved liquid fuel burner showing the parts in the normal operative position. Figure 2, is a side elevation of the collar with the inclined apertures, and Figure 3 is an inverted sectional plan of the head of the tubular plug, on the dotted line 2—2, Figure 2. In the drawing the same reference letters are used to mark the same or like parts wherever they are repeated.

As shown in Figure 1, of the drawing, the burner consists of two concentric tubes A, and B, provided with inlet ports C, and D. The inner tube A, forms a passage E, for the oil, whilst the space between the tubes A, and B, forms a passage F, for the air or steam. The inner tube A, near its outer end, is provided with a collar G, having an upward extension G^1 in which is formed an inclined annular space G^2. The collar G, has formed in it a number of inclined holes H, communicating with an annular space J, forming a mixing chamber, between a choke K, and the head of an externally screwed tubular plug L, which is screwed into the outer end of the inner tube A. The under surface M, of the head N, of the plug L, Figure 3, is corrugated annularly so as to retard the flow and assist in breaking up the oil, issuing from a number of holes P, in the plug L, before it contacts with, and is atomized by, the air issuing from the inclined holes H, in the collar G.

The angle of the holes H, in the collar G, and the annular space J, may be varied according to conditions and circumstances under which the burner is to be used.

In operation the action of the improved liquid fuel burner is as follows:—Oil enters by the port C, past a valve R, into and up the passage E, into the tubular plug, L, whence it escapes by the holes P, over the corrugated surface M, whilst at the same time air or steam, enters by the port D, passes up the passage F, and through the inclined holes H, in the collar G, and so mixes with the oil. The inclined holes H, ensure that the air will impinge at an angle on the oil issuing radially from under the corrugated surface M, thus ensuring more efficient atomization and combustion, and a substantial reduction in the fuel required for a given temperature.

What I claim is:—

A liquid fuel burner, comprising a pair of tubes disposed in concentric relation and forming a central passageway and an outer passageway, a collar disposed on the outer end of the inner tube and completely closing the end of said outer passageway, said collar having an annular extension spaced from the wall of said outer passageway, a tubular plug extending through said extension and threaded into the outer end of said central passageway, the wall of said extension being radially spaced from said plug and the plug provided with radial perforations communicating with the space between the extension and plug, said plug having an en-

larged head overlying the extension, and said collar having a plurality of parallel, inclined perforations communicating at their opposite ends respectively with the outer passageway and with the space between the wall of said outer passageway and said annular extension, the overlying surface of said head being corrugated.

In testimony whereof I have signed my name to this specification.

GEORGE WILLIAM BOYD.