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N. A. STEED

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GAS FEEDER

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Fig. 1.

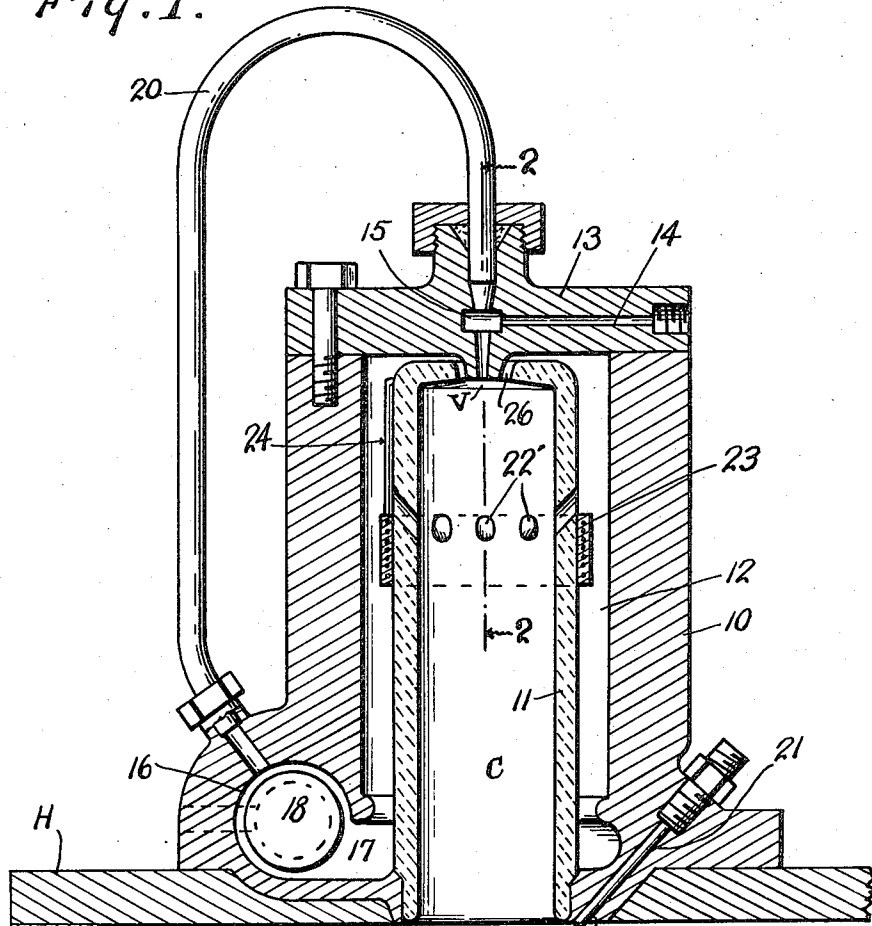
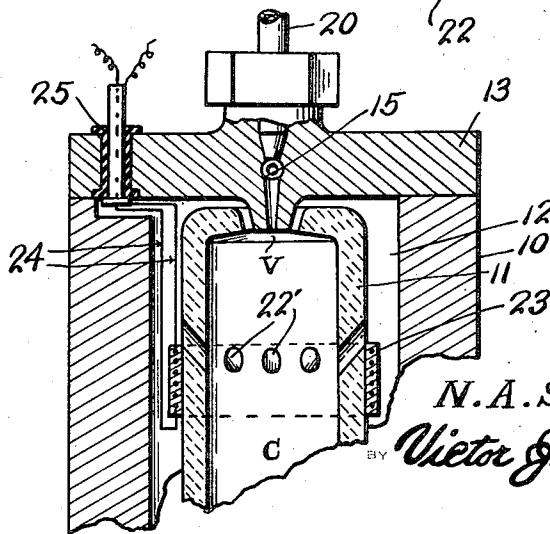


Fig. 2.



L. B. James

WITNESS:

N. A. Steed, INVENTOR

BY Victor J. Evans

ATTORNEY

UNITED STATES PATENT OFFICE

NOEL A. STEED, OF PORTLAND, INDIANA

GAS FEEDER

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This invention relates to fuel vaporization means for engines and has for an object the provision of means for use in connection with a combustion engine whereby thorough vaporization of liquid fuel will be obtained and mixed with a proper amount of air to provide a more readily combustible slow burning fuel mixture, with the expanded gases acting upon the engine piston substantially in the same manner as steam upon the piston of the steam engine.

Another object of the invention is the provision of a fuel mixing and feeding means of the above character, which may be applied to reciprocating and rotary engines, and turbines, and will provide continuous combustion, which adapts it for the last mentioned use.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claim.

In the drawings:—

Figure 1 is a sectional view of a fuel feeding means constructed in accordance with the invention.

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

Referring particularly to the drawings wherein like characters of reference denote corresponding parts, the invention is illustrated as applied to the head H of an engine and comprises an outer casing 10 and an inner casing 11. The walls of the inner casing are spaced from the walls of the outer casing so as to provide an annular chamber 12. The inner casing 11 is in communication with the cylinder of the engine.

The outer casing 10 is provided with a head 13 and this head is provided with a liquid fuel inlet passage 14 which is adapted to be connected with a suitable source of liquid fuel supply, the inner end of the passage communi-

cating with the interior of the inner casing 11 through a chamber 15.

The outer casing 10 is further provided with an air inlet port 16 which communicates with the air chamber 17, communication being controlled by a valve 18 of any suitable character and operated by any suitable means.

The outer casing 10 is further provided with a water inlet passage 21 which communicates with a port 22. This casing 11 is provided with circumferentially spaced inclined ports or passages 22, while the annular chamber 12 has located therein an electric heating element 23 which may receive current from a suitable source. The walls of the casing 11 are formed of lava or similar material so that they may be readily heated to incandescence. Conductor wires 24 may extend to the heating element 23 through a suitable insulating sleeve 25.

Air, which supports combustion, may be drawn from a suitable source of air under pressure maintained by a suitable entrance or air chamber under control of the valve 18 and if desired, the air may be suitably heated for this purpose. Air from the chamber 17 passes into the annular space 12, which forms a superheating chamber, this air coming in direct contact with the walls of the inner casing 11 which become incandescent. This superheated air passes upward and into the inner casing 11 through the openings 22, the said air passing through these openings at high speed owing to the strong draft within the inner casing. Liquid fuel passes inward through the passage 14 and mixes with an auxiliary air feed through the passage 26 and the tube 20. The tube 20 provides a cooling tube and the air passing through this tube mixes with the liquid fuel and the latter is thoroughly atomized as it enters the upper end of the inner casing 11. The space between the fuel entrance end of this casing and the openings 22 provides a vaporizing chamber V. This fuel vapor is then thoroughly mixed with

the air jets passing inward through the openings 22. Liquid fuel passing through the passage 14 is preferably fed by a time fuel pump (not shown) working synchronously with the valve 18 and when mixed with air from the tube 20 which leaves said tube at high speed, is thoroughly broken up and formed into a very fine spray which enters the vaporizing chamber V. This vapor fuel then moves very slowly and is subjected to extremely high temperature, due to the incandescence of the casing 11, so that the fuel is thoroughly vaporized and forms a very dry highly superheated mixture which due to its richness, will not burn within the vaporizing chamber. Superheated air from the chamber 12 enters the casing 11 through the openings 22 at high speed and strikes the slow moving superheated vapor mixture from the chamber V and is ignited between the openings 22 and the lower end of the casing 11 so that the interior of this portion of the casing forms a combustion chamber C. A very high temperature clean burning blue flame is thus provided which flame maintains the incandescence of the casing 11. A portion of the heat of the casing 11 also serves to superheat the air within the chamber 12. This air and the casing 11 are initially heated by the heating element 23 and after the casing 11 attains proper incandescence, the heating element 23 may be dispensed with.

The invention furnishes highly expanded products of combustion under high pressure the air for which is regulated by the valve 18', the latter furnishing complete control over the volume of pressure and heat admitted. In this manner the exact heat, degree and duration of pressure upon the piston head of the engine is completely controlled and gives the same complete control over the engine as is possible with the present type of steam engine.

The continuous feed is designed for turbine nozzles or feed chests, and the manifolds of engines requiring a continuous feed, while the intermittent or timed feed is designed for single cylinder engines.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claim.

Having described the invention what is claimed is:—

A burner of the character described comprising an outer casing, an inner casing spaced from the walls of the outer casing to define an air chamber therebetween, said inner casing being open at its lower end, said inner and outer casings having aligned fuel inlet ports at their upper ends, said outer casing adjacent the bottom thereof being formed with an annular air inlet passage surrounding the inner casing, and formed to provide a

valve chamber forming part of said passage, a valve operating in said chamber and controlling the admission of air into the annular passage, said annular passage communicating with the space between the inner and outer casings, and a heating element surrounding and supported by said inner casing, and said inner casing having an annular series of inclined ports arranged directly above the heating element.

In testimony whereof I affix my signature.
NOEL A. STEED.