

APPLICATION FILED APR. 5, 1918.

Patented Feb. 14, 1922.

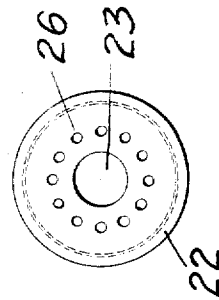


Fig. 3

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UNITED STATES PATENT OFFICE.

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COMBINATION GAS AND OIL BURNER.

1,406,238.

Specification of Letters Patent. Patented Feb. 14, 1922.

Application filed April 5, 1916. Serial No. 226,871.

To all whom it may concern:

Be it known that we, WILBUR W. STEVENSON and OWEN H. BATHGATE, citizens of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Combination Gas and Oil Burners, of which the following is a specification.

This invention relates to improvements in fuel burners and more particularly to burners of the externally mixing low pressure air type, viz. burners in which the fuel and the air do not meet until they are ejected from the burner and it is the particular object of this invention to provide a burner of this class with such attachments as to enable the burner to use either liquid fuel or gas, should such exigency arise.

Other objects of our invention will appear in the following specification in which a preferred form of our fuel burner is described.

The invention is illustrated by the aid of the accompanying drawing in which Fig. 1 is a vertical longitudinal, sectional view of our improved burner;

Fig. 2 is a transverse cross sectional view taken along the plane of line 2—2 in Fig. 1, and

Fig. 3 a plan view of a cap forming part of the burner.

Like characters of reference denote similar parts throughout the several views and the following specification.

Our device consists, broadly speaking, of a burner of the low pressure air type, means for shutting off the liquid fuel supply, and a connection to the interior of the burner for the purpose of admitting gas, and means to discharge the same at outlet of the burner as will now be more fully explained.

10 is a cylindrical casing of substantially L shape; its shorter branch 11 is threaded interiorly to receive an air supply pipe 12. The terminal of the longer branch 13 of casing 10 is threaded exteriorly at 14. A tubular chamber 15 formed by wall 16 extends through the casing 10 in axial alignment with its longer branch 13. Wall 16 connects the chamber 15 with the outer wall of casing 10 opposite its shorter branch 11 and is threaded interiorly for connection with a gas supply pipe 17.

Casing 10 is bored out, adjacent to branch 11, to receive what will be called hereafter an "oil spindle" 18. This oil spindle is of hollow construction being provided with a central duct 19, and extends through the tubular chamber 15 in central alignment therewith. 20 is an enlarged upper end of spindle 18 threaded internally to receive a spray plug 21 of the usual design employed with the low pressure air, externally atomizing oil burner. 22 is a cap screwed onto the exterior of the wall 16 and contacts with the spray plug 21 thereby forming a closure for the tubular chamber 15. Cap 22 is provided with a central opening 23 and deflecting faces 24. 26 are a number of drilled openings through cap 22. 27 is a cap adapted to screw onto the threaded end 14 of branch 13 of casing 10, which cap is provided with a central and circular opening 28 and with lugs 28^a to facilitate screwing the same onto the threaded part 14.

29 is a reduced portion of oil burner spindle 18, projecting outside of the casing 10, and is threaded exteriorly to receive a needle valve 30 of standard construction, a spindle 31 of which controls a port 32 through which oil is admitted into duct 19 of spindle 18, supplied through a pipe 33.

The operation of the device is as follows:—

Oil is admitted, as is usual with oil burners of this class, through supply pipe 33 and needle valve 30, whence it passes through duct 19 and through burner nozzle or spray plug 21 out at the front end of the burner, where it mixes with air under low pressure, forced into the casing 10 through pipe 12, which pipe is of relatively large diameter necessary to supply sufficient oxygen for perfect combustion. This air is deflected by means of cap 22 and more particularly faces 24 coacting with inner wall 27^a of cap 27 towards the spray of oil issuing from spray plug 21.

Should it be desired to change the fuel from oil to gas, the oil control valve 30 is closed and the gas supply valve (not shown) is opened. Gas then passes through the pipe 17 into the chamber 15 whence it issues through the openings 26 of cap 22, out at the front end of the burner.

It is obvious that the oil and gas features of this burner are entirely independent of

each other, and that the fuel can be instantly changed from oil to gas should such exigency occur.

Should it be desirable to discharge an extraordinarily large volume of gas, it will be noticed that by slightly unscrewing the central cap 22, opening 23 will serve as an auxiliary gas passage for that purpose.

It is understood that while we have above described our invention as applied to one kind of burner of the low pressure type, its use and application may be varied, and serve other kinds of burners as well.

Various changes in the form, proportion and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as defined in the appended claims.

What we claim as new, is:

1. In a fuel burner of the low air pressure, externally atomizing kind, a liquid fuel supply pipe extending through the burner, a gas chamber surrounding the said liquid fuel supply pipe, a spray nozzle at the terminal of the liquid fuel supply pipe, a cap contacting with and enclosing the said spray nozzle and serving as a closure

to the said gas chamber, a number of ports through said cap, and means, independent of the said liquid fuel supply pipe, to admit gas to the said gas chamber.

2. In a burner of the class described, a liquid fuel supply pipe extending through the burner, a gas chamber surrounding the said liquid fuel supply pipe, a spray plug at the terminal of the liquid fuel supply pipe, an adjustable cap serving as a closure to the said gas chamber and contacting with the said spray plug, the said adjustable cap being provided with a large central opening and a number of smaller openings for the purpose of discharging gas at the outlet end of the burner, and means at the outlet end of the burner to deflect air against the jets of gas issuing from the openings of the said adjustable cap, beyond the outlet end of the burner.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WILBUR W. STEVENSON.
OWEN H. BATHGATE.

Witnesses:

B. B. HINES,
OTTO S. SCHAIRER.