June 10, 1924. 1,497,099

G. KEITH

GAS BURNER

Filed Jan. 3, 1924

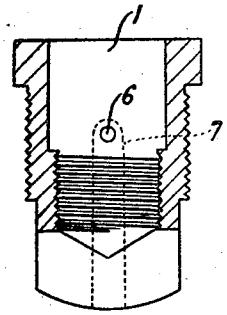


FIG. 1.

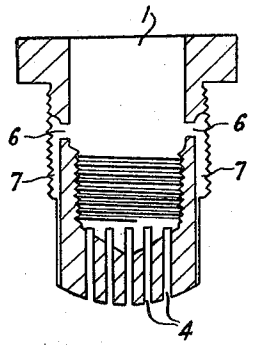


FIG. 2.

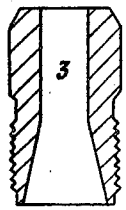


FIG. 3.

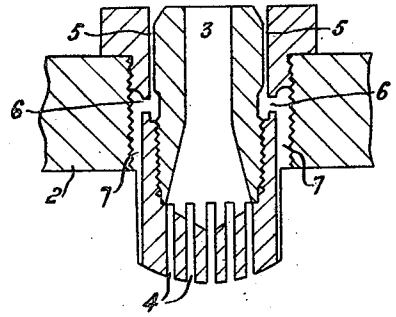


FIG. 4.

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Patented June 10, 1924. 1,497,099

UNITED STATES PATENT OFFICE.

GEORGE KEITH, OF LONDON, ENGLAND, ASSIGNOR TO JAMES KEITH & BLACKMAN COMPANY, LIMITED, OF LONDON, ENGLAND, A COMPANY ORGANIZED UNDER THE LAWS OF GREAT BRITAIN AND IRELAND.

GAS BURNER.

Application filed January 3, 1924. Serial No. 684,129.

To all whom it may concern:

Be it known that I, GEORGE KEITH, a subject of the King of Great Britain and Northern Ireland, and residing at London, England, have invented a certain new and useful Improvement in Gas Burners, of which the following is a specification.

This invention relates to gas burners, more particularly to burners designed for burning an explosive mixture of gas and air in a closed space, and has for its primary object to provide a construction of burner head which obviates liability of the high velocity flame to be blown off the burner tip, and also obviates liability to lighting back at low velocities, or explosion on extinction.

The invention consists essentially in an atmospheric gas burner head comprising a metallic cup into which is fitted a tubular liner leaving a narrow passage between the external wall of the liner and the internal wall of the cup, the bottom wall of the cup being formed with slots opening into the bore of the liner and the lateral wall of the cup being formed with a port or ports opening into the narrow passage.

In the accompanying drawing Figs. 1 and 2 are vertical sections at right angles to one another showing the cup; Fig. 3 is a vertical section showing the liner removed and Fig. 4 is a vertical section showing the parts assembled.

In the drawing 1 denotes a metallic cup having cylindrical external and internal lateral walls, both formed with screw threads, the lower portion only of the internal wall being threaded, whereby said cup 1 may be fitted to a carrier 2 forming part of the wall of the mixing chamber, and may accommodate a tubular liner 3, the external wall of which is threaded at the lower portion. The outer end of the liner 3 is preferably flush with the outer end of the cup 1; the inner end of the liner 3 is chamfered to present a flaring opening merging into the bore of the liner 3; when the liner 3 is seated, its chamfered end rests on the bottom of the cup 1. The bottom wall of the cup 1, which is preferably of substantial section, is intersected by a number of parallel longitudinal narrow saw-cut slots 4 opening into the bore of the liner.

Between the non-threaded or outer portion of the external wall of the liner and the internal wall of the cup is a narrow annular passage 5 of such dimensions as will prevent the flame of a self-burning mixture of low velocity from passing inwards. In practice, the cavity in the cup 1 is wider at the non-threaded portion than at the threaded portion, and the outer edge of the liner suitably chamfered.

A small port or ports 6 opening into the said annular passage 5 is or are formed in the lateral wall of the cup 1. To provide for the case shown in Fig. 4 where the burner head is screwed into a carrier 2 thick enough to mask the ports 6, the external threads on the cup 1 are intersected by longitudinal grooves 7 extending from the base to the ports 6.

The outer end of the cup 1 may be of polygonal form, say hexagonal, to permit the burner head to be conveniently threaded into the carrier 2 by operation of a key.

In operation, the main stream of the explosive mixture flows through the slots 4, which serve to straighten out eddies, and through the bore of the liner 3. being ignited at the exit. Fractional pilot streams also flow through the port or ports 6 into the narrow annular passage 5. The fractional stream issuing from the extremity of the passage 5 having substantially lost its velocity, the flame resulting from the combustion of such fractional stream remains alight and prevents extinction of the main stream flowing through the bore of the liner 3, even though the velocity of issue should exceed the velocity of combustion, or relights the main stream should it be momentarily blown off through any cause.

What I claim is:—

1. A gas burner head comprising a cup the bottom of which is slotted and the lateral wall of which is formed with a port, and a liner fitted within said cup presenting a tubular passage for the mixture of gas and air and leaving between the external wall of said liner and the internal wall of said cup around and above said port a narrow passageway for a small branch stream of mixed gas and air, serving as a pilot.

2. A gas burner head comprising an internally screw-threaded cup the bottom of which is slotted and the lateral wall of which is formed with a port, and a tubular liner threaded into said cup, presenting a tubular

passage for the mixture of gas and air and leaving between the external lateral wall of said liner and the internal lateral wall of said cup a narrow annular passage in communication with said port, said annular passage constituting a passageway for a small branch stream of mixed gas and air, serving as a pilot.

3. A gas burner head comprising a cup the bottom of which is slotted and the lateral wall of which is formed with a port and with a longitudinally extending groove leading to said port for passage of a pilot stream, and a tubular liner fitted into said cup, said liner presenting a tubular passage for the mixture of gas and air, leaving between the external wall of said liner and the internal wall of said cup a narrow passageway for the pilot stream passing through said port.

4. A gas burner head comprising an externally screw-threaded cup the bottom of which is slotted and the lateral wall of which is formed with a port, and with a groove intersecting the external screw-threads and leading to said port for passage of a pilot stream, and a tubular liner fitted within said cup, said liner presenting a tubular passage for the mixture of gas and air, leaving between the external wall of said liner and the internal wall of said cup a narrow annular passageway for the pilot stream passing through said port.

5. A gas burner head comprising an externally and internally screw-threaded metallic cup, the bottom of said cup being slotted and the lateral wall of said cup being formed with a port and with a groove intersecting the external screw-threads and leading to said port for passage of a pilot stream, and a tubular liner threaded into said cup with its lower end bearing on the bottom of said cup and its upper end flush with the upper end of the cup, said liner presenting a tubular passage for the mixture of gas and air, there being between the external wall of said liner and the internal wall of said cup a narrow passageway for the pilot stream passing through said port.

6. A gas burner head comprising a cup the bottom of which is intersected by longitudinal slots and the lateral wall of which is formed with a port, and a tubular liner fitted within said cup presenting an axial convergent tubular passage for a mixture of gas and air admitted by said slots and leaving between the external wall of said liner and the internal wall of said cup a narrow annular passage for a branch stream of mixed gas and air admitted by said port and serving as a pilot.

7. A gas burner head comprising a cup the bottom of which is intersected by longitudinal slots and the lateral wall of which is formed with a port and with an external longitudinal groove leading from the bottom of said cup to said port and affording a passage for a pilot stream of gas and air, and a tubular liner within said cup resting on the base of said cup presenting an axial convergent tubular passage for a mixture of gas and air flowing through said slots and leaving between the external wall of said liner and the internal wall of said cup a narrow annular passage for the pilot stream flowing through said port.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE KEITH.

Witnesses:
ISABEL ROLLO,
ANNE R. WATT.