J. HICKS.

GAS BURNER.

APPLICATION FILED OCT. 27, 1915.

1,232,921. Patented July 10, 1917.

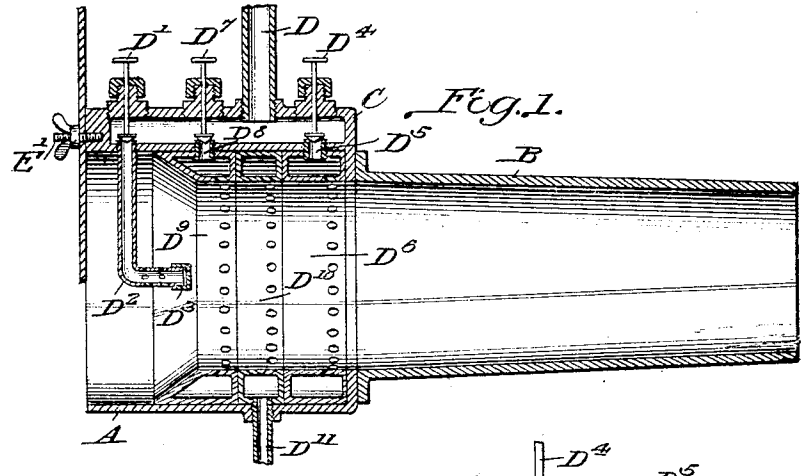



Fig. 1.

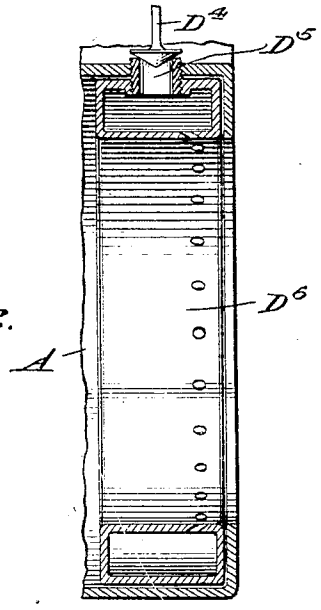



Fig. 2.

WITNESSES :-

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# UNITED STATES PATENT OFFICE.

JOHN HICKS, OF CALGARY, ALBERTA, CANADA.

## GAS-BURNER.

1,232,921. Specification of Letters Patent. Patented July 10, 1917.

Application filed October 27, 1915. Serial No. 58,288.

*To all whom it may concern:*

Be it known that I, JOHN HICKS, a subject of the King of Great Britain, and a resident of the city of Calgary, in the Province of Alberta, Canada, have invented certain new and useful Improvements in Gas-Burners, of which the following is the specifications.

My invention relates to improvements on my former patent for gas burners filed March 21st, 1914, Serial No. 826188, and Patent No. 102751, and the object of the invention is to devise a burner particularly adaptable to gas furnaces and which will produce a greater and cheaper heat than that which has heretofore been obtained by other fuels, by which the gas and air are thoroughly mixed to form a combustible mixture and adapted to various gas pressures.

A still further object of my invention is to provide means to make perfect combustion when the draft is insufficient and the gas pressure low by means of steam or air under pressure.

Figure 1, is a central longitudinal sectional view of my device.

Fig. 2, is a sectional view of one of the annular perforated tubes.

In the drawings like letters of reference indicate corresponding parts in each figure.

A, and B, is a hollow body, slightly tapered, having open ends and divided in two sections, and bolted together which forms an air tube, or mixing chamber. C is a gas reservoir cast on the side of section A. D is a gas supply pipe screwed into reservoir C. The section A is cast in such a manner as to receive the annular perforated tubes $D^6$, $D^9$ and $D^{10}$ and inclose the same.

$D^1$ is a valve screwed into the reservoir C to supply gas to $D^2$.

$D^2$ is a perforated elbow end portion screwed through the walls of section A into the reservoir C and is supplied by gas from the valve $D^1$ and is located lengthwise in the center of section A.

$D^4$ is a globe valve screwed into the reservoir C and is to supply gas to the feed pipe $D^5$ which supplies gas to the annular perforated tube $D^6$, which is inclosed by the shell or recess cast in the section A.

$D^2$ is a perforated elbow and a perforated portion.

$D^3$ is a perforated cap.

$D^5$ is a feed pipe inserted through the $D^4$ valve opening in the reservoir C and into the reservoir C and screwed through the walls of section A into the annular perforated tube $D^6$.

$D^6$ is an annular perforated tube inclosed in the recess cast in section A and is supplied by the $D^5$ portion to which it is attached.

$D^7$ is a valve screwed into the reservoir C to supply gas to $D^8$ portion.

$D^8$ is a feed pipe inserted through the $D^7$ valve opening in the reservoir C and into the reservoir C and screwed through the walls of section A into the annular perforated tube $D^9$.

$D^9$ is an annular perforated tube inclosed in the recess cast in section A and is supplied by the $D^8$ portion to which it is attached.

$D^{10}$ is an annular perforated tube inclosed in the recess cast in section A and is supplied by steam by a feed pipe $D^{11}$.

$D^{11}$ is a feed pipe screwed through the wall of section A with enlargement into the annular perforated tube $D^{10}$ and a valve for controlling the same not shown.

E is a swinging disk valve extending over the front open end of section A, to which it is pivotally connected by a set screw $E^1$. The disk valve E is swung laterally so as to admit the air to the open end of section A.

It will then be seen that when it is decided to use my burner the valves $D^1$ and $D^4$ and $D^7$ are open, the gas passing from the reservoir into the perforated elbow and perforated portion and perforated cap and the annular perforated tubes through the hollow body A and B. The rush of gas through the hollow body A and B draws the air through the opening so as to mix with the in-going stream of gas and thereby form a perfect combustible mixture. Steam or air under pressure may be used in combination with the gas in like manner.

When desired the valve $D^1$ can be closed and the valves $D^4$ and $D^7$ used for higher pressure of gas or the valve $D^1$ can be used for lower pressure as the combination can be adapted to the different pressures existing in the gas supply. The steam or air supply and the valve E may be adjusted for the same purpose.

The open ends of the gas supplies to $D^2$, $D^5$ and $D^8$ in the reservoir C are beveled to form the valve seats for the valves $D^1$, $D^4$ and $D^7$.

The perforations in the elbow $D^2$ and the

perforated portion and the perforated cap $D^8$ and the annular perforated tubes $D^6$, $D^9$ and $D^{10}$ are drilled in such manner as to insure perfect combustion. The perforated elements are drilled at an angle to their axis which gives a spiral or rotary motion to the column of air and gas while passing through the mixing chamber to the point of ignition, and with a result that a preferred combustive mixture is thrown to the center of the burner.

The perforated portion and perforated cap and the annular perforated tubes are easily detached and can be redrilled to suit various conditions encountered.

What I claim and desire Letters Patent for is:—

1. A gas burner comprising a hollow body open at both ends and constituting an air tube and mixing chamber, a plurality of hollow annuli individually and removably arranged within the tube adjacent one extremity thereof, and closely associated, each annulus being provided with a circumferential series of apertures, said body being further formed to provide an exteriorly disposed gas reservoir communicating with certain of said annuli, valves controlling said communication, a gas inlet pipe communicating with said reservoir, a steam inlet pipe communicating with one of said annuli, and a valve for controlling the opening at one end of the tube.

2. A gas burner comprising a hollow body open at both ends and constituting an air tube and mixing chamber, a plurality of hollow annuli individually removably fitted within the tube adjacent one end thereof, the outer wall of certain of said annuli having an opening registering with an opening in said tube, valve seats fitted within said registering openings, each of said annuli having an annular series of tangentially disposed openings, said tube being formed to provide a gas reservoir communicating with said annuli through the valve seats and said openings, valves controlling said communication, a gas inlet pipe communicating with said reservoir, a steam inlet pipe communicating with one of said annuli, and a valve for controlling the opening at one end of the tube.

3. A gas burner comprising a hollow body open at both ends and constituting an air tube and mixing chamber, said tube being further formed to provide a gas reservoir, a gas inlet pipe communicating with said reservoir, a plurality of annuli removably fitted within said tube adjacent one end thereof and having communication with the gas reservoir, valves controlling the communication between the reservoir and certain of said annuli, each of said annuli being provided with a circumferential series of openings disposed tangentially to the axis of said tube, a steam inlet pipe communicating with one of said annuli, a gas supply pipe leading from said reservoir and having an offset extremity disposed in parallelism with the axis of said tube, said offset extremity being perforated, a valve controlling communication between the reservoir and said supply pipe, and a valve controlling the opening at one end of said tube.

4. A gas burner comprising a hollow body open at both ends, constituting an air tube and mixing chamber, said tube being further formed to provide a gas reservoir, an intake pipe communicating with said reservoir, a plurality of hollow annuli removably fitted within said tube, certain of said annuli having communication with the reservoir, valves controlling said communication, each of said annuli having a circumferential series of openings tangentially disposed with respect to the axis of said tube, a steam inlet pipe communicating with one of said annuli, a gas supply pipe leading from said reservoir and having an offiset apertured end portion disposed in the direction of said tube, a valve controlling the communication between the reservoir and said supply pipe, a perforated cap closing the free extremity of said supply pipe, and a valve controlling the opening at one end of the tube.

In testimony thereof, I have affixed my signature this twenty-fifth day of September, A. D. 1915, before two witnesses.

JOHN HICKS.

Witnesses:
G. F. ANDERSON,
E. A. RAY.