L. D. LOVEKIN.

GAS BURNER.

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1,134,628.

Patented Apr. 6, 1915.

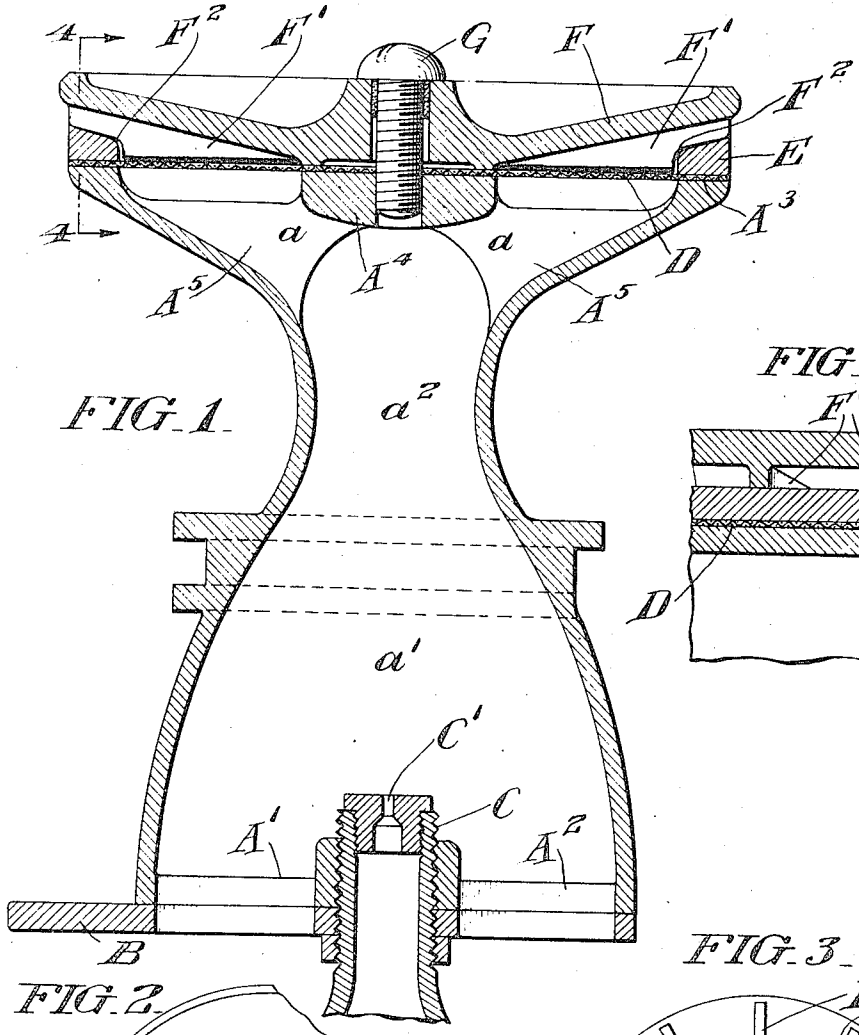


FIG. 1.

FIG. 4.

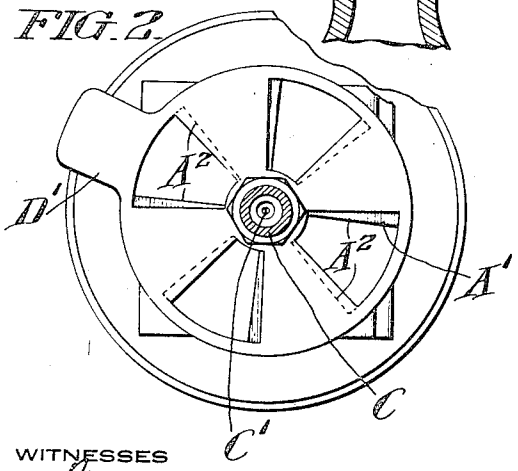


FIG. 2.

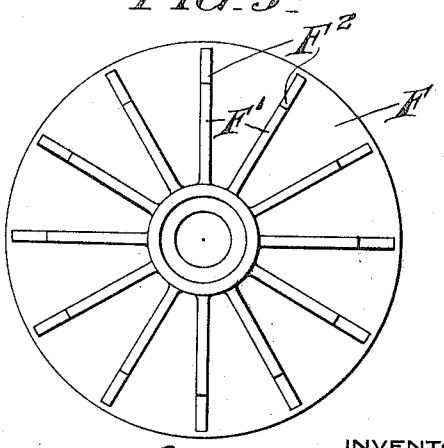


FIG. 3.

WITNESSES

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GAS-BURNER.

1,134,628. Specification of Letters Patent. Patented Apr. 6, 1915.

Application filed July 11, 1914. Serial No. 850,398.

To all whom it may concern:

Be it known that I, LUTHER D. LOVEKIN, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Gas-Burners, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My present invention consists in an improved form of gas burner of the Bunsen type.

The object of my invention is to provide a simple and effective burner of the type specified, especially adapted for domestic use, as in a water heater, in which gas is taken from lighting mains at the usual pressure and air at atmospheric pressure is mixed therewith to support combustion.

More specifically, the object of my invention is to provide a simple and efficient burner of the type and for the purpose specified, which is adapted to effect a thorough mixture of air and gas in proper proportions with varying rates of gas consumption, and will be free from back firing trouble under the varying conditions of use.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and of the advantages possessed by it, reference should be had to the accompany drawings and descriptive matter, in which I have illustrated and described a preferred form in which my invention may be embodied.

Of the drawings: Figure 1 is a sectional elevation of a preferred embodiment of my invention; Fig. 2 is an inverted plan of the burner; Fig. 3 is an inverted plan of the cap forming the upper end of the burner; and Fig. 4 is a partial section on the line 4—4 of Fig. 1.

In the preferred embodiment of my improved burner shown in the drawings, A represents the body portion of the burner casing or body. As shown, this casing is of hour glass form, and the chamber therein is formed of two portions a and a', which diminish in cross section from the ends of the casing to the orifice or short throat a^2 at which the two chamber portions a and a' meet. As shown, the lower end of the casing is partially closed by the end wall A formed with the air inlet ports A^2, and with a central passage through which the gas supply pipe C projects into the chamber a'. As shown, an apertured damper B is provided, by which the effective area of the air ports A^2 may be adjusted. It is to be observed that the gas supply pipe C, which is axially disposed with respect to the chambered casing and is directed toward the short throat or orifice a^2 through which the chamber portions a and a' communicate, terminates at an appreciable distance short of said throat or orifice. At its opposite end the casing A is thickened to provide an annular seat A^3 for the periphery of the circular screen D made of fine wire mesh. The latter is also supported at its center by the central boss or member A^4, which, as shown, is integrally connected to the casing body A by diametrically opposed fins or webs A^5. The edge of the screen D is held against the seat A^3 by the beveled ring E, and the ring E in turn is held in place in the construction shown by the cap member F, which closes the upper end of the chamber a. The member F is provided with a central portion fitting against the upper side of the member A^4, to which it is secured by means of a screw G capped into the member A^4. The portion of the cap F surrounding this central portion is slightly flared outwardly, and advantageously is provided on its under side with ribs F′, the lower edges of which engage and support the screen D. These ribs, as shown, are notched at F^2 to fit over the ring E. The ribs F′ serve to divide the mixture of air and gas issuing from the casing at the periphery of the cap F into jets which burn as they issue from the burner casing.

With the construction described, the gas jet issuing through the nozzle C′ of the supply pipe C exerts a substantial aspirating effect on the air, which is thereby sucked into the chamber a' through the ports A^2. As the air and gas pass through the short throat or orifice a^2 connecting the chambers a and a', they mix to a considerable extent. The fact that the gas jet is discharged from the supply pipe tip C′ at an appreciable distance to the supply side of the orifice, while it diminishes to some extent the aspirating effect of the gas jet, adds materially to the mixing effect occurring as the air and gas pass from the chamber a' into

the chamber a, and this mixing effect is supplemented also by the bulging or concave character of the portion of the wall of the chamber a' adjacent the contracted outlet a^2 therefrom.

While the air and gas are thus mixed to a considerable extent in their passage through the orifice a^2, the mixture is not sufficient to effect the uniform combustion necessary for the most efficient use of the gas burned. This preliminary mixing is supplemented in the burner construction shown by the mixing occurring in the chamber a, which depends for its effectiveness largely upon the shape of the chamber and the arrangement of the barrier or baffle formed by the central boss A^4. The latter is so disposed that the more rapidly moving central portion of the discharge through the orifice a^2, and which is also the portion richest in gas, impinges directly against this barrier, and is deflected outwardly and caused to thoroughly commingle with the more slowly moving and poorer gas mixture in the outer portion of the chamber a.

The outward inclination or flare given the under side of the outer portion of the member F causes the gas issuing at the periphery of the cap member F to have a desirable inclination or direction of discharge. Moreover, this avoids gas pockets within the casing of the burner, in which more or less stagnant bodies of air or gas may collect, and thereby tend to the production of back firing, especially when the consumption of gas is comparatively small. With the construction described, the air and gas mixture is caused to flow through the burner casing with such velocity, under the varying conditions of use, that there is very little tendency to back firing, even when the gas consumed is relatively very small, and even though the screen D be omitted; and, with this screen in place, back firing does not occur at all with a properly designed burner operating under the usual conditions.

While I have shown an adjustable damper B, to regulate the effective area of the air inlet ports A^2, I have found that, with the shape of the chambers a and a' illustrated, the damper B is really unnecessary, if the ports A^2 be large in aggregate cross sectional area as compared with the cross sectional area of the orifice a^2.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a gas burner, a casing formed with a chamber consisting of two portions extending from a central orifice at which they meet to the opposite ends of the chamber and each increasing in cross section from said orifice to the end of the chamber to which it extends, said casing being provided at one end with air inlets and with a central gas inlet opening within said casing adjacent said end toward, but at an appreciable distance from, said orifice, and said air inlets being large in transverse area as compared with said orifice, said casing having an end wall at its opposite end closing the latter except for burner outlets at its periphery and formed with a central barrier or baffle portion projecting into said chamber and a surrounding portion slightly flared outwardly.

2. In a gas burner, a casing formed with a chamber consisting of two portions extending from a central orifice at which they meet to the opposite ends of the chamber and each increasing in cross section from said orifice to the end of the chamber to which it extends, said casing being provided at one end with air inlets and with a central gas inlet opening within said casing toward said orifice, said air inlets being large in transverse area as compared with said orifice, said casing being formed at its opposite end with a central boss forming a barrier or baffle in front of said orifice and a removable cap covering said boss and extending from the latter to the periphery of the casing and being spaced away from the latter to provide burner outlets.

3. A gas burner comprising a casing body of hour glass form having air and gas inlets at one end and a central boss at its opposite end and a cap extending from said boss to the peripheral edge of said casing, said cap being outwardly flared and separated at its periphery from the adjacent peripheral edge of the casing body.

4. A gas burner comprising a casing body of hour glass form having air and gas inlets at one end and a central boss at its opposite end and an apertured screen extending from said boss to the peripheral edge of the casing body, and a cap also extending from said boss to the edge of the casing body, said cap being outwardly flared and spaced away from said screen and the peripheral edge of said casing body.

5. A gas burner comprising a casing body of hour glass form having air and gas inlets at one end and a central boss at its opposite end, an apertured screen extending across said opposite end of the casing body and engaging said boss and the peripheral edge of the casing body, a clamping ring holding the edge of said screen against the edge of the casing body, and a cap member clamping said screen against said boss and extending to the peripheral edge of said casing body, said cap member being outwardly flared and spaced away from said screen and ring to form an annular chamber on the outlet side of said screen which increases in thickness from said boss to the peripheral edge of the casing body and is partially restricted at its outer edge by said ring.

6. A gas burner comprising a casing body of hour glass form having air and gas inlets at one end and a central boss at its opposite end, an apertured screen extending across said opposite end of the casing body and engaging said boss and the peripheral edge of the casing body, a clamping ring for holding the edge of said screen against the edge of the casing body, and a cap member clamping said screen against said boss and extending to the peripheral edge of said casing body, said cap member comprising an outwardly flared body portion spaced away from said screen and ring to form an annular chamber on the outlet side of said screen, increasing in thickness from said boss to the peripheral edge of the casing body, and having ribs at its inner side shaped to bear against said screen and ring.

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Witnesses:
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D. STEWART.