

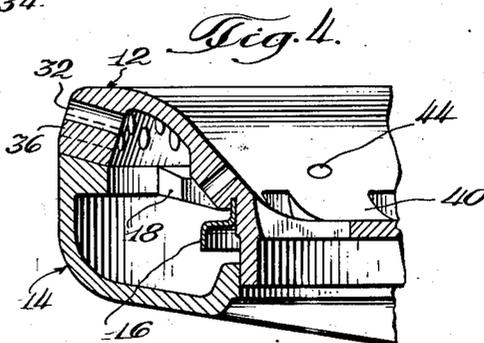
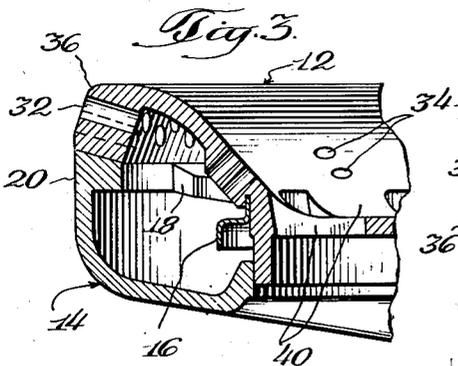
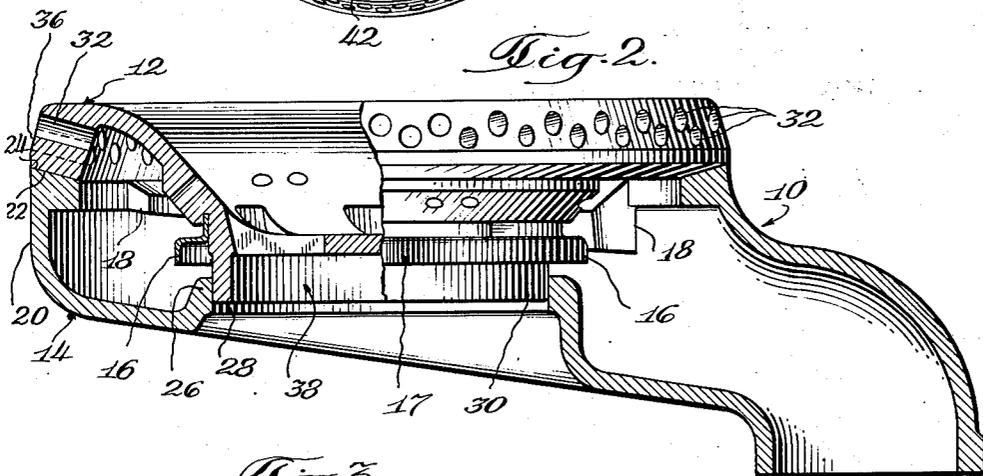
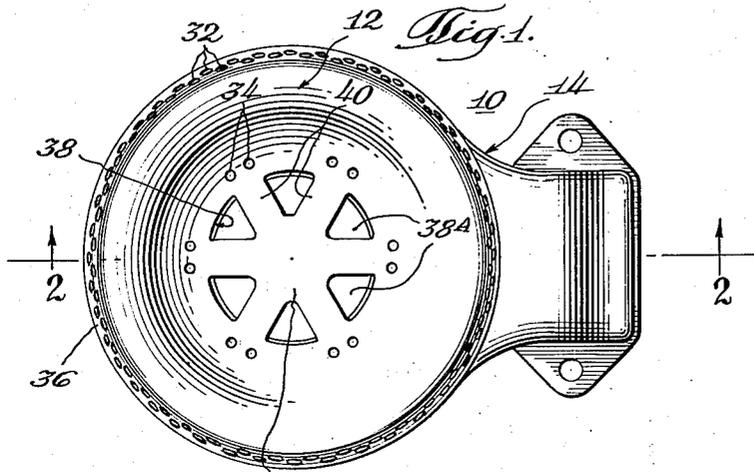
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GAS BURNER WITH SECONDARY AIR BAFFLE

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# UNITED STATES PATENT OFFICE

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## GAS BURNER WITH SECONDARY AIR BAFFLE

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The present invention pertains to a gas burner and has for its primary object the provision of a gas burner having a central opening and a series of outer and central ports, and which is so constructed and arranged that the central ports will be readily ignited from the outer ports, will be supplied with good secondary aeration, and the flames held on with high primary air injection.

A further object of the present invention is to provide a new and improved burner having both central and outer ports and in which the central ports will light over quickly from the outer ports.

A further object of the present invention is to provide a new and improved gas burner of the type having a central opening and having proper secondary aeration through the central opening without blowing flames off the ports.

A further object of the present invention is to provide a new and improved gas burner having a central opening and central ports which can be operated with high injection of primary air without causing the flames from the central ports to lift off.

A further object of the present invention is to provide a new and improved gas burner having central ports located so as to produce high efficiency and good heat distribution.

A further and more specific object of the present invention is to provide a new and improved gas burner having a central opening and central and outer ports wherein the central ports have associated therewith air baffles, preferably in the form of diametrical bars extending across a central opening and located inwardly of and below the central ports, which baffles prevent the secondary air from blowing off the flames from the ports and which provide a faster lighting of the gas issuing from the central ports from the flames at the outer ports.

Other objects and advantages of the present invention will become apparent from the ensuing description of an embodiment thereof, in the course of which reference is had to the accompanying drawing, in which:

Fig. 1 is a top plan view of a gas burner constructed in accordance with the present invention;

Fig. 2 is an enlarged cross sectional view, partly broken away, taken along the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary cross sectional view similar to Fig. 2, illustrating a somewhat different central port arrangement; and

Fig. 4 is a view similar to Fig. 3 of another central port arrangement.

Referring now to the drawing and first to Figs. 1 and 2, it will be noted that the gas burner

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is of two-part construction and includes a cap or head 12 and a base 14. The cap may be made of some suitable material such as die cast aluminum, while the base is preferably made of cast iron. The two are detachably secured together, preferably by a bayonet type securing means of a type disclosed and claimed in the copending application of Philip S. Harper, Serial No. 533,159, filed April 28, 1944, (Patent No. 2,486,278) and assigned to the assignee of this application. The securing means comprises a bayonet member 16 having oppositely extending arms 17 (only one of which is visible in Fig. 2) and secured to the cap in suitable manner, and a pair of cooperating cam defining portions of lugs 18 (only one of which is shown) which are preferably, but not necessarily, formed integrally with the outer wall 20 of the base.

The outer wall of the burner base has an inwardly sloping annular seating surface 22 forming a gas seal with a complementary seating surface 24 formed at the underside of the outer wall of the cap. The burner base has also a central inner wall 26 having a machined inner surface 28 forming with the machined outer surface 30 of the central inner wall of the cap a thermal seal, i. e., a seal which becomes highly effective as a gas seal when the burner cap is heated and expands in operation. The parts fit relatively loosely prior to heating in operation so that the cap may be readily inserted into its indicated position and then turned so as to be locked in place by the opposed arms 17 of the bayonet member 16 and the opposed oppositely located lugs 18.

The burner is of the type having a plurality of outer ports 32 and also a plurality of central ports 34 located at slightly lower level than the outer ports. It is contemplated that the outer ports 32 will be lighted first by suitable lighting means, not shown, and that the inner ports will be lighted over from the outer ports. As already indicated, the primary object of the present invention is to provide an improved arrangement of this character and especially one in which good secondary aeration will occur without the flames of the central ports being blown off and wherein the lighting of the central ports will occur quickly and wherein high injection of primary air can be used and, furthermore, to provide a gas burner wherein the central ports are located to produce high efficiency and good heat distribution.

The outer ports 32 are preferably formed by openings inclined somewhat downwardly and inwardly and passing through the outer wall 36 of the burner cap. These ports, it may be noted,

are staggered so as to provide good aeration and holding characteristics.

In accordance with the present invention, the central ports 34 have associated therewith air baffles preventing the secondary air, which rises through a central opening 38 in the burner cap, from directly sweeping by the ports at high velocity and lifting the gas issuing from the central ports or the lifting of the flames present after ignition. In the illustrated embodiment of the invention, the baffles are constituted by generally diametrical bars 40 which, for structural reasons, are united centrally as indicated by the reference character 42. The ports 34 are located inwardly of and slightly above bars and are in line with the bars, thereby preventing the secondary air from sweeping directly past the ports at high velocity. The ports are also located in pairs, thereby to enhance their "holding on" characteristics.

The size of the central opening 38, or the sizes of the individual ports 38—A thereof, is so chosen that sufficient secondary air is provided. As a result, the ports 34 are located on a larger circumference with the further result that a more uniform heat distribution over a greater area is obtained.

The baffle bars 40 reduce the velocity of the secondary air flowing past the central ports thereby preventing the secondary air from lifting the flames off and also preventing the secondary air from blowing the raw gas away from the ports which would otherwise result in the slowing down of the lighting over and even causing failure to light over. The lighting over with the arrangement of the invention occurs quickly because the bars prevent the raw gas from being blown away. The arrangement also enables good secondary aeration to be effected because the secondary air does not blow the flames off the ports. Furthermore, high injection of primary air may be utilized because the deleterious effect of the secondary air is minimized. High efficiency and good heat distribution are another attribute of the present invention, this resulting from the location of the central ports upon a greater circumference.

The embodiments of the invention illustrated in Figs. 3 and 4 are closely similar to that described above. The only differences are that in Fig. 3 the individual central ports 34 of the pairs are spaced vertically with respect to each other rather than horizontally and in Fig. 4 the central ports are constituted by single ports 44 located radially beyond and centrally above each cross bar 40.

While the invention has been described in connection with the details of three illustrative embodiments, it should be understood that such details are not limitative of the invention, except in so far as set forth in the accompanying claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. Gas burner structure, including in combination, structure defining a series of spaced apart gas ports and an opening located generally centrally of and in close proximity to the gas ports, and a series of diametrical bars extending across said opening and located inwardly of and below the gas ports.

2. Gas burner structure of the type having a central opening and central and outer gas ports concentrically arranged thereabout and wherein the central gas ports are lighted from the outer

ports, characterized in that the central gas ports are spaced apart and that diametrical bars extending across the central opening and located underneath the gas ports are provided, the central opening being dimensioned to provide adequate secondary air to the central gas ports, whereby said ports are located upon a circle of larger circumference because of the space occupied by the bars and distribute the heat over a greater area.

3. Gas burner structure of the type having a central opening and central and outer gas ports concentrically arranged thereabout and wherein the outer gas ports are at a higher level than the central ports and the central gas ports are lighted down from the outer ports, characterized in that the central gas ports are arranged in pairs and that diametrical bars extending across the central opening and located underneath each pair of ports are provided, the central opening being dimensioned to provide adequate secondary air to the central gas ports, whereby said ports are located upon a circle of larger circumference because of the space occupied by the bars and distribute the heat over a greater area.

4. Gas burner structure, including in combination, structure defining a central opening and a series of spaced apart upwardly and inwardly extending gas ports, said gas ports being in close proximity to said opening, and a series of diametric bars extending across said opening and located inwardly of and below said gas ports, said bars being generally in line with said gas ports whereby they are located underneath the ports and flames issuing therefrom.

5. Gas burner structure including structure defining a central opening and a series of angularly spaced apart upwardly and radially inwardly extending gas ports, said parts being in close proximity to said opening, and a series of angularly spaced apart non-ported baffle bars located below said gas ports and each extending a substantial distance generally radially inwardly into said opening in line with said gas ports, whereby they are located underneath the ports and flames which may issue therefrom.

6. Gas burner structure including structure defining a central opening and a series of angularly spaced apart upwardly and inwardly extending gas ports, said gas ports being in close proximity to said opening, and a series of angularly spaced apart non-ported baffle bars located below said gas ports and each extending a substantial distance into said opening in line with said gas ports, whereby they are located underneath the ports and flames which may issue therefrom.

7. Gas burner structure of the type having a central opening and central and outer gas ports concentrically located relative to the opening, characterized in that the central gas ports are located in closely spaced groups that are angularly spaced from each other, and that spaced non-ported baffles extending from the burner into said opening are located radially inward and below each group of the central gas ports to reduce the velocity of secondary air flowing past them.

8. Gas burner structure of the type having a central opening and central and outer gas ports concentrically located relative to the opening, characterized in that the central gas ports are located in pairs and the pairs are angularly spaced from each other, one port of each pair being above the other, and that spaced non-

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ported baffles extending from the burner into said opening are located radially inward and below each pair of the central gas ports to reduce the velocity of secondary air flowing past them.

9. Gas burner structure of the type having a central opening and central and outer gas ports concentrically located relative to the opening, characterized in that the central gas ports are located in pairs and the pairs of ports are spaced from each other, one port of each pair being closely spaced horizontally relative to the other, and that angularly spaced non-ported baffles extending from the burner into said opening are located radially inward and below each pair of the central gas ports to reduce the velocity of secondary air flowing past them.

10. Gas burner structure, including in combination, top structure having a central opening and a generally upwardly and outwardly flared top portion, said top portion having a series of angularly spaced apart groups of gas ports extending generally upwardly and inwardly and located in close proximity to said opening, and a series of angularly spaced apart baffles in said opening, said baffles being located below said gas ports and extending generally radially inwardly into said central opening in line with said gas ports, the central portions of said baffles being united to each other and the outer portions of each baffle being integral with and smoothly merged at its upper surface into the flared top structure, said baffles being of solid construction, relatively thin vertically and of a width corresponding generally to the angular extent of a group of the gas ports.

11. Gas burner structure, including in com-

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5 bination, top structure having a central opening and a generally upwardly and outwardly flared top portion, said top portion having a series of angularly spaced apart groups of gas ports extending generally upwardly and inwardly and located in close proximity to said opening, and a series of angularly spaced apart baffles in said opening, said baffles being located below said gas ports and extending generally radially inwardly a substantial distance into said central opening in line with said gas ports, the outer portions of each baffle being integral with and smoothly merged at its upper surface into the flared top structure, said baffles being of solid construction, relatively thin vertically and of a width corresponding generally to the angular extent of a group of the gas ports.

CHARLES C. LAMAR.  
VINCENT C. PETERSON.

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