Jan. 9, 1951 E. H. MUELLER 2,537,692

GAS BURNER WITH VARIABLE PORT SIZE

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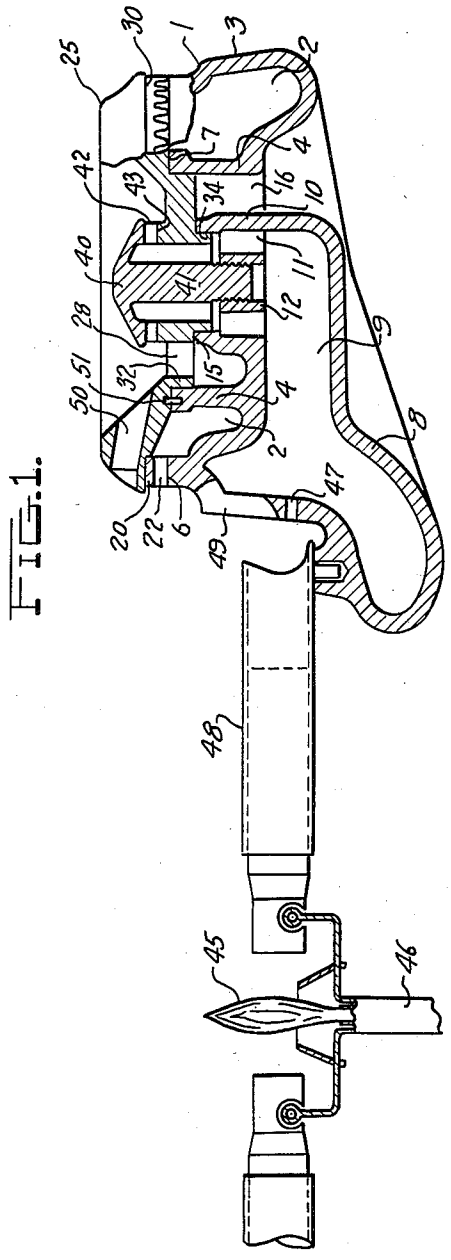


FIG. 1.

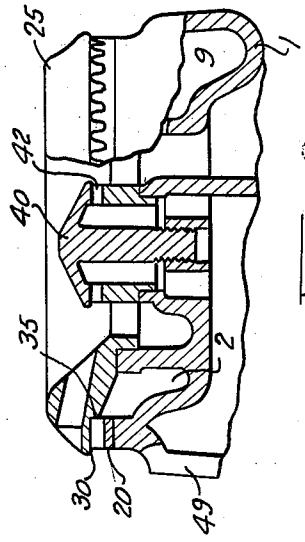


FIG. 2.

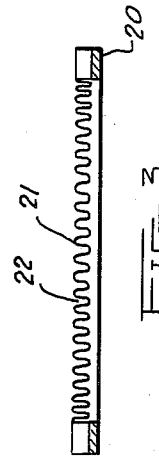


FIG. 3.

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FIG. 4.

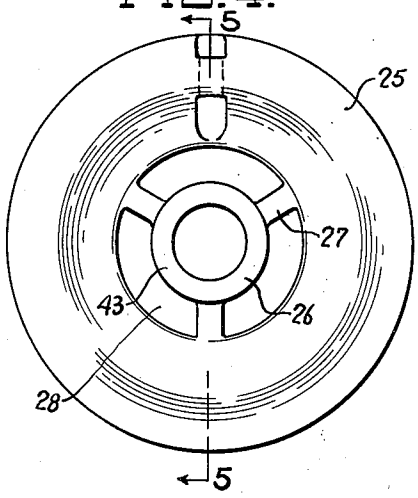


FIG. 5.

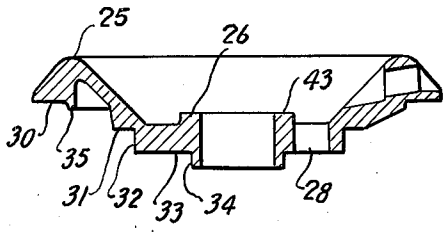


FIG. 6.

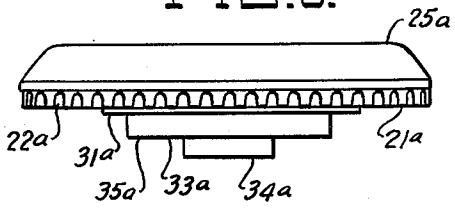
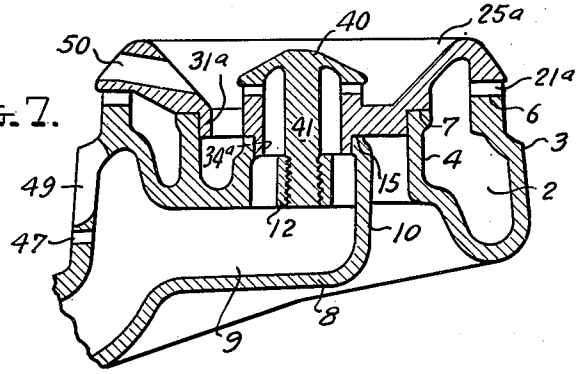


FIG. 7.



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GAS BURNER WITH VARIABLE PORT SIZE

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2 Claims. (Cl. 158—116)

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This invention has to do with a gas burner and it is concerned particularly with a gas burner structure especially useful on gas ranges.

Among the objects of the invention is to provide an improved double-burner construction. In such a construction, two gas passageways are necessary for conducting gas to the constituent burner sections and with this arrangement, the burner body and the burner cap must have mating or interfitting surfaces at two or more locations to provide gas sealing joints. The present invention contemplates an arrangement where at least some of these locations embodies relatively telescoping parts so that the tolerances of manufacture need not be held to such close limits. Another object of the invention is to provide a burner, either single or double, comprised of component parts which facilitates manufacture and which lowers manufacturing costs, and to this end an element constituting the ports, through which gas flows for supporting a flame at each port, is formed as a separate piece arranged to be assembled with the other portions of the burner.

A further object of the invention is to provide a burner which, although it embodies a single structure, may be used with gases of different types or under other variable conditions where the burner ports are required to be of different sizes. To this end, a separate port ring is provided and which is reversible as to position. When assembled in one position, relatively large burner ports are provided; when assembled in another position relatively smaller burner ports are provided, one of the other elements of the burner construction cooperating with the separate burner ring to provide this result. The invention is disclosed by the structures shown in the accompanying drawing:

Fig. 1 is a view largely in cross section showing a burner constructed in accordance with the invention and showing a lighter arrangement.

Fig. 2 is a partial sectional view similar to Fig. 1 showing the port ring reversed as to position.

Fig. 3 is a cross sectional view of the port ring.

Fig. 4 is a top plan view of the cap of the burner.

Fig. 5 is a cross sectional view taken substantially on line 5—5 of Fig. 4.

Fig. 6 is a view of a modified form where the burner ports are formed in the cap.

Fig. 7 is a cross sectional view of a burner which embodies the cap structure shown in Fig. 6.

The burner shown in Fig. 1 has a body portion

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which may be of cast ferrous metal and which is generally indicated at 1 having an outer gas passage or channel 2 defined by an outer wall 3 and an intermediate wall 4. The wall 3 has a peripheral upper or top surface 6 while the wall 4 has an upper top surface 7. These surfaces are smooth. The body is formed as at 8 to provide a gas passage 9 and has an inner circumferential wall 10. Integrally formed with the inner wall is a spider construction 11 having a central ring formation 12 which is internally screw threaded. The circumferential wall 10 has an upper surface as indicated at 15. The body is formed to provide several air passages 16 between the intermediate wall 4 and the inner wall 10.

A port ring, as shown in Fig. 3, comprises an unbroken ring structure having a back 20 and having a multiplicity of projections 21 thereon which form intervening ports 22. This port ring may be disposed on the surface 6 with the projections extending downwardly and resting on the surface 6 and with the back portion 20 positioned upwardly as shown in Fig. 1.

A cap structure applicable to the burner body is shown in Fig. 4. It comprises a ring-like body 25 with an interior hub 26 connected to the ring by bars 27 thus leaving passages 28. This cap, as shown in Fig. 5, has an underface 30 and a second underface 31. Inwardly of the face 31 is a projecting portion 32 and inwardly therefrom is a face 33. Inwardly from the face 33 is another projecting portion 34. Positioned inwardly from the outer face 30 is a flange 35. The cap is applicable as shown in Fig. 1, with the face 30 designed to mate with the port ring; the face 31 is designed to mate with the upper surface 7 of the intermediate wall 4 while the face 33 is designed to mate with the upper surface 15 of the inner wall 10. With this construction, the cap 25 can be made of various grades of metal, such as a die cast metal, cast iron, forging or other formed metal, and it may not be of the same metal as the port ring. The port ring can be of any desired metal and can be formed by die casting, stamping, or crimping.

Now, it will be seen that, when the cap is applied to the body, the gas passages 2 and 9 should be sealed. It will at once be appreciated that in order to have the cap seat solidly on the walls 4 and 10 that the manufacturing tolerances must be held exceedingly close. To avoid this necessity and thereby lower the manufacturing cost, the circumferential shoulder 32 telescopingly fits within the wall 4; the circumferential shoulder

34 telescopingly fits within the wall 10. The parts are arranged for a nicety of telescoping fits in both locations to provide an adequate gas seal. Therefore, if there is a slighly improper fitting engagement between the surfaces 30, 31 and 33 of the cap, with the port ring and with the walls 4 and 10 of the body, a gas sealing arrangement for the passages 2 and 9 are nevertheless obtained.

The parts are held in assemlby by a center piece 40, somewhat in the nature of a button which has an extending central portion 41 with a screw threaded engagement with the central portion 12 of the body. The member 40 is provided with a number of projections similar to those on the port ring, as shown at 42, which engage the upper surface 43 of the cap to thus form ports through which issues the gas flowing through the passage 9.

In the assembly, as shown in Fig. 1, the back 20 of the port ring lies substantially against the surface 30 and as the center member 40 is screwed into position, the cap is tightened against the body. It is relatively unimportant which surface, as between the surface 33, the surface 31 and the surface 30 of the cap binds with the greatest pressure due to the telescoping seals. In other words, the extremely close tolerances as to the positions of the three surfaces 30, 31 and 33 of the cap and the surfaces 6, 7 and 15 of the body need not be maintained.

As shown in Fig. 1, the burner may be ignited through the means of a pilot flame 45 supplied with gas by a conduit 46. When gas is supplied to the passage 9, some of the gas flows out through port 47 and flows through the flash tube 48. The gas is ignited by the flame and the resultant flash back ignites gas issuing from port 47. Gas also issues through a slot 49 and a flame is ignited. Some of the gas issuing through the ports 42 flows through a guide passage 50 and is ignited by the flame issuing from the slot 49. This ignition chains back through the passage 50 and ignites the gas issuing from ports 42. When gas is supplied to the chamber 2, the gas issues through ports 22 and is ignited by the flame issuing from slot 49 with the ignition chaining around the circumference of the burner. For the purpose of properly locating the cap, with respect to the flash tube, there is preferably a locator pin 51 which may be integral on the cap for engaging in a recess in the body.

In Fig. 2, an assembly is shown wherein the port ring is reversed. The burner body, the cap, the center piece, and the port ring are all the same and the same reference characters are applied thereto. In this case, it will be noted that the back 20 of the ring rests upon the burner body and that the projections 21 extend upwardly. The flange 35 lies directly inside the port ring and it will be noted how the flange partially overlies the ports 22 and thereby reduces the effective size of the ports. The burner ring may be thus reversed for use with a gas different from that where the burner is placed, as shown in Fig. 1, or where other conditions are different or variable as to require smaller burner ports.

As shown in Figs. 6 and 7, the burner is modified, in that there is no separate port ring. In this case, the ports are formed integrally with the cap. The burner body is the same and has the same reference characters applied but the cap 25*a* is formed with integral downwardly extending projections 21*a* which form ports 22*a*. The cap is otherwise formed with the telescoping extension 34*a* and the intermediate extension 35*a* for telescoping fit with portions of the body, and surfaces 33*a* and 31*a* for mating with the surfaces 15 and 7 of the burner body and, in this case, the ends of the projections 21*a* seat upon the upper surface 6 of the outer wall 3. Here again it will be seen that the maintenance of extremely close tolerances, relative to the position of the surfaces 33*a* and 31*a*, and the ends of the projections 21*a* of the cap, and as to the positions of the upper surfaces of the walls 10, 4 and 3 of the burner, is not necessary due to the telescoping interfit between the portions of the cap and the burner body as shown in Fig. 7.

I claim:

1. A gas burner comprising, a body formed with a chamber therein for the flow of gas and having an upstanding wall partially defining the chamber, said wall having an upper surface, a cap for fitting on the body, said cap having a surface complemental to the said surface of the wall, a separate port ring disposed between the surface of the wall and the complemental surface of the cap, said ring having a circumferential back portion and a plurality of substantially radially disposed projections thereon with spaces therebetween, the cap having a shoulder disposed inwardly from said complemental surface substantially engaging the back of the port ring when the port ring is positioned with the projections facing said surface of the wall of the body, said port ring being reversible so that the back of the port ring faces said wall and said shoulder partially obstructs the spaces between the projections to thereby provide relatively smaller ports.

2. A gas burner comprising, a body member having an upstanding wall, a cap member fitting on the body member, said body member and cap member forming a gas flow chamber therebetween, the body member and cap member having spaced complemental surfaces, one of the members having a circumferential shoulder adjacent its complemental surface, a separate port ring having a circumferential back and a plurality of spaced projections, said port ring being disposed between the complemental surfaces and forming ports for the issuance of flame supporting gas, relatively large ports being provided when the back of the port ring is positioned adjacent said circumferential shoulder and relatively small ports being provided when the port ring is reversed in position with the circumferential shoulder restricting the port spaces between the projections.

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