R. R. JAMES.

BURNER.

APPLICATION FILED FEB. 24, 1913.

1,156,845. Patented Oct. 12, 1915.

Fig. 2.

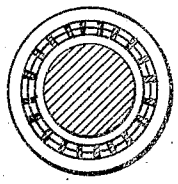


Fig. 4.

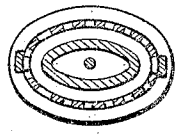


Fig. 6.

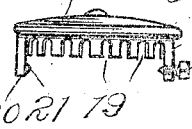
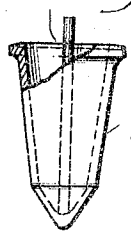


Fig. 5.



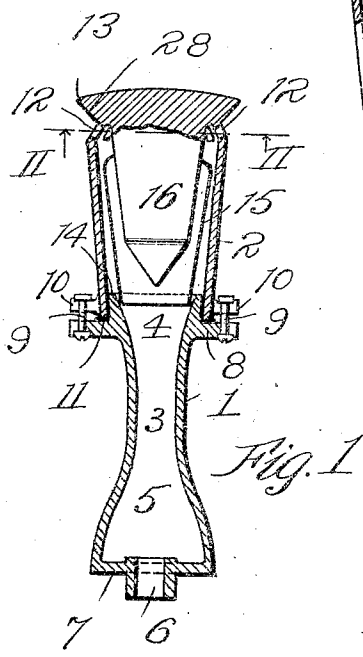


Fig. 1.

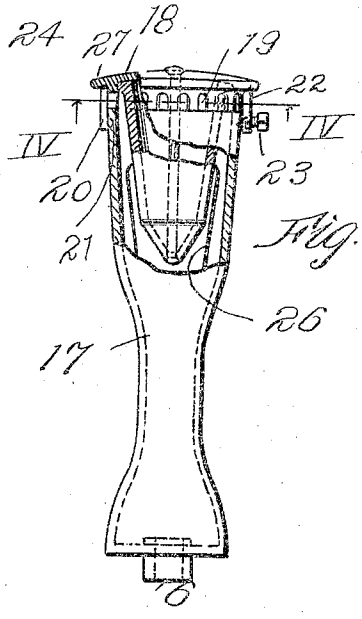


Fig. 3.

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1,156,845. Specification of Letters Patent. Patented Oct. 12, 1915.

Application filed February 24, 1913. Serial No. 750,335.

To all whom it may concern:

Be it known that I, RICHARD R. JAMES, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Burners, of which the following is a full and clear specification.

This invention relates to gas and vapor burners and has for its primary object to provide an improved construction, combination, and arrangement of parts in a device of this character, by means of which the danger of back firing is positively and completely eliminated, and by means of which the air and gas or vapor are thoroughly intermixed and commingled under various pressures and conditions of the gas or vapor supply.

A further object is to provide an improved construction contemplating a maximum degree of simplicity, durability and economy.

Other and more specific objects will appear in the specification and be pointed out in the appended claims, reference being had to the accompanying drawings, in which,

Figure 1 is a vertical section of one embodiment of my invention, parts being broken away and parts shown in elevation; Fig. 2 is a section on the line II—II, Fig. 1; Fig. 3 is an elevation of another embodiment of my invention, parts being broken away and parts shown in section; Fig. 4 is a section on the line IV—IV, Fig. 3; Fig. 5 is an elevation of the modified form of baffle or spreader detached, parts being broken away and parts shown in section; Fig. 6 is a side elevation of the modified form of cap detached.

Referring more particularly to the drawings, and first to the embodiment shown in Figs. 1 and 2, the shell within which the mixing chamber is formed, consists of a lower portion 1 and an upper portion 2. Said lower portion of the shell comprises a central neck 3 which is flared upwardly at 4 and flared downwardly at 5 into the enlargement at the lower end of the mixing chamber into which the gas or vapor passes through the inlet 6 and the air through the ports or openings 7. Adjacent the upper end of the lower portion 1, said lower portion is provided with a flange 8 with oppositely disposed slots for the reception of bolts 9, which serve to releasably secure the upper portion 2 of the shell in position upon the lower portion 1. For this purpose said upper portion is provided adjacent its lower end with bifurcated lugs 10 to adapt the bolts 9 to draw the cap of upper port 2 down on to a gasket 11 which effects a tight joint. Adjacent the upper end of the cap or upper portion 2, are arranged a plurality of discharge orifices 12, said orifices being immediately below an overhanging flange or ledge 13 which shield the orifices from the moisture of condensation from the water tubes of water heaters with which the burner is well adapted to be used. The cap 2 is preferably slightly reduced in cross-section toward its lower end to fit snugly around a flange 14 on the upper end of portion 1. Seated within the flared passage 4 of the lower portion 1 is a perforate screen 15 which is thus disposed intermediately of the inner wall of the mixing chamber and a baffle or spreader 16, which depends from the top wall of cap 2. The screen 15 is deflected inwardly and interlocks with the baffle or spreader 16. Said screen forms an annular passage around the baffle or spreader 16, the contracted passage thus formed serving to direct the mixture of air and gases or vapors, directly to the screen 15 and to an enlarged area of said screen by which the air and gas or vapor is forced into more intimate mixture by a well kn[illegible]n principle. The discharge subchamber or passage on the outside of screen 15 is an annular chamber of small volume through which the gas or vapor mixture flows in an uninterrupted current and should the gas or vapor supply partially or wholly fail, the larger portion of the mixing chamber is separated from the flame without the burner, by a narrowed passage leading from the screen, making it substantially impossible for the screen 15 to become sufficiently incandescent to fire the gaseous mixture within.

In the embodiment shown in Figs. 3, 4, 5 and 6, the lower portion 17 of the mixing shell is made relatively long and surmounted by a cap 18 having a depending flange provided with discharge orifices 19. Said depending flange constitutes a substantial continuation of the lower portion 17. At one end of cap 18 is a depending lug 20 provided with a spur 21, which engages an indentation in the outer wall of lower portion 17. On the other end, the cap 18 is provided with a depending lug 22 within which is threaded a screw 23 which is adapted to co-

operate with the spur 21 in holding the cap 18 in position. The baffle or spreader in this embodiment is constructed as a separate hollow casting 24 having a central supporting bolt 25 which passes through a central aperture in the cap 18 and is riveted above. The perforate screen 26 in this embodiment is disposed lower within the mixing chamber, thus adapting the baffle or spreader to be set closer to the inner wall of the mixing chamber. The orifices 19 discharge horizontally and radially from beneath the overhanging flange 27. In the embodiment shown in Figs. 1 and 2, the top of the casting which constitutes portion 2 of the shell, is beveled upwardly at 28 to correspond to the upwardly opening orifices 12. In connection with the embodiment shown in Figs. 3, 4, 5 and 6, in which the parts are made generally oval in cross section as indicated in Fig. 4, the volumes of air and gas or vapor are deflected more nearly into a common plane of flow, thus increasing the tendency toward intimate mixture of the air and gas or vapor.

What I claim is:

1. In a burner, a mixing chamber provided with discharge orifices, a baffle extending across said orifices to form contracted passages leading thereto, said baffle being arranged to diverge from the inner wall of said discharge chamber, and a perforate screen substantially parallel to said baffle and between it and the inner wall of said chamber.

2. A burner provided with a mixing chamber and with discharge orifices adjacent the upper end of said chamber, a perforate screen extending around the inner wall of said chamber, said screen being spaced therefrom to form a discharge chamber communicating with said orifices, and a baffle or spreader depending from the top wall of said burner intermediately of said orifices and within said screen, said baffle or spreader being thus adapted to form a contracted passage between itself and said perforate screen.

3. In a burner, the combination with a shell, comprising a lower portion adapted to be connected up with a gas supply pipe and an upper portion, said shell being provided with an overhanging flange and a plurality of circumferentially arranged discharge orifices below said flange, of a baffle or spreader depending from the upper portion of said shell between said orifices to form a contracted passage leading to said orifices, said shell portions being releasably connected, and a perforate screen surrounding said baffle or spreader.

4. In a burner, the combination with a shell, comprising a lower portion adapted to be connected up with a gas supply pipe and an upper portion, said shell being provided with an overhanging flange and a plurality of circumferentially arranged discharge orifices below said flange, of a baffle or spreader depending from the upper portion of said shell between said orifices to form a contracted passage leading to said orifices, said shell portions being releasably connected, and a perforate screen surrounding said baffle or spreader, said screen being secured in position by means of said baffle or spreader.

5. A burner provided with a mixing chamber having laterally discharging orifices, a baffle or spreader depending between said orifices and forming with the inner wall of said chamber a passage leading to said orifices, and a perforate screen extending through said passage between the inner wall of said chamber and said baffle or spreader.

6. In a burner, a mixing chamber, provided with discharge outlets adjacent its upper end, a screen extending longitudinally of said chamber, said screen being spaced from the inner wall of said chamber and terminating adjacent said discharge outlets, and a baffle depending from the top wall of said chamber across said discharge outlets and into the space within said screen.

7. In a burner, a mixing chamber provided with discharge outlets adjacent its upper end, a screen extending longitudinally of said chamber, said screen being spaced from the inner wall of said chamber and terminating adjacent said discharge outlets, and a baffle depending from the top wall of said chamber across said discharge outlets and into the space within said screen, the portion of said baffle which depends into the space within said screen being spaced from said screen.

RICHARD R. JAMES.

Witnesses:
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FRED W. SANES.