

Jan. 30, 1923.

1,443,338

W. J. BARBER.
GAS BURNER.
ORIGINAL FILED MAR. 8, 1920.

2 SHEETS-SHEET 1

Fig. 1.

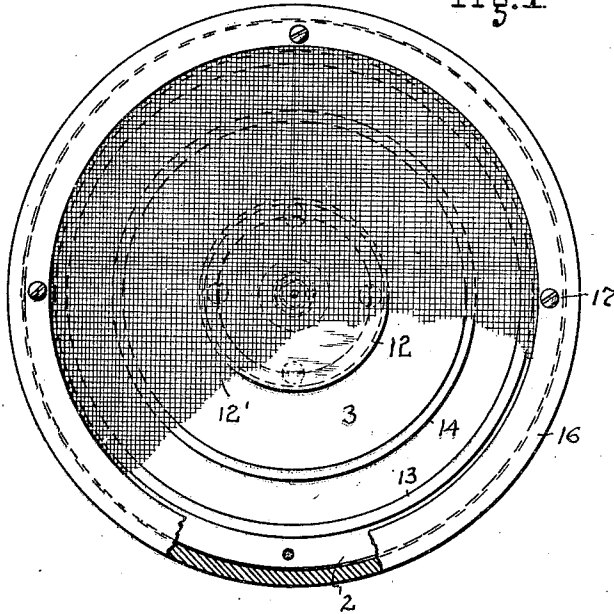
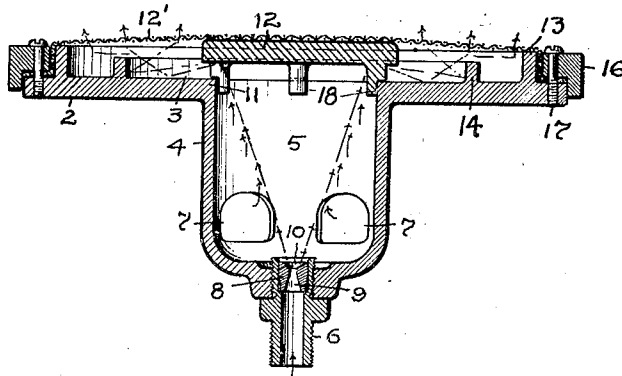


Fig. 2.



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2 SHEETS-SHEET 2

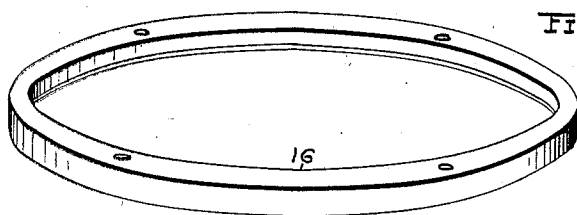


Fig. 3.

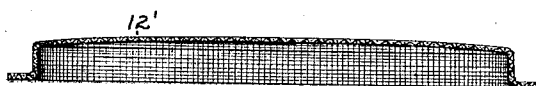


Fig. 4.

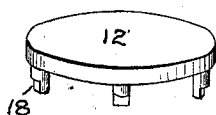


Fig. 5.

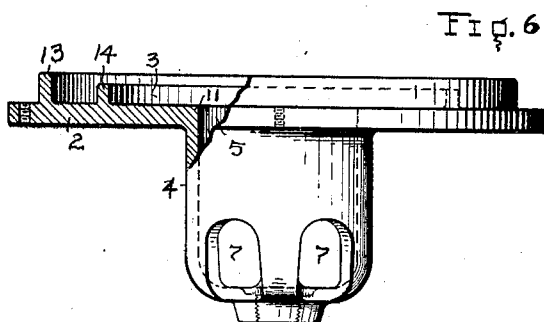


Fig. 6.

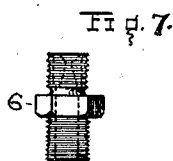


Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM J. BARBER, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO EDWARD M. KLINE, OF CLEVELAND, OHIO.

GAS BURNER.

Application filed March 8, 1920, Serial No. 363,986. Renewed June 26, 1922. Serial No. 570,935.

To all whom it may concern:

Be it known that I, WILLIAM J. BARBER, a citizen of the United States, residing at Cleveland in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Gas Burners, of which the following is a specification.

My invention pertains to an improvement in gas burners, and my present object is to provide a gas burner adapted to promote uniform combustion over an extensive area of finely-woven wire screen. To accomplish the desired result I provide means for discharging gas on diverging lines and in a circle against a deflector which is adapted to spread the gas laterally into an annular gas distributing chamber having additional means therein to diffuse and spread a combustible mixture beneath the bottom of the screen.

In the drawing accompanying this application, Fig. 1 is a plan view of the burner with a portion of the screen and clamping ring broken away. Fig. 2 is a vertical section centrally through the burner. Fig. 3 is a perspective view of the clamping ring. Fig. 4 is a cross section of the burner screen. Fig. 5 is a perspective view of the spreader disk. Fig. 6 is a side elevation, partly in section, of the burner body, and Fig. 7 is a side view of the gas nipple or supply connection.

The present gas burner is especially designed for use in domestic cooking stoves or ranges having open grids upon which a pan or other cooking utensil is adapted to rest. To provide an effective body of flame beneath the larger utensils the burner must be constructed to spread or to diffuse the flame over an area approximately 4 to 6 inches in diameter. To obtain an effective and wide spreading flame with a woven-wire screen I have found it necessary to provide special means within the burner to diffuse the combustible mixture.

Thus, the burner comprises a round flat body 2 having a shallow annular chamber 3 on its upper side and a tubular extension 4 at its bottom side which is adapted to provide a mixing chamber 5 for gas and air. The gas is discharged upwardly through a nipple or gas supply connection 6 which is screwed centrally into the closed bottom end of extension 4 and the air is entrained through openings 7 in the side wall of ex-

tension 4 at points adjacent the discharge end of the nipple. A plug 8 wedged within the upper end of the nipple or tube 6 has a central orifice of relatively small diameter through which the gas is discharged and the plug is drilled or otherwise formed with an elongated tapering entrance 9 and a shallow flaring outlet 10 on opposite sides of the orifice 8, whereby in operation the gas is caused to issue on diverging lines and in a circle upwardly through mixing chamber 5. Attention is called in this connection to my application Ser. No. 363,984, filed March 8, 1920, in which the subject matter of the tube 6 and nipple 8 is claimed. The angle of discharge may be varied by slight changes in the formation of the gas passage in plug 8, but in a burner having the proportions substantially as shown in the drawings, the diverging line of travel of the gas through mixing chamber 5 will cause the gas to pass through the upper mouth of the chamber in close proximity to the corner edge 11 thereof, and by placing a spreader plate or disk 12 opposite said mouth and at a slight distance above or apart from the bottom of chamber 3 the gas will strike the bottom side of plate 12 and thence the gas will be deflected laterally into chamber 3 where it will rise and be discharged through the multitude of fine openings in the burner screen 12' which completely covers the top of shallow chamber 3. This screen is made of finely-woven wire to provide openings or interstices small enough to prevent back-firing, and in a burner having a chamber 3 of extended width or diameter the gas or combustible mixture tends to pass through the burner screen in segregated areas usually in the form of a ring which is not coextensive with the full width of the screen between the edge of the disk 12 and the outer annular flange 13 of body 2. To overcome this diverse or uneven distribution of the combustible mixture and to promote a uniform and even discharge of the mixture through the entire area of open mesh I provide an upright flange or rib 14 annularly within the bottom side of chamber 3 at a point intermediate the circumference of disk 12 and body flange 13, and the height of this intermediate rib 14 is such that the chamber 3 is entirely open beneath the screen between disk 12 and body flange 13. In effect rib 14 acts as a baffle and diffusing member for the gas and combustible

mixture which is caused to spread laterally and in a circle from beneath the outer edge of deflector disk 12, and a portion of this mixture is arrested or deflected toward the inner central portion of the screen adjacent the circumference of the deflector disk as well as being deflected outwardly toward and to the extreme outer diameter of the screen adjacent body wall 13, and in practice the entire bottom area of the screen is traversed by the mixture and passes upwardly through the screen through all the interstices or meshes to promote uniform combustion outside and in close proximity to the screen over the entire circular area between the borders of the burner and the central disk 12. The flame is vari-colored—green, violet, and blue, tinged with orange, and burns in the form of a wide ring above the screen and at a high degree of temperature. Varying pressures on the gas supply do not appear to materially effect combustion except to raise and lower the flame, and a more intense heat is obtained with this burner than with the other burners in common use in cook stoves and ranges.

Notwithstanding the high temperatures derived by this burner I find that the screen is not materially affected by the heat but that the screen when made of the proper material has a long life. However, as the openings and interstices are necessarily fine and small the screen is apt to become clogged when a cooking utensil is tipped over or overboiling occurs with certain materials, and therefore the burner screen is removably clamped in place upon the burner body by a separate ring 16 and screws 17 to facilitate removal and cleansing of the screen. The screen also rests at its center upon disk 12 and is held under sufficient tension by the clamping ring 16 to prevent it from warping or buckling. I prefer also to make the spreader plate or

deflector disk 12 a separate removable member having notched feet 18 adapted to hold the plate or disk centrally in place upon the body opposite the mouth of mixing chamber 5.

What I claim is:

1. A gas burner, having a shallow distributing member for a combustible mixture, a woven wire burner screen forming one wall of said chamber open into said distributing chamber, a deflecting member within said distributing chamber opposite said mixing chamber, means to discharge gas into said mixing chamber against said deflecting member, and means within said distributing chamber to diffuse the combustible mixture uniformly beneath said screen.

2. A gas burner, comprising a chambered body having a mixing chamber at its bottom provided with a gas supply connection, a deflector member mounted opposite said gas supply connection, a woven wire screen removably mounted upon said body and deflector member and an annular gas diffusing rib within said body beneath the screen adjacent said deflector member.

3. A gas burner, comprising a round body having a shallow chamber in its top and a tubular extension at its bottom and provided with an annular rib within the bottom side of said chamber, a removable screen mounted upon said body forming one wall of said chamber, a gas deflecting disk seated centrally beneath said screen within said chamber opposite said tubular extension, and a gas discharge nipple centrally seated within said extension and adapted to discharge gas on diverging lines in a circle against said deflector disk.

Signed at Cleveland, in the county of Cuyahoga, and State of Ohio, this 1st day of March, 1920.

WILLIAM J. BARBER.