My invention relates to gas burners for heating appliances, and the present burner is an improvement in the burner shown and described in Letters Patent of the United States, granted to me, November 3, 1926, No. 1,560,248. Reference may also be had to my pending applications for improvements in gas burners, Serial Nos. 99,213 filed April 2, 1926, now Patent No. 1,601,607, issued November 13, 1928, and 105,436, filed April 29, 1926, now Patent No. 1,728,180, issued August 6, 1929, respectively. In general my object is to combine an air and gas commingling tube of small dimensions, such as shown and described in my Letters Patent aforesaid, with a second mixing and delivering tube of larger dimensions. The larger tube is constructed to baffle the discharge from the small commingling tube and to divide and deliver the mixture to a plurality of discharge jets or nipples, all as hereinafter shown and described and more particularly pointed out in the claims.

In the drawings accompanying this application, Fig. 1 is a sectional view vertically of a gas burner unit embodying my improvement, and Fig. 2 is a section on line 2-2 thereof. Fig. 3 is a side elevation of the forked delivery head, and Fig. 4 a side elevation of the commingling tube for said head. Fig. 5 is a top view of a circular gas burner having a series of my improved gas burner units mounted rotatably thereon. Figs. 6 and 7 are sectional views of modified forms of the invention.

The invention comprises a small air and gas commingling tube—A—having a screw-threaded extension 2 adapted to connect with a gas distributing manifold 3 of any desired form or shape. The main body of tube—A—is cylindrical and adapted to support a hollow forked member—B—. Tube—A—contains a small gas orifice 4 in its base adapted to jet a fine stream of gas at high velocity through the main bore 5 of the tube into hollow member—B—, and the sides of the tube contain lateral air intake openings 6 adjacent the outlet end of orifice 4 through which streams of air of definite size may be entrained by the rapidly moving gas stream. Bore 5 of tube—A—is only about seventy-three seconds of an inch in diameter, and its length is about one inch. The flow of air through this small tube is definitely restricted by making the air intake openings 6 smaller in diameter than bore 5 of the tube. In that way the air and gas may be discharged constantly in definitely fixed proportions into hollow member—B—. The gas stream is discharged from the mouth of tube—A—with considerable force, which discharge is so great under maximum pressure conditions of supply that no flame can be maintained beyond the mouth of the tube in the absence of hollow member—B—. This member is therefore formed with a curved baffle wall 7 opposite the mouth of tube—A— to intercept the stream of gas and cause it to spread within the hollow member. Baffling also produces a thorough intermix of the gas and air within the hollow member, and the combustible mixture is divided and caused to flow with reduced speed through the branching passages 8—8 before escaping at their outlets or tips 9—9 where combustion occurs. Member—B—is adjustable vertically upon tube—A—to regulate the force of impact and spreading movement of the gas stream within hollow member—B—and to promote proper admixture of air and gas before dividing and discharging the same. Thus member—B—is sleeved upon tube—A—and may be fixed at different elevations thereon by means of a set screw 10, thereby varying the distance between baffle wall 7 and the mouth of the tube. Such adjustment also regulates the force of discharge of the combustible mixture at the outlets or tips 9, and the height of the flame is also controlled thereby. The separate streams of combustible mixture issuing from the separate outlets or tips 9 may be caused to intermingle by inclining the tips 9 toward each other and thereby produce a single large body of flame, as shown in Fig. 1. However, separate columns of flame of less height may be produced by using a hollow member—B’—having straight vertical outlets or tips 9’ as shown in the modified form of burner in Fig. 7. In Fig. 6 I show a hollow head or delivery member—B’’—
mounted in screw-threaded connection with a screw-threaded air and gas commingling tube —A—to permit vertical adjustment of said member upon the tube, substantially as indicated in dotted lines. Members —B—and —B’— may also be rotated upon their supporting tubes, which permits different settings of such members to be obtained above and in respect to the manifold 3 as shown in full and dotted lines in Fig. 5.

In Fig. 7 the lower part 11 of the sleeve portion 12 of hollow member B’ is enlarged to permit it to be sleeved over the enlargement 14 containing the air intake opening 6. The entrance to these openings may be opened more or less by part 11 in adjusting member —B’— vertically upon tube —A’—, thereby regulating the amount of air to be taken into the tube for intermix with the gas stream.

What I claim is:

1. In a gas burner for heating appliances, the combination of a small commingling tube having an axial gas orifice and lateral air intake opening of small cross section for producing undernormal gas pressure a non-burning mixture at the outlet of the tube, with a supplemental mixing and delivery tube having a baffle wall axially of said tube and a plurality of outlets for the combustible mixture.

2. A gas burner for heating appliances, comprising a commingling tube having a gas orifice and restricted air intake, and a separate forked delivery tube axially aligned with and sleeved upon said commingling tube to intercept the gas stream, said first tube being inoperative under normal gas pressures in the absence of said second tube.

3. A gas burner for heating appliances, comprising a commingling tube having a straight bore provided with an axial gas orifice at one end, and formed with air intake openings adjacent the outlet end of said gas orifice, said air intake openings being smaller than said bore to limit the flow of air, in combination with a supplemental mixing tube axially aligned with and sleeved upon said commingling tube to intercept the gas stream and having diverging delivery branches terminating in outlet nipples.

4. A gas burner for heating appliances, comprising an air and gas commingling tube, and a forked tube adjustably mounted upon said first tube having separate outlets inclined toward each other to produce a confluent discharge of the combustible mixture.

5. A gas burner for heating appliances, comprising an air and gas commingling tube of small dimensions, in combination with a supplemental mixing tube having diverging discharge passages and converging outlets.

6. A gas burner for heating appliances, comprising an air and gas commingling tube adapted to discharge air and gas at high velocity from its mouth, a supplemental mixing member connected to said tube having a curved baffle wall opposite said outlet and branching passages terminating in inclined outlets extending toward each other, and means adapted to fix said mixing member at different elevations upon said commingling tube.

7. A gas burner for heating appliances, comprising a commingling tube having a gas orifice axially therein and air intake openings in its side, in combination with a supplemental mixing and delivery tube axially aligned with, sleeved over and adjustably mounted upon said tube to control said air intake openings.

8. A gas burner for heating appliances, comprising a commingling tube having gas and air intake openings, and a supplemental mixing tube sleeved adjustably upon said commingling tube in covering relation to said air intake openings, said mixing tube having branching outlets for the combustible mixture.

9. A gas burner for heating appliances, comprising a commingling tube having gas and air intake openings proportioned to prevent maintenance of a flame at the mouth of the tube under maximum pressure conditions of supply, and a supplemental mixing tube axially aligned with and sleeved upon said commingling tube to retard the gas stream, said supplemental tube having separate spaced outlets for the combustible mixture.

In testimony whereof I affix my signature.

HARRY E. KERR.