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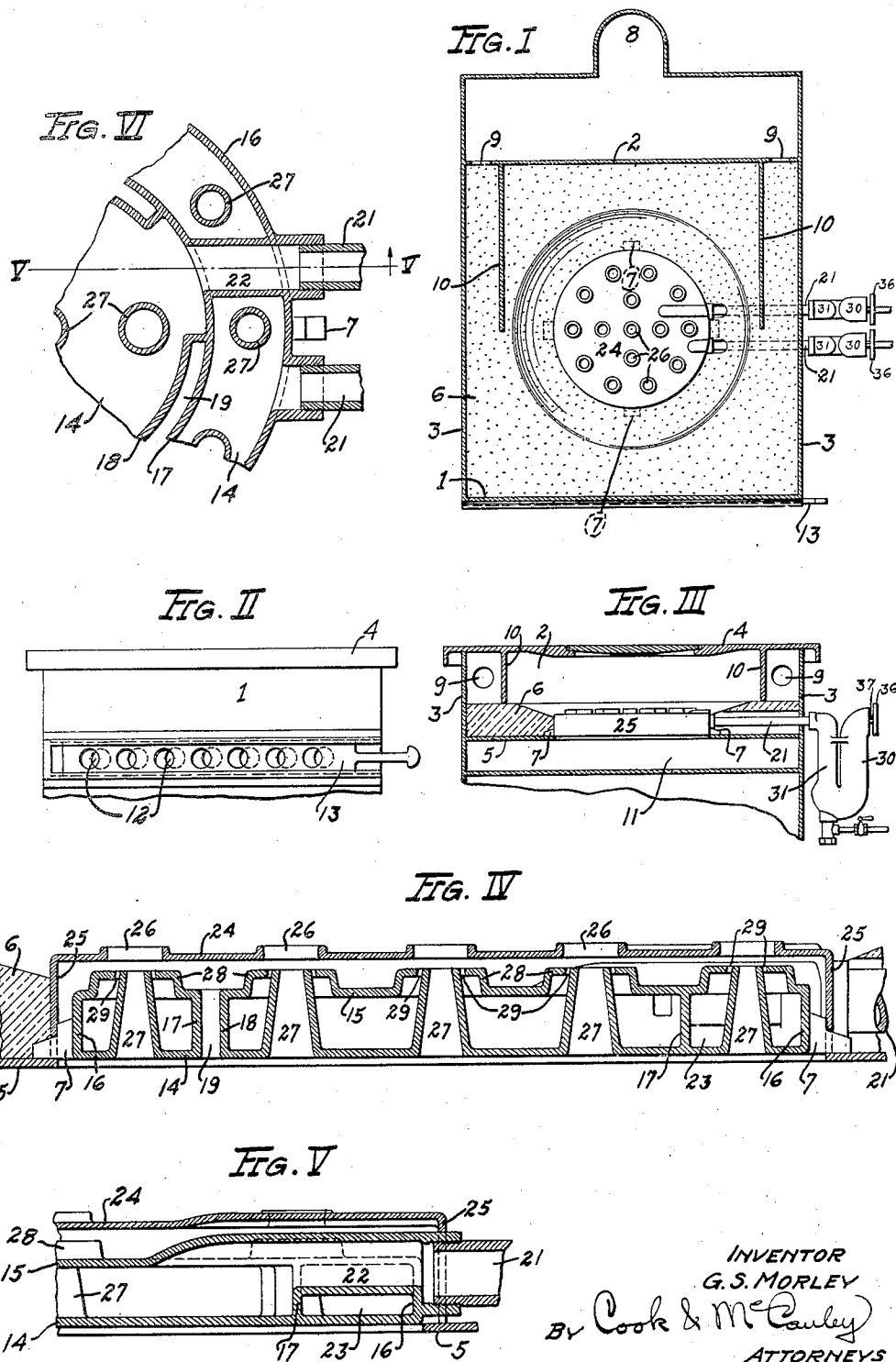
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1,626,047

GAS STOVE

Filed Dec. 11, 1925

2 Sheets-Sheet 1



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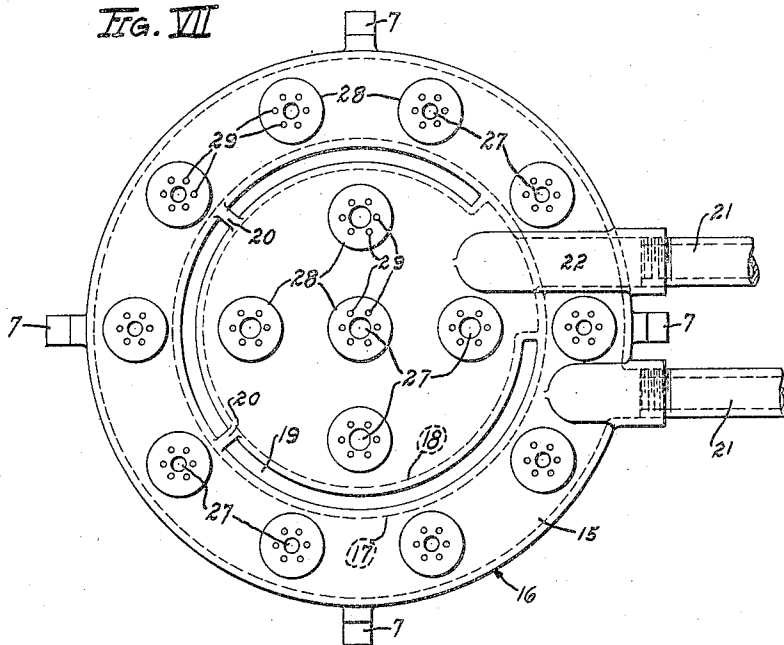
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2 Sheets-Sheet 2

FIG. VII



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GAS STOVE.

Application filed December 11, 1925. Serial No. 74,694.

This invention relates to improvements in gas stoves, and more particularly to a means for mixing gas and air before they pass from the burner of a stove. The burner herein disclosed is of the type shown by the patents to Harris, 742,643, Oct. 27, 1903, and Roe, 588,532, August 17, 1897. A mixture of gas and primary air is discharged into a combustion chamber and secondary air is added to the mixture. One of my objects is to provide an adequate delivery of secondary air in such a manner that a large volume of secondary air is thoroughly mixed with the gas.

I prefer to accomplish this partly by discharging secondary air from a nozzle surrounded by a gas nozzle, and have found this to be considerably more effective than a similar arrangement with the gas nozzle at the center. More specifically stated, the burner hereafter described includes a central secondary air nozzle, a gas nozzle surrounding the central air nozzle, and a secondary air passage around the gas nozzle. The gas is therefore discharged around a core of secondary air, and another body of secondary air is discharged around the gas. The gas is thus interposed between two streams of secondary air, and the streams are united as will be hereafter described to thoroughly mix the gas with the secondary air.

Another object is to produce an effective means for mixing gas with primary air before the gas enters the burner.

Fig. I is a horizontal section taken through the combustion chamber of a gas stove embodying the features of this invention.

Fig. II is a front elevation of the upper portion of the stove showing the secondary-air regulator.

Fig. III is a vertical section showing the combustion chamber and the secondary-air compartment below the same.

Fig. IV is an enlarged vertical section through the burner.

Fig. V is a section on the line V—V in Fig. VI, showing one of the inlets for gas and primary air.

Fig. VI is an enlarged horizontal section showing portions of the burner.

Fig. VII is a top view of the burner with the cover removed.

The combustion chamber shown by Figs.

I, II and III comprises a front wall 1, a rear wall 2, side walls 3, a top 4 and a bottom 5, the latter being covered with refractory material 6 having a central opening in which the burner is mounted. The bottom 5 has a central opening below the burner, and the latter is provided with peripheral lugs 7 (Figs. I, IV and VII) resting upon said bottom 5. An outlet 8 for products of combustion (Fig. I) is formed at the rear of the combustion chamber, and the rear wall 2 is provided with discharge ports 9 through which the products of combustion escape from said chamber. Baffles 10 extend from the rear wall 2 to points about midway between the front and rear of the combustion chamber, and the discharge ports 9 are formed between the rear ends of these baffles and the adjacent side walls 3. These baffles may be cast integral with the top 4, as shown in Fig. III.

The bottom 5 forms the top wall of a secondary-air chamber 11 (Fig. III) provided with inlet ports 12 (Fig. II), and a damper 13 slidably mounted on the front of the stove is provided with similar ports adapted to register with the ports 12. This damper can be adjusted to regulate the admission of secondary air to the burner, and attention is directed to the fact that it lies in the course of the secondary air passing to the burner, and not in a flue through which products of combustion pass from the burner. After the stove has been installed and connected to a flue (not shown), the burner is tested, and if the draft is too great for the secondary air, the damper 13 is adjusted to obtain the desired condition.

The burner comprises a bottom wall 14, a top wall 15, a circular outer side wall 16 provided with the supporting lugs 7, and a circular partition wall 17 between the concentric inner and outer compartments of the burner. As shown most clearly by Figs. IV, VI and VII, the inner compartment is provided with an arcuate wall 18 separated from the partition 17 to provide a vertical air passage 19 through which air rises from the space below the burner. Connecting webs 20 (Fig. VII) extend from wall 18 to partition 17.

Each of the two concentric compartments in the burner is provided with a delivery pipe for the admission of a mixture of gas and primary air. The inlet duct 22 (Figs. 110

V, VI and VII) for the central compartment lies above the bottom wall 14 as shown in Fig. V, to permit free circulation of gas and primary air in the annular outer compartment.

A cover 24, arranged over the burner, is provided with a downturned peripheral flange 25 separated from the outer wall 16 of the burner (Fig. IV) to provide a vertical passage through which air rises from the secondary air chamber below the burner. This flange fits onto the lugs 7 as shown in Fig. IV. The top of the cover 24 is provided with discharge orifices 26, and said cover is preferably separated from the top of the burner to form a secondary air passage which receives air from the vertical passage around the periphery of the burner and also from the vertical passage 19 between the inner and outer compartments of the burner.

The burner also comprises secondary air nozzles 27 extending through the body of the burner to transmit secondary air from the chamber below the burner. Each of these air nozzles is concentric with one of the discharge orifices 26 (Fig. IV) and it is surrounded by a gas nozzle 28 having a circular series of ports 29 for the discharge of the mixture of gas and primary air. Each series of the gas ports 29 is formed around one of the air nozzles 27, the latter being centrally located relative to the surrounding gas ports. These ports are directly below a discharge orifice 26 (Fig. IV) and they lie very close to the discharge end of the central air nozzle 27.

When the burner is in service, the mixture of gas and primary air is projected from the ports 29 and through the discharge orifices 26. Attention is directed to the manner in which a large supply of secondary air is transmitted to the mixture discharged from ports 29. The ports are preferably inclined (Fig. IV) to converge toward the center of a discharge orifice 26 and the mixture discharged therefrom tends to draw secondary air through said orifice. The draft resulting from the products of combustion rising in the flue (not shown) also tends to draw secondary air from the compartment below the burner. The secondary air from each nozzle 27 is discharged at the center of a circular series of gas ports 29, and these ports are surrounded by the secondary air passage between the cover 24 and the top of the burner. The mixture of gas and primary air is therefore discharged between two streams of secondary air, and the resultant mixture passes through a discharge orifice 26. An ample supply of secondary air to provide most effective combustion is thus delivered to and thoroughly mixed with the gas and primary air.

The means for mixing the gas and pri-

mary air is shown in Figs. I, III, VIII and IX. It comprises two mixing devices, one for each of the delivery pipes, or ducts, 21. Each of these mixing devices includes a down-duct 30 open to the atmosphere at its upper end and leading to the lower end of an up-duct 31 which extends upwardly to the horizontal delivery duct 21, the upper ends of ducts 30 and 31 being extended laterally, as shown in Fig. VIII. 32 designates a gas nozzle (Fig. VIII) whereby gas under pressure is projected into the flaring lower end of the up-duct 31, said nozzle being in alinement with the duct 31, and it has a screw 33 in its lower end that can be adjusted to prevent an excessive flow of gas. The gas is supplied through a pipe 34 having an ordinary regulating valve 35.

The primary air flows downwardly through duct 30 and then upwardly through duct 31 to the delivery duct 21, and the gas is projected from nozzle 32 to the duct 31 where it mixes with the air. One of the objects of this feature is to thoroughly mix an ample amount of primary air with the gas, and attention is directed to the relative areas of the several ducts. A large supply of air can readily flow through the large air duct 30 (Fig. VIII), and the gas is projected through the more restricted duct 31 where it serves to draw in the air. The velocity in the restricted duct 31 is relatively high, and this results in a desirable condition for the mixing of the air and gas as well as an effective suction to draw in the air. After being united under pressure and at a high velocity in the restricted duct 31, the mixture of air and gas is turned abruptly in the bend at the upper end of said restricted duct, and then delivered into the relatively large delivery duct 21, where the velocity is decreased and some expansion occurs, the mixing operation being prolonged while the gas passes through the delivery duct 21 to the burner. The different conditions in this mixing device are favorable to the mixing of the air and gas, and the delivery of air will be automatically varied in response to variations in the velocity of the gas.

To regulate the admission of air to duct 30, its entrance is provided with a valve, or damper, 36 movable toward and away from the intake end of the duct. A stem 37, extending from the valve 36, is screwed into a rib 37 to permit adjustment of said valve.

I claim:

1. A gas burner provided with a central air port from which secondary air is discharged, a circular series of gas ports formed around and adjacent to said central air port, means whereby a mixture of gas and primary air is discharged from said gas ports to commingle with the air from said central air port, and a cover having an ori-

5 fice of a diameter larger than the diameter of said central air port above said air ports and gas ports, a secondary air passage being formed between said cover and the body of the burner to provide for the delivery of additional air to said orifice, and said central air port, gas ports and air passage being in communication with each other at points below said cover.

10 2. A gas burner having a gas chamber through which a mixture of gas and primary air is transmitted, said chamber being provided at the top with gas ports for the discharge of said mixture, a cover arranged over said gas chamber and separated therefrom to provide an air passage between the

bottom of the cover and the top of said chamber, said cover being provided with discharge orifices constituting the sole discharge passageway from said chamber directly above said gas ports, said chamber having air nozzles directly below the centers of the discharge orifices in said cover, and means whereby secondary air is transmitted to said air passage and air nozzles to provide for the delivery of air to opposite sides of each of said gas ports, the discharge orifices in said cover being of larger diameter than the diameter of said air nozzles.

In testimony that I claim the foregoing I hereunto affix my signature.

GUILFORD S. MORLEY.