Feb. 2, 1943. P. F. RATCLIFF 2,310,116

GAS BURNER

Filed June 16, 1938

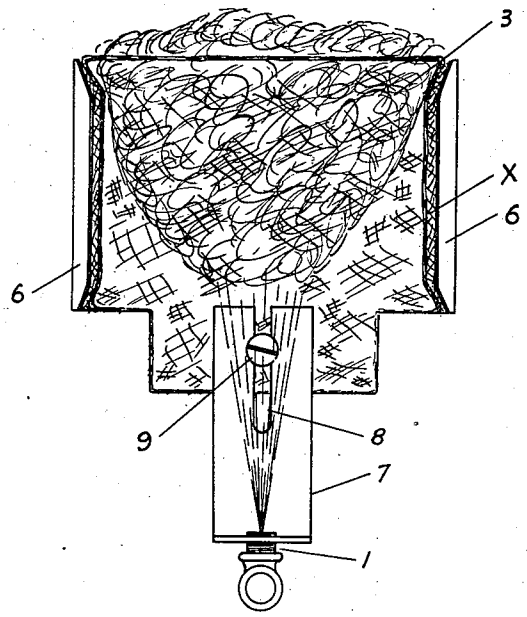


FIG. 3

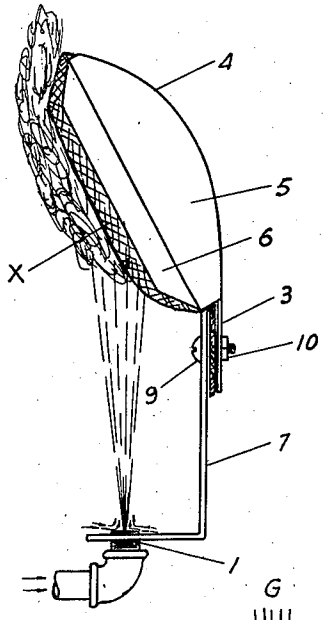


FIG. 4

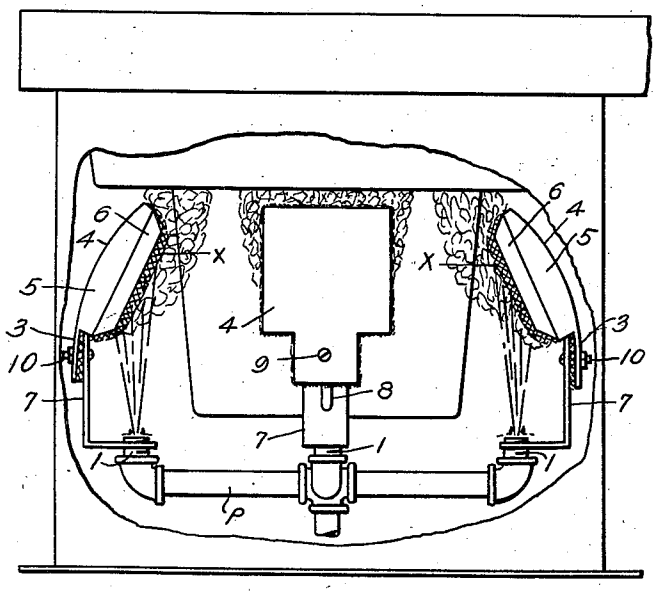


FIG. 1

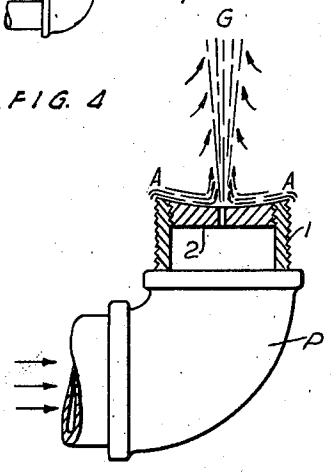


FIG. 2

Inventor

Peary F. Ratcliff

By A. F. Flournoy

Attorney

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GAS BURNER

Peary F. Ratcliff, Shreveport, La.

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3 Claims. (Cl. 158—113)

My invention relates to gas burners and more particularly to the type of gas burner used in cooking equipment.

An object of my invention is to provide a gas burner with a combustion chamber type flame deflector to insure complete combustion.

Another object of my invention is to provide a burner tip that will automatically induce the correct flow of air for combustion for varying gas pressures.

Another object of my invention is to provide an adjustable deflector in a gas burner adapted to focus and deflect a flame coming from the burner tip.

In the accompanying drawing forming a part of this application and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a broken vertical view of an assembly of my burner mounted under a conventional cooking receptacle;

Figure 2 is a vertical view in part cross section showing the construction of the tip part of my burner;

Figure 3 is a vertical front view of the chambered flame deflector construction of my burner and, Figure 4 is a vertical side view of the chambered flame deflector of my burner.

In the drawing wherein for the purposes of illustration is shown a preferred form of my invention, numeral 1 designates the tip of my burner as shown mounted in a gas pipe connection P. The exposed portion of the tip 1 terminates in a dished shaped perforated plate 2.

The feature of my tip which makes it different from the tips of the prior art is the dished shaped plate 2 with the gas orifice in its center. After experimenting with many constructions of tips, I discovered that the use of a dished shaped closing plate in my tip made the gas burn better than when the best tips on the market were used. I discovered also that the tip induces sufficient air for the combustion of the gas whether the gas pressure was high or low.

With the gas pressures in standard practice, 4 oz. to 8 oz., I found that a dip of $\frac{1}{16}$ of an inch at the center of a ½ inch plate gave me best results. I found also that it was better to have the dished surface curved than inverted cone shaped. However, the inverted cone shaped saucer surface gave much better results than the prior art flat surface closing plate structure or the outwardly rounded surface.

My above described tip performed nicely over the entire range of gas pressure encountered in the retail consumption of gas.

I do not know the exact theory on which to base this phenomenal performance but I am inclined to the belief that the gas emitted through the orifice in the saucer plate 2 creates a partial vacuum over its center portion surrounding the orifice.

The partial vacuum thus caused increases the flow of air to the gas stream. The increase of air at this point accounts for the improvement in the burning. As the gas pressure in the line is increased the rate of flow of gas through the orifice of the saucer plate 2 is necessarily increased with the result that the pressure around the orifice is further lowered, resulting in an increase flow of air to the increased gas stream. The increased air flow is available for the combustion of the additional gas emitted through the orifice. The reverse of the above statement is also true.

It must be borne in mind, of course, that the gas emitted through the orifice picks up additional air in its further travel, in the well observed manner of performance of prior art tip type burners.

Having described the tip 1 and its operation, I will now proceed to the description of the chambered flame deflector structure. Numeral 3 designates the chambered flame detector, which functions not only as a mixing chamber but also as a deflector for the products of combustion.

The chambered flame deflector 3 is defined by a curved back wall 4 and two parallel side walls 5, each of which terminate in an inwardly directed deflecting flange 6.

The chambered flame deflector 3 is mounted on the tip 1 by means of an L shaped bracket 7 threaded onto the tip 1. The upper end of the bracket 7 is provided with a slot 8. The chambered flame deflector 3 is fastened to the bracket 7 by means of a screw 9 which extends through the slot 8 and by clamping nut 10.

By means of the slot 8, the slot 9 and nut 10 the height of the chambered flame deflector 3 above the burner tip 1 may be adjusted to suit conditions. The chambered flame deflector 3 is lined with asbestos, or the like heat resisting material.

As explained earlier, the gas G escaping through the orifice of the tip 1 entrains air A at the orifice and carries it up with it to the chambered flame deflector 3 along with additional air A the gas picks up on its way to the chambered flame deflector 3.

In practice, the chambered flame deflector 3 should be so adjusted with respect to the tip 1 that the gas G burns within the chambered flame deflector 3.

When the chambered flame deflector 3 is correctly adjusted, its lining will stay at a white heat as long as the gas burns. Due to the white heat conditions of the lining X the incoming gas G with entrained air A ignites so rapidly that it may be said to explode inside the chambered flame deflector 3. The purpose of the flanges 6 is to confine the products of the explosion (flame) to the proportions of a stream. The general shape and position of the chambered flame deflector 3 together with its flanges 6 is relied upon to deflect the flame in the correct direction.

In the chambered flame deflector 3 the incoming gas G and air A in the turbulence created in the chambered flame deflector 3 become thoroughly mixed insuring complete combustion.

I contemplate using the burner tip and chambered flame deflector 3 combination for use in cooking stoves wherein only single units are employed for each eye of the stove. In this case, the gas from the tip 1 will emit from the same in a horizontal direction and the combustion chamber will deflect the flame upwardly. I also contemplate using my tip and chambered flame deflector 3 units grouped opposing one another, see Figure 1, wherein several deflected flames are shown focused on one surface to be heated.

It is to be understood that the form of my invention herewith shown and described is to be taken as only a preferred embodiment of the same and that various changes in shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention I claim:

1. A gas burner comprising a tip in combination with a chambered flame deflector so aligned with the said tip as to deflect a flame coming from the tip, said chambered flame deflector being provided with a pair of outwardly extending, inwardly directed wall extensions adapted to deflect products of combustion and light and heat rays.

2. The burner as claimed in claim 1 wherein means is provided for adjusting the said chambered flame detector both longitudinally and rotatably with respect to the said tip.

3. In a burner of the class described, a flame deflecting means comprising a back wall member adapted to deflect a flame and a pair of side walls extended out from the said back wall member, said side walls being inwardly directed and being extended parallel one to the other said side walls being adapted to confine the flame deflected by the said back wall member.

PEARY F. RATCLIFF.