Sept. 14, 1937. P. S. HARPER 2,093,272

AUTOMATIC LIGHTING MEANS FOR GAS RANGE BURNERS

Filed Feb. 2, 1934

Fig. 1.

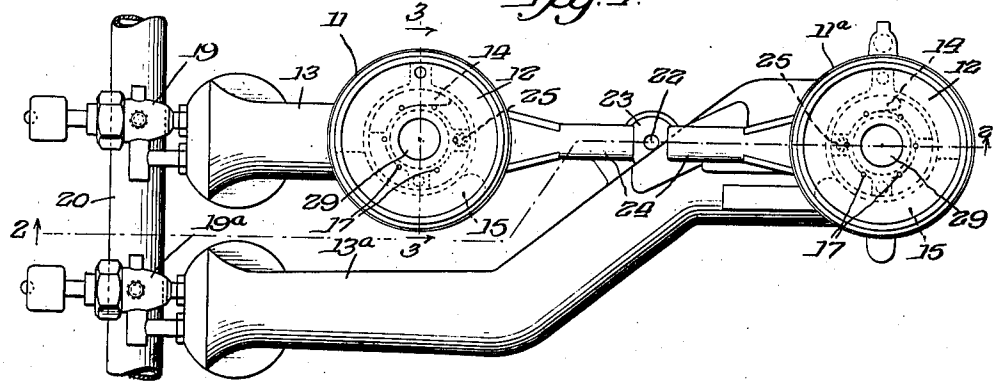


Fig. 2.

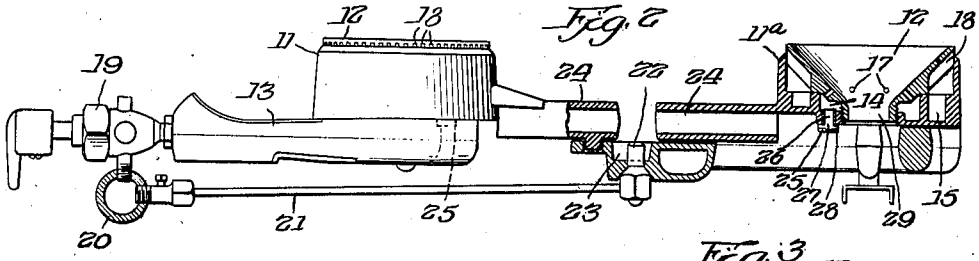


Fig. 3

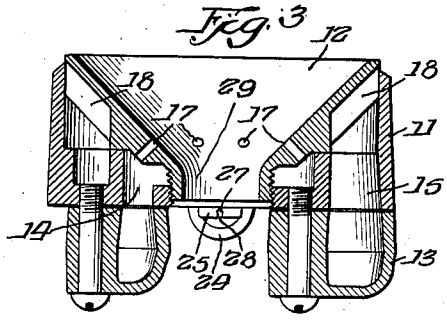


Fig. 6

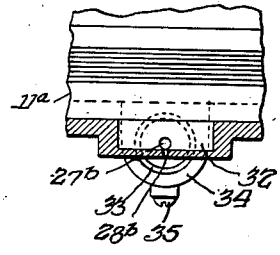


Fig. 5.

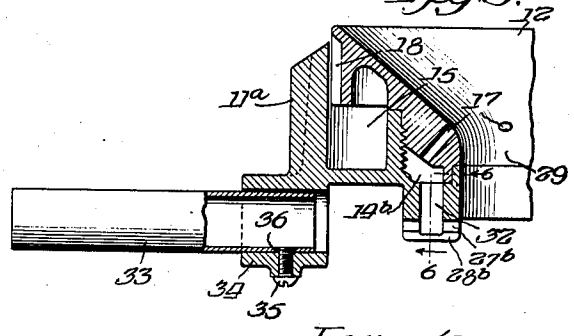
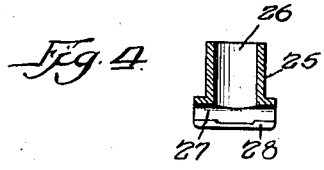


Fig. 4



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AUTOMATIC LIGHTING MEANS FOR GAS RANGE BURNERS

Philip S. Harper, Chicago, Ill.

Application February 2, 1934, Serial No. 709,449

5 Claims. (Cl. 158—115)

This invention relates to automatic lighting means for gas range burners, and particularly to means initiating the ignition at the center of such burners.

It is very desirable to automatically ignite a gas range burner in the center in place of at the outer edge for the reason that the ports providing automatic ignition always interfere to a certain extent with the combustion. In the case of ignition at the inside hole of a burner, any poor combustion due to the ignition and consequent formation of carbon monoxide tends to be corrected as the products of combustion of the center ports pass through the outer flames of the burner by which any carbon monoxide formed is consumed. Previous attempts have been made to ignite burners automatically in the center but the considerable upward flow of air through the center of such a burner has always interfered with obtaining proper ignition over a suitably wide range of pressures and also after such a burner has been in recent operation since when a burner is hot in such case the draft through the center of the burner is accentuated. In the present invention I have used the draft that exists through the center of the burner as an aid to the ignition by suitable arrangement of parts. With the upward draft aiding rather than hindering the ignition of the burner, very much superior results are obtained.

The first object of this invention is to provide a means for automatically igniting the center of a gas range burner at reduced pressure or with a small quantity of gas flowing into the burner.

A further object of this invention is to arrange the parts to accomplish the above result in such a manner so they may be cheaply and practically manufactured.

Another object of this invention is to provide automatic ignition for a burner in which all ports functioning in the ignition are so placed in the burner as to be shielded from any spillage which might clog them up and so interfere with the lighting function.

A further object of this invention is to provide automatic ignition in a burner in such a manner that there is no decrease in lighting efficiency when the burner becomes heated.

A further object of this invention is to arrange a burner so that the upward draft through the center facilitates the lighting arrangement so that as much central flow of air may be provided as necessary for efficient combustion.

These and other objects of this invention will be more apparent from the drawing in which—

Figure 1 is a plan view of a system of burners incorporating the lighting features of this invention;

Figure 2 is a partial sectional elevation along the line 2—2 of Figure 1;

Figure 3 is a sectional elevation along the line 3—3 of Figure 1;

Figure 4 is an enlarged sectional elevation of the lighter jet used in the previous figures;

Figure 5 is a sectional elevation of a portion of a burner head showing a modified form of this invention; and

Figure 6 is a sectional elevation along the line 6—6 of Figure 5.

Referring now to the drawing in which like figures refer to like parts throughout, in Figure 1 a front burner 11 is shown having a ring type burner head 12 as shown and described in my copending application Serial No. 703,902, filed Decemebr 26, 1933, and there is also shown in this figure a rear burner 11*a*, having parts similar in every respect to the front burner 11 except that said rear burner is longer so as to be in proper position on a gas range. Said burners 11 and 11*a* each have mixing tubes 13 and 13*a* which connect with and provide for passage of gaseous mixture into burner chambers 14 and 15 of the burner heads 12 of each burner. Each of the burner chambers 14 and 15 have respective burner ports 17 and 18 therein from each of said chambers in each of said burners.

The burner 11 has a gas valve 19 connecting into its mixing tube, said valve being of a commonly used double burner style, and there is also a second valve 19*a* connecting into the mixing tube of the rear burner 11*a*. Both of said valves 19 and 19*a* are screwed into a gas range manifold 20 as shown. Into this manifold 20 there is attached a lighter 21 as previously shown and described in my copending application Serial No. 658,763, filed February 27, 1933, and said lighter has a lighter tip 22 which extends into and is located by a cup 23 fastened to said rear burner mixing tube or cast integrally therewith, and by means of said lighter together with said lighter tip there is provided a pilot flame extending vertically from the upper portion of said lighter tip in the usual manner.

Taking now the burner head 12 on the rear burner 11*a*, a lighter tube 24 is connected integrally therewith, one end of said lighter tube 24 extending from the burner head 12 to the proximity of the pilot flame burning from said lighter tip 22. The other end of said lighter tube 24 is fastened to said burner head 12 and opens

into a recess extending upward slightly into the larger burner chamber 15 whereas the inner chamber 14 is not recessed and so extends downward and partially in axial line with the opening to the passage through the lighter tube 24. Said inner chamber 14 has a lighter jet 25 inserted therein as shown in Figure 2, which jet is shown in an enlarged view in Figure 4. Said lighter jet 25 has a central vertical passage 26 extending from the smaller chamber 14 and said jet 25 also has a transverse passage 27 intercepting the aforesaid vertical passage 26 in said jet. With the jet 25 in position as shown in Figure 2 it can be seen that one end of the transverse passage 27 discharges toward the lighter tube 24, and in this manner discharges a combustible gaseous mixture down the tube toward the pilot light burning from the lighter tip 22 while the other end of said transverse passage extends toward the center of the burner through which there is a natural draft induced by any gas issuing from the burner ports of the burner. Said jet 25 has a slot 28 therein completely connecting both ends of the transverse passage 27, whereby when combustion is taking place at the lighter tube end of said passage 27 such combustion is transferred so causing the burning of any gas issuing from said passage 27 toward the center of said burner head 12.

As to the operation of this invention, a constantly burning pilot light is provided from the lighter jet as previously described. When it is desired to ignite the burner and to start combustion, the gas valve 19a is opened allowing passage of gas to the mixing tube or tubes 13a and then into either the small burner chamber 14 or into both burner chambers 14 and 15. As soon as gas passes into the smaller chamber 14 it also travels through the vertical passage 26 in the lighter jet 25 and out both ends of the passage 27 as well as out the connecting slot 28 of the ends of said passage. The combustible mixture discharging from the lighter tube end of said transverse passage 27 passes down the lighter tube 24 and an explosive combustion takes place from the pilot light back to the combustible mixture discharging from the transverse passage 27 in the lighter jet 25 where it is burned after the manner of the usual automatic gas range lighter. Immediately following the ignition of the lighter tube end of the transverse passage 27 the combustion extends to the gas issuing from the slot 28 and then the combustion extends to the opposite end of the transverse passage 27 which results in a flame of gas extending inwardly from the inward end of the transverse passage 27 in the lighter jet 25 to the central hole 29 of the burner. As previously mentioned, there is a considerable upward draft through this central hole of the burner and the flame and heat of combustion are drawn upward to such an appreciable extent that any gas at that time issuing from the burner ports 17 in the smaller chamber 14 are immediately ignited. In this construction as shown, the greater the force of the upward draft through the central hole 29 of the burner as may be the case with the stove operating for some period, the greater will be the tendency for the flame issuing from the inner end of passage 27 to be drawn upward in contact with any gas issuing from the burner ports 17. In case gas is turned into both chambers 14 and 15 of the burner head 16, any gas issuing from the burner ports 18 of the outer chamber 15 is immediately ignited from the gas burning from the inner circle of burner ports 17. The reason for the ignition of these burner ports at such a considerable distance from each other is described in my copending application Serial No. 703,902, filed December 26, 1933, describing a gas range burner of the type shown in this invention.

Referring now to Figures 5 and 6 of the drawing, a modified form of my invention is shown in which the lighter jet and its corresponding passages and slots are formed directly in the burner head in place of being formed in a separable jet. In this modified form of this invention there is a depression 32 in the smaller burner chamber 14b which corresponds to the former vertical passage 26 in the former lighter jet 25. A transverse passage 27b is drilled through the two walls of this depressed portion 32 of the chamber 14b and a slot 28b connects the two ends of said passage 27b in the previous manner. Such modified form of my invention also provides a separable lighter tube 33 which is fastened into a socket 34 and held by a screw 35 which passes into a hole 36 in said tube 33, this modified construction taking the place of a tube cast integral with the burner head as in the original form.

The modified form of my invention shown in Figures 5 and 6 has the same form of operation and accomplishes the same results as in the original form of this invention, but the modified form has advantages in manufacture in that the burner body may be made of an aluminum die casting, the expense of a separate lighter jet is saved, and the construction is applicable when a very long lighter tube is required as when the pilot light is located in the center of the stove.

The essential difference between the invention herein described and in previous forms of automatic lighting to the center of a gas range burner is that the opening from the burner chamber which discharges gaseous mixture into the lighter tube is far removed from the central hole of the burner and that a separate flame is employed extending in an opposite direction and toward the central hole of the burner from which flame the usual burner ports in the burner head are ignited.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form and proportion of parts and substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit or scope of this invention.

I claim:

1. In combination, a gas burner having walls defining a chamber therein and a central opening therethrough, a wall of said burner defining said opening having burner ports formed therein, an igniting device positioned below said burner and opening into said chamber, said igniting device having two outlet ports, one of said outlet ports being directed inwardly toward said central opening and the other outlet port being directed outwardly away from said central opening, said inwardly directed port being in igniting proximity to said outwardly directed port and said burner ports, a flash tube having one of its ends positioned to receive gas from said outwardly directed port, and ignition means positioned adjacent the opposite end of said flash tube.

2. In combination, a gas burner having walls defining a chamber therein and a central opening therethrough, a wall of said burner defining said opening having burner ports formed therein

and discharging at least partially upward, an igniting device positioned below said burner and opening into said chamber, said igniting device having two outlet ports, one of said outlet ports being directed inwardly toward said central opening and the other outlet port being directed outwardly away from said central opening, said inwardly directed port being in igniting proximity to said outwardly directed port and said burner ports, a flash tube having one of its ends positioned to receive gas from said outwardly directed port, and ignition means positioned adjacent the opposite end of said flash tube, said igniting device having a slot extending longitudinally thereof substantially from one outlet port to the other.

3. In combination, a gas burner having walls defining a chamber therein and a central opening therethrough, a wall of said burner defining said opening having burner ports formed therein and discharging at least partially upward, an igniting device positioned below said burner and opening into said chamber, said igniting device having a port means therein including an outlet port directed inwardly toward said central opening and another outlet port directed outwardly away from said central opening, the whole of said port means being ignitable from any part thereof, said inwardly directed outlet port being at a lower level than the said burner ports and in igniting proximity thereto, a flash tube having one of its ends positioned to receive gas from said outwardly directed port, and ignition means positioned adjacent the opposite end of said flash tube.

4. In combination, a gas range burner having walls defining two chambers therein and a central opening therein, one of said chambers being an outer chamber surrounding the other said chamber, the walls of said burner having burner ports therein, extending into both of said chambers, the burner ports being in lighting proximity to each other, an igniting device positioned below said burner and opening into one of said chambers, said igniting device having two outlet ports, one of said outlet ports being directed inwardly toward said central opening and the other outlet port being directed outwardly away from said central opening, said inwardly directed port being in igniting proximity to said outwardly directed port and the burner ports extending into the inner of said chambers, a flash tube having one of its ends positioned to receive gas from said outwardly directed port, ignition means positioned adjacent the opposite end of said flash tube, a portion of the wall forming the lower closure of said outer chamber being directly above the path of gas discharging from said outwardly directed port and the end of said flash tube where gas enters.

5. In combination, a gas burner having walls defining a chamber therein and a central opening therethrough, a wall of said burner having burner ports formed therein discharging into said opening from the upper portion of said chamber, an igniting device positioned below said burner and opening into said chamber, said igniting device having two outlet ports, one of said outlet ports being directed inwardly toward said central opening and the other outlet port being directed outwardly away from said central opening, said outlet ports being in ignitable relation to each other, the inwardly directed outlet port being in igniting relation to said burner ports, and means for initially igniting the other of said outlet ports.

PHILIP S. HARPER.