March 3, 1936. P. S. HARPER 2,032,877

GAS RANGE BURNER AND LIGHTER

Filed April 3, 1933 2 Sheets-Sheet 1

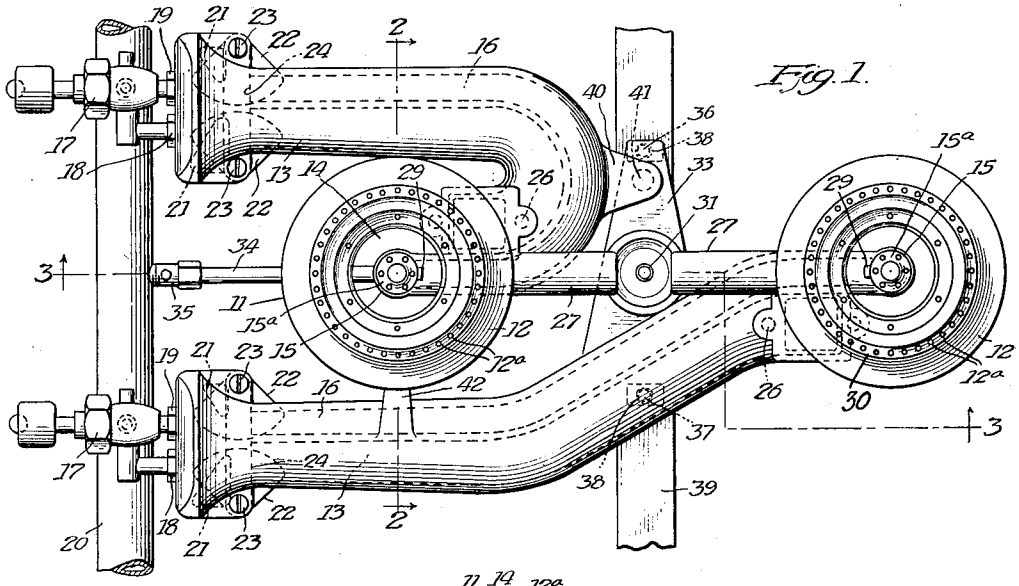


Fig. 1.

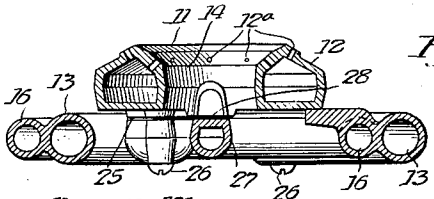


Fig. 2.

Fig. 3.

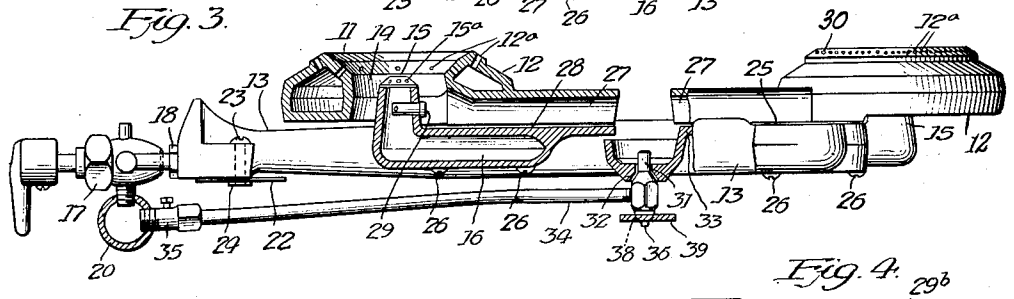


Fig. 4.

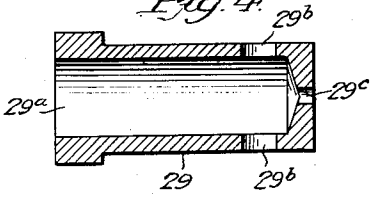
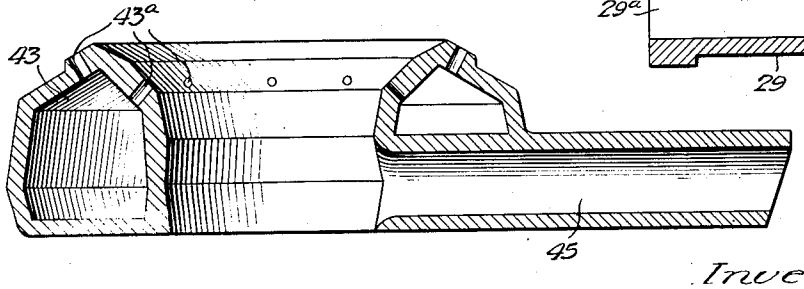


Fig. 5.



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Fig. 6.

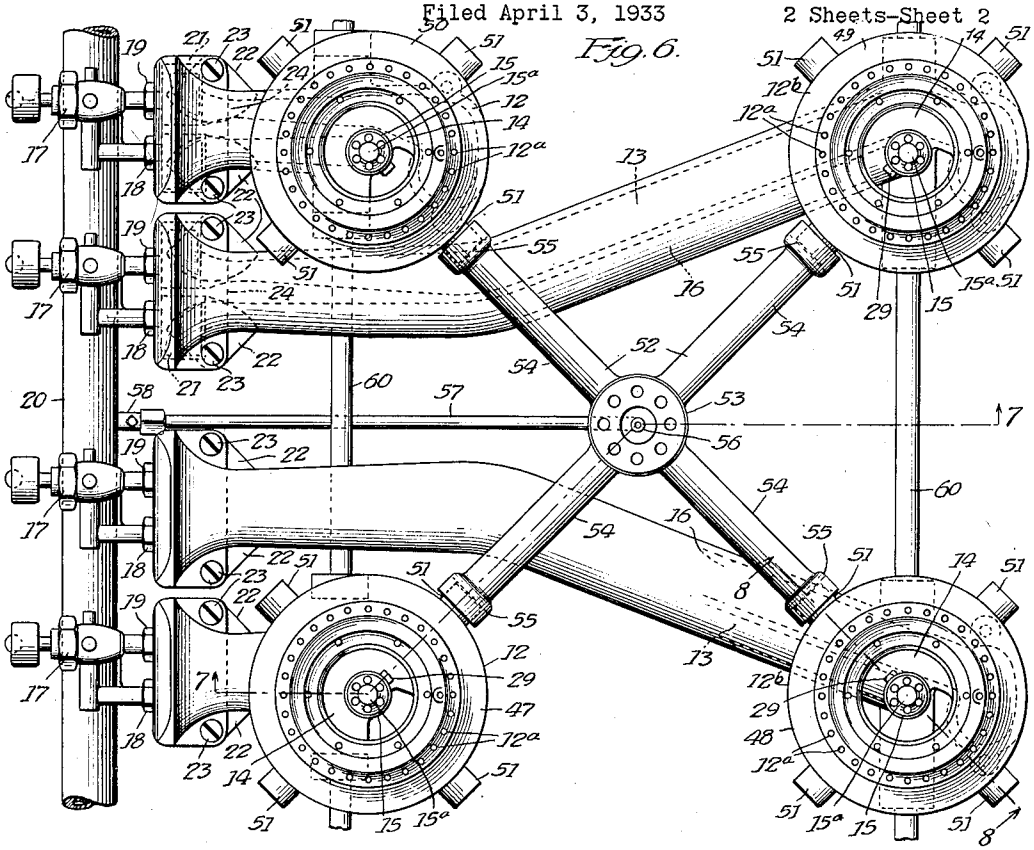


Fig. 7.

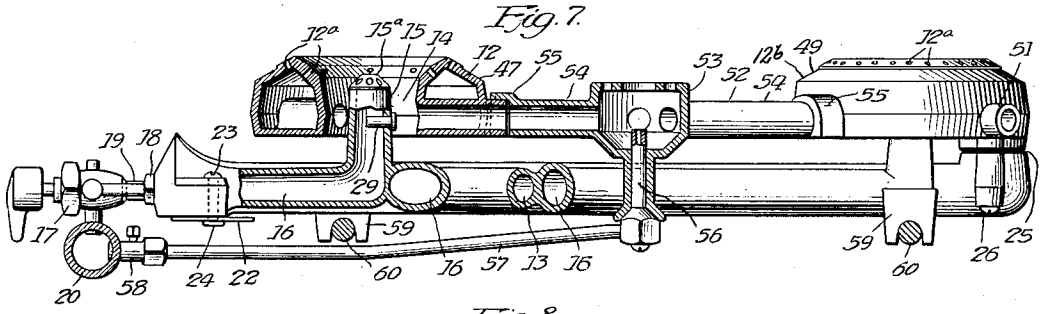
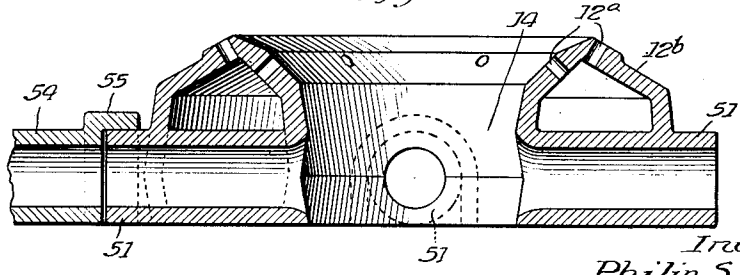


Fig. 8.



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UNITED STATES PATENT OFFICE

2,032,877

GAS RANGE BURNER AND LIGHTER

Philip S. Harper, Chicago, Ill.

Application April 3, 1933, Serial No. 664,179

2 Claims. (Cl. 158—115)

This invention relates to double section burners incorporating automatic lighting means and particularly to a double burner of the round or ring variety with a centrally located simmer section.

This lighter consists of an advantageous arrangement of the parts of an automatic lighter in conjunction with a system of such double section burners for the purpose of accomplishing the objects below set forth.

The first object of this invention is to provide means for automatically igniting a centrally located simmer section in a double section burner.

Another object of this invention is to initiate automatic ignition in the center of a gas stove burner.

A further object of this invention is to provide practical means of extending a lighter tube through the side wall of a ring burner.

A further object of this invention is to provide automatic means of lighting a central simmer section with greater speed of operation.

A further object of this invention is to provide means of central fast lighting and at the same time overcome difficulties due to upward draft in the central hole in a gas range burner.

A further object of this invention is to provide a common burner head adapted to central lighting in a system of gas range top burners.

These and other objects of this invention will be more apparent from the drawings, in which:

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

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

Figure 3 is a partial 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 modified form of burner head that may be used in conjunction with the burners shown in Figure 1;

Figure 6 is a plan view of a system of burners showing a second modified form of this invention;

Figure 7 is a partial sectional elevation along the line 7—7 of Figure 6; and

Figure 8 is a vertical section along the line 8—8 of the burner head shown in Figure 7.

Referring now to the drawings in which like figures refer to like parts throughout, in Figure 1 a front burner 11 is shown having a ring type burner head and large section 12 and having a mixing tube 13 leading to said burner head. Said burner head 12 has a plurality of ports 12a after the manner of the usual construction of ring type gas range top burners. Said burner head 12 has a large central opening 14 having in its center a small or simmer burner section 15 having burner ports arranged in its surface 15a. The mixing tube 16 is cast integral with aforesaid mixing tube 13 and connects with said simmer section 15. A gas valve 17 has nozzles 18 and 19 projecting into said mixing tubes 13 and 16 respectively, and said gas valve 17 is screwed into or otherwise fastened in a manifold 20. Said mixing tubes 13 and 16 each have openings 21 for the admission of primary air with shutters 22 which may be rotated so that primary air supply can be regulated and fixed at any desired position by means of the clamping screws 23 tapped into the strap 24, all such opening and adjusting means to the mixing tubes being in accordance with a usual form of double section gas range burner construction.

The mixing tubes 13 and 16 and said simmer section 15 are made in a casting separate from said burner section 12 and said burner section 12 is joined to its mixing tube 13 by means of a bolted joint having a gasket 25 and said parts are held in an assembled relation by means of bolts 26 passing through the mixing tube 13 and tapped into the burner head 12.

The burner head 12 has an inverted trough 27 cast in its under surface, said trough having one end entering the central hole 14 and said trough extending radially outward from said burner section as shown. The mixing tube 16 has a flat upper surface 28 which is extended so as to cover said trough 27 throughout its entire length so that the trough 27 as closed by said surface 28 constitutes in effect a tube. Said burner section 15 has a lighter jet 29 fastened therein and said jet is arranged to discharge into the tube 27. In substitution for said lighter jet a lighter orifice may be used wherewith satisfactory operation may be obtained in some forms of my invention. Said lighter jet and said tube comprise a lighting means as described in my copending application Serial No. 658,763, filed February 27, 1933.

In said Figure 1 there is a second burner 30 having the same type construction as above described burner 11, and having all the hereinbefore described parts which are in each case similarly numbered in the drawings. So far as described said front burner 11 and said rear burner 30 are exactly similar except that the mixing tubes in the rear burner enter the front end of the burner head 12 whereas the mixing tubes to the front burner make a return bend and enter the rear of the respective burner head. The

consequent reversing of the burner heads 12 on the front and rear burners causes the tubes 27 to extend toward each other as shown in the drawings, and these two tubes extend in the proximity of a lighter head 31 which serves as a means of ignition all as described in my above mentioned copending application. Said lighter head is held in location by means of a suitable cone shaped opening 32 in an arm 33 cast integral with the mixing tube portion of said rear burner 30. Said lighter head is fastened to a tube 34 extending into a lighter valve 35 and said lighter valve is screwed into the said manifold 20 which is also all as disclosed in my copending application above indicated.

The lighter arm 33 has a downward projecting pin 36 and the mixing tube portion of said burner 30 has a second pin 37 extending downward in the position shown in the drawings, said pins 36 and 37 entering holes 38 in a strap 39 all of which constitutes a supporting means for the system of burners shown. The front burner 11 has a lug 40 with a pin 41, said parts extending in a suitable manner so as to engage the aforesaid arm 33 for the purpose of supporting the front burner 11, and said front burner 11 is also supported by a lug 42 on the mixing tube section of the rear burner 30.

In Figure 4 I have shown an enlarged sectional view of the jet 29 which has a central discharge passage 29*a*, a plurality of side entering passages 29*b*, and a central entrance opening 29*c*. In placing such lighting jet within the central hole as 14 of a burner, I have found that the draft of air up through such central hole may interfere to a very considerable extent with the proper functioning of such lighter. It is to overcome such difficulty that I have provided the lighter jet as shown with a central inlet opening 29*c* which increases the velocity of discharge from the jet through the passageway 29*a* and at the same time I have employed side entrance passages 29*b*, 29*b*, to modify such forward velocity effect. It is by a judicious proportioning between the areas of these passages in the lighter jet 29 that a proper and satisfactory operation is obtained. When the lighting passage as 27 is of considerable length, it is then necessary to increase the size of the central passage 29*c* in relation to the side passages 29*b* so as to obtain a sufficient velocity to overcome the upward draft action through the hole 14 and to obtain sufficient force to propel the combustible mixture to the full length of the tube 27. This arrangement in the lighting jet is an advantageous part of my invention. However, by careful proportioning of parts a single lighting orifice may be used in the place of the lighting jet, such proportioning involving the length and area of the lighting tube as 27 and in the case where a single orifice is used such is all in accordance with the intended scope of this invention. It should be noted that for proper effect, the combined area of all the entrance passages 29*b* and 29*c* to the jet 29 should be less than the area of the discharge passage 29*a*.

The operation of this invention in its lighting effect is the same as described in my copending application mentioned, except that I have shown a means of extending the lighting tube through a large section so as to initiate lighting of a separate centrally located simmer section. The desirability of such lighting of the simmer section is at once apparent from the fact that in any double section burner it is essential for the purpose of such burners that the simmer section burn with the large section extinguished, whereas it is the usual practice that whenever the outer section as 12 is being supplied with a gas mixture the simmer section is likewise always at the same time supplied. In consequence, it is seen that I have devised a double section burner in conjunction with a lighting means in which ignition takes place regardless of whether both sections are burning or whether the simmer section alone is in use.

I contemplate that for the purposes where a double gas valve is used, wherein either section of a double burner may be burned independently, a second tube leading to the outer section might be superposed upon the tube 27, said second tube extending to the proximity of the pilot light in the same manner as tube means 27 shown. This would constitute simply a combination of my above designated previous invention with the invention herein described and consequently it is seen that figures and claims of the combination of these two inventions would be unnecessary.

Referring again to the drawings, Figure 5 shows a modified form of my invention, in which figure a burner section 43 is shown having burner ports 43*a* in the manner of the burners previously described. This modified burner head of Figure 5 has a tube 45 cast through its wall, said tube 45 constituting a lighting tube and having the same effect as the tube in the previously described burners formed by the trough 27 and mixing tube surface 28. The tube 45 may be formed by a separate core, or such passage may be drilled through the burner section 43, or it may be formed in any other practical manner. In any event, said tube performs the same function as the passage previously described and formed by the meeting of the upper and lower parts of the burner structure.

Referring now to Figure 6, a complete system of four burners 47, 48, 49 and 50 is shown, and these burners while differing slightly from burners described in shape and form have all structural parts and passages numbered from 13–26 inclusive described in connection with Figure 1. These like parts in Figure 6 are in every case given the same numerical characters on the drawings as the like and respective parts in Figure 1. In Figure 6, however, the burner heads 12*b* each has four tubes 51 cast through the wall and these tubes extend only slightly beyond the burner sections 12*b*. The extending of these tubes is for the support of the spider 52 comprising the central housing 53 and tubes 54 leading therefrom and extending so as to rest on one of the extensions of the tubes 51 in each of the burner heads 12*b*. The tubes 54 each has a bell end 55 open at the bottom but so formed as to fit as closely as possible the tubes 51 so that each tube 54 together with the tube 51 on which it rests forms in effect a continuous conduit from the central hole 14 in each burner 12*b* to the housing 53 of the spider 52.

The housing 53 has extended therein a lighter head 56 which is connected with a tube 57 leading from a lighter valve 58, said valve being screwed into the manifold 20 in the manner shown and described in connection with the similar parts of Figure 1. In each burner of Figure 6 the lighter jet 29 is positioned in its respective simmer section so as to discharge into the particular tube 51 of the burner head 12*b* which connects with one of the tubes 54. Each burner

in Figure 6 has two forked extensions 59 which rest on rods 60, these parts serving the purpose solely of supporting all burners in a suitable manner. Any other supporting means may be provided as such means is common practice in gas range construction and no particular supporting method is necessary to the proper functioning of this invention.

In lighting operation, this modified form of my invention shown in Figure 6 is similar in every respect to the operation of the first form shown in Figure 1, but it should be particularly noted that in Figure 6 I have devised a burner head of which a single pattern may be used for each of the four top burners in the usual arrangement in gas range construction. This result is also obtained with a single lighter for the ignition of all top burners.

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 the proportion of parts and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit or scope of the invention.

I claim:

1. In combination, an annular main heating burner, a simmering burner positioned centrally of said annular burner but on a lower plane, separate means connected to each of said burners to deliver air and gas thereto, means to supply fuel to each of said burners, a constantly burning pilot light located out of igniting relation to both of said burners, and a conductor tube below said annular burner and having one end positioned adjacent said pilot and the other end positioned adjacent said simmering burner, said simmering burner having a plurality of orifices one of which is positioned to direct gas into said conductor tube to be ignited by said pilot, and at least one other of which orifices is directed upwardly toward said annular burner to ignite the same when gas is supplied thereto, and to provide a small flame for simmering purposes.

2. In combination, a main heating burner having a central hole, a simmering burner positioned centrally of said main heating burner, separate means connected to each of said burners to deliver air and gas thereto, a constantly burning pilot light located out of igniting relation to both of said burners, and a conductor tube below said annular burner and having one end positioned adjacent said pilot and the other end positioned adjacent said simmering burner, said simmering burner having an orifice which is positioned to direct gas into said conductor tube to be ignited by said pilot, said simmering burner having port means above said orifice and located in lighting proximity to said annular burner to ignite the same when gas is supplied thereto, and to provide a small flame for simmering purposes.

PHILIP S. HARPER.