

PATENT SPECIFICATION



Convention Date (France) : Jan. 3, 1939.

534,164

Application Date (in United Kingdom) : Jan. 2, 1940.

No. 127/40.

Complete Specification Accepted : Feb. 28, 1941.

COMPLETE SPECIFICATION

Improvements in or relating to Gas Producers

I, JEAN GOHIN, French citizen, of 6 rue Thiers, Choisy le Roi (Seine), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to gas producers, and more particularly producers for supplying fuel to internal combustion engines.

In gas producers for supplying fuel to internal combustion engines it has been proposed to provide for the supply of air for the combustion of the fuel in the producer a downwardly inclined tuyere and also to provide at the base of the fuel container an ash pit separated from the container by a grille, the bottom of the ash pit being closed by a plate through which air can flow through the ash pit to the fuel at the bottom of the container, so that the combustion of the fuel at the bottom of the container causes slag or clinker formed adjacent the tuyere to drop onto the grille as the fuel at the base of the container is burned, the air percolating through the ash pit serving to complete the combustion of any combustible fuel which may remain mixed with the slag or clinker.

According to the present invention the fuel container of the producer is extended for a substantial distance below the tuyere or main combustion zone and the gas outlet, the said extended portion serving as a secondary combustion zone in which fuel is burnt by means of a properly proportioned air supply which is diffused through a perforated plate or grille forming the bottom of the said secondary combustion zone whereby as the fuel is burnt in the secondary combustion zone slag or clinker formed around or in front of the tuyere in the main combustion zone will progressively and automatically descend thereby maintaining it free of clinker or ash. Preferably the tuyere is arranged horizontally.

With such a gas producer it is advantageous to employ in the extended portion or secondary combustion zone a highly reactive fuel preferably leaving a

minimum residue, whilst employing a low reactive fuel in the main portion of the producer. The carbonic acid gas produced by the burning of this fuel enters the main combustion zone of the producer thereby producing carbon monoxide which is added to that produced from the tuyere and this increases the output of the apparatus.

Due to the constant freeing of the main combustion zone from which ashes, dust and clinker are separated, the power output of the producer is constantly maintained so that it is possible, since there is no longer any risk of blocking of the main combustion zone, to increase the speed of production or to maintain for a longer period the same speed with any given fuel or to maintain a comparable speed and duration of output employing inferior fuels, whilst also rendering it possible to have longer runs of the producer without cleaning.

One form of the invention is illustrated in the accompanying drawing, in which figure 1 shows a gas producer in vertical section, whilst figure 2 is a section on the line II—II figure 1; figure 3 being a detailed view of a cut-off device which may be employed when the producer is to be charged.

Referring to figures 1 and 2 of the drawing, the gas producer comprises a main portion 1, in which is positioned a horizontal tuyere 2 and a gas outlet 3. The gas producer is extended downwardly for a comparatively large distance below the tuyere 2 to form a secondary combustion zone or ash pit 4, the base of said pit comprising a perforated plate 5 and a detachable base plate 6 provided with an air inlet 7. The arrangement of the perforated plate 5 and detachable base plate 6 is such that air can percolate through the air inlet 7 and is diffused by the perforated plate 5 and detachable base plate 6 into the secondary combustion zone 4. The main portion 1 of the producer is closed by a detachable cover 8 and in the side of the main portion 1 is provided an opening which, during run of the producer is closed by a fluid-tight cover 9, the said opening being utilised for the in-

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roduction of a cut-off to be described with reference to figure 3. 10 is a door provided for cleaning of the apparatus, whilst inside the door is a grille 11 which screens the gas outlet so that particles of fuel are prevented from leaving the producer. The grille 11 preferably is provided with oblong holes and is secured to the door 10 by rods 12 forming a parallelogram so that on opening of the door 10 the grille 11 is pulled out, so that it may readily be examined and cleaned. As will be seen from figure 2, in addition to the grille 11, in order to provide a greater gas exit area, two grilles 13 may be provided sliding in lugs 14 from which they may be readily withdrawn for examination and cleaning.

The air inlet 7 is of predetermined size according to the type of fuel employed in the secondary combustion zone 4, and the amount of ash in the slag or clinker formed in the main combustion zone, and is so selected for each fuel according to the ash contents thereof, its friability and its greater or lesser characteristic of combustion, all of which cause a more or less rapid blocking of the main fire zone. Thus it will be appreciated that the size of the air inlet 7 must be greater as the tendency to blocking becomes greater. By this means, according to the fuel employed in both combustion zones, there is established a desirable ratio between the rates of combustion of fuel in the two zones.

Referring more specifically to figure 3, when it is desired to clean the producer, a cut-off is introduced in the opening, the said cut-off comprising two semi-circular portions 15, 16, which serve to cut-off the fuel in the main portion 1 of the producer, whilst the clinker is being emptied and whilst the secondary combustion zone 4 is being refilled through the door 11 with fuel such as charcoal, semi-coke, lignite, peat or other suitable fuel having a relatively high reactivity.

The operation of the producer is as follows: the secondary combustion zone 4 is filled with suitable fuel up to the tuyere 2 and the main portion of the producer is then filled with the same or other fuel of a lower reactivity. The producer is lighted simultaneously by the tuyere and in the secondary combustion zone 4 by air passing through the holes in the perforated plate 5. After starting the base plate 6 is closed, and combustion proceeds gently. As the fuel in the secondary zone 4 is burned any slag formed in the main combustion zone adjacent the tuyere automatically falls, so that the main combustion zone is maintained free of slag or clinker. Moreover, the carbonic acid gas

which is produced by the burning of the fuel in the secondary combustion zone 4 enters the main combustion zone 1 thereby producing carbon monoxide which is added to that produced from the tuyere and this increases the output of the apparatus.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A gas producer in which the fuel container is extended for a substantial distance below the tuyere or main combustion zone and the gas outlet, the said extended portion serving as a secondary combustion zone in which fuel is burned by means of a properly proportioned air supply which is diffused through a perforated plate or grille forming the bottom of the said secondary combustion zone, whereby, as the fuel is burned in the secondary combustion zone, slag or clinker formed around or in front of the tuyere in the main combustion zone will progressively and automatically descend, thereby maintaining it free of clinker or ash.

2. A gas producer as claimed in claim 1, in which the tuyere is arranged horizontally.

3. A gas producer as claimed in claim 1 or 2, in which the base of the secondary combustion zone is provided with an air inlet so dimensioned with respect to the tuyere that the descent of slag or clinker from the main combustion zone occurs at a speed dependent upon the ratio between the rates of combustion of fuel in the main and secondary combustion zones.

4. A gas producer as claimed in any of the preceding claims, in which the gas outlet is closed by a removable door which carries a gas filter element.

5. A gas producer as claimed in any of the preceding claims, in which a cut-off is provided so that when it is desired to clean the producer, said cut-off is introduced above the tuyere into the main combustion zone.

6. A gas producer as claimed in claim 5, in which the cut-off comprises two semi-circular members substantially as described with reference to figure 3.

7. The method of producing producer gas, by the use of the gas producer claimed in any of the preceding claims, which consists in burning a low reactive fuel in the main combustion zone and in burning a high reactive fuel in the secondary zone.

8. The method of producing producer gas by the employment of two fuels substantially as described.

9. A gas producer constructed, arranged and adapted to operate substantially as hereinbefore described and as shown in the accompanying drawing.
Dated this 30th day of December, 1939.

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24, Southampton Buildings,
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Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1941.

[This Drawing is a reproduction of the Original on a reduced scale.]

