

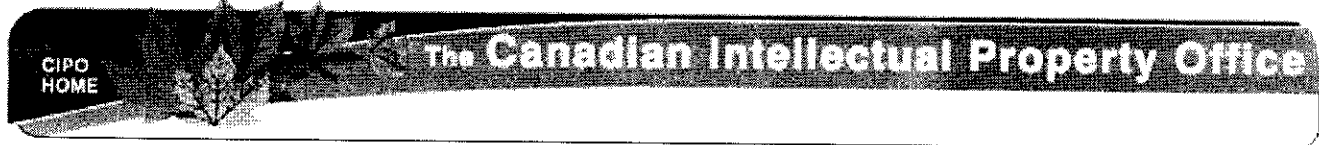


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(12) Patent:

(54) GAS PRODUCER

(54) GAZOGENE

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The present invention relates to an improved method for producing water gas or producer gas from small-sized or granular fuels in a shaft furnace by blowing the gasifying agent, such as air, steam and the like into the gas producer in such a way as to keep the whole charge in an ascending and descending or whirling movement.

The subject matter of the present application has been divided out from our copending application for a process and means for the production of gases, No. 324,012, filed April 7, 1927.

We have now found that the said process of gas production can be carried out in a highly satisfactory manner with a horizontal support for the fuel, the gasifying agents, such as air, steam and the like being admitted from below through very small openings the total cross-sectional area of which constitutes from about 1/100 to 1/1000 of the total area of the said support. The gasifying agent is blown into the charge of fuel with sufficient velocity to prevent the latter from passing through the said openings, which may take the form of narrow slots or fine bores. In the latter case it is advisable to provide a large number of such bores, preferably situated in a water-cooled metal plate, and adapted to be closed by suitable means enabling only a portion of them to be put out of operation. In order to keep the charge of fuel in motion, the number of openings required to operate is comparatively small, even with producers of large cross-sectional dimensions. The openings may take the form of upwardly directed holes, slots or the like, which may project like nozzles from the plate. In such case the clinkers will be deposited between the nozzles and on the plate and can be removed either by rakes or other mechanical devices. It is sometimes advantageous to arrange the openings wholly in the centre of the plate, or to operate only those situated there, so that the fuel enters the hot zone only by degrees as the small sized fuel evenly distributed over the whole cross-sectional area of the producer is only

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whirled up in the middle by the gasifying agent admitted and forms a crater into which the fuel continuously slides down in the same amount as it is used up by the gasifying process. By this means disturbances resulting from a too sudden disengagement of steam from damp fuel are prevented. The method of working of the said process is described with reference to Figure 1 of the drawing which illustrates a section through the lower part of the producer, the shaft area of which measures about 1.2 square metres. A water-cooled plate F is provided in which are upwardly projecting slots G each 700 millimetres long and 5 millimetres wide or thereabouts. A damper H is used for closing these slots and is partially withdrawn into the bottom chamber C. A plan of the plate is shown in Figure 2. Air, at the rate of 700 cubic metres per hour, may be blown into the producer the charge consisting of glowing brown-coal coke to a depth of about 30 centimetres above the nozzles, topped to a total depth of about 1 metre with brown-coal coke containing about 5 per cent moisture, the fuel being maintained in continuous rising and falling or whirling motion. At a furnace temperature of 950°C the gas has the following composition: carbon dioxid, 1.2 per cent; carbon monoxid, 29.6 per cent; hydrogen, 2.8 per cent; methane, 1.2 per cent; nitrogen, 65.2 per cent. On steam being added to the air and the temperature raised to 1000°C the gas has the following composition: carbon dioxid, 0.8 per cent; carbon monoxid, 30.2 per cent; hydrogen, 12 per cent; methane 1.4 per cent; nitrogen, 55.6 per cent. When the producer is charged with brown-coal containing about 10 per cent moisture and about 10 per cent of volatiles, instead of with brown coal coke, the gas obtained at 950°C consists of approximately 1 per cent of carbon dioxid, 28 per cent of carbon monoxid, 4 per cent of hydrogen, 1.5 per cent of methane and 65.5 per cent of nitrogen.

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The openings may be of any desired size in cross section and the slots may be three or more as desired. Provided the openings in the centre of the plate are kept in operation, or if they are grouped into a comparatively small central area, the fuel can be raised very quickly to 1100°C by using a strong blast of air, a valueless gas, containing up to 18 per cent of carbon dioxid being produced. At the same time the central portion of the fuel in the producer is projected upwards, like a fountain, and falls back into the main body, which is kept in continuous whirling motion. This arrangement is especially applicable for use in cases where the gases generated in the blast stage of the manufacture of water gas cannot be employed for any useful purpose. The arrangement above described can also be constructed as a travelling grate.

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WHAT WE CLAIM AS OUR INVENTION IS:-

1. A gas producer comprising a gasification chamber, a horizontal bottom in said chamber, openings in said bottom the total cross-sectional area of which constitutes from about 1/100 to 1/1000 of the area of the said bottom, means for supplying fuel to above said bottom and means for blowing a gasifying agent through said narrow openings and through the fuel above said bottom.

2. A gas producer comprising a gasification chamber, a horizontal bottom in said chamber, openings in said bottom the total cross-sectional area of which constitutes from about 1/100 to 1/1000 of the area of the said bottom, means for closing part of said openings, means for supplying fuel to above said bottom and means for blowing a gasifying agent through said narrow openings and through the fuel above said bottom.

3. A gas producer comprising a gasification chamber, a horizontal bottom in said chamber, means for cooling said horizontal bottom, openings in said bottom the total cross-sectional area of which constitutes from about 1/100 to 1/1000 of the area of the said bottom, means for closing part of said openings, means for supplying fuel to above said bottom and means for blowing a gasifying agent through said narrow openings and through the fuel above said bottom.

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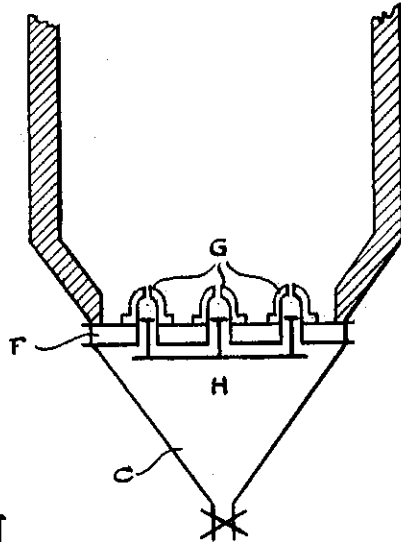


FIG. 1

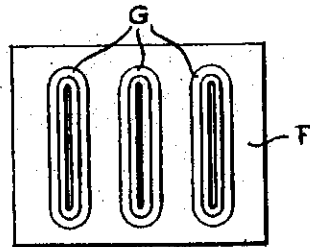


FIG. 2

Certified to be the drawings referred to in the specification hereunto annexed.

Ottawa, *Jan. 17th* 1928.

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