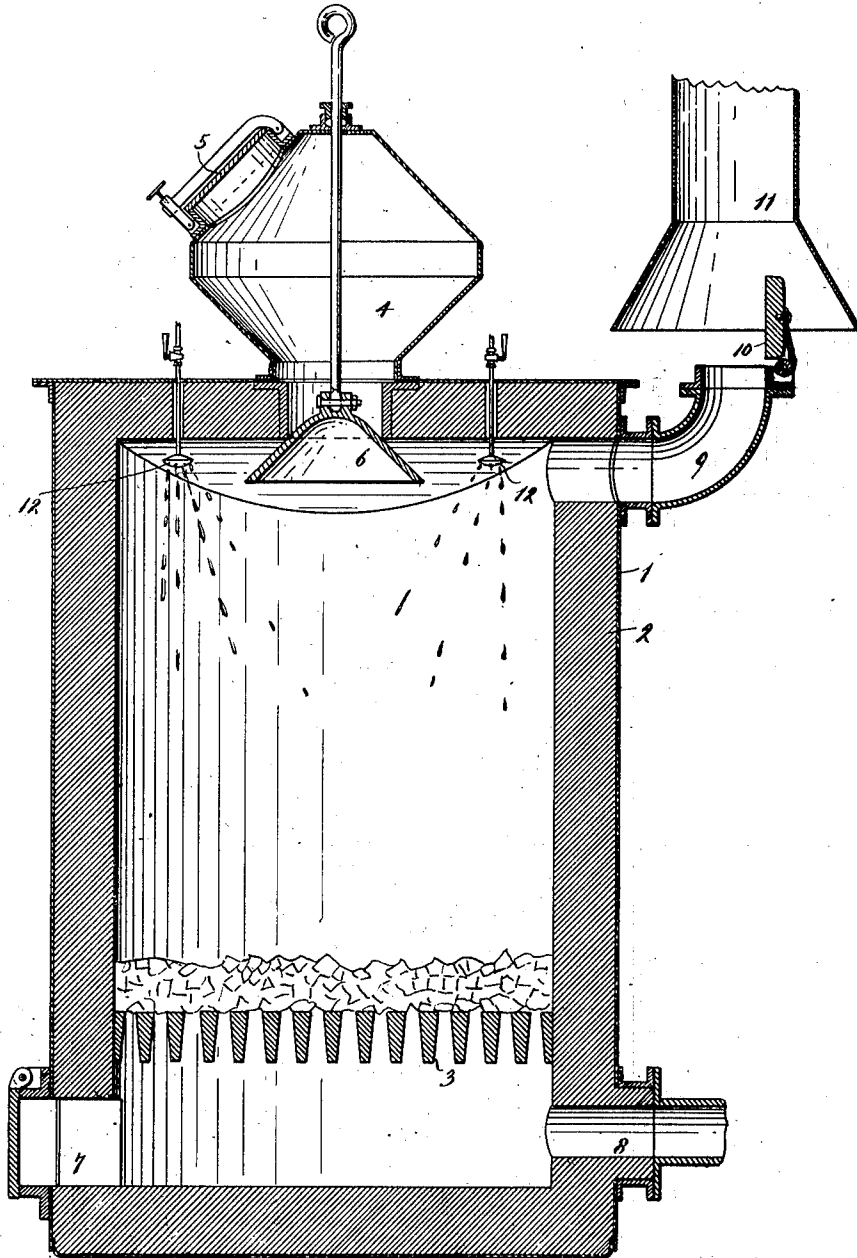


L. P. LOWE.
PROCESS OF MAKING PRODUCER GAS.
APPLICATION FILED FEB. 18, 1909.

967,213.

Patented Aug. 16, 1910.



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UNITED STATES PATENT OFFICE.

LEON P. LOWE, OF SAN FRANCISCO, CALIFORNIA.

PROCESS OF MAKING PRODUCER-GAS.

967,213.

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To all whom it may concern:

Be it known that I, LEON P. LOWE, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Processes of Making Producer-Gas, of which the following is a specification.

The object of the present invention is to provide a method of making producer gas economically and continuously.

In many localities oil is a cheaper fuel than coal, especially the residual oils that are obtained from the crude oil by distillation. Producer gas is readily obtained from light distillates or very light crude oil, but they are comparatively expensive, while the residuums of the usual crude oils, after distillation, have much less value. It is therefore of great importance to be able to obtain producer gas from such cheap residual heavier oils.

It has been attempted to make producer gas from oil by using part of the oil as fuel to generate heat to vaporize the remainder of the oil, and to supply with such oil sufficient air, over and above that required for the combustion of the fuel portion thereof, to make, with the vaporized oil, combustible gases. But, in practicing such a method, the difficulties are encountered, especially with heavy asphaltic oils, that the oil thus heated is disassociated into combustible gases, heavy tarry products and lamp black, if the heat is sufficiently high to cause the formation of lamp black, and which will be the case if a fair amount of the heavy portions of the oil are to be gasified; or the oil is converted into combustible gases and a greater proportion of heavy tarry products only, if the heat is not sufficiently high to form lamp black. In either case the lamp black and heavy tarry residuals become waste products, and, indeed, must be removed to make the producer gas commercially available, otherwise they would settle from the gas and cause stoppage of the various conduits, engine ports, and the like. They may sometimes be removed, but only with additional expensive apparatus, in addition to the cost of removal; but in many cases, they would have to be thrown away.

It is the object of the present invention to overcome these difficulties; at the same time to greatly increase the efficiency of the generator and the quantity of the resulting

gas from a given amount of material, and also to make it possible to use oils or their heavy residuals which could not otherwise be used in the production of producer gas.

In the accompanying drawing, the figure is a vertical section of an apparatus adapted for carrying out my improved process, although it is to be understood that the apparatus itself forms no part of the invention.

Referring to the drawing, 1 indicates the casing of a combined combustion and gas generating chamber, having a refractory lining 2, and a grate 3. At the top is a feed hopper 4 closed by a door 5, the material falling into the chamber from said feed hopper over a distributor 6. At the bottom of the chamber below the grate on one side is an opening 7 for admitting air and also for removing the ashes, and on the other side a conduit 8 for carrying off the producer gas manufactured and preferably leading to means for creating suction to draw the gas through said conduit. From one side of the top leads a pipe 9 controlled by a valve 10 discharging into a stack 11. Into the top of the chamber depend sprinklers 12 through which crude oil can be sprinkled in the chamber.

The process is as follows:—A comparatively thin bed of coal is spread upon the fire grate, and a fire is started, the hopper being closed and the air supplied through the opening 7 being allowed to flow upward through said fire grate until the bed of coal has become incandescent. The apparatus is then ready for continuously carrying on the process. The conduit 7 is closed, the valve 10 is opened to admit air, and the conduit 8 is connected to the means for producing suction which draws the air downward through the chamber and through the incandescent bed of coals. At the same time oil is sprinkled from the sprinklers 12. When the oil, in descending through the chamber, arrives at a sufficiently heated zone, in the bed of coal, it is first decomposed into gas and heavy hydrocarbons in the form of tarry products, owing to the comparatively low temperature at the top of the bed of fuel. By gravity and by reason of the suction, these heavy hydrocarbons flow down and into a more highly heated zone, until they reach a point, where the heat is sufficiently great to convert the heavy hydrocarbons into gases and solid carbon in the form of lamp black, which lamp black then becomes a

portion of the bed of fuel, fixed gases passing to the suction pipe. The oxygen of the air is first used to support combustion, and, in so doing, is converted into carbonic acid gas, which, subsequently, in its further passage through the bed of incandescent fuel is converted into carbonic oxid. The bed should be replenished with coal from time to time, but such replenishment will not interfere with the continuity of the process of making producer gas.

If it be desired to bank the fires, as when the making of the producer gas is temporarily stopped, the door 5 and valve 10 are closed. It will be understood that the amount of coal used is comparatively small having regard to the quantity of producer gas formed, because of the fact that a great proportion of the fuel is obtained from the heavier constituents of the oil, thus requiring a correspondingly smaller part of the heating effect to be done by the coal.

The advantages of the process are:—First, producer gas is manufactured from low grade residual oil; second, all of the constituents of the oil are utilized in one operation; third, the producer gas can be used immediately, without the necessity of scrubbers and washers to get rid of the as-

phaltic or tarry constituents, because these have already been removed from the oil and utilized in the immediate production of gas; fourth, considerable marsh gas is obtained from the oil, so that a high grade of producer gas is formed; fifth, the apparatus is cheap and simple in construction and the operation is economical.

I claim:—

The process of making producer gas which consists in passing air through an ignited bed of solid fuel to heat the same to incandescence and then passing oil and air into and through said incandescent bed in a downward direction, to, first, disassociate the oil into gases and heavy hydro-carbons, and then to convert the heavy hydro-carbons into gases and solid carbons, the latter combining with the air to maintain the proper temperature and assist in forming the producer gas in the usual manner, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LEON P. LOWE.

Witnesses:

FRANCIS M. WRIGHT,
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