No. 790,113. PATENTED MAY 16, 1905.

A. DESGRAZ.

PROCESS OF OBTAINING PRODUCER GAS.

APPLICATION FILED DEC. 12, 1904.

Fig. 1.

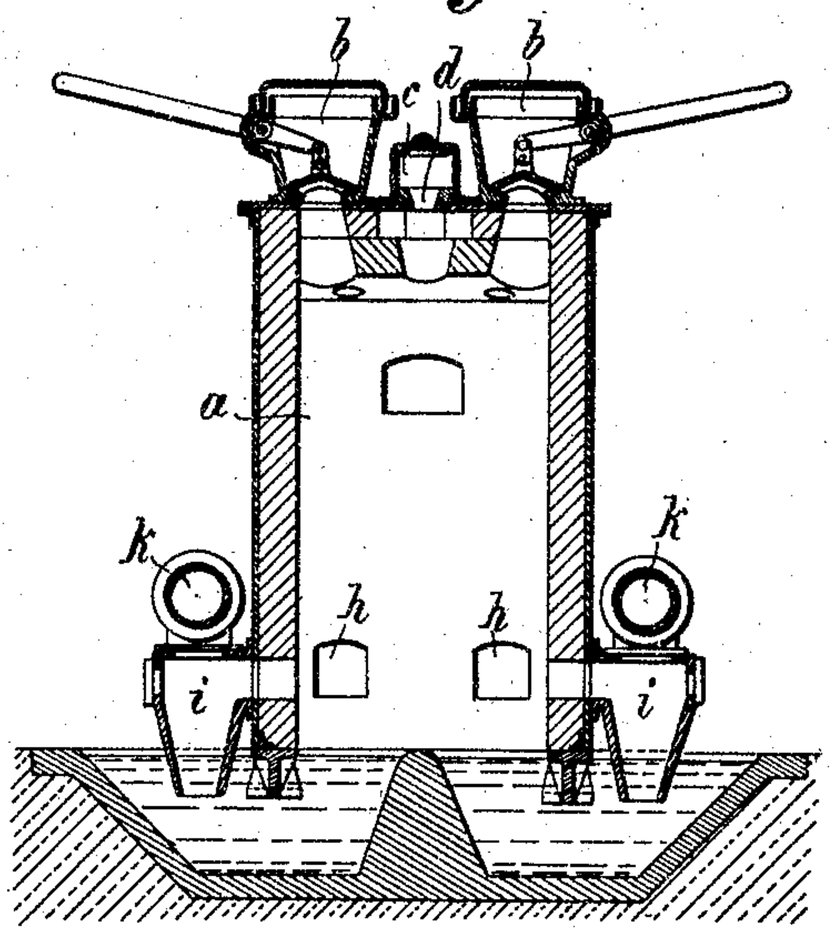


Fig. 2.

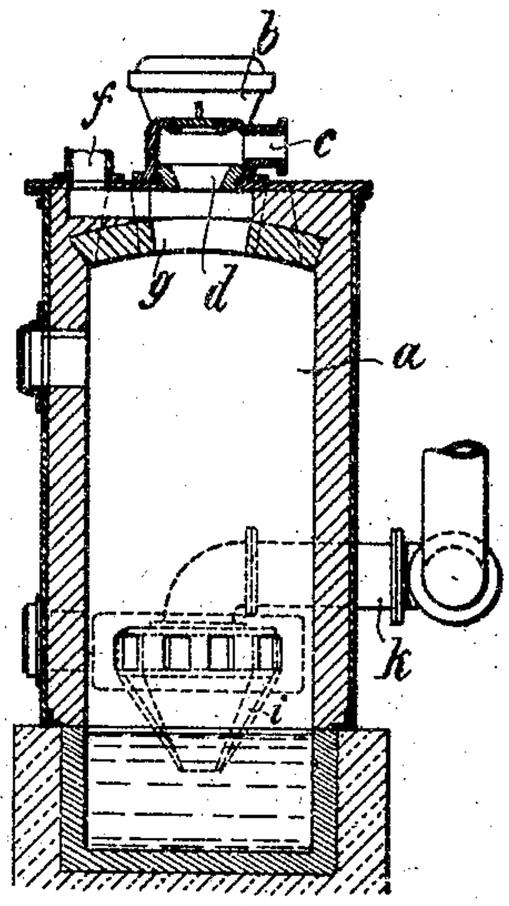
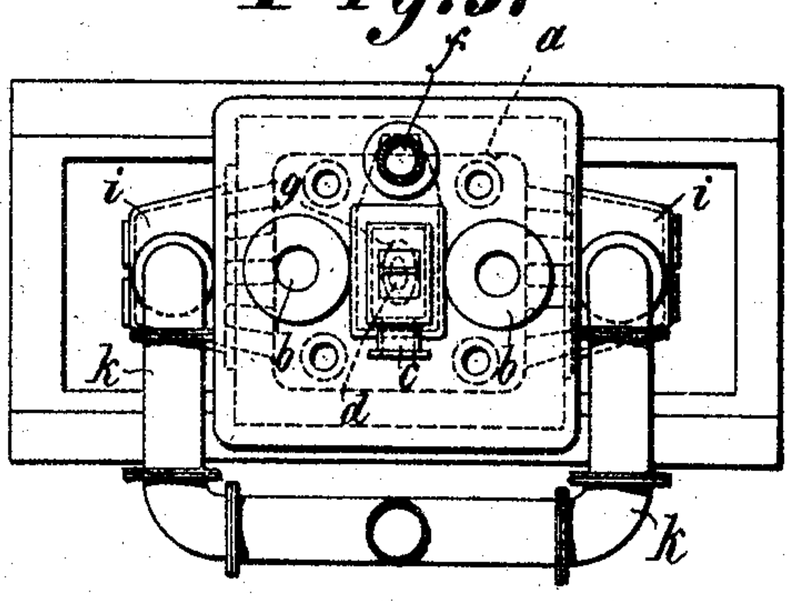


Fig. 3.



Witnesses:

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No. 790,113. Patented May 16, 1905.

UNITED STATES PATENT OFFICE.

ADOLPHE DESGRAZ, OF HANOVER, GERMANY.

PROCESS OF OBTAINING PRODUCER-GAS.

SPECIFICATION forming part of Letters Patent No. 790,113, dated May 16, 1905.

Application filed December 12, 1904. Serial No. 236,552.

To all whom it may concern:

Be it known that I, ADOLPHE DESGRAZ, engineer, of 1 Prinzenstrasse, Hanover, in the German Empire, have invented certain new and useful Improvements in the Methods of Obtaining Producer-Gas Free of Tar and of High Burning or Calorific Value, of which the following is a specification.

This invention relates to a process of obtaining producer-gas free of tar and of high burning or calorific value. Heretofore gas of this character could only be obtained if all the tar-like particles became transformed into pure gas, the carbonic acid entirely converted into carbonic oxid, and the aqueous vapor entirely decomposed. For the purpose of removing the tarry particles the gases are conducted over highly-heated coke, and the decomposition of the steam is effected by driving the gases from above downward through glowing coke. The practical solution of this problem has often been sought, but hitherto not attained. A simple turning about of the producer or of the air-pipe will not solve the problem, because when the fresh cold coal meets the air for combustion, even if the latter is preheated, the fresh coal does not become ignited and the process gets stopped. The employment of several producers or generating-chambers, whereby the gas is alternately conducted from above downward and from below upward, necessitates constant and careful supervision and the arrangement of reversing devices.

According to the present invention the heat requisite for the distillation of the coal is obtained by prepared producer or other gas, derived from any suitable source and mixed with the air necessary for combustion, the said air and gas being admitted to the upper part of the producer, so that combustion takes place above the upper surface of the fuel, and the products of combustion being conducted downward through the fuel. The air for combustion is supplied in excess, so as to furnish the necessary oxygen for the combustion of the coal, and may be advantageously preheated. The heat necessary for the distillation of the upper layer of fuel or coal is given by the combustion of the prepared gas which takes place in the upper part of the producer. The combustible gas required for the starting and maintenance of the combustion of the coal may be derived from any other source and conducted to the said main producer and may even show a certain percentage of carbon dioxid and steam. The following processes therefore take place in the generator: first, a reduction of the carbon dioxid and steam of the primary gas and of its combustion products as well as of the combustion products formed from the products of distillation of the fresh coal, and, secondly, a gasification of the fuel by the incomplete combustion by means of air and by the reduction of the products of complete combustion of the first-mentioned gases. The process therefore is continuous and differs thereby from similar known processes, which all are carried out in a periodical or intermittent manner.

By the present method non-condensable fixed gas is continuously generated free from carbonic acid, and local superheating within the coal is avoided.

An apparatus or producer, with water seal, suitable for carrying out the present process, is illustrated, by way of example, in the annexed drawings, wherein—

Figure 1 is a vertical section of the producer; Fig. 2, a section in right angle to Fig. 1; Fig. 3, a plan view.

The producer *a* is fed with fuel through two openings *b*. The prepared gas enters through pipe *c* and nozzle *d* and the air through channel *f* and nozzle *g*. Both prepared gas and air, the latter in excess, pass together into the upper part of the generator *a* above the fuel, (not shown,) where they are ignited and burned. The heat thus produced maintains the fuel in incandescence and entertains the reduction processes. By means of the excess of air the distillation products of the fresh fuel are completely burned. Further, the distillation of the fuel itself is assisted, which distillation also partly is effected by the reduction of the combustion products, and, finally, the temperature in the generator is maintained on the required height. The produced gas leaves through the opening *h* and pipes *i* and *k*.

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 process of obtaining producer-gas free of tar and of high calorific value, consisting in introducing combustible gas and an excess of air into a producer above the fuel, igniting the mixture of combustible gas and air, and burning it in the said parts of the producer, passing the products of combustion and the excess of air from above downward through the coal, and leading off the produced gas from the lower part of the producer, substantially as described.

2. A process of obtaining producer-gas free of tar and of high calorific value consisting in introducing combustible gas and an excess of preheated air into a producer above the fuel, igniting the mixture of combustible gas and air and burning it in the said part of the producer, passing the products of combustion and the excess of air from above downward through the coal and leading off the produced gas from the lower part of the producer, substantially as described.

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

ADOLPHE DESGRAZ.

Witnesses:
LEONARE KASCH,
ANNA DIPPEL.