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PROCESS FOR THE PRODUCTION OF GAS FROM BITUMINOUS FUELS IN INTERMITTENT OPERATION.

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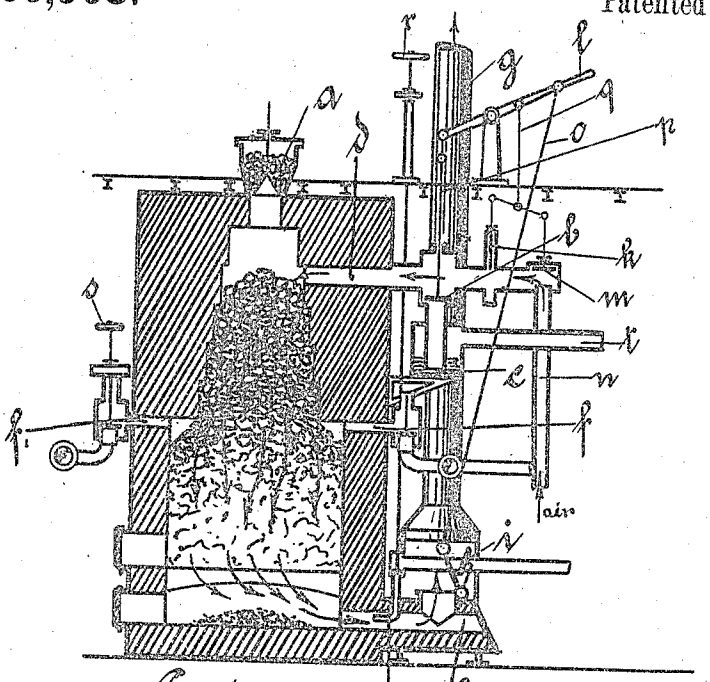


Fig. 1.

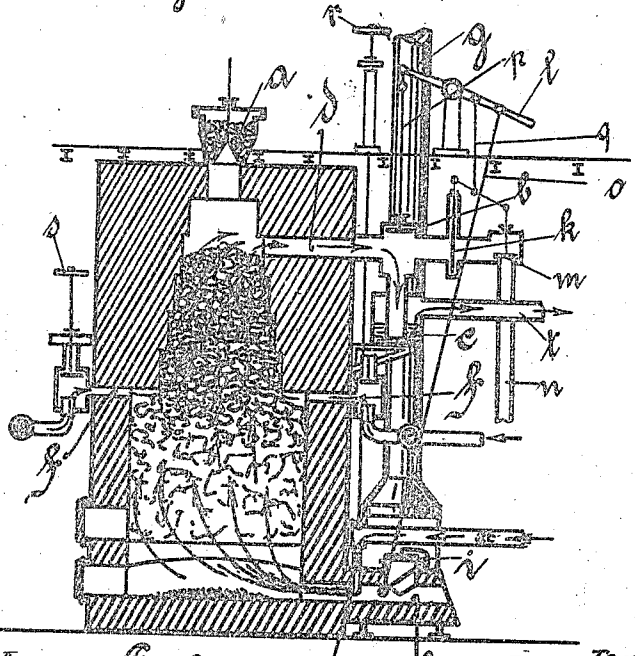


Fig. 2.

Witnesses.

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PROCESS FOR THE PRODUCTION OF GAS FROM BITUMINOUS FUELS IN INTERMITTENT OPERATION.

1,160,908. Specification of Letters Patent. Patented Nov. 16, 1915.

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To all whom it may concern:

Be it known that I, PHILIPP KOSTER, engineer, a citizen of the German Empire, residing at Frankfort-on-the-Main, in the Province of Hesse-Nassau and Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Processes for the Production of Gas from Bituminous Fuels in Intermittent Operation, of which the following is a specification.

This invention relates to a process for the production of gas from bituminous fuels, and has for its object the combination of two well known methods of gas production into a single process. The first of these processes is the continuous generator gas method. In this, steam and air are driven through the producer chamber continuously and at the same time, so that the mass of coal is caused to glow and the steam is decomposed simultaneously. No water gas is produced by this method but a gas which contains the products of combustion formed by the burning of the coal. This gas is very impure and unsatisfactory for most purposes. The second of these processes is known as the intermittent water gas method. In this case, the coal is blown hot by injected air, and only after the hot blast and air have been cut off, is the steam blown in. By this method the products of combustion may be separately carried off and only pure water gas passes into use. This method is however somewhat unsatisfactory as only a non-bituminous combustible can be used.

I purpose to use a combination of the two methods explained in brief above, so that I may secure an almost pure water gas from a bituminous combustible. With this object in view I make use of the intermittent operation method, by blowing air into the producer chamber during the hot-blast and conducting away the products of combustion as they are formed, while in the second period I inject both air and steam thus reverting to the old generator gas process. Since it is only necessary to inject a very small quantity of air during this latter period in order to keep the combustible mass glowing, it will be seen that only a very small amount of the products of combustion will pass off with the gas which is to be used, which is the only difference between the gas produced by my method and pure water gas produced by the usual intermittent process. I have thus been able to use a bituminous fuel for producing a pure gas by means of a suitable process, without making a generator gas of low heating value.

A further characteristic of the present process is the injection of the air during the gassing period at the point where the already coked mass and the combustible matter meet.

The accompanying drawings illustrate one form of apparatus suitable for use with my process.

In said drawings Figure 1 shows the position of the mechanism during the hot blast, and Fig. 2 shows the same during the gassing period.

The letter *a* denotes the fuel feed opening, *b* the valve for the gas conduit, *c* a water seal, and *d* the gas conduit leading from the producer chamber to the seal.

e is a nozzle for the introduction of steam, *f* the ports for the hot-air blast, *g* the chimney, *h* the connecting channel between the chimney and producer chamber, *i* the damper for the chimney, and *k* and *m* the valves for closing the gas channel.

l is a hand lever, connected to the damper *i* by a rod *o;* with the valve *b* by a rod *p;* and with the slide valve *k* and valve *m* by rod *q; r* is the handle to operate the steam nozzle *e* and *s* is the handle to operate the air nozzle *f*.

Fig. 1 shows the position of the mechanism during the heating blast. The hand lever is thrown up thereby opening the chimney damper by means of the rod *o*, and the valves *k* and *m* by means of the rod *q*. The steam nozzle *e* and the air port *f* are at the same time closed by means of the handles *r* and *s*. Air from the hot blast now flows through the upper portion of the producer chamber, circulates through the combustible mass therein, and out of the chimney through the channel *h* and damper *i*.

When the fuel is sufficiently heated the handle *l* is depressed, thereby closing valves *i*, *k*, and *m*. The steam valve *e* and the air port *f* are then opened (see Fig. 2). The steam flows upwardly through the bed of

fuel, and a small quantity of air, just enough to keep the mass of combustible matter glowing, is injected through the air ports *f*, which are located substantially at the point where the coked and uncoked material meet. In this manner the upper surface of the coal is distilled and begins to form gas, which together with the gaseous products, are drawn outwardly through the channel *d* and seal *c*, into any suitable storage tank.

I claim:

1. A process for the production of gas, consisting in heating a bed of fuel by a down blast, shutting off said blast and passing air and steam upwardly through the heated fuel whereby the steam is decomposed and gas is formed.

2. A process for the production of gas, consisting in heating a bed of fuel by a down blast, shutting off said blast and passing steam upwardly through the bed of fuel and introducing into the fuel sufficient air to support combustion, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

PHILIPP KOSTER.

Witnesses:

FRIEDRICH CARL WENTZEL,

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