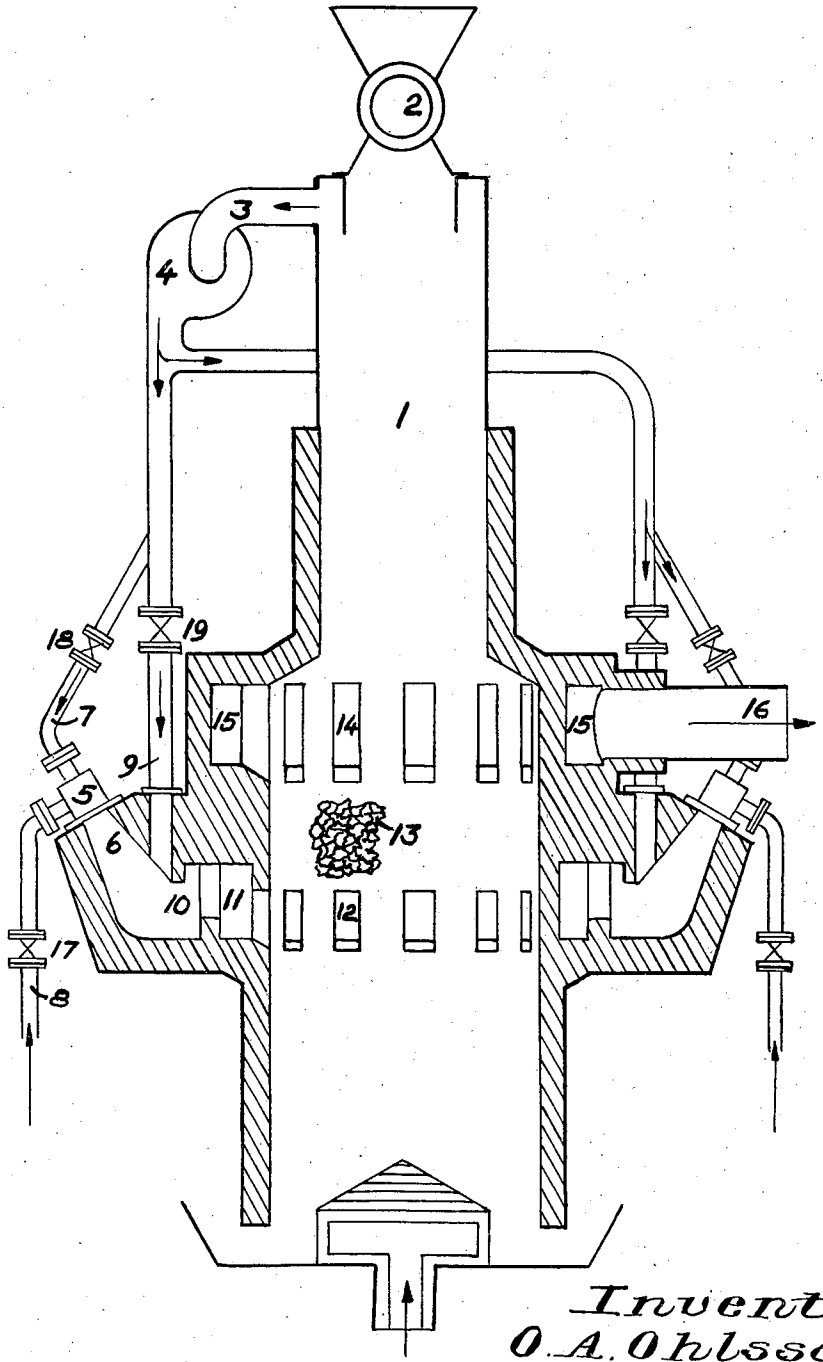
July 19, 1949. O. A. OHLSSON 2,476,760

PROCESS AND APPARATUS FOR THE OPERATION OF GAS PRODUCERS

Filed Oct. 29, 1946



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Patented July 19, 1949

2,476,760

UNITED STATES PATENT OFFICE

2,476,760

PROCESS AND APPARATUS FOR THE OPERATION OF GAS PRODUCERS

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Application October 29, 1946, Serial No. 706,356
In Sweden August 8, 1946

6 Claims. (Cl. 48—76)

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Lignite gas producers are being brought into increasingly wide use in order to facilitate the distribution of fuel in iron works, ceramic factories, etc. These industries, however, as a rule have no use for the tar products, such as phenols etc., the so-called lignite tar ("Schwelteer"), which is formed in considerable amounts in the production of the gas, and which must be separated from the gas by cooling or filtering before it can be discharged into the gas conduits. The tar can indeed be used as fuel in boilers, etc., but the arrangements required for its separation, storage, transport and combustion are complicated, expensive and need much attendance.

It is therefore very desirable in some way to eliminate the drawbacks entailed by these tar products. It is particularly suitable to decompose them into simpler, non-condensing gases, which like purified gas can be discharged without inconvenience into the gas conduits. One object of the present invention is to achieve this result by supplying heat to the tar-containing gases escaping from the producer, so that these gases are decomposed in the manner described. The gases are then introduced into the glowing layer of coke in the producer in order (1) to reduce carbon dioxide contained in the gases because the tar-containing gases preferably be heated by combustion of the said gases wholly or partly as described below, and (2) to purify the gases from finely divided carbon produced during the heating and/or the decomposition.

A schematic example of the invention is shown in the accompanying drawing, partly in vertical section.

1 denotes the producer shaft, which is charged through the feeding device 2. From the uppermost part of the producer shaft, where the tarry gases collect, these gases are conveyed for instance through a pipe 3 to a fan 4, after which they preferably are distributed in one or more burners 5, with appertaining burning chambers 6, situated round the periphery in the lower part of the producer. The gas flow to each burner has previously been divided into two parts. The one part, which is supplied to the burner through the pipe 7, is mixed with a substantially equivalent amount of air, which issues through the pipe 8 and is combusted in the burning chamber 6. The other part is introduced through the pipe 9 to a zone 10 after the burning chamber, whereupon mixing of the two gas streams takes place. Hereby the tarry gases are heated by the hot combustion gases and are thus decomposed.

The gas mixture then passes through an annular channel 11 and openings 12 into the producer, after which it flows upwards through the glowing coke layer 13 and finally passes out of the producer through the openings 14, the annular channel 15 and the purified-gas outlet 16 for further transmission to the places of consumption.

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When the two gas currents from the burning chamber 6 and the pipe 9 meet at the mixing place 10, the temperature of the gas mixture must be so high that an effective decomposition of the tarry gases takes place. Likewise the gas mixture in passing through the glowing coke layer 13 must have a sufficiently high temperature to maintain a glowing condition in the coke or else, if necessary, to heat it to incandescence, so that an effective reduction of the carbonic acid formed in the combustion is obtained. One of these two requirements determines the amount of heat to be supplied to the tarry gases, which can be regulated by means of the valves 17, 18 and 19.

In the example shown in the drawing, the heating is effected by the complete or partial combustion of the returning gas. The gas may also be heated from without, for example by electricity and/or by some kind of heat regulator.

If, however, the supply of heat is effected by the combustion of the returning gas, the required amount of heat can generally be obtained by the combustion of merely part (e. g. a minor part) of the gas. In that case it is desirable to separate this part from the rest of the gas and to combust it separately, as indicated in the drawing. In this way a higher temperature is obtained in the combustion, with more rapid and complete gas reaction.

If required, the primary air of the mixture of steam and primary air supplied to the bottom of the producer may be pre-heated, for example by utilizing the physical heat of the gas escaping through the purified gas-outlet 16. The heat supplied through the pre-heating is utilized in the coke layer 13, whereby a smaller amount of tarry gases are consumed for the combustion in order to maintain the required temperature in this layer. In this manner the heat value of the escaping purified gas is increased.

What I claim is:

1. In a gas producer, a branched conduit on the outside of the producer for passing the tarry gases from the distillation zone downwardly to the producer fuel bed, a combustion chamber for the tarry gases, a branch pipe from said conduit connected with the combustion chamber for the tarry gases, said combustion chamber hav-

ing at least one inlet for an oxygen containing gas and a connecting passage between said combustion chamber and the generator fuel bed above the grate of the producer, an inlet in said passageway for the introduction of the second branched pipe from the distillation zone so situated that the tarry gases from the second branch are heated by being mixed with the hot gases from the combustion chamber before entering said producer.

2. In a process for the operation of gas producers in which tarry gases are passed from the distillation zone downwardly to the producer fuel bed, the steps of branching off and combusting part of said tarry gases before being returned into the fuel bed of the producer, heating another part of said tarry gases by mixing the latter part directly with the hot combustion gases from said combustion before introducing them into the producer fuel bed and then passing said hot mixture into the fuel bed of the producer at a substantial height above the primary combustion zone of the producer.

3. A process in accordance with claim 2, in which the heating of the gas is effected by its being completely or partly combusted together with oxygen containing gas before re-entering the producer.

4. A process in accordance with claim 2, in which the heated gases during their passage through the glowing layer of fuel are partly reduced.

5. A process in accordance with claim 2, in which merely part of the returning tarry gases are combusted together with a substantially equivalent amount of oxygen containing gas, whereupon the hot combustion gases thus formed and the remaining tarry gases are mixed and decomposed and the mixture thus produced introduced into the glowing layer of fuel.

6. In a gas producer the combination of at least one conduit for returning tarry gases from the distillation zone into another part of the producer, a second conduit for the tarry gases, a chamber connected with said second conduit, at least one conduit for supplying oxygen containing gas such as air to the said chamber for the combustion of the tarry gases supplied through said second conduit, said chamber being situated before the zone where the gases are introduced into the producer.

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