B. VERSEN.

GAS PRODUCER.

APPLICATION FILED JULY 29, 1908.

987,195. Patented Mar. 21, 1911.

Fig. 1.

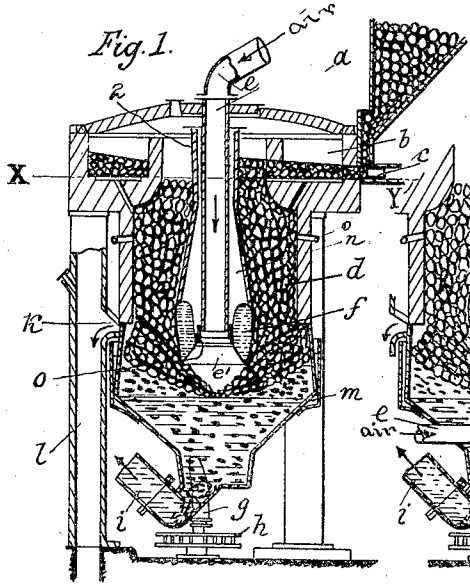


Fig. 2.

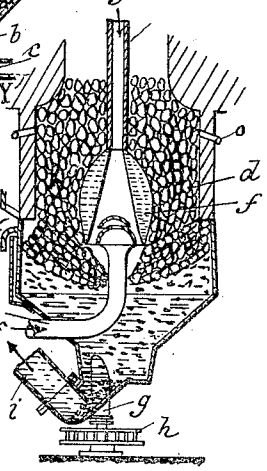
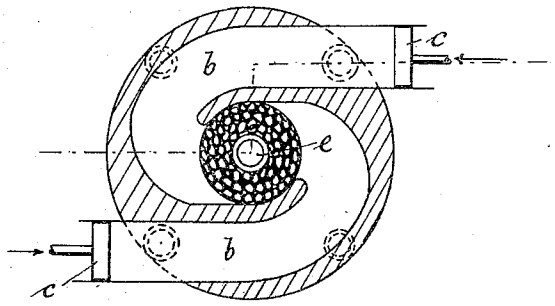


Fig. 3.



Witnesses

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BRUNO VERSEN, OF DORTMUND, GERMANY.

GAS-PRODUCER.

987,195. Specification of Letters Patent. Patented Mar. 21, 1911.

Application filed July 29, 1908. Serial No. 445,937.

To all whom it may concern:

Be it known that I, BRUNO VERSEN, a subject of the German Emperor, residing at the city of Dortmund, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Gas-Producers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to gas producers and has for its object to construct a producer capable of working automatically with fuel that produces quite fusible slags or cinder, the fuel being supplied continuously at the top of the producer shaft and the air being supplied through a pipe enlarged at its end or burner. At the burner the combustion chamber enlarges quite rapidly to prevent the slags or cinder from packing, and to allow them to be free to fall into a water chamber below the furnace.

Referring to the drawings in which like parts are similarly designated—Figure 1 is a vertical section through a gas producer embodying my invention. Fig. 2 is a similar section of the lower part of a gas producer showing a modification. Fig. 3 is a horizontal section on the line X—Y of Fig. 1.

The fuel is fed from the hoppers *a*, Fig. 1, to a tangential substantially horizontally disposed feed conduit *b*, there being two such conduits and hoppers oppositely disposed. A piston *c* operating below the discharge opening of the hopper in the end of the feed conduit forces the fuel through the conduits to the central combustion chamber *d* in the shaft of the producer.

The chamber *d* of the producer may be considered as containing at its upper part a gas zone, at its central part the combustion zone, and at its lower part the slag or cinder zone; and at the combustion zone at or just below the burner, the chamber *d* widens considerably, *i. e.*, has a larger cross-sectional area through which the fuel can pass.

In Fig. 1 the air for combustion is supplied through a pipe *e* extending downwardly into the producer and ending in an enlarged or flaring portion *e'* forming the burner. This pipe is surrounded by a chamber *n* formed between pipe *e* and pipe 2 which is also enlarged at its lower portion and distanced from the pipe *e* so as to form an annular space around said pipe *e*. The pipe 2 opens into the upper part of the producer, so that the distillation gases will be free to enter the annular chamber *n* at the upper end of said pipe. The upper surfaces of the flared end of pipe *e* are cooled by a water cooler *f*, extending between the burner and the lower edge of pipe 2 and is contracted downwardly to the portion *e'* of pipe *e* that prevents the cinder from adhering to the burner. At or below the burner and zone of combustion the producer widens and contains a body of water into which the hot cinder falls and is disintegrated. The disintegrated cinder then drops through the body of water below the combustion zone to the smaller lower end of an upwardly inclined cinder discharge *i* that is filled with water and forms a water seal. A cinder breaker or breaking cone *g* is mounted in the lower portion or water chamber of the producer and is driven by a chain wheel or other suitable device mounted thereon below the producer. The enlarged portion of the producer at or about the combustion zone is provided with a water cooling jacket *m*. The gas produced has its exit at *k* above the water-jacket *m* and enters hollow columns *l* that support the producer. Nozzles *o* are formed at the burner, whereby the gas that has collected in the upper part of the producer will be drawn downward through the chamber *n* and nozzles *o* by the incoming air through pipe *e*, so that this gas will be mixed with the air at the zone of combustion.

In the modification Fig. 2, the air supply pipe *e* enters through the water chamber and terminates in an enlarged burner head surrounded and protected by a water-cooled chamber *j* enlarged at its lower end, the burner being constructed to deflect the air downwardly.

In both of these forms the combustion zone at or about the burner has a larger area of cross section to permit the cinder to automatically fall, so that there will be no constriction of the fuel at the zone of combustion but rather a spreading of the fuel at this point, so that it can loosen of itself and not become fused into a compact mass, or have conditions present which might lead to said result.

There is also a water cooling device at the outside of the producer and one at the burner, so that the fuel must pass between the two water coolers at the combustion zone, thus effectually preventing clinkers from sticking to these parts and choking the downward feed of fuel.

The gas producer is of the suction type, where the gas is drawn off at a point below the top.

I claim—

1. In a gas producer, the combination with a producer body enlarging downwardly from the combustion zone; of a burner comprising a central air supply device, a pipe surrounding the device increasing in diameter downwardly to the combustion zone and opening at its top in gas-space of the producer body and supplying gas for the burner, a cooling device for the burner decreasing in diameter downwardly at the combustion zone, thereby forming an annular fuel chamber increasing in sectional area downwardly, substantially as set forth.

2. In a gas producer, the combination with the producer body having conical walls at the combustion zone; of a burner comprising a central air supply pipe and a central gas supply pipe fed by gas from the gas space of the producer, a water cooler having a conical exterior at the burner, said cooler and conical wall tapering in opposite directions to form an annular combustion zone enlarging in section downwardly.

3. In a gas producer, the combination with a vertical shaft; of an air supply device extending from the top downward into the shaft and having an air supply pipe with an enlarged exit end, a chamber surrounding said pipe, extending above the fuel level in the producer and communicating with the enlarged discharge end.

4. In a gas producer, a vertical shaft, a central air supply device extending from the top downward to the combustion zone, said device comprising a central air pipe having an enlarged exit end, a water cooler for said end and a pipe surrounding the air pipe and extending from the cooler to above the fuel level in the producer, thereby forming an internal annular fuel chamber decreasing in area downward, and the body of the producer enlarging at the combustion zone downward to provide larger space at the cinder zone; a water chamber in the lower part of the producer extending to the cinder zone to disintegrate the cinder, and the annular chamber between the two pipes communicating with the exit end of the air pipe.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

BRUNO VERSEN. [L. S.]

Witnesses:
OTTO KÖNIG,
WM. WASHINGTON BRUNSWICK.