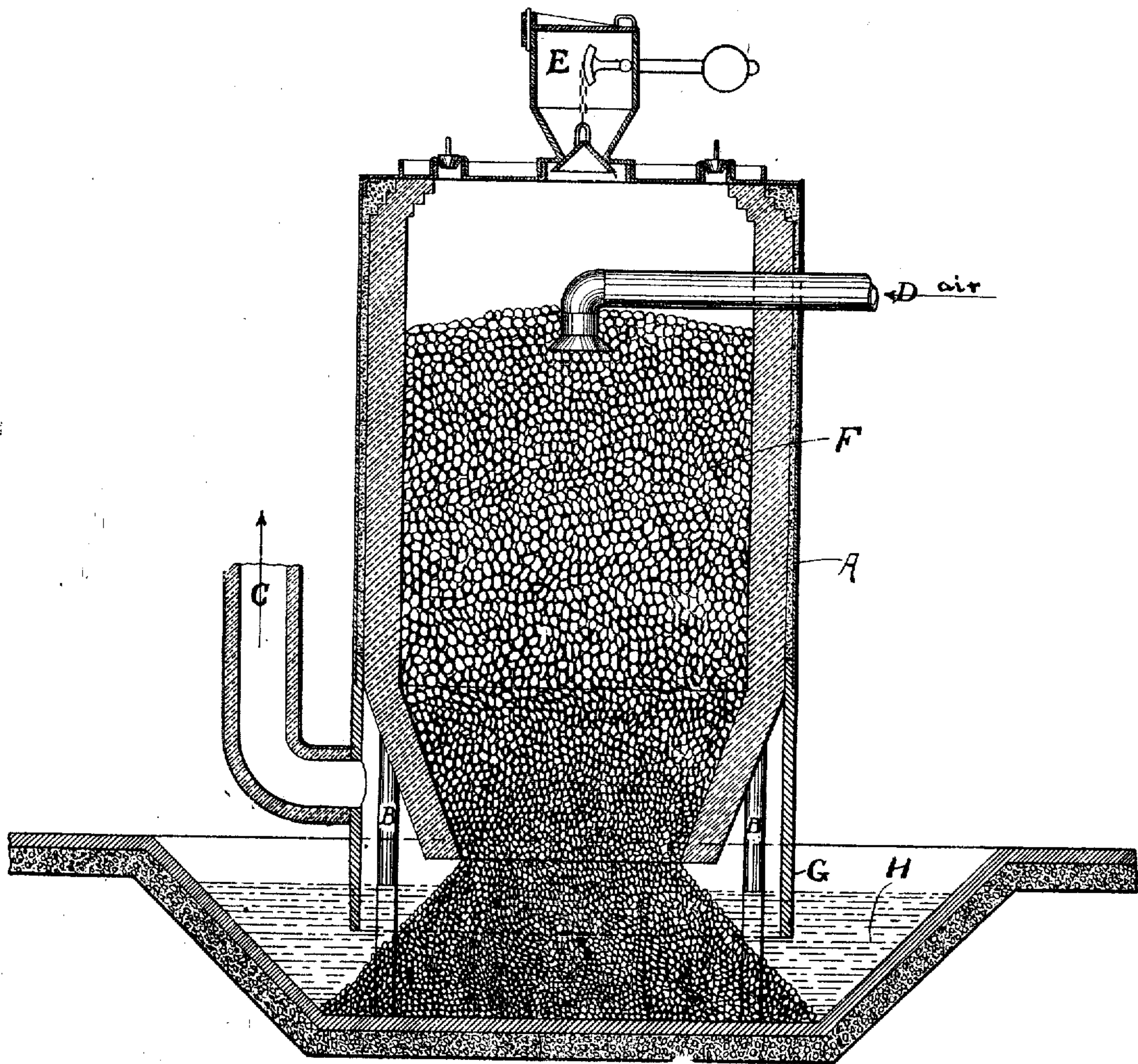


No. 843,715.

PATENTED FEB. 12, 1907.

G. M. S. TAIT.
GAS GENERATING APPARATUS.
APPLICATION FILED AUG. 16, 1906.



WITNESSES:

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INVENTOR

Godfrey M. S. Tait
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UNITED STATES PATENT OFFICE.

GODFREY M. S. TAIT, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO COMBUSTION UTILITIES COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

GAS-GENERATING APPARATUS.

No. 843,715.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed August 16, 1905. Serial No. 274,497.

To all whom it may concern:

Be it known that I, GODFREY M. S. TAIT, a subject of the King of Great Britain, and a resident of Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Gas-Generating Apparatus, of which the following is a specification.

My invention relates to improvements in gas-producers of the downdraft type; and the object of my improvement is to provide a means for generating from bituminous coal a clean pure gas rich in combustible matter, which is eminently suited for use in internal-explosion engines. I attain this object by the apparatus illustrated in the accompanying drawing, which depicts the producer in vertical section.

In the drawing, A is the producer-shell lined with fire-brick and supported by the columns B B. The lower portion of the producer-lining is contracted to form a bosh. The shell A is not contracted at this point, but extends perpendicularly downward to the water seal H, as shown at G, thereby forming with the bosh and water-surface an annular passage or gas-collecting chamber. From this chamber leads the gas-outlet flue C. At D is shown a twyer for admission of the draft-current containing air or air and steam or carbon dioxid or other gasifying agent.

E is a hopper for the introduction of fuel, ordinarily of bituminous coal, although other fuels, such as anthracite coal, coke, wood, or peat, may be employed. The producer is of such height that a fire of suitable gasifying depth may at all times be maintained.

The operation of my apparatus is as follows: As in usual producer practice a fire is built up in the generating-chamber until of the proper depth. The draft-current is introduced through the twyer D either by suction or pressure, passes downwardly through the fuel, and escapes through the ashes into the gas-collecting chamber and from thence through the outlet C to the place of consumption. As the ash at this point is moist, owing to the capillary attraction of the fine particles thereof for the water of the water seal beneath, the contacting gas is cooled and purified and is brought into condition to be carried to a remote place of consumption.

without objectionably choking the conduits through which it passes by deposition of soot and tar.

I do not limit myself to the exact constructional features herein described. I believe that I am the first to make use of the purifying action on producer-gas of the moist ash contiguous with the water seal, and therefore believe I am broadly entitled to such features of construction as will accomplish this end. Wherefore I do not limit myself to a hopper or hoppers for the introduction of the fuel, as in the case of operation by suction simply an opening in the producer-roof will suffice; nor do I limit myself to the introduction of the fuel in the upper part of the producer solely nor to the form of twyer as shown, for the draft may be admitted in any other suitable manner—in the case of a suction-producer through the hopper or through other openings in the producer roof or sides.

The present form of twyer is suitable for fuels which have a tendency to contract during combustion, thereby forming free passage for the draft around the fuel mass. The central admission of the draft, as shown, permits of a uniform dispersion thereof throughout the fire. The construction of the boshes and lower portion G of the shell may be greatly varied, as is evident. It is not essential that the gas-collecting chamber entirely surround the bosh, and if built in several sections each section may be equipped with an outlet, if desired. In case it is desired to avoid constriction in the lower portion of the producer the interior walls may be made perpendicular and the gas-collecting chamber be constructed with projecting exterior walls.

The level of the water of the water seal may be varied as desired in order to receive a greater or less filtration-surface. If the water is brought to the level of the lower portion of the boshes, the gas will bubble through the water, thereby effecting an additional purification. The ashes which are removed from the producer are impregnated to a greater or less extent with tarry and other carbonaceous matter. If this be considerable in amount, the ash may be drained or dried and used as a fuel, for the porous nature of the ash is often such that the tar is easily burned therefrom under circumstances which would preclude the combustion of tar alone without a carrier of some sort.

My apparatus when properly operated produces gas high in carbon monoxid and in this respect, among others, is superior to the down-draft-producers heretofore used, all of which,
5 so far as I am advised, produce a gas of relatively poor quality.

What I claim is—

A continuous-operating downdraft gas-producer comprising a producer with an
10 open-ended reduced lower portion, an annular collar surrounding such reduced portion and spaced apart therefrom to form a gas-chamber, said collar extending downwardly below the open end of the reduced portion, a

gas-outlet pipe tapping the gas-chamber, a 15 water-sealing device adapted to maintain a normal liquid-level below the end of the producer and above the end of the collar, and an air-draft-inlet pipe at the upper end of the produce. 20

Signed at New York, in the county of New York and State of New York, this 10th day of August, A. D. 1905.

GODFREY M. S. TAIT.

Witnesses:

WARREN E. DIXON,
JAS. K. CLARK.