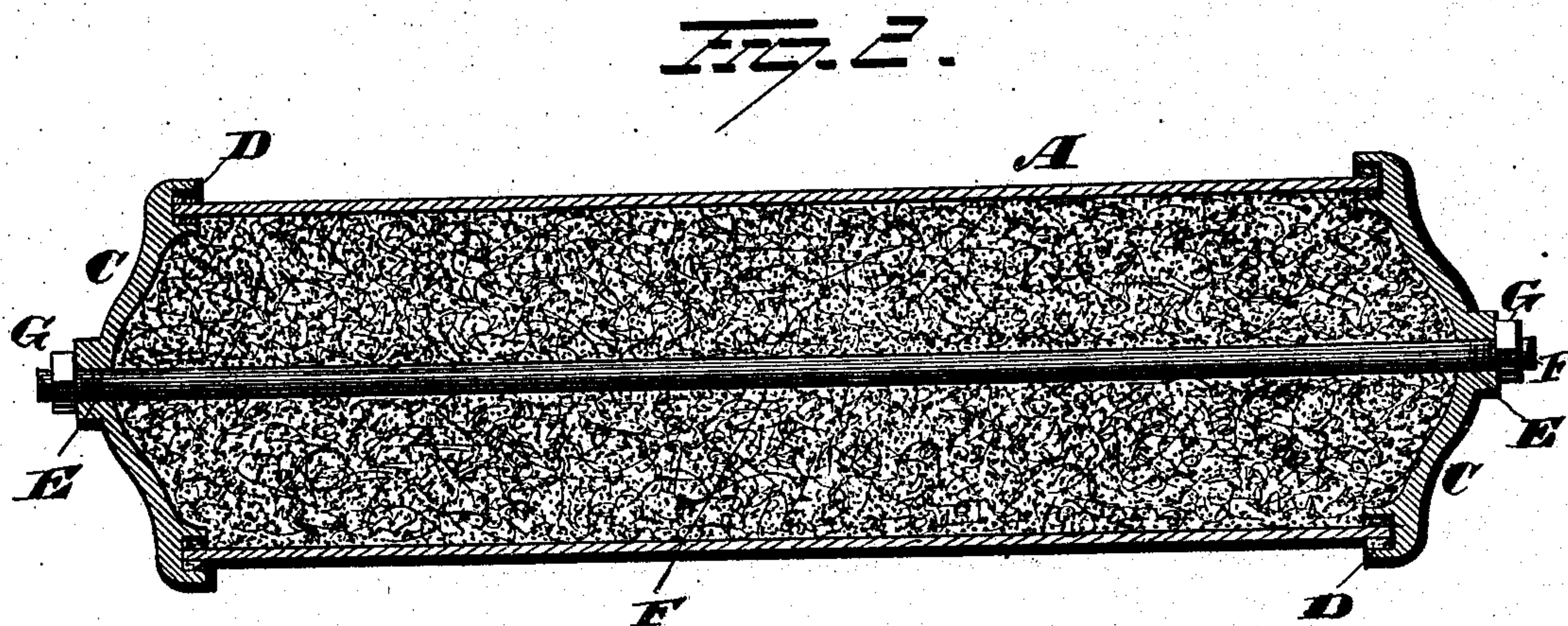
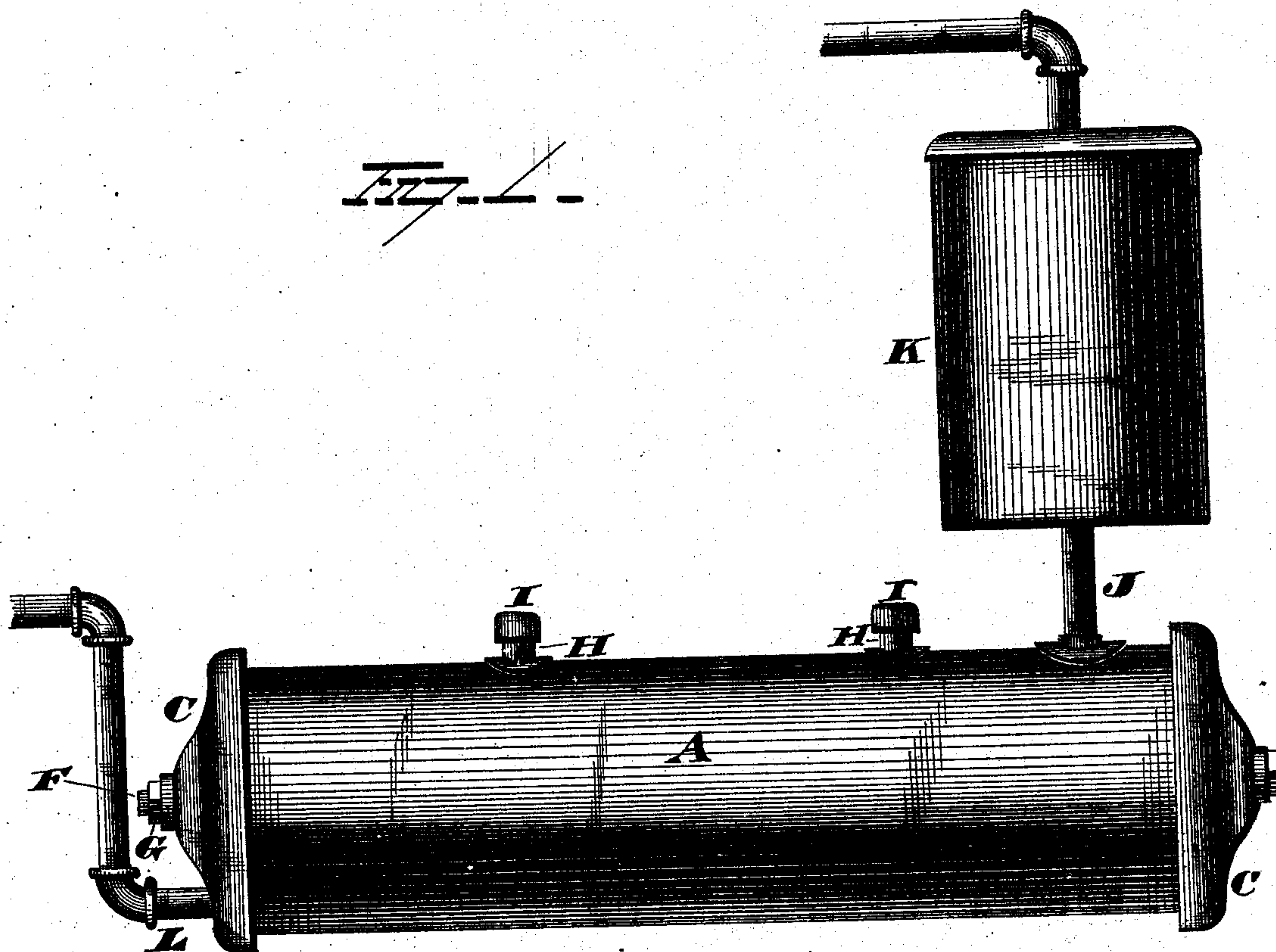


(No Model.)

G. W. BILLINGS.
APPARATUS FOR PRODUCING GAS.

No. 292,622.

Patented Jan. 29, 1884.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE W. BILLINGS, OF CLEVELAND, OHIO.

APPARATUS FOR PRODUCING GAS.

SPECIFICATION forming part of Letters Patent No. 292,622, dated January 29, 1884.

Application filed May 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BILLINGS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Apparatus for Producing Gas; 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 of reference marked thereon, which form a part of this specification.

My invention relates to an apparatus for producing illuminating and heating gas, the object being to provide a device of this character which shall combine simplicity of construction and ease of operation with durability and efficiency in use, and which shall be adapted to produce a gas practically non-condensable in virtue of the extreme tenuity to which the hydrocarbon is reduced.

With this object in view my invention consists in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claim.

In the drawings, Figure 1 is a view in side elevation of a gas-producing apparatus constructed in accordance with my invention. Fig. 2 is a view in vertical longitudinal section of the atomizing-cylinder.

A represents a metallic cylinder, of any desired size and construction, and preferably made of galvanized iron. It is closed at each end by dome-shaped heads C, the inner peripheral edges of which are provided with annular grooves D, which receive the ends of the cylinder aforesaid. The union between the heads and the ends of the cylinder is made air-tight by packing the grooves *a* with sheet-lead and with a thin layer of any suitable fibrous material previously saturated with common soap, such packing being represented in Fig. 2 of the drawings. The said heads are centrally perforated, as at E, to receive the ends of a rod, F, which extends through the center of the cylinder, the heads being held in position by nuts G, which are screwed on the projecting ends of the rod. The cylinder is charged with liquid hydrocarbon through the charging-pipes H, which are provided with caps I. It is also provided with a gas-pipe,

J, to convey the gas produced to the gas-chamber K, which may be located at any desired distance from it. The said cylinder is packed with a densely-compressed mass of any suitable fibrous material—a material being chosen which is capable of absorbing a great quantity of liquid hydrocarbon.

In packing the cylinder one of the heads C is placed in position over one end thereof. The rod F is then introduced into the cylinder and passed through the head placed in position, as described, that end of the rod projecting from the open end of the cylinder being supported by a narrow block of wood or iron, which is perforated to receive it. The head C, already adjusted over one end of the cylinder, is now drawn into tight engagement with it by a nut, which is screwed onto the end of the rod projecting through the said block. The cylinder is now packed with fibrous material, which is introduced into the open end thereof, such material being packed to form a dense mass. After the operation of packing the cylinder is concluded, the block is removed, and the other head is placed over the open end of the cylinder. The nuts G, secured to the projecting ends of the rod, are now manipulated to draw the heads into an engagement with the cylinder, which will enable it to withstand the pressure of the air which is forced into it.

When the cylinder is packed and sealed, as hereinabove set forth, the caps I are removed, and a quantity of liquid hydrocarbon equivalent to about half the capacity of the cylinder is introduced into it. After this has been done, the caps I are restored to the pipes H and tightly screwed down upon them. In virtue of the porous nature of the packing within the cylinder, and also in virtue of the compression to which it is subjected during packing, the liquid hydrocarbon will be distributed by capillary action throughout the whole mass of packing in the cylinder. When air under pressure is introduced into the cylinder through an aperture, L, in one of the heads C, or other suitable point of inlet located near the bottom of the cylinder, it will, in forcing its way through the saturated packing, atomize and take up a small quantity of the hydrocarbon, the passage of the vaporized or atomized hydrocarbon through the whole mass of

packing operating to break up the atoms of liquid and reduce them to a state of extreme attenuation, the gas produced being one in which a greatly predominating percentage of
5 air is physically mixed with a small percentage of hydrocarbon.

It is by virtue of the extremely-fine division of the particles of hydrocarbon that the gas produced in my apparatus is practically non-
10 condensable, or, in other words, non-condensable under the temperatures and pressures to which illuminating-gas is ordinarily subjected. As the quantity of hydrocarbon mingled with
15 a given quantity of air is very small, a single charge of hydrocarbon will suffice to produce a large volume of gas. When one charge of hydrocarbon has been exhausted, the cylinder is readily recharged.

I am aware that the open ends of cylinders
20 have been closed by heads secured in place by one or more rods uniting said heads and extending through the cylinders.

I am also aware that an apparatus for charging air with the vapor of hydrocarbon has
25 been made by combining an outer and an inner tube, the former being filled with fibrous material saturated with hydrocarbon and fitted to have air admitted into it, and the latter being perforated to receive the charged air,
30 and arranged to hold the heads which close the open ends of the outer tube in place.

My invention is distinguished from those

above referred to in consisting in a particular organization of parts, embracing a cylinder, removable heads therefor, a rod to hold the
35 heads in place, a packing of fibrous material, pipes to introduce hydrocarbon into the cylinder, and ingress and egress ports for air and gas, arranged so that the whole length of the cylinder and the thickness of the packing is
40 traversed by the air in making a transit through the apparatus.

Having fully described my invention, what I claim as new, and desire to secure by Letters
Patent, is— 45

In an apparatus for producing gas, the combination, with the described atomizing-cylinder, of removable heads therefor, a rod extending through the cylinder to hold the heads
in place, a homogeneous body of compressed
50 fibrous material filling the cylinder, pipes for the introduction of oil thereinto, and ports for the ingress of air and the egress of gas, respectively located on opposite sides and ends of the cylinder, substantially as and for the
55 purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of May, 1882.

GEORGE W. BILLINGS.

Witnesses:

J. E. ENSIGN.

W. GARWARD.