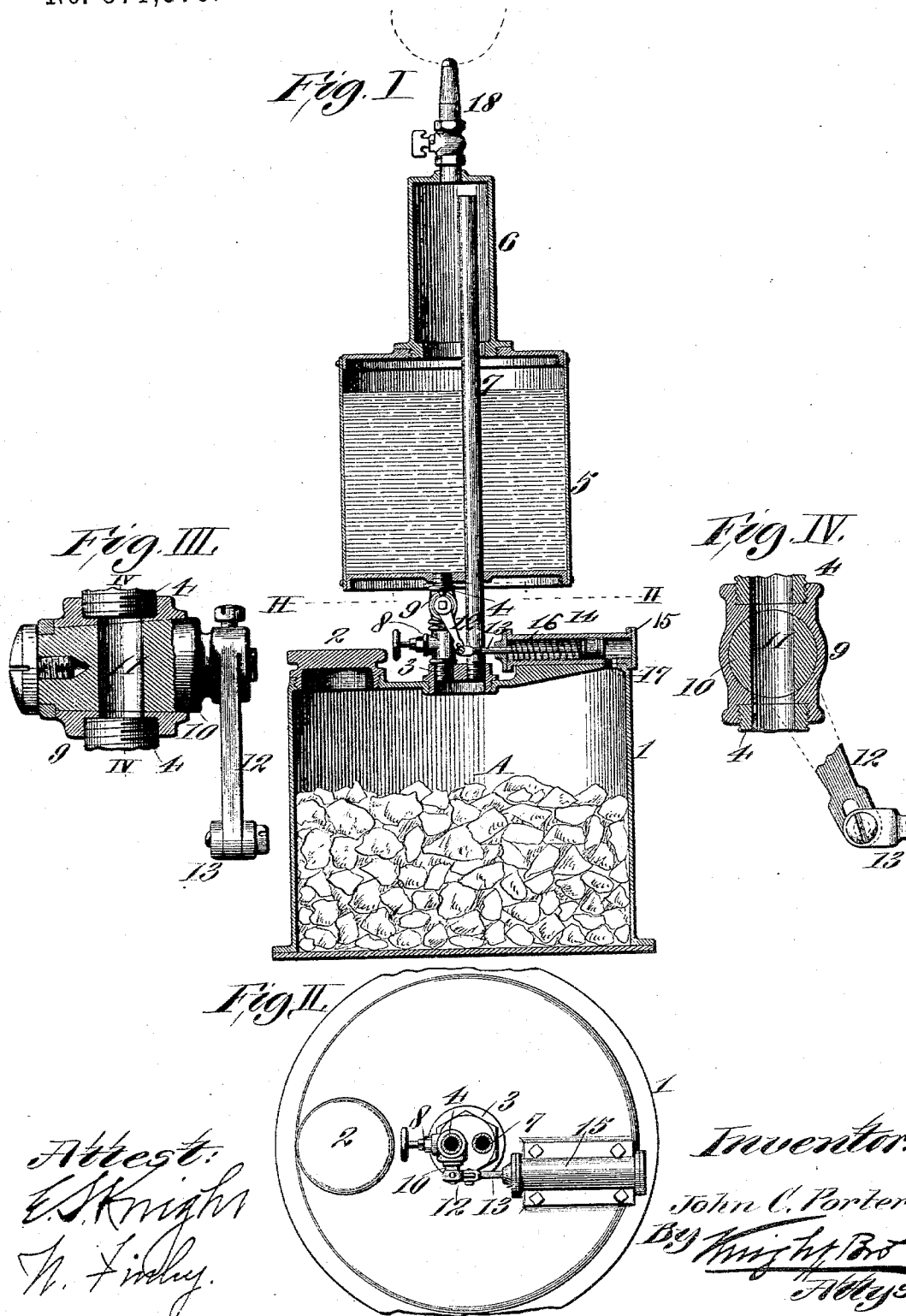


(No Model.)

J. C. PORTER.
GAS GENERATOR.

No. 571,576.

Patented Nov. 17, 1896.



Attest:
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UNITED STATES PATENT OFFICE.

JOHN C. PORTER, OF ST. LOUIS, MISSOURI.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 571,576, dated November 17, 1896.

Application filed December 28, 1895. Serial No. 573,637. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. PORTER, a citizen of the United States, and a resident of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Gas-Generators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that class of apparatus in which gas is generated or evolved from a chemical substance on the application of a liquid. Important among such substances is calcic carbid, from which gas evolves on water coming in contact with it, and it is especially this substance that is designed to be used in my apparatus.

The apparatus is of such nature that it may be constructed either in the shape of a hand-lamp or of large size to furnish sufficient gas to supply dwellings or other buildings on connection with suitable piping, or the gas may be supplied from the apparatus for the propulsion of mechanical devices.

My invention consists of features of novelty hereinafter fully described, and pointed out in the claim.

Figure I illustrates a vertical section taken through the apparatus. Fig. II illustrates a plan of the chemical-holding chamber, the upper portion of the apparatus being removed by a horizontal section taken on line II II, Fig. I. Fig. III is an enlarged detail view, part in elevation and part in vertical section, of the regulating-valve through which the liquid is admitted from the intermediate reservoir to the chemical-holding chamber. Fig. IV illustrates a section taken on line IV IV, Fig. III.

In the drawings, 1 designates the chemical-holding chamber in which the chemical is located, as indicated by A. This chamber is provided at its upper end with an opening closed by a screw-cap 2, through which the chemical is introduced to the chamber. In the central portion of the top of the chamber is a screw-plug 3, provided with an opening into which is introduced the lower end of a vertical pipe 4, that supports a liquid-holding reservoir 5 at its upper end.

6 designates a gas-receiving chamber placed

above the reservoir 5 and having screw connection therewith.

7 designates a vertical pipe inserted in the screw-plug 3 and extending thence upward through the liquid-holding reservoir 5 into the gas-receiving chamber 6. This pipe conveys the gas when evolved from the chemical-holding chamber 1 up into the gas-receiving chamber 6, the gas being formed on the admission of liquid through the pipe 4 into the chemical-holding chamber 1. The passage of water through the pipe 4 is controlled by an ordinary lower horizontal valve 8 and also by a self-regulating upper horizontal valve, which will now be described.

The self-regulating valve consists in a valve-housing 9, located in the pipe 4 and provided with a turning plug 10, having a single aperture 11. To the plug 10 is connected a crank-arm 12, through means of which the plug is turned in its housing. Pivotaly connected to the crank-arm 12 is a laterally-extending piston-rod 13, whose opposite end carries a piston 14, that operates in a horizontal cylinder 15. Around the piston-rod on the interior of the cylinder 15 is a coil-spring 16, which bears against the outer head of the cylinder on its interior and against the outer face of the piston 14. 17 is a port extending through the top of the lower chamber and the lower side of the cylinder leading from the interior of the chemical-holding chamber to the interior of the cylinder 15, thereby providing a communication between said chamber and cylinder.

18 designates a burner which may be connected to the gas-chamber 6, or a pipe may be employed in lieu of this burner and the gas be conveyed to a near or remote point for consumption as an illuminant or for heating or providing power for the propulsion of mechanical devices.

The operation of the apparatus in the generation of gas is as follows: The chemical substance, such as calcic carbid, is introduced into the chamber 1 through the opening closed by the screw-cap 2, and the liquid-holding chamber 5 being filled on unscrewing and removing the gas-receiving chamber 6, when, after replacing the chamber 6, the valve 8 is turned to permit a small quantity of liquid to pass through the pipe 4 into the chamber 1,

where such liquid comes in contact with the chemical therein contained. The gas then evolves on the chemical becoming decomposed by the liquid, and on formation the gas ascends through the pipe 7 into the gas-receiving chamber 6, from which it may be conveyed through the burner 18 or through suitable piping to the point of consumption.

An important feature of the construction is that the gas on reaching the gas-receiving chamber 6 is free to circulate down into the liquid-holding reservoir 5, and it therefore exerts the same force of pressure above the liquid as is exerted by it in the chamber 1, and therefore the flow of liquid through the pipe 4 is not retarded through upward pressure of the gas in the chamber 1, which would tend to prevent the flow of liquid into the chamber 1.

The normal position of the piston 14 is that illustrated in Fig. I, in which position the spring 16 normally holds the piston and consequently the self-regulating valve, the valve at this time being open, as illustrated in the sections, Figs. III and IV. When sufficient gas has been evolved to create a high pressure in the apparatus, the gas pressing against the piston 14 by its entrance through the port 17 presses the cylinder inward and, compressing the spring 16, carries the crank-arm 12 until the plug 10 is turned a sufficient distance to close off or partly close the passage-way 11 and stop the flow of liquid through the pipe 4, while when the gas-pressure becomes diminished in the apparatus the spring 16 will force the piston back toward its normal position and the flow of liquid will

again be established into the chamber 1 for the purpose of decomposing the chemical A to evolve an additional quantity of gas.

It may be found an advantage to locate a purifier containing lime or other purifying substance at some point in the apparatus, so as to purify the gas after its formation, and such a purifier might be added to the apparatus without departing from the essence of my invention.

I claim as my invention—

A gas-generator comprising the chemical-holding chamber, the liquid-holding reservoir surmounting the said chemical-holding chamber, the gas-receiving chamber surmounting the said liquid-holding reservoir and open to the latter to permit the free circulation of the gas between the gas-receiving chamber and the liquid-holding reservoir, the gas-pipe extending from the chemical-holding chamber through the liquid-holding reservoir and into the gas-receiving chamber, the liquid-pipe connecting the liquid-holding reservoir with the chemical-holding chamber, and having a controlling-valve, and a self-regulating valve provided with a turning plug, a pendent crank-arm secured to the said plug, the horizontal gas-pressure cylinder mounted on the chemical-holding chamber and in communication therewith, the spring-piston, working in the said cylinder, having a rod connected with the pendent crank-arm; substantially as described.

JOHN C. PORTER.

In presence of—

E. S. KNIGHT,
N. FINLEY.