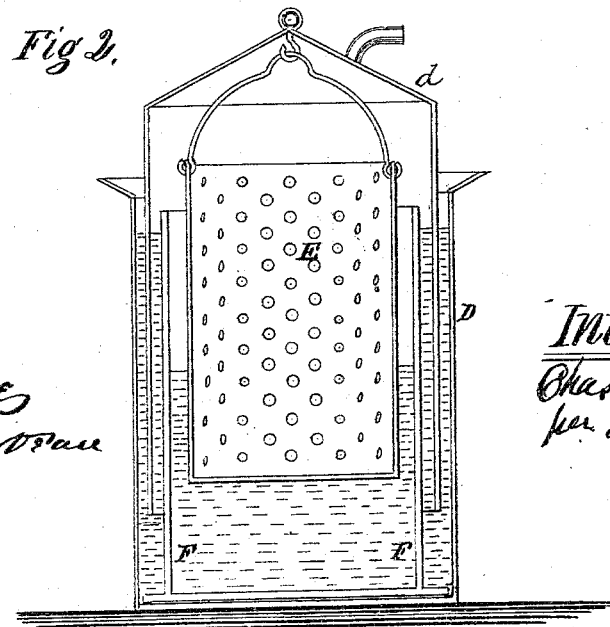
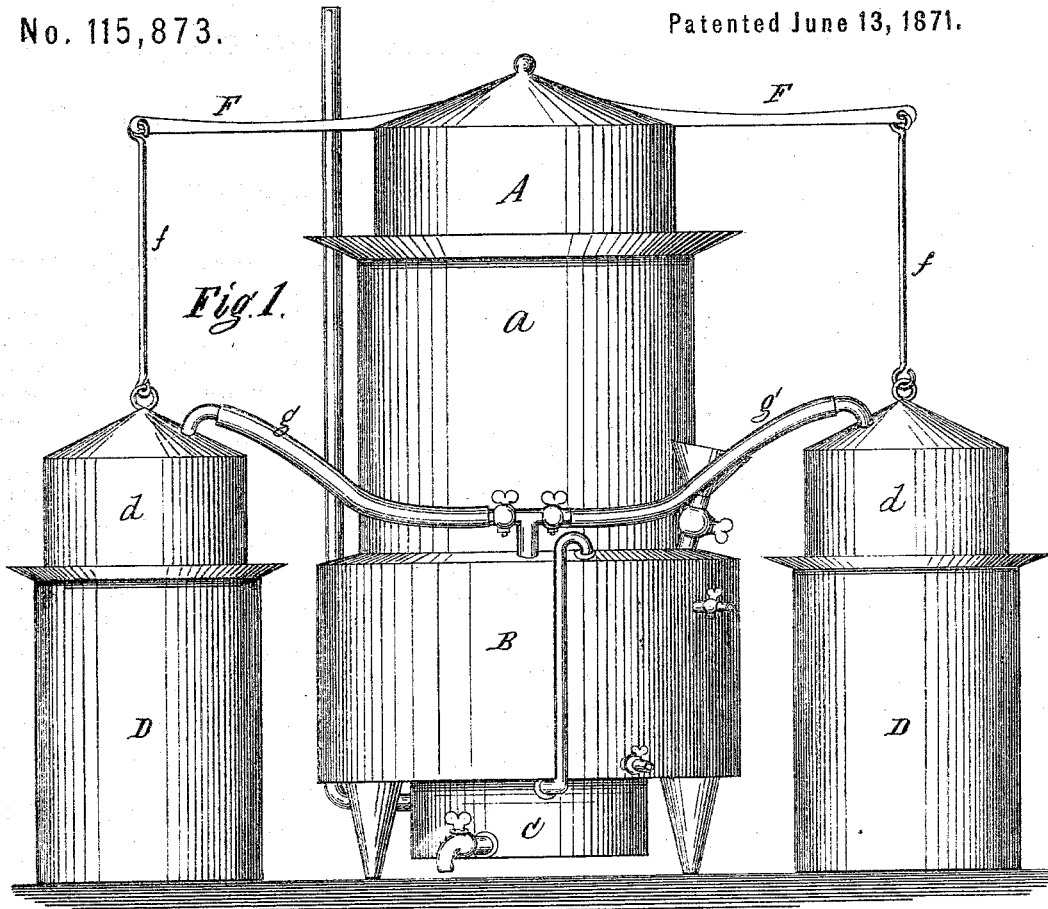


CHARLES B. LOVELESS.

Improvement in Apparatus for Carbureting Hydrogen Gas.

No. 115,873.

Patented June 13, 1871.



Witnesses.

Chas. J. Dodge
Samuel D. Brown

Inventor.

Chas. B. Loveless
per J. A. Morley
Att'y.

UNITED STATES PATENT OFFICE.

CHARLES B. LOVELESS, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN APPARATUS FOR CARBURETING HYDROGEN GAS.

Specification forming part of Letters Patent No. 115,873, dated June 13, 1871.

To all whom it may concern:

Be it known that I, CHARLES B. LOVELESS, of Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Improvement in Hydrocarbon-Gas Generators; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a front view of my invention; and Fig. 2 is a detailed view, enlarged, showing one of the hydrogen-gas generators in section.

Similar letters of reference indicate like parts.

This invention relates to that class of gas-generators in which pure hydrogen gas is first generated by electro or chemical action and then carbureted by passing it through a volatile or light hydrocarbon oil, making a fixed or non-condensable gas of high illuminating power; and the invention consists in the combination of parts as hereinafter described and claimed.

In the accompanying drawing, A *a* is the main gasometer, B is the carbureter, C is the receptacle or condenser for impurities, and D D are the hydrogen-gas generators.

The generators D are constructed as follows: The outside vessels D are made open at the top, and within each is placed a similar vessel, E, of lead, the diameter of which is considerably less than that of the outside vessel D, so that an annular chamber is formed between them, which is filled with water, to make a water-joint for the primary or hydrogen gasometer *d d*. The leaden vessels F are filled with a solution of water and sulphuric acid, the relative proportion being about eight parts of water to one of the acid, and the perforated copper vessels E are suspended in the solutions from the roofs of the gasometers *d d*, and within the copper vessels are placed zinc or iron borings, turnings, filings, &c., and the hydrogen that is set free by the decomposition of water is collected in the gasometers *d*, and is then carbureted by being passed through the carbureter D, while on the way to the main gasometer A. The copper vessels or baskets E are each attached to its gasometer *d* so as to accompany it in its vertical movements; and the said gasometers are con-

nected with the main gasometer A by arms F and rods or small chains *f f*, so that when the supply of gas in A increases the gasometers all lift together, and the metal in E is lifted out of the actuating solution or lowered into it as the supply decreases, and the gas is generated as required. The gasometers *d* are suspended from opposite sides of the main gasometer A, so that A shall be balanced and move without friction or cramping. As an additional preventive against the cramping of the gasometer it is provided with a vertical rod or tube, attached centrally to the cover inside, and working in a larger tube or sleeve secured under the bottom of the condensing-chamber. The gasometers *d* make connection with the carbureter by means of flexible tubes *g g*, so as to allow them to move freely vertically. The lead cylinders F confine the acid to the parts to be acted upon, and prevent its contact with the parts *d D*.

Should either generator become inoperative from any cause, its rise and fall will be equalized from the generator which is in operation by transfer of gas through the flexible tubes *g g'*.

By this construction the batteries or hydrogen generators are very accessible, and can be renewed without interrupting the operation of the apparatus, at any time, by renewing them one at a time, the whole being self-regulating, and keeping up a steady supply of gas until its contents or generating material requires a renewal.

I am aware of the patent granted to Amos Stevens, November 30, 1869; but do not claim any part of his invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The combination of generators D *d D d*, connections *f*, rigid arms F, and a gasometer, A, the generators *d d* being connected with the carbureter by means of flexible tubes *g g'*, all arranged and operating substantially as described, for the purpose specified.

The above specification of my invention signed by me this 14th day of November, 1870.
C. B. LOVELESS.

Witnesses:

WM. J. DODGE,
F. A. MORLEY.