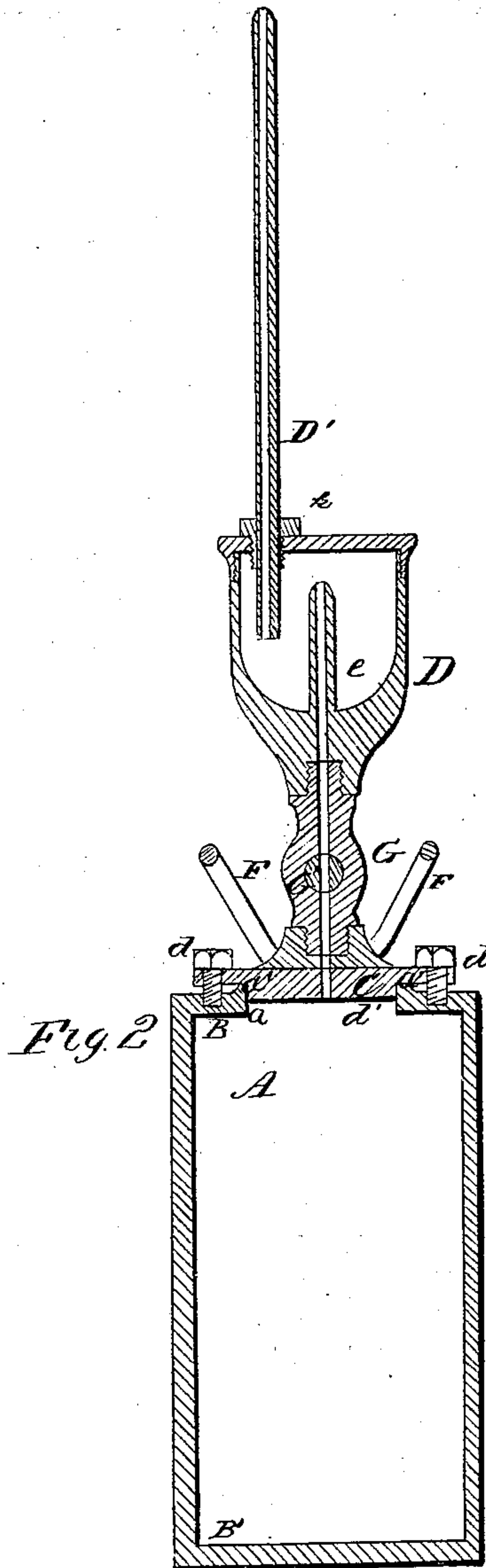
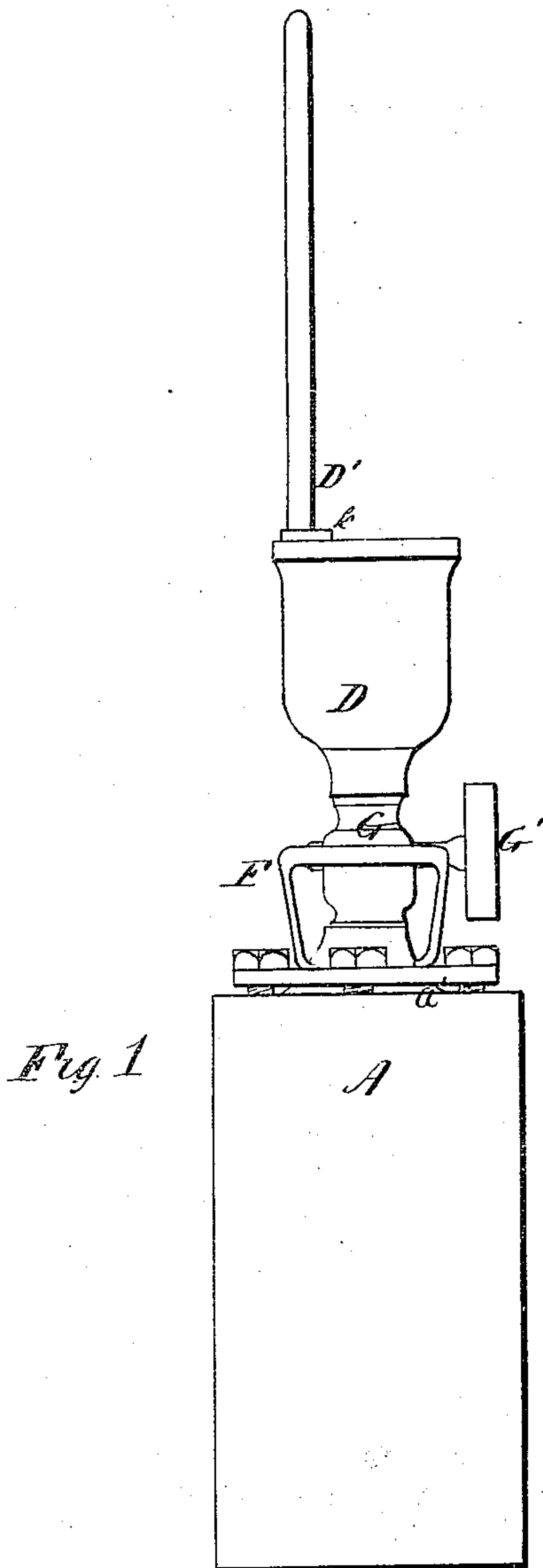


N. H. EDGERTON.  
Self-Condensing Gas-Generators.

No. 153,057.

Patented July 14, 1874.



Witnesses  
J. B. Connolly  
C. Sullivan

By

Connolly & Poiré

Nathan H. Edgerton, Inventor

Attorneys

# UNITED STATES PATENT OFFICE.

NATHAN H. EDGERTON, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN SELF-CONDENSING GAS-GENERATORS.

Specification forming part of Letters Patent No. **153,057**, dated July 14, 1874; application filed June 6, 1874.

*To all whom it may concern:*

Be it known that I, NATHAN H. EDGERTON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Self-Condensing Gas-Generator; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a side view, and Fig. 2 a vertical central section, of my invention.

The object of this invention is to provide for the condensation of gases through their own molecular action without the aid of external or mechanical pressure; and it consists in the construction of a generator or vessel to contain the gas while undergoing condensation, in the novel manner hereinafter described, whereby sufficient strength is obtained to resist the expansive force of the gas to an extraordinary degree. My invention furthermore consists in the novel construction and combination, with the vessel above referred to, of a liquid-gage to indicate the pressure of the gas during the whole period of chemical action.

Referring to the accompanying drawings, A designates a generator or condensing-vessel, preferably of a wrought-iron cylinder, of sufficient thickness and strength, with plug-welded ends B B'. The end B or top of the cylinder has a central aperture, *a*, surrounded by an annular flange, *a'*, and closed by means of a cap, C, ground to fit the cylinder-head accurately, and secured rigidly thereto by means of bolts and nuts *d*, rendering the joints or crevices perfectly gas-tight. The cap C has a depending portion or re-enforcement at *d'*, which corresponds with the central aperture of the head and enters the same, as shown, providing additional security against leakage. F F are handles attached to the cap for convenience in moving the latter. G designates a short tube rising from the cylinder-cap, which has a small central communicating hole; and G' is a stop-cock or valve located therein to regulate the flow of gas. The upper end of the tube G is threaded, and supports, during the

process of condensation, a pressure-gage comprising a bulb, D, and graduated tube D'. A tube, *e*, rises in the center of the bulb to near the top thereof, while the tube D', passing through the cap of the bulb, descends to near the bottom thereof. This tube is fitted to a screw-socket, *k*, which is inserted in the cap of the bulb, as shown.

The operation is as follows: The cap being removed, the cylinder is first dried over a furnace or range. The material to produce gas is then put in and the cap replaced and bolted down. The valve is then opened and communication established between the cylinder and gage. The bulb of the latter contains water or other suitable fluid, which, being affected by the pressure of the gas, rises in the tube and indicates the degree upon the graduated scale. When the gas is to be used the valve is turned so as to shut off communication with the gage, after which the latter is removed and a conducting-tube adjusted to the end of the tube D'.

The condenser is designed to contain gases for various purposes, as philosophical experiments, operations with oxyhydrogen blow-pipe, &c., and is believed to be effective, convenient, and safe.

The process and apparatus above described are intended exclusively for use in the generation and condensation of hydrogen and oxygen.

I am aware that a process somewhat similar has been employed for the liquefaction of carbonic acid, but the apparatus employed for such purpose is entirely different from mine, and is neither intended for nor adapted to the generation and condensation of hydrogen or oxygen, the latter of which requires heat in its production, while carbonic acid does not.

The essential features of novelty of my invention are, therefore, embraced in, first, the mechanical construction of the apparatus; secondly, in the materials used; and, thirdly, in the substance generated; and, finally, in the aim and purpose of the invention.

While I do not pretend to have discovered that oxygen and hydrogen can be condensed or generated under pressure, I consider that I am the first to discover that this property can be made available for practical purposes; or,



in other words, that I can make molecular action do the work of a pneumatic condensing-pump.

What I claim as my invention is—

1. The herein-described process of generating oxygen or hydrogen and condensing the same through molecular action in a close wrought-iron cylinder, substantially as described, and for the purpose set forth.

2. The wrought-iron cylinder A, having plug-welded ends, and adapted for the generation and condensation of oxygen or hydrogen, sub-

stantially in the manner and for the purpose specified.

3. The gage, consisting of the bulb G and graduated tube G', in combination with the cylinder or vessel A, as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of June, 1874.

NATHAN H. EDGERTON.

Witnesses:

THOS. A. CONNOLLY,  
JNO. A. BELL.