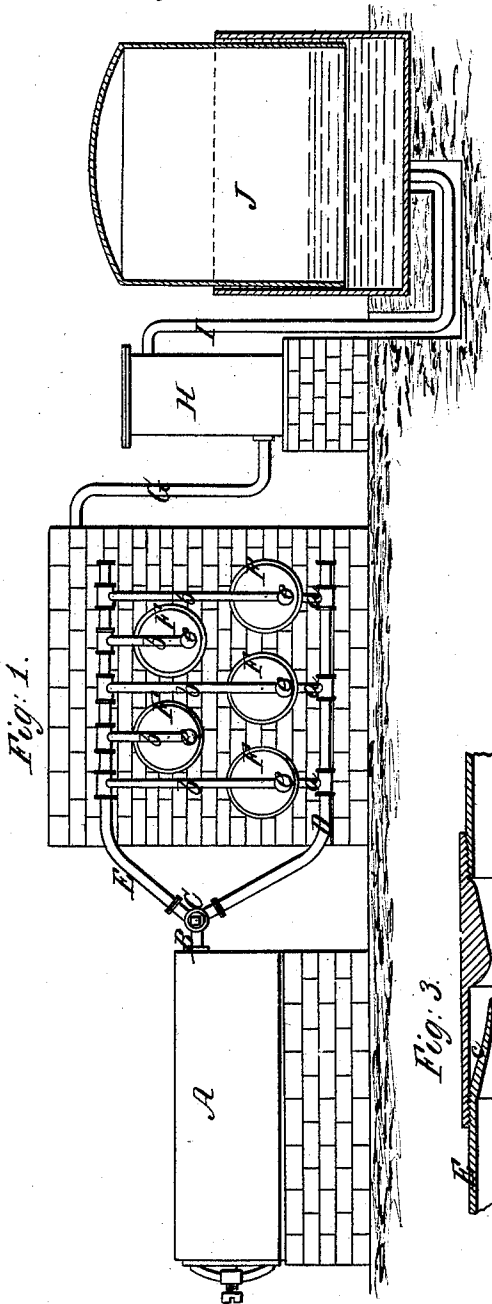
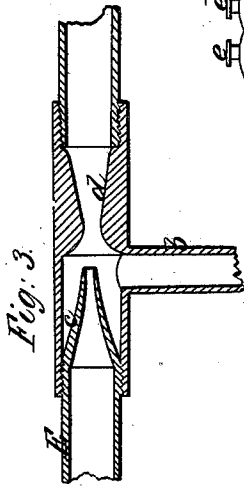
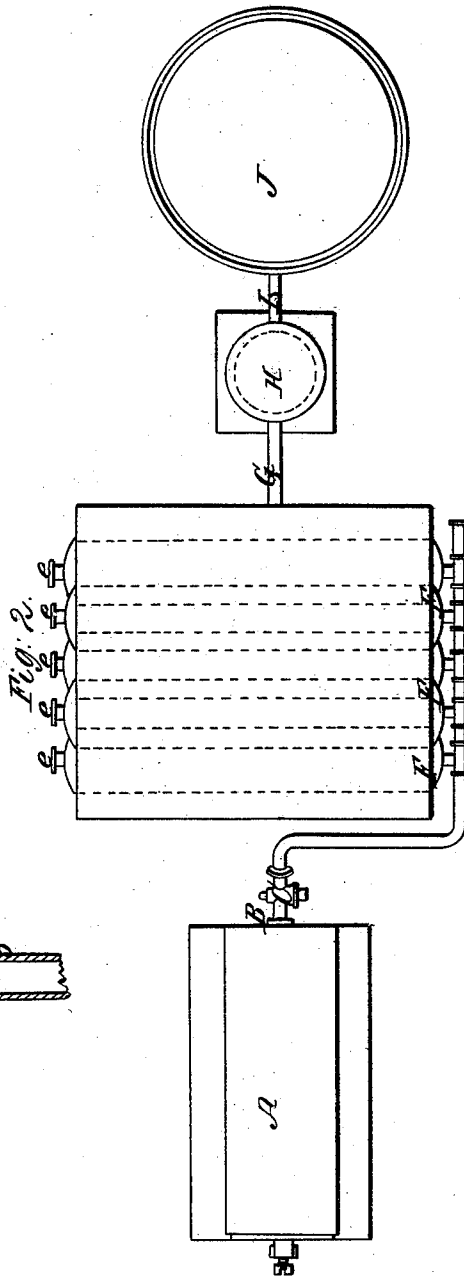


O. M. Phillips.

Making Oxygen Gas.

N^o 86,248.

Patented Jan. 26, 1869.



Witnesses;
Russ Langmeister
at Brice

Inventor;
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per
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attys

United States Patent Office.

ORVILLE M. PHILLIPS, OF NEW YORK, N. Y.

Letters Patent No. 86,248, dated January 26, 1869.

IMPROVEMENT IN THE MANUFACTURE OF OXYGEN-GAS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ORVILLE M. PHILLIPS, of the city, county, and State of New York, have invented a new and useful Improvement in the Manufacture of Oxygen-Gas; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 represents a side view of this invention.

Figure 2 is a plan or top view thereof.

Figure 3 is a detached section of the exhaustor, which may be used in carrying out my invention.

Similar letters indicate corresponding parts.

This invention is intended as an improvement on the process and apparatus of Motay and Marechal for producing oxygen-gas from alkaline manganates.

This process, which has only quite recently been introduced in the United States, has originated in the ascertaining of two facts:

First, that if a current of steam passes over an alkaline manganate, by preference, manganate of soda, it will abstract and carry away a considerable portion of the oxygen, which can afterwards be separated and secured by the simple condensation of the steam; and

Second, that if a current of air is passed over the partially-deoxidized compound, said compound will recover from the air the oxygen it had lost. When this is done, a new current of steam may be employed to take off a second portion of oxygen, to be followed by a new current of air to restore it again; and so on indefinitely.

In carrying out this process, the manganate of soda is heated in a nest of retorts, steam is passed through these retorts from a steam-boiler, then the steam is shut off, and currents of air are passed through the retorts, by a suitable air-pump or fan-blower.

This operation is attended with certain disadvantages, which I have sought to overcome by my invention.

In the first place, the shutting off of the current of steam, and the subsequent starting of the air-forcing apparatus, and then the stopping of the air-forcing apparatus, and the letting on of the current of steam, require constant attention of an experienced mechanic.

Secondly, the steam, which still fills the upper parts of the retorts, when the currents of cold air are admitted, condenses at least in part, and the water of condensation accumulates in said retorts, and obstructs the operation.

These difficulties I have overcome by creating and maintaining in the retorts, after the steam has been shut off, a partial vacuum, whereby the steam still retained in said retorts is caused to pass off through the suction-pipes, and, at the same time, the requisite currents of air are caused to pass through said retorts by suction.

Furthermore, the partial vacuum in the retorts is produced by jets of steam, on the principle of Giffard's injector, and the steam requisite for this purpose is taken from the same steam-boiler which supplies the

steam-jets, both the steam-supply and the suction-pipes being connected by a three-way cock, so that, by the simple act of closing the steam-supply pipe, the suction-pipe is opened, and *vice versa*, and thereby the operation of the apparatus is materially facilitated.

In the accompanying drawing—

The letter A represents a steam-boiler, which connects, by a pipe, B, with the three-way cock C, from which branch off the steam-supply pipe D and the suction or exhaust-pipe E, as clearly shown in fig. 1.

The steam-supply pipe D connects, by branch-pipes *a*, with the several retorts F, and from the upper parts of the retorts extend branch-pipes *b*, which connect with the suction-pipe E.

In the interior of this suction-pipe, I place the conical nozzles *c* and spouts *d*, (see fig. 3,) so that the steam, in passing through said pipe, will create a partial vacuum in each of the retorts.

Suitable check-valves or vacuum-valves *e* admit the external air into the retorts, as soon as the pressure in the same has been reduced below the atmospheric pressure.

The oxygen-gas, when disengaged from the manganate of soda in the retorts F, passes off with the steam through the pipe G, which leads to the condenser H, and in this condenser the steam is condensed, and the oxygen-gas passes through the pipe I into the gas-holder or receiver J.

After the steam has acted a sufficient length of time on the manganate of soda in the retorts, the three-way cock C is turned, and thereby the supply-pipe D is shut off, and the suction-pipe E is opened.

By the steam passing through this pipe, a partial vacuum is created in each retort, the steam still retained in such retorts is sucked out, and the external air enters through the vacuum-valves *e*, so as to restore the oxygen previously abstracted from the manganate in the retorts.

By these means, the apparatus required for the manufacture of oxygen, and the operation of the same, are simplified, and, by exhausting the steam still remaining in the retorts after the steam-pipe has been shut off, a decided advantage is obtained over the old process, in regard to the yield of oxygen.

I distinctly disclaim everything shown and described in the process of Motay and Marechal; but having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The within-described process of facilitating the manufacture of oxygen-gas, by creating in the retorts containing the alkaline manganates, or other material from which the oxygen is extracted, at certain intervals, a partial vacuum, substantially in the manner described.

2. The arrangement of a suction-pipe, E, in combination with the steam-pipe D and retorts F, substantially as and for the purpose set forth.

ORVILLE M. PHILLIPS.

Witnesses:

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ERNEST F. KASTENHUBER.