

J. F. Lafogne.

Carburetor.

N^o 94,898.

Patented Sept. 14, 1869.

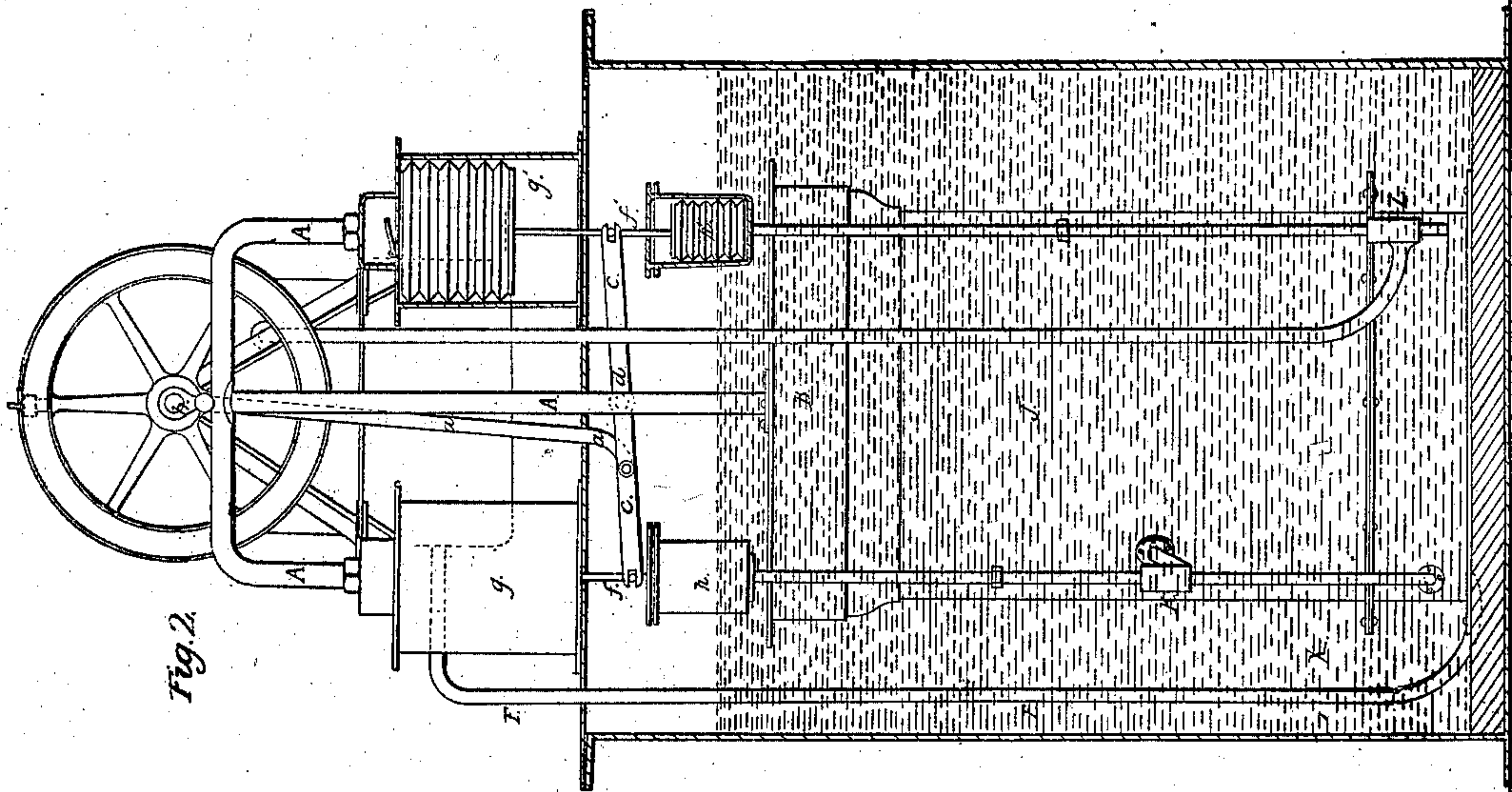


Fig. 2.

Fig. 3.

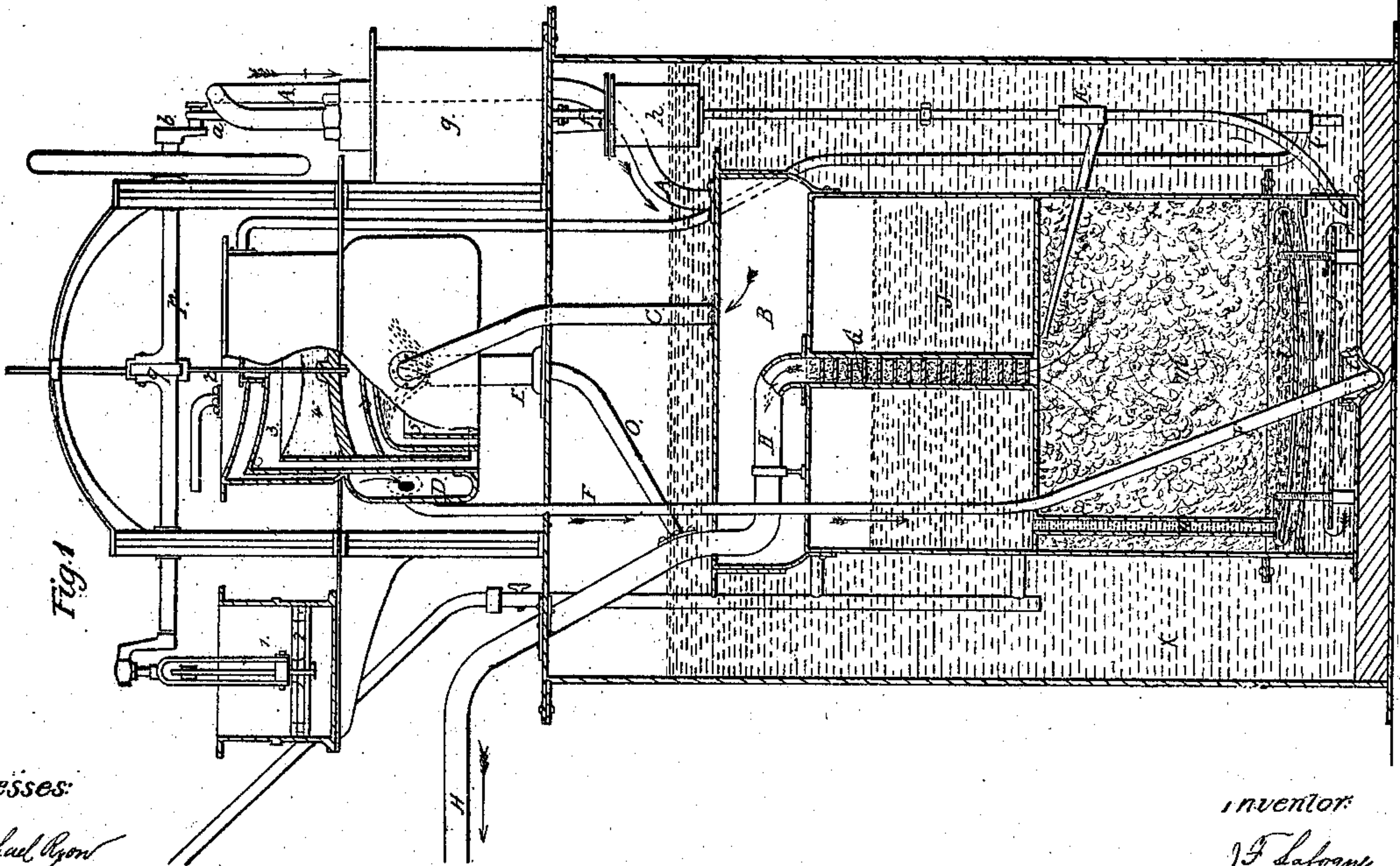
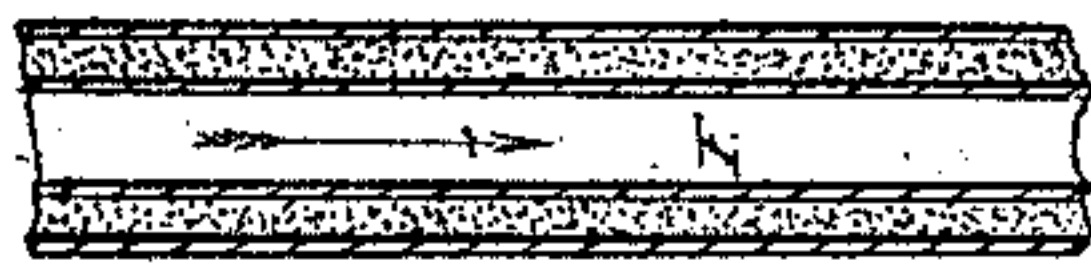


Fig. 1.

Witnesses:

Michael Lyon
a J. Davis

By his Attorney

Inventor:

J. F. Lafogne
J. E. Carl

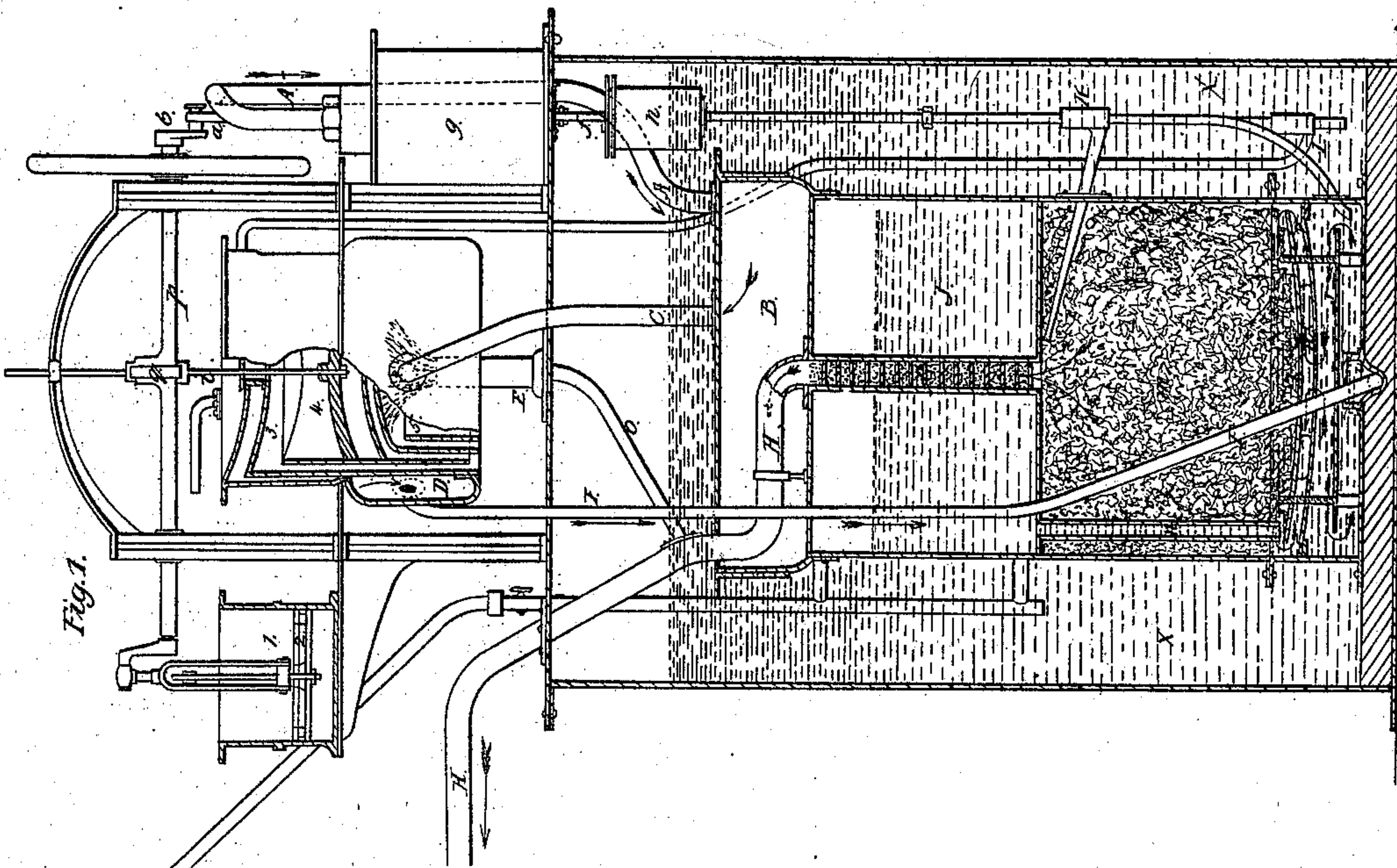
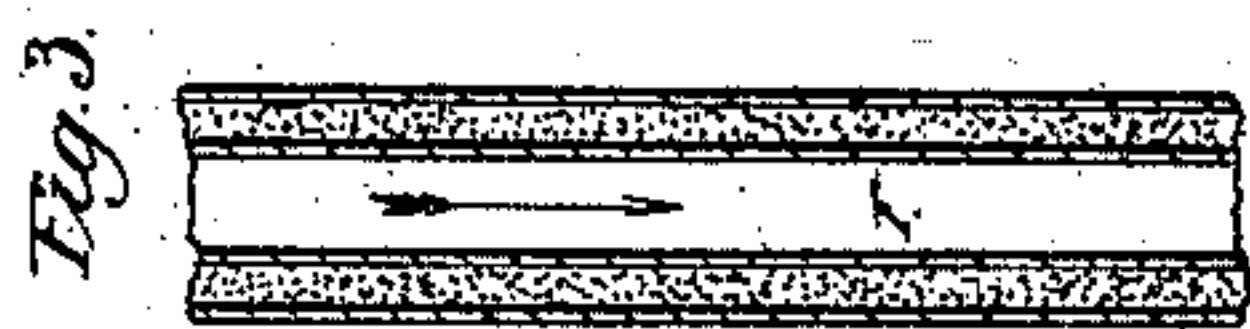
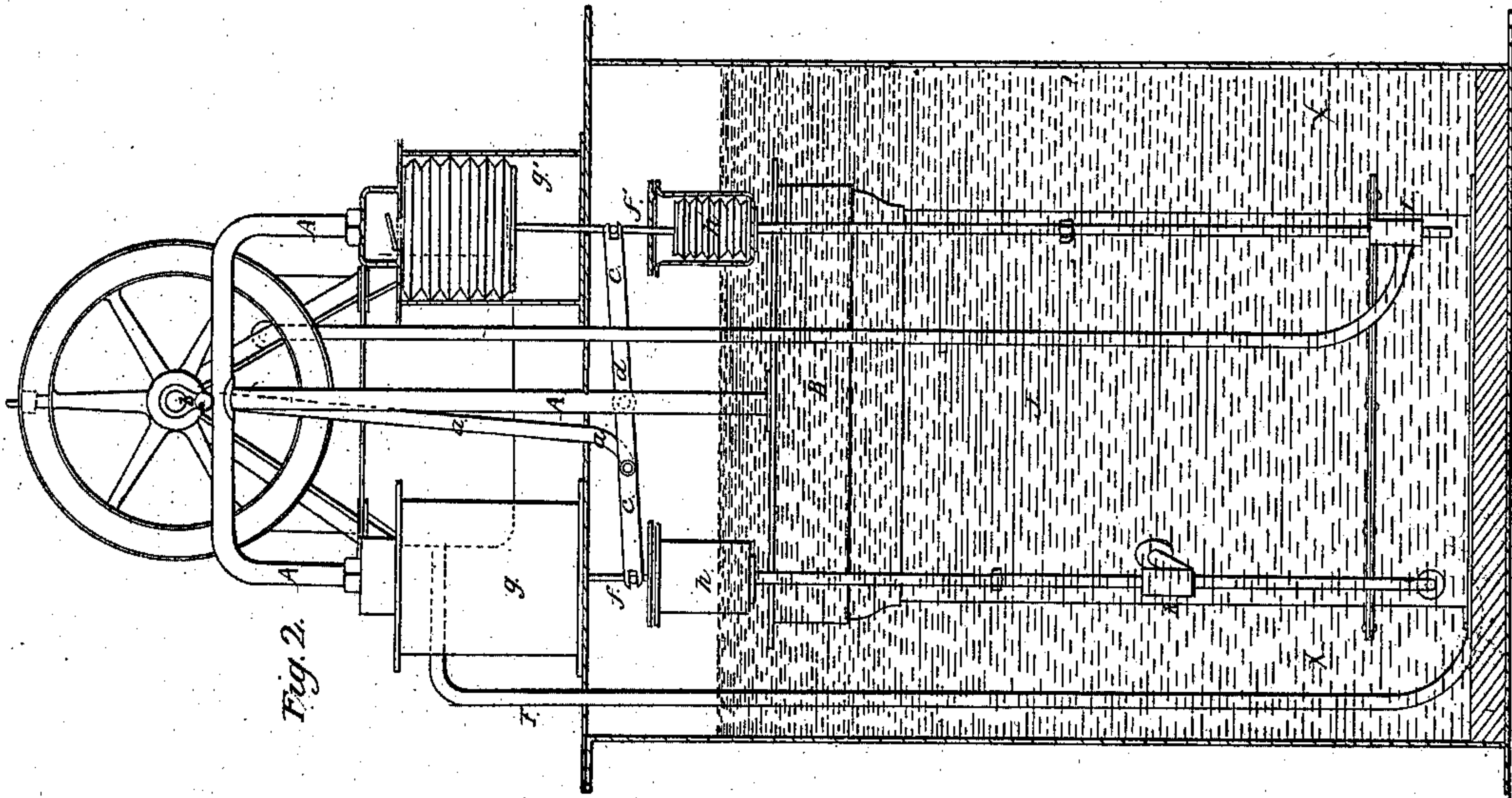
J. F. Laforgue.

Sheet 2-2, Sheets.

Carburetor.

N^o 94,898.

Patented, Sept. 14, 1869.



Witnesses:

Michael Ryan
a. J. Tibbitts

Inventor:

J. F. Laforgue

By his Attorney. A. E. Earle

United States Patent Office.

JULES FRANCOIS LAFROGNE, OF PARIS, FRANCE.

Letters Patent No. 94,898, dated September 14, 1869.

IMPROVED APPARATUS FOR CARBURETTING AIR.

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, JULES FRANÇOIS LAFROGNE, of Paris, in the Empire of France, engineer, have invented new and useful "Improvements in the Manufacture of Gas for Lighting and Heating, and in Apparatus employed therein," and do hereby declare the following to be a true and exact description thereof, reference being had to the accompanying sheet of drawings, and to the letters of reference thereon, that is to say—

Various methods for simplifying and economizing the production of gas have engaged the attention of manufacturers of this article for a considerable time.

Instead of the present system of producing gas by the distillation of coal, it is desirable to substitute more easy methods which, without incurring a great outlay in works and pipe-laying, will enable a rich supply of gas to be obtained by villages, factories, and even private residences, at a small cost.

Among the methods proposed, the one that seems to be most in favor among the inventors of the present time, is that which consists in causing a current of air to pass over and through a natural or artificial mineral product, by which the principal gases are volatilized and carbonized, and afterward supplied to the burners.

This scheme, for the carbonization of atmospheric air, has been in use for about thirty years, and has formed the basis of numerous processes and apparatus which have proved anything but successful.

In following the same path myself, I have thought that this process could not be practically successful without all the difficulties relating thereto being thoroughly solved.

My system comprises a totally novel process and apparatus: it is founded upon the carbonization of atmospheric air, and presents this method, as will be hereafter seen, under more simple and rational conditions than has hitherto been the case.

The chief characteristics of my invention are as follows:

First, the apparatus is combined with a motor, worked by a part of the gas produced, and which feeds directly the reservoir or carbonizer containing the mineral oil with the atmospheric air necessary for the generation of gas.

Second, the presence of the motor enables circulation of water to be set up in a chamber surrounding the carburetter, in order to absorb the cold resulting from the evaporation of the essential oil. The cold water is then led into the motor, where it is reheated, in acting as a condensing agent, and returns into the chamber, and gives back to the hydrocarbon the heat it has lost, so that the said hydrocarbon is constantly reheated by the water as soon as it becomes cool, there being no interruption or retardation in the production of the gas.

Third, the air is drawn in by a system of bellows actuated by the motor, then sent into a regulating-reservoir, where it accumulates under a nearly constant pressure.

Fourth, the air is saturated with the carbonized vapors in passing through a series of layers of flannel and of wood shavings or sawdust, which imbibe the hydrocarbon by capillary attraction, and which, besides, are always kept in a moist state by a pneumatic injector actuated by the motor. The saturated air passes up through this series of alternate layers of flannel, shavings, and iron-filings, which deprive it of its excess of vapor, and of its non-volatilized globules, and it then passes, in the required saturated condition, through a main pipe, from whence it is consumed.

Having thus explained the principal characteristics of my invention, I will now describe the same with reference to the accompanying sheet of drawings, which shows the mode of constructing my apparatus and its action.

Figure 1 and 2 represent sectional elevations of the apparatus, and

Figure 3 is a longitudinal section of part of the insulating-tube, which conducts the air to the carburetter.

The motive power I prefer to use is constructed after the manner of that invented by M. Laubereau, and is worked by hot and cold air. It will not be necessary for me to give a detailed description of it here. I will merely state that it consists of a cylinder, 1, furnished with a piston, 2, and with a cold-air chamber, 3, in which works a hollow piston or bucket, 4, and which is surrounded by a reservoir for containing cold water.

The movements of the pistons 2 and 4 operate so that, when the expanded air has raised the piston 2 the piston 4 rises quickly to draw in hot air to the cold part of the chamber 3, which aids the descent of the piston 2.

The lower part of the chamber 3 forms a hearth, 5, provided with a chimney, the said hearth being heated by a gas flame issuing from a pipe, E, supplied by the branch *o* of the main gas-pipe H.

The piston-rod of the motor is, by means of a crank, connected to the shaft *p*, which, by the aid of a cam, *q*, and of a groove, actuates the rod *r* of the bucket 4 working in the chamber 3.

I use this bucket-rod *r* for actuating, either directly or by an intermediate lever, the bellows hereafter described.

The shaft *p* imparts its motion, through the crank *b*, to the small rod *a*, which causes the lever *c* to oscillate on its fulcrum *d*.

This oscillation of the lever *c* produces the alternate rectilinear ascent and descent of the two piston-rods *f* and *f'*, and consequently causes the compression and expansion of the four bellows *g g'* and *h h'*.

The two first, *g g'*, serve to continually draw in the air and expel it into the vessel B, the two others, *h h'*, serve for another purpose, hereafter explained.

The air continuously forced out by the tube A passes into the vessel B, which thus forms the regulating-reservoir; from thence it escapes by the tube C, and fills the annular space D surrounding the heating-chamber E.

The temperature of the air is here raised, facilitating its consecutive carbonization and combustion, and it then leaves by the tube F, in a heated state, to enter the lower part of the carbonizing-apparatus.

This tube F, of which a section is shown in fig. 3, is double, the interior tube serving for the circulation of hot air, and the space between the two tubes being filled with sawdust or other non-conducting substance.

This arrangement of the tube F is to avoid the cooling of the air in its passage from the annular reservoir D to the carburetter.

On leaving the tube F the hot air traverses the small flannel disk *i*, then circulates among the plates *j, k, and l*, following the course indicated by the arrows. The arrangement of these plates causes the air to distribute itself in zigzag directions, and thereby thoroughly saturate itself with the principal volatile essences of the hydrocarbons, through which it passes in all directions.

Above the last plate *l* the air traverses the mass *m* of wool and wood shavings impregnated with hydrocarbons; then, after having also been exposed to the carburization of the flannel and iron filings soaked in the tube G, it escapes, ready for lighting-purposes, through the tube H, which distributes it as required.

The reservoir J is always kept full of hydrocarbon-oils, which flow through the tube *n* to cover the plates *j k l*, and the lower part of the mass of wool and shavings *m*, which also receives an injection of hydrocarbon-oil at its upper part from the small pump *k*, actuated by the bellows *h*, above described.

The second bellows *h'* draws cold water from the lower part of the exterior casing X by means of the pump L, and expels it at the upper part of the motor, thus causing it to become cold again.

A small branch pipe, *o*, always supplies the jet E, for heating the chamber 3 with gas.

These explanations render it unnecessary for me to go into the more extended application of the operation of the apparatus.

After having filled the reservoir J with the required amount of the essential oils of schist, petroleum, or other hydrocarbon, the apparatus is put in motion by hand; and having, by this means, produced a sufficient quantity of gas, the jet E is lighted, and the apparatus will then work automatically.

It will be understood that the cocks of the different tubes, and the valves with which the reservoirs and their pipes are provided, will be accurately regulated before the apparatus is set in motion.

It would be also advantageous to apply this apparatus to heating-purposes, in which case a coil of pipe would be arranged in the interior of the hearth, or some of the air supplied by the bellows might be circulated in the apartment.

I reserve to myself the right of modifying the details of my apparatus so far as the form, materials, and dimensions are concerned, according to its application, and the number of jets to be supplied in the establishment.

Having thus described my improvements,

I claim the exclusive benefit resulting from my invention, as set forth by the following characteristics thereof:

1. The novel application to the carbonizing-apparatus of a motor actuated by a calorific supply obtained from the gas produced, the which motor may be worked by air, gas, or steam; and I claim particularly the use of Laubereau's motor, before mentioned, in conjunction with my invention.
2. The reheating of the hydrocarbon essential oils or liquids by the use of a jacket attached to the motor, in which said jacket water is caused to circulate.
3. The employment of a series of bellows with continuous action worked by the motor, and serving for drawing in and expelling air, and of a reservoir for accumulating the air and regulating its flow.
4. The reheating of the air before its admission into the carbonizer.
5. The employment of the mass of wool and shavings, moistened by capillary attraction, and also by an injection of liquid by the motor.

In testimony whereof, I have signed my name to this specification before two subscribing witnesses.

J. F. LAFROGNE.

Witnesses:

C. LAFOUD,
F. OLCOTT.