M. H. STRONG.

Process and Apparatus for the Manufacture of Gas.

No. 197,061. Patented Nov. 13, 1877.

Fig. 1.

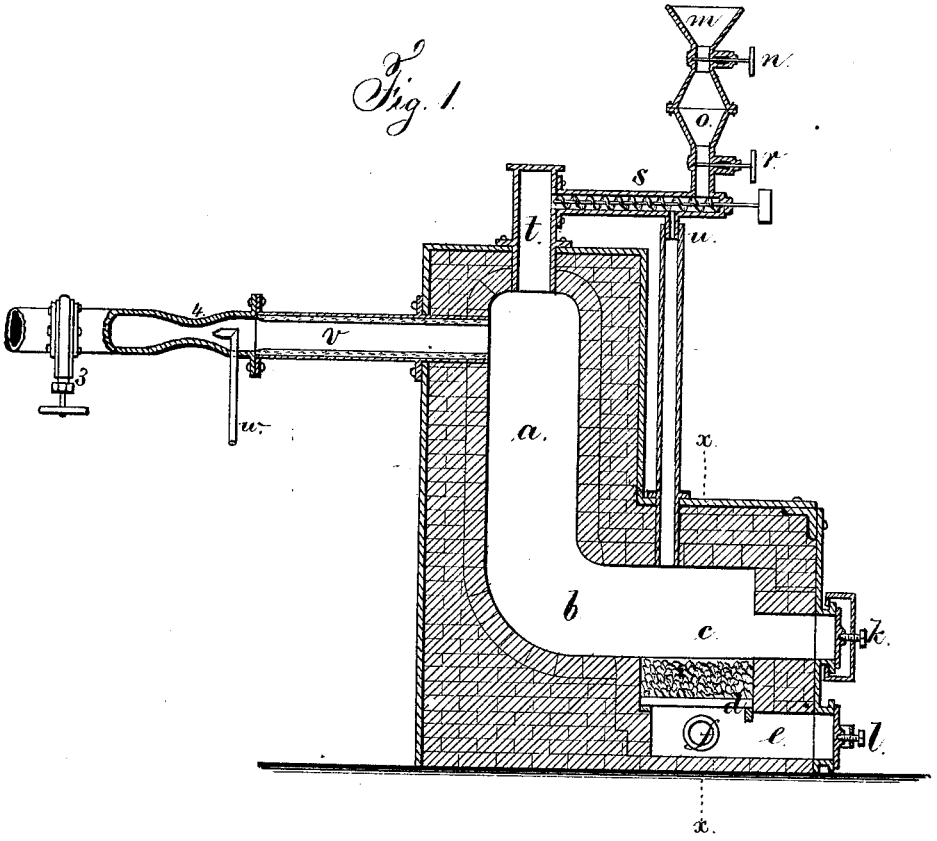
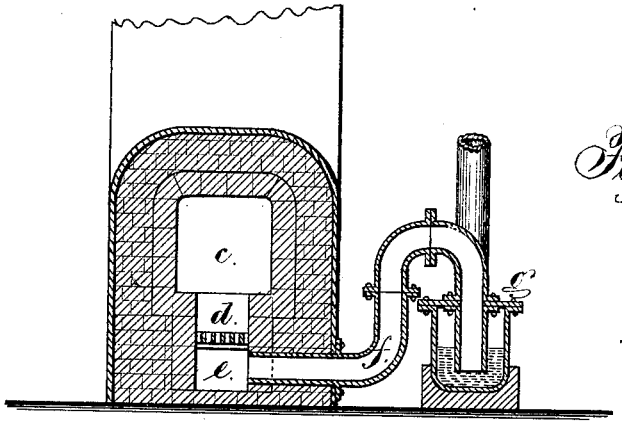


Fig. 2.



Witnesses

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MYRON H. STRONG, OF BROOKLYN, NEW YORK, ASSIGNOR TO LEMUEL W. SERRELL, TRUSTEE FOR SAID STRONG, SIDNEY CORNELL, HENRY M. PIERSON, AND WALTER E. LAWTON.

IMPROVEMENT IN PROCESSES AND APPARATUS FOR THE MANUFACTURE OF GAS.

Specification forming part of Letters Patent No. **197,061**, dated November 13, 1877; application filed October 11, 1876.

To all whom it may concern:

Be it known that I, MYRON H. STRONG, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in the Manufacture of Gas, of which the following is a specification:

Carbon has been supplied into a vertical heated retort, into which steam has been admitted to aid in the decomposition of the carbon, the two passing down through such heated retort.

I employ a vertical retort with a fire in the bottom part thereof. The carbon is supplied at the top and falls toward the fire, and steam is admitted to the retort. If anthracite coal is used the gases will possess but little luminosity. If bituminous carbon is used the result will be a more luminous gas.

There is a connection from the ash-pit below the fire-bed to the hydraulic main, the object of this being that when the apparatus is in operation for making gas, the gases will pass through incandescent carbon on the fire-bed, to fix the gases or receive an additional element of carbon to render them more luminous; and when the retort is being heated during a suspension of the gas-making operation, the carbon on the fire-bed is allowed to burn by the admission of the atmosphere, and the products of combustion pass up through the retort to heat the same. During this operation any coke that may remain from the gas-making operation is consumed and utilized in heating the retort.

In the drawing, Figure 1 is a vertical section of the gas-making retort. Fig. 2 is a cross-section of the same at the line *x x*.

The retort *a* is for gas-making. It is in a vertical position, and connected at the bottom by an inclined flue, *b*, with the fire-chamber *c*, in which is a grate, *d*, for a fire-bed, and an ash-pit, *e*, beneath it, from which passes the pipe *f* to the hydraulic main *g*, of any ordinary character. The fire-chamber and ash-pit are provided with air-tight lids *k l*, or self-sealing doors similar to those used upon gas-retorts.

A hopper, *m*, with valve *n*, is used to admit ground coal, coal-dust, or similar carbonaceous material, into the feeding-hopper *o*, from which the valve *r* allows the pulverulent carbon to pass to the feeder *s*, which is a screw or similar device, delivering the carbon regularly in small quantities or in detail into the openings *t* and *u*. The opening *u* leads by a pipe to the fire-chamber *c*, and the opening *t* leads into the top of the retort.

A tube, *v*, may lead to a chimney, or terminate at any suitable place where heated products of combustion can be discharged, and in the same is a valve, 3, and a contracted neck, 4, and steam-blast from a pipe, *w*.

The operation is as follows: Fire is kindled in the chamber *c*, and the draft is promoted by the jet *w*, and the products of combustion pass away through the pipe *v*. When the retort is sufficiently heated the valve 3 is closed, and also the lids *k* and *l* at the fire-chamber and ash-pit, respectively. Then the coal-dust, or similar carbonaceous material, is fed into the retort at *t*, and the heat of the retort converts the volatile matters into gases, that pass off through the fire-bed to the hydraulic main *g*. The steam cannot escape by the valve 3 when that is closed, and hence the same steam-pipe can be used to admit the proper quantity of steam, regulated by a cock, the steam passing back into the upper part of the retort.

According to the quality of the carbonaceous dust and the heat of the retort, so the resulting gas will be more or less luminous. If bituminous coal be used the supply at the opening *t* will fall into the retort *a*, and will be converted into a gas, which gas, passing in a heated condition through the bituminous carbon supplied at *u* into the fire-chamber, will receive an addition of carbon sufficient to form an illuminating-gas.

If steam is admitted into the retort the resulting product will have less luminosity, and there will be a larger yield of gas and less coke, the supply of carbonaceous dust remaining the same; but if the bituminous dust is proportionately increased the illuminating power of the gas will be maintained. When the retort ceases to be of the required temperature, the gas-making operation is suspended,

the supply of coal-dust stopped, and the door of the ash-pit is slightly opened and the gases ignited, as in an ordinary gas-retort, the valve 3 being first opened to allow the gases in the retort to escape. The draft is started gradually, the fire on the bed increases in intensity, the coke in the flue *b* is consumed, and the combustion continued, with or without the addition of other fuel, until the retort is sufficiently heated, and then the gas-making operation is repeated, as aforesaid.

I claim as my invention—

1. The process herein specified of making gas, consisting in introducing carbon in a pulverized condition, in detail or small regular quantities, into the top of a highly-heated retort, admitting steam into that retort, and passing the resulting gases through highly-heated carbon, for the purposes set forth.

2. The process herein specified of making gas, consisting in the introduction of carbon into a highly-heated retort in the presence of steam, supplying pulverized carbon, separately and in detail, upon a bed of incandescent carbon, and then passing the resulting gases through that incandescent carbon, substantially as and for the purposes set forth.

3. The process herein specified of making gas, consisting in the introduction of pulverized carbon into a highly-heated retort in the presence of steam, the introduction of a second supply of carbon into the retort upon a bed of incandescent carbon, and passing the gases through the incandescent carbon, and, to make the process continuous, reheating the retort when it has cooled below a decomposing temperature by the internal combustion of the coke resulting from the manufacture of gas.

Signed by me this 9th day of October, A. D. 1876.

MYRON H. STRONG.

Witnesses:

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HAROLD SERRELL.