

Improvement in the Manufacture of Illuminating Gas.

Patented May 9, 1871.

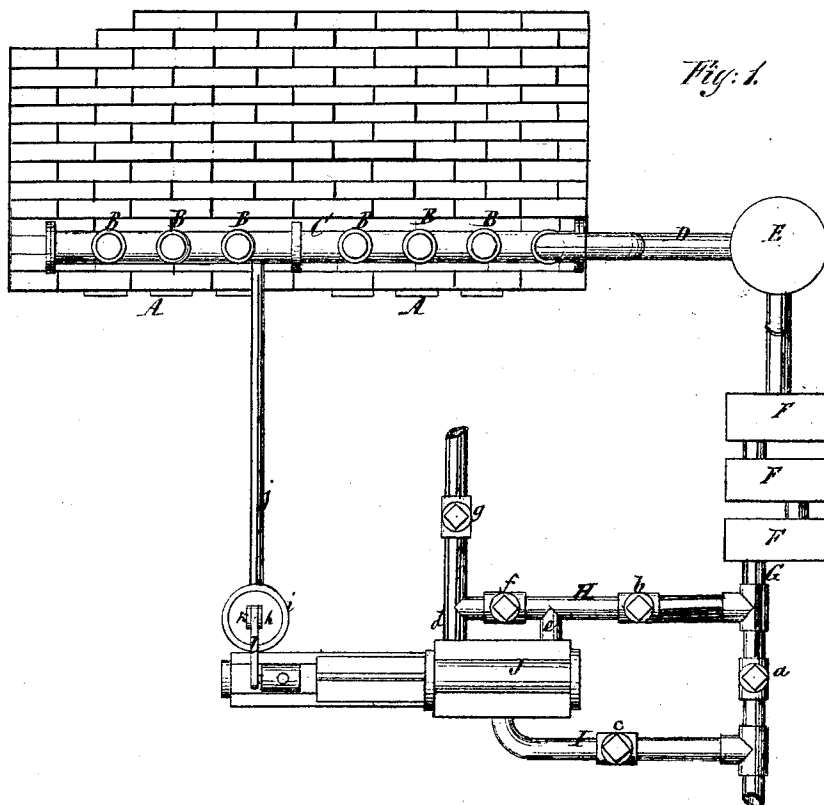
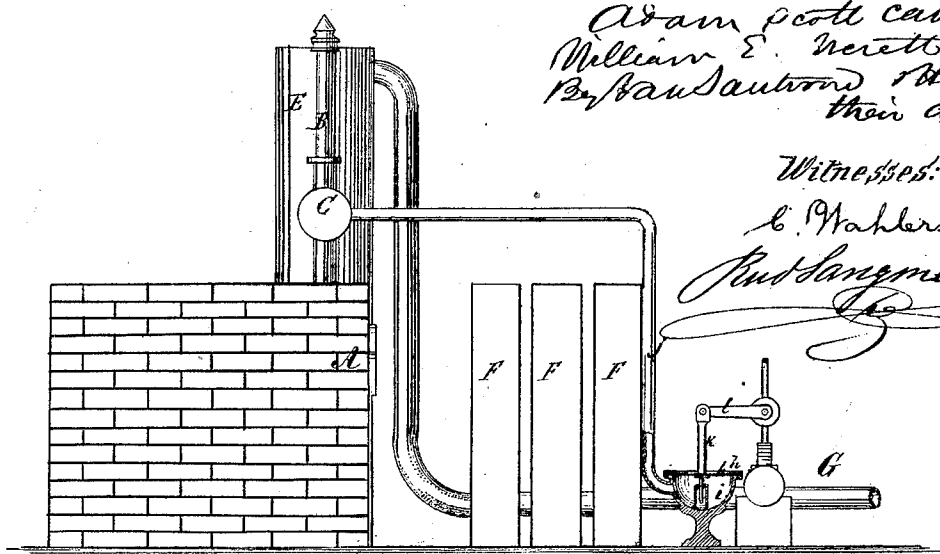


Fig:2.



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Letters Patent No. 114,642, dated May 9, 1871.

IMPROVEMENT IN MANUFACTURE OF ILLUMINATING-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 we, ADAM S. CAMERON, of the city, county, and State of New York, and WILLIAM E. EVERETT, of Rye, in the county of Westchester and State aforesaid, have invented a new and useful Improvement in the Manufacture of Illuminating-Gas; and we 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 plan or top view of this invention.

Figure 2 is a sectional side elevation of the same.

Similar letters indicate corresponding parts.

The object of this invention is to combine with one or more benches of retorts a direct-acting pumping-engine, taking the place of the exhauster in such a manner that no separate motive power is required to impart motion to the exhauster, thereby effecting a considerable saving in room and expense, and enabling small gas-houses to apply an exhauster.

The pumping-cylinder connects with the gas discharge-pipe by means of two pipes, one being the suction and the other the discharge-pipe; and these pipes are separated from each other by a stop-cock, and they are provided each with its own stop-cock in such a manner that, by adjusting these cocks, the pump can be thrown in or out of connection with the gas-pipe, as may be desirable.

The suction-pipe of the pumping-cylinder is divided into two branches, which are separated from each other by a stop-cock, and one of which connects with the gas-pipe while the other extends into a carbureting apparatus in such a manner that by the action of the exhauster the gas issuing from the retorts is mixed with carbureted air and thereby its illuminating power is materially increased.

The speed of the engine is automatically regulated by the pressure of the gas acting on an elastic diaphragm which connects with the throttle-valve of the engine.

In the drawing—

The letter A designates one or more benches of retorts, from which rise the stand-pipes B, which communicate with the hydraulic main C in the manner usually employed in gas-works.

From the hydraulic main the gas passes through a pipe, D, into and through the washer E, thence through the coolers F, whence it issues through the pipe G.

From this pipe extend two branch pipes, H I, which are separated from each other by a stop-cock, *a*, in the

pipe G, and which connect with a pumping-cylinder, J, of a direct-acting engine, the pipe H forming the suction-pipe and the pipe I the discharge-pipe of said pumping-cylinder.

Each of these pipes is provided with a stop-cock, *b* and *c*, and when the pumping-engine is to be brought into action the cock *a* is closed and the cocks *b* and *c* are opened, and the gas issuing from the coolers F is sucked in through the pipe H and expelled through the pipe I. By these means a simple, cheap, and effective exhauster is obtained, which can be readily put up even in small gas-works, since it requires no distinct motive power; and, furthermore, it can be put up in a comparatively small space, is automatic, and requires no skilled attendance when once in operation.

The suction-pipe H is provided with two branch pipes, *d e*, which communicate with the opposite end of the pumping-cylinder, and which are separated from each other by a stop-cock, *f*.

The branch pipe *d* extends into a carbureting apparatus of any suitable construction, and it is provided with a stop-cock, *g*.

If the cock *f* is closed and the cock *g* is opened the pump-piston in moving in one direction acts as an exhauster for the retorts, and in moving in the opposite direction draws atmospheric air through the carbureter, and the air, after having been carbureted, is then forced out through the pipe I, and, consequently, mixed with the gas issuing from the retorts. By these means the gas can be enriched in a simple and effective manner, and without requiring an extra pump or other expensive apparatus.

The supply of steam to the steam-cylinder of the pumping-engine is regulated automatically by the pressure of the gas issuing from the retorts by means of an elastic diaphragm, *h*, stretched across the mouth of the cup-shaped vessel, *i*, which connects by a pipe, *j*, with the hydraulic main C.

From the diaphragm *h* rises a pin, *k*, which is pivoted to the lever *l* of the throttle-valve. If the pressure of the gas in the hydraulic main or in the retorts increases, the diaphragm *h* is forced up and the throttle-valve is opened so as to give more steam to the pumping-engine, and, consequently, increase its speed, and when the pressure of the gas decreases the diaphragm returns to its original position and the supply of steam to the pumping-engine is decreased.

We prevent the diaphragm from collapsing by means of a standard, *m*, arranged in the vessel *i*, which supports the diaphragm when the pressure from within is less than that of the atmosphere.

By this arrangement our engine can be run without

requiring any attendance after it has been started, and its effect is regulated automatically as the change of the pressure of gas in the exhauster demands.

It is needless to enlarge in regard to the beneficial effect of an exhauster in gas-works, this being well known; but we will here add that the yield of gas has been increased over thirty per cent. in a small gas-house by the application of one of our reciprocating exhausters.

By adjusting cocks or valves *g f* and *b* the ends of cylinder *J* can be used in common with each other, or separately, in controlling the supply.

We apply our invention also to the manufacture of gas obtained from distillation or evaporation of petroleum and other oils, and to the mixing of atmospheric air therewith when required in such operation.

We are aware that Letters Patent were granted to C. M. Williams July 8, 1867, and reissued October 22, 1867, in which the process of impregnating illuminating-gas with hydrocarbon vapors is fully described.

We do not wish to claim anything shown and described in this patent, our invention, as far as the same relates to impregnating gas with hydrocarbon liquids, being strictly confined to the particular apparatus which we have shown and described.

We do not claim as our invention the combination of a double-acting pump with the pipe communicating between the hydraulic main and the purifiers of gas-works, such being described in the English patent No. 2,939, for 1853, granted to George Anderson, and also in the United States patent of S. R. Brick, No. 101,348, dated March 29, 1870; but

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

1. The combination, with one or more benches of retorts, of a direct-acting pumping-engine, substantially as shown and described.

2. The branch pipes *d e* with an intervening cock, *f*, in combination with the suction-pipe of a pumping-cylinder and with the gas discharge-pipe *O*, substantially as described.

3. The elastic diaphragm *h* exposed to the pressure of the gas in the retorts or hydraulic main, and communicating with the throttle-valve, substantially as set forth.

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