J. T. Rich.

Manufacture of Gas.

No 67,217. Patented July 30. 1867

Fig. 1

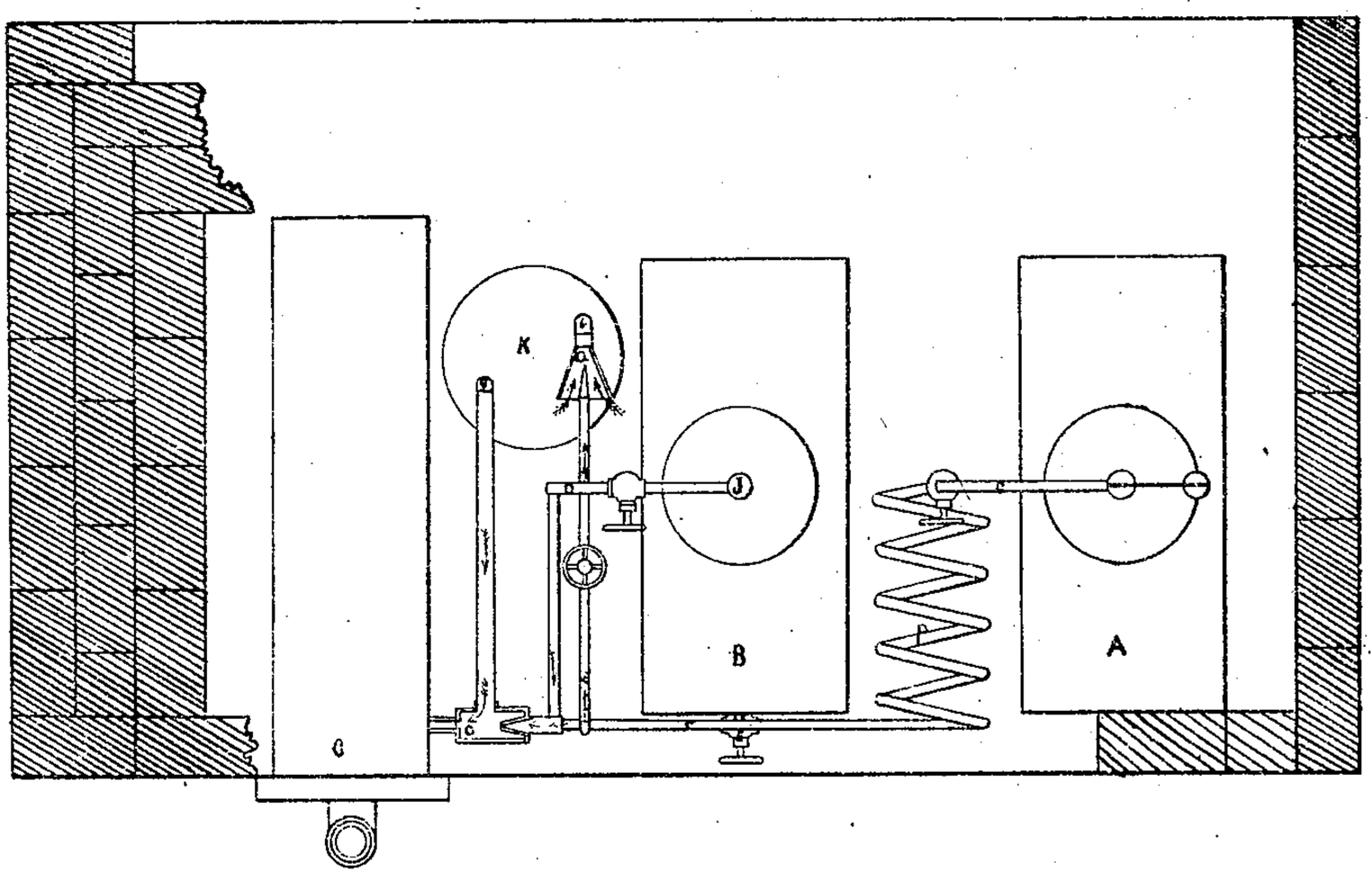
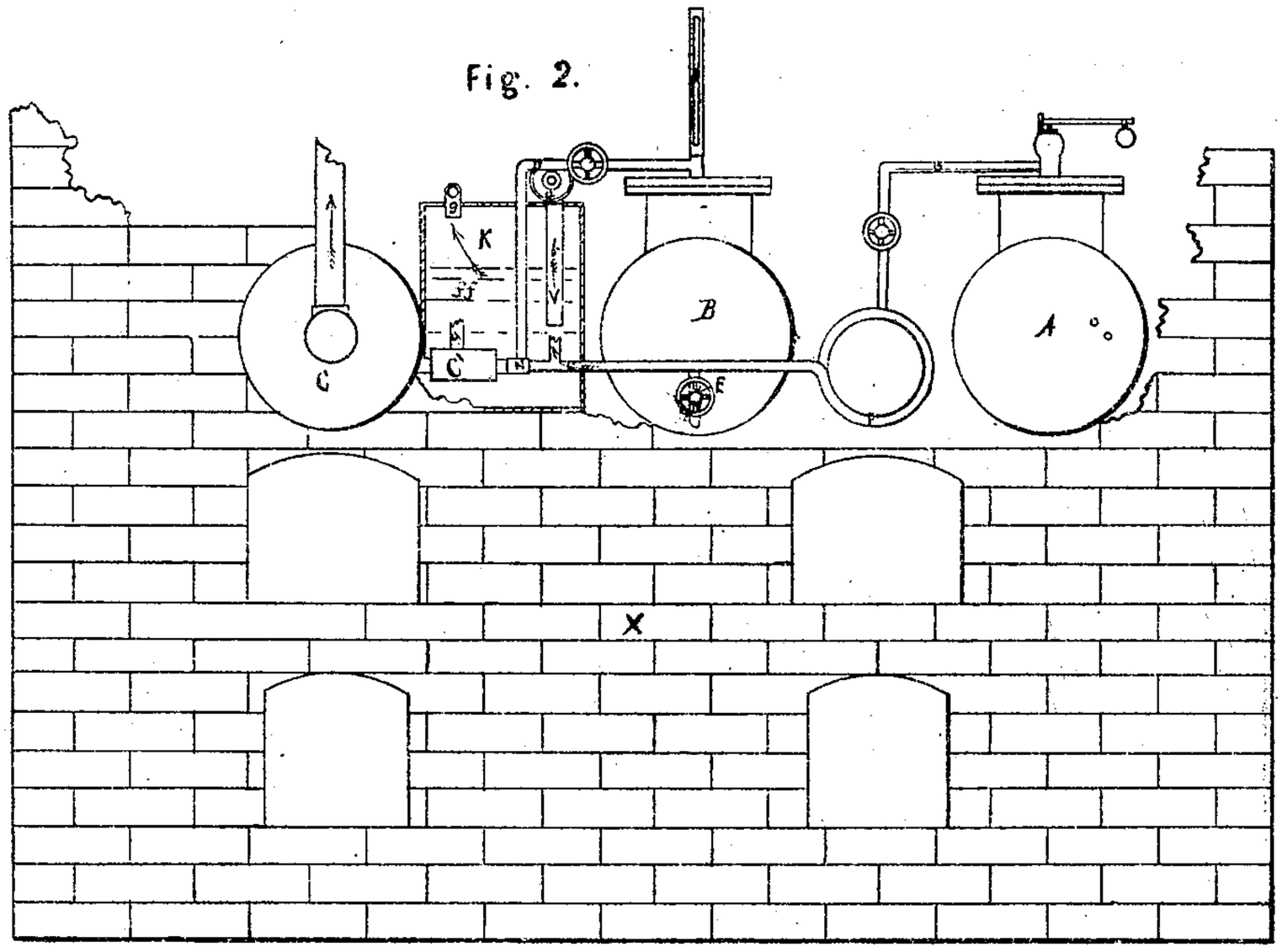


Fig. 2.



Witnesses:
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Inventor:
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his attys

United States Patent Office.

JOHN T. RICH, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 67,217, *dated July* 30, 1867; *antedated March* 25, 1867.

IMPROVEMENT IN THE MANUFACTURE OF 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, JOHN T. RICH, of Philadelphia, in the county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in the Mode of Manufacturing Illuminating or Heating Gas; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan, and

Figure 2 a front elevation.

In the different figures I use the same letters in indicating identical parts.

X is a furnace, of brick or other suitable material, supporting the boilers, retorts, &c., and having fire-grates suitably arranged. A is a steam-boiler, for generating steam from water which passes through the steam pipe C. In this pipe is inserted the coil F, which is placed within the furnace, and exposed to the direct action of the fire. B is a boiler or reservoir, filled, or partly filled, with petroleum or other hydrocarbon, to which heat may be applied when rosin or other solid substances are used. Into this reservoir the steam pipe is conducted, forcing the liquid through the pipe D, which passes below its surface. The pipe D leads into the steam pipe C, which, beyond the point of junction, terminates with an orifice having a conical ajutage, through which the mingled steam and fluid are violently forced, the fluid being by this means broken into a fine spray, and in this form delivered into the retort G. The pipe *h* is carried from the steam pipe C, and terminates, like the pipe C, in a narrow orifice within the flaring funnel-formed mouth *a* of the pipe *b*, leading into the condenser K. Over the mouth *a* is placed a register, by which the flow of atmospheric air into the mouth is regulated.

The current of steam passing through the mouth *a* into the pipe *b* will carry with it a considerable quantity of atmospheric air, which may be increased to nearly double the volume of the steam. The relative proportion of steam and air may be yet further increased as to the quantity of air by forming a series of concentric funnels, all open in front, and all conducting into the pipe *b*. The current passing through the contracted ends of these successive funnels will at each receive an increased flow of air. I have only shown one funnel, as this, for ordinary purposes, is sufficient. The mingled steam and atmospheric air thus are carried into the condenser K, where the steam is condensed. This condensation carries with it the carbonic acid gas, mingled with the atmosphere, and the purified atmospheric air passes through the pipe *g*, and, uniting in the pipe *c'* with the steam and fluid spray, is introduced into the retort G, and subjected to about a dull red heat, by which a chemical union is effected by the decomposition of the hydrocarbon, forming carburetted hydrogen gas, with which the oxygen of the atmosphere unites, forming a permanent illuminating gas of great purity. The mingling of air with the carburetted hydrogen may take place either before or after the decomposition of the hydrocarbon in the retort G.

In manufacturing illuminating gas I make about eight hundred cubic feet of gas from one gallon of petroleum, mixing the carburetted hydrogen gas with about four times its volume of the atmospheric product. In making a heating gas for use in furnaces, &c., I increase the proportion of the atmospheric product to from twenty to fifty volumes. With the increase of atmospheric air the orifice at the point of combustion must also be increased.

I is a pressure-gauge for determining the amount of pressure on the boiler A and reservoir B, in which the pressure will be the same.

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

1. The process for preparing atmospheric air for chemical union with decomposed hydrocarbon for the purpose of forming a permanent heating or illuminating gas, substantially in the manner set forth.

2. The combination of the steam pipe *h*, funnel-formed mouth *a* of the pipe *b*, and condenser K, said parts being constructed and arranged substantially as set forth.

3. Mixing a purified product of atmospheric air with hydrocarbon gas for dilution, either before or after decomposition of the fluid or other hydrocarbon, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN T. RICH.

Witnesses:

JOHN CLOUD,

W. P. HEBLIND.