

A. DUCHESNE.

APPARATUS FOR THE MANUFACTURE OF GAS.

No. 179,005.

Patented June 20, 1876.

Fig. 1.

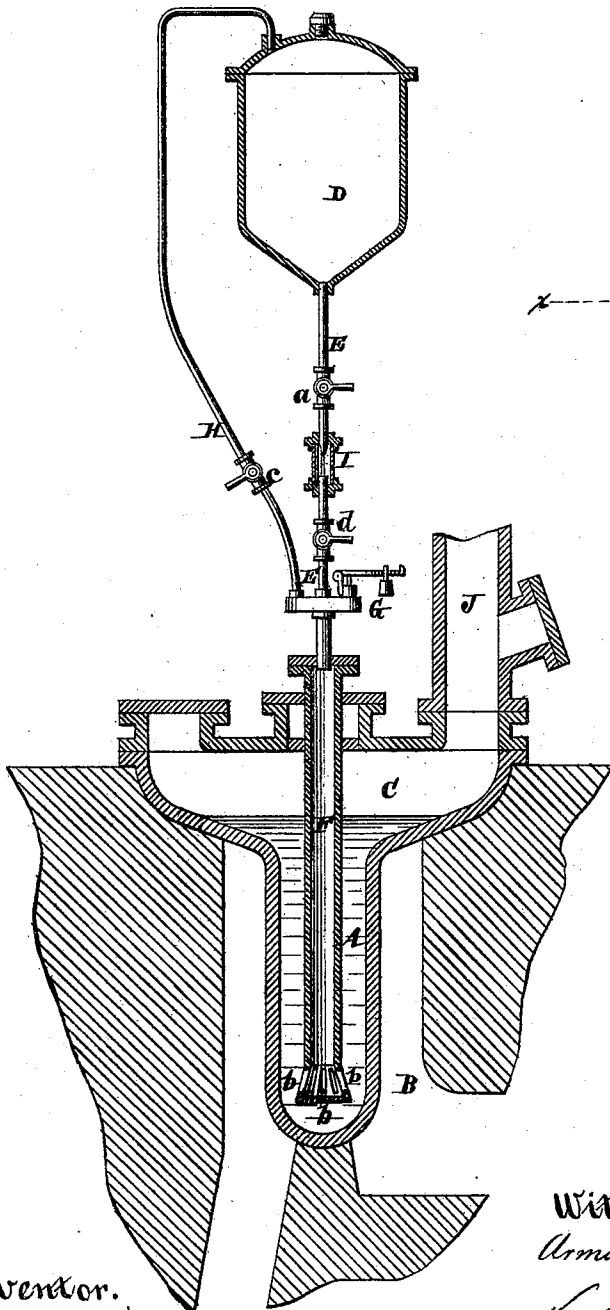


Fig. 2.

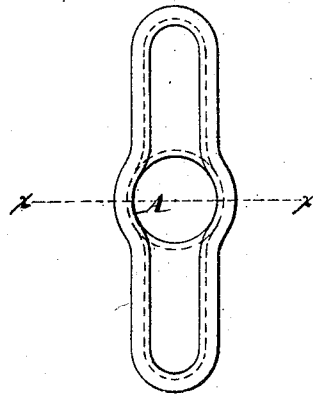
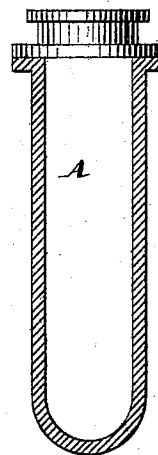


Fig. 3.



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IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE OF GAS.

Specification forming part of Letters Patent No. **179,005**, dated June 20, 1876; application filed October 29, 1875.

To all whom it may concern:

Be it known that I, ARMAND DUCHESNE, of Seraing, in the Kingdom of Belgium, have invented a new and useful Improvement in the Apparatus for the Manufacture of Gas, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a vertical central section of the apparatus which I use in carrying out my invention. Fig. 2 is a plan view of the retort detached. Fig. 3 is a cross-section thereof, in the plane of the line *x x*, Fig. 2.

Similar letters indicate corresponding parts.

This invention relates to a process of manufacturing gas for illuminating and heating purposes from hydrocarburets, and to an apparatus for carrying such process into effect.

The nature of my improved apparatus consists in an air-tight reservoir for holding the hydrocarburets in a liquid state, in conjunction with a retort adapted to receive the metallic bath, the reservoir communicating with the retort by a pipe, which is provided with a stop-cock, in order to permit of controlling the flow of the hydrocarburets. A spout, emptying within and near the bottom of the retort, is affixed to the pipe connecting the reservoir and the retort; hence, the hydrocarburets, when allowed to flow from the reservoir into the retort, are caused to discharge directly into the metallic bath, and after having been reduced to vapor by the action of the bath to pass through the latter upward. The pipe which connects the reservoir and the retort is provided with a safety-valve, which automatically regulates the pressure of the vapors formed in the spout in the retort. From such connecting-pipe, moreover, extends a branch pipe, which communicates with the reservoir above the level of any liquid hydrocarburets which may be poured therein, for the purpose of equalizing the pressure of the air above and below the liquid, when the reservoir is made air-tight.

The main disadvantages of the various processes of manufacturing gas hitherto used, and which are based on the principle of passing vapors or a gaseous current through heated retorts, are as follows: The circumference of the gaseous current is liable to be overheated,

while the temperature of the central part of such current is too low to allow the decomposition of the vapors to be complete. It follows that a comparatively poor quality of gas is obtained. A voluminous deposit of carbon, moreover, is formed on the inside of the retort, which prevents the easy transmission of heat, and at the same time a large amount of coal-tar is produced, the result of which is that frequent and difficult cleansing of the retort is necessary. These disadvantages are obviated by my invention.

I will now describe in detail my improved apparatus for manufacturing gas, represented in the accompanying drawing.

The letter A designates a vertical cast-iron retort, which is partially filled with molten lead or other metal, to form a metallic bath, the lead being preferably molten and kept in a molten state by heating the retort, and to this end the latter is placed over a furnace, B. The object of only partially filling the retort A with the metallic bath is to obtain a space, C, in the upper part of the retort for the accumulation of vapors, and which is referred to at another part of this specification. The retort A communicates with a reservoir, D, which is intended to hold the hydrocarburets, which I use in a liquid state, such hydrocarburets being subsequently reduced to vapor. I prefer to construct the reservoir D so that it can be made air-tight. To connect the reservoir D with the retort I use a pipe, E, which is provided with a stop-cock, *a*, by which the flow of liquid from the reservoir to the retort is governed. To the lower end of the pipe E is affixed a spout, F, which extends vertically through the retort A, and is so adjusted therein that its lower or open end is situated a short distance from the bottom. The lower part or end of the spout F is provided with holes *b*, and is made to flare outwardly, as shown. At a suitable part of the pipe E is secured a so-called safety-valve, G, in any suitable manner, the object of such valve being to permit of automatically regulating the pressure of the hydrocarburet vapors, which are formed in the spout F by the reduction of the hydrocarburet liquid to vapor, as hereinafter described. The letter H designates a branch pipe, which extends from the pipe E, and is connected to

the upper part of the reservoir D—that is to say, to a part of the reservoir which is above the level of any hydrocarburet liquid that may be poured therein. This pipe H extends in the present example from that part of the pipe E containing the safety-valve G; but it may be connected to any other part of such pipe, provided the connection is made below the stop-cock *a*. The branch pipe H is provided with a stop-cock, *c*. If this stop-cock *c* is opened and the cock *a* is closed, while the reservoir D is made air-tight, an equalization of the pressure of the air above and below the liquid in the reservoir takes place; and if the cock *a* is then opened, so as to allow the liquid to flow from the reservoir to the retort, such flow of the liquid takes place simply by the action of its own weight. In order to enable the operator to observe when the liquid flows through the pipe E, and the extent of this flowing, a glass tube, I, is arranged in the pipe for a part of its length in any suitable manner.

In carrying out my invention I fill the reservoir D with a suitable hydrocarburet, and then hermetically close the reservoir. The cocks *c d* are then opened for the purpose of equalizing the pressure above and below the liquid in the reservoir. I then open the cock *a*, whereby the liquid is allowed to flow from the reservoir D into the upper part of the tube F upon the surface of the molten metal therein. By the contact of the liquid with the metallic bath hydrocarburet vapors are formed in the spout F, whose pressure is regulated

by the safety-valve G. By the hydrocarburet vapors the metal in the spout is compressed to the lower end thereof, when the vapors issue from the lower end of the spout or the perforations *b*, and if from the latter a very uniform division of the vapors takes place.

The hydrocarburet vapors are thus caused to penetrate the metallic bath in the retort, and to pass through the same upward, when the vapors are collected in the space C, and thence conducted by a nozzle, J, to an apparatus, such as generally used in the manufacture of gas.

By the passage of the hydrocarburet vapors through a metallic bath a uniform decomposition thereof is insured; moreover, the retort is not rusted, and the production of coal-tar is reduced to a minimum, while the production of gas is increased.

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

The combination of the retort A with a vertical tubular-shaped bottom for containing molten metal, and the vertical tube F, in which the hydrocarbon vapors are generated, communicating with a supply-tank, D, and extending downward to near the bottom of the retort, to distribute the vapors generated through the body of the molten metal, and insure thorough destructive distillation, substantially as described.

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Witnesses:

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