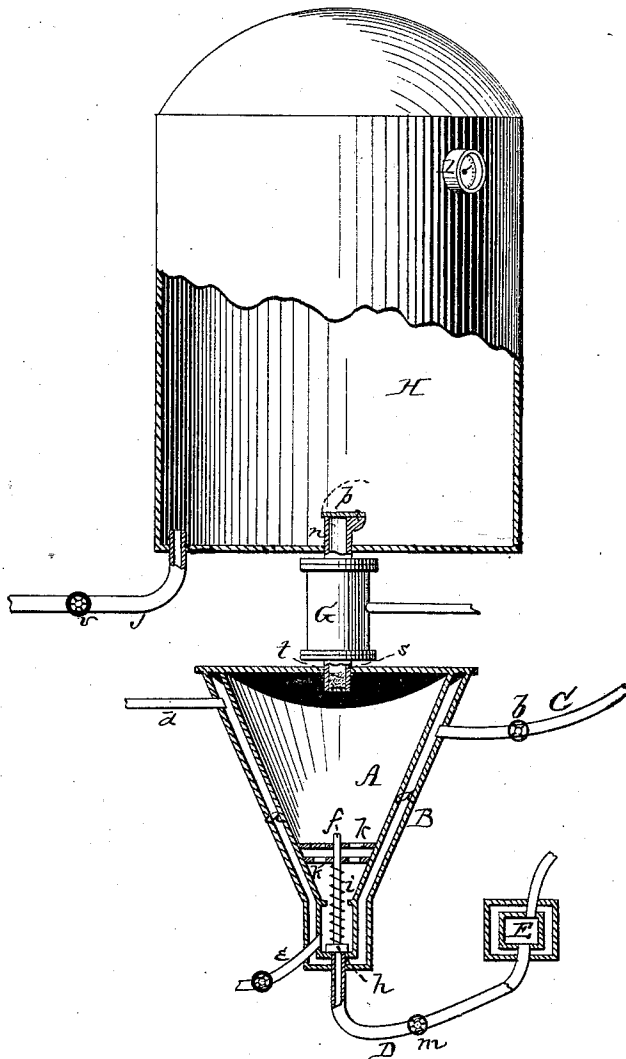


J. G. HAYMAKER.

CARBURETING GAS APPARATUS.

No. 176,955.

Patented May 2, 1876.



WITNESSES

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JAMES G. HAYMAKER, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN CARBURETING GAS APPARATUS.

Specification forming part of Letters Patent No. **176,955**, dated May 2, 1876; application filed October 9, 1875.

To all whom it may concern:

Be it known that I, JAMES G. HAYMAKER, of Pittsburg, in the county of Allegheny, and in the State of Pennsylvania, have invented certain new and useful Improvements in Carbureting Gas Apparatus; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a carbureting gas apparatus, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, which represents a vertical section of my machine.

A represents the generator or carbureter, made funnel-shaped, or in the form of an inverted cone, and is surrounded by a jacket, B, forming a steam space or chamber, *a*, all around the generator. Into this space or chamber steam is admitted from a steam-boiler through a pipe, C, said pipe being provided with a stop-cock, *b*, for regulating the flow of steam into the chamber, and the steam escapes through a pipe, *d*, as shown. *e* is simply a draw-off pipe from the lower end of the generator, to be used when it is desired to draw off the hydrocarbon liquid for cleaning the generator or for other purposes.

The generator A, being made in funnel shape or inverted cone, having the small end downward, will bring the material used in the generator down to a small space in the bottom, and thus enable the operator to use up all the material in the generator, which could not be done where the liquid is spread over a large surface at the bottom of the generator.

D is the air-pipe, conducting air into the bottom of the generator A. Above the end of this pipe, within the generator, is placed a valve, *h*, provided with a stem, *f*, passing up through perforated diaphragms *k k*, inside of the generator, to guide the movement of the valve vertically up and down. The stem *f* is surrounded by a spiral spring, *i*, which holds

the valve down with a certain pressure on the end of the air-inlet pipe D. This plunger or valve prevents too much air from entering the generator, but rises to admit air under a certain pressure, the air entering the pipe D from an air-chamber, E, into which the air is compressed by means of an ordinary air-pump and the pipe D, provided with a stop-cock, *m*, for regulating the flow of air to the generator or carbureter.

The air-chamber E is made double, as shown, so that, if desired, steam may be admitted between the two shells, for the purpose of heating the air before it passes into the generator. In this case the surrounding of the generator with steam may be dispensed with; or both may be used, if required, according to the size of the machine and the quantity of gas desired to be made.

From the generator A the gas passes, through an ordinary force-pump, G, into a receiver or gasometer, H, and is by the pump compressed into said receiver. On the end of the pipe *n*, from the force-pump to the receiver, is a self-acting valve, *p*, which will rise while the receiver or gasometer is being filled, and when the operation ceases the pressure in the receiver closes the valve, thereby preventing condensation. In the lower end of the pipe *s*, from the generator to the force-pump, is a filter or valves, *t*, made of sand, charcoal, cotton, or any other suitable material, for the purpose of purifying the gas before it enters the gasometer.

The force-pump G is only necessary in large machines. In smaller machines the force-pump may be dispensed with, and the generator connected directly with the receiver or gasometer.

The receiver or gasometer H is constructed on the principle of an ordinary steam-boiler, capable of withstanding a certain amount of pressure, and provided with a gage, I, to test the pressure at any time. An ordinary rising and falling gasometer may, however, be used, if so desired.

J is the main, or pipe for conducting the gas from the gasometer to the service-pipes; and in this main I use a stop-cock, *v*, for regulating the flow of the gas.

Instead of using air, steam may be admitted into the generator through the bottom. This

steam may be compressed and regulated in the same manner as the hot or cold air. By using steam in this manner I can dispense with the use of air, and also dispense with the forcing of steam around the generator.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The double-walled generator A, made in the shape of an inverted cone, with the air-pipe D entering the same at the lower (smaller) end, and provided with a spring plunger or valve, *h*, as and for the purposes set forth.

2. In a carbureting gas-machine, the combination of the generator A, the closed gasometer H above the same, and a force-pump, G, interposed between them, for compressing the gas into the gasometer, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of October, 1875.

JAMES G. HAYMAKER.

Witnesses:

H. A. HALL,
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