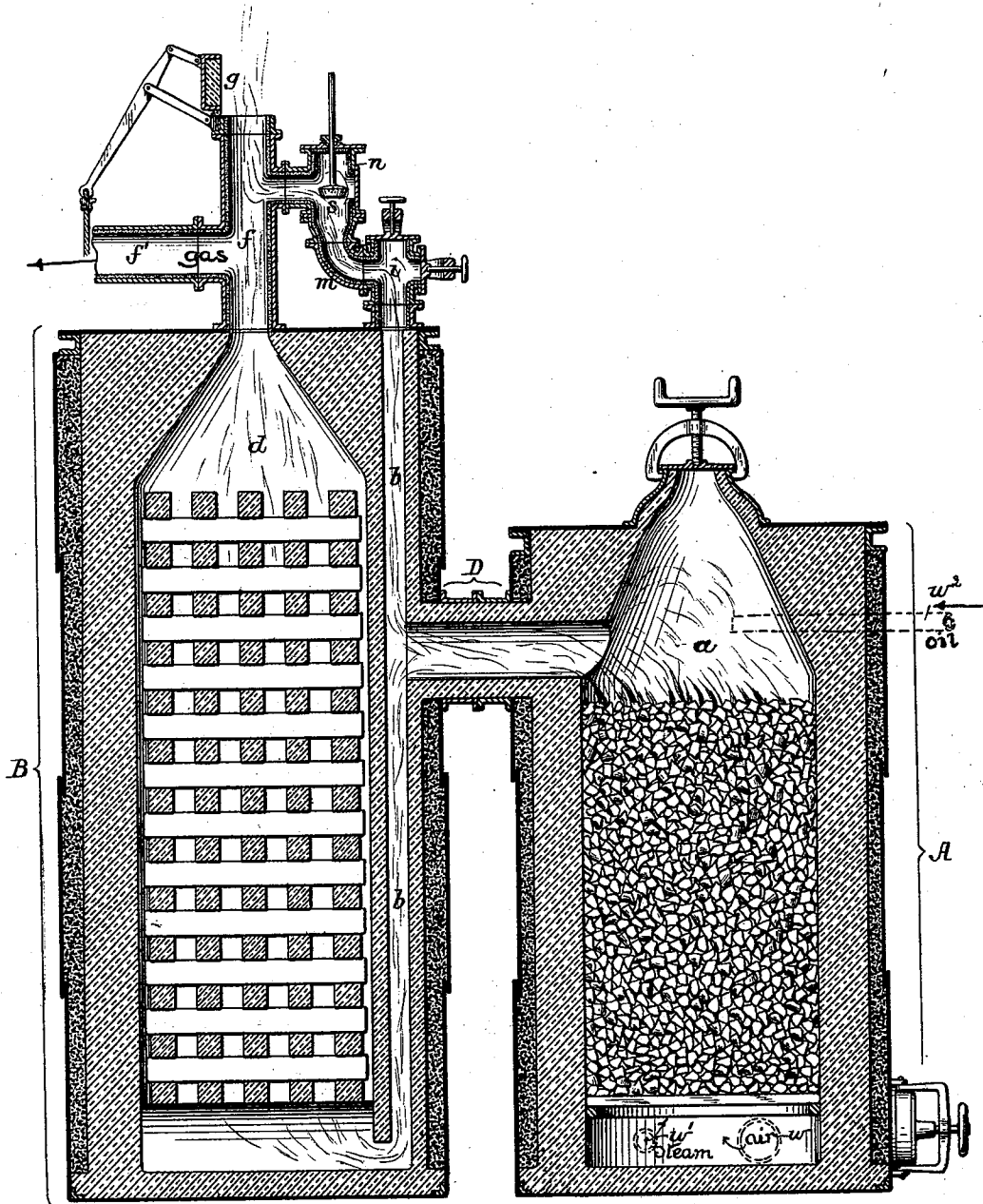


(No Model.)

T. CURLEY.
GAS APPARATUS.

No. 518,181.

Patented Apr. 10, 1894.



Witnesses:
Fred D. Goodwin
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Inventor:
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UNITED STATES PATENT OFFICE.

THOMAS CURLEY, OF WILMINGTON, DELAWARE, ASSIGNOR OF ONE-HALF
TO JOHN MCILHENNY, OF PHILADELPHIA, PENNSYLVANIA.

GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 518,181, dated April 10, 1894.

Application filed November 23, 1891. Serial No. 412,739. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CURLEY, a citizen of the United States, and a resident of Wilmington, New Castle county, Delaware, have invented certain Improvements in Gas Apparatus, of which the following is a specification.

My invention consists of a certain improvement in that class of gas apparatus in which a generator and superheater are employed, the products of combustion from the fuel in the generator during one part of the process, passing through the superheater in order to highly heat the same, and this operation being continued until the fuel in the generator has been brought to a condition of incandescence, whereupon steam is admitted to the generator or passed through the incandescent fuel therein, and then mixed with oil or oil vapor, and the mixture then passed through the superheater to the hydraulic main or wash box.

The object of my invention is to so construct an apparatus of this character that the heating of the cellular brick work structure in the superheater can be regulated, and overheating of the same prevented, so that the oil used in the manufacture of the gas will not be broken up into light carbides and lamp black, to the same extent as before but will be mainly devoted to the production of a fixed olefiant gas, thus materially economizing in the expenditure of oil, preventing the excessive deposit of lamp black in the superheater and at the same time producing a marketable tar free from water. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, which represents, in vertical section, sufficient of a gas apparatus of the character specified to illustrate my invention as applied thereto.

A represents the fire place or generator of the apparatus, and B the superheater, each consisting of a suitable casing with an internal structure or lining of fire brick, or like refractory material, these two structures being connected by a brick lined neck D, which communicates at one end with the combustion chamber *a* at the top of the generator, and at the other end with a vertical flue or passage

b formed in the internal fire brick structure or lining of the superheater.

The air and steam blast pipes and the oil supply pipes are shown by dotted lines, *w* representing the said air pipe, *w'* the steam pipe, and *w²* the oil pipe. The central chamber *d* of said superheater has a cellular filling composed of bars or blocks of refractory material as usual, and said chamber communicates at the upper end with a discharge pipe *f*, which has a lateral branch *f'* leading to the hydraulic main or wash box, and is provided at the upper end with a valve *g*. When the fire in the generator A is being blown up by a blast of air introduced into the ash pit so as to bring said fuel to a proper condition of incandescence, the products of combustion from the chamber *a* pass through the neck D into the vertical flue or passage *b* in the superheater lining. Usually this flue or passage *b* has a communication only with the bottom of the chamber *d* of the superheater, so that, during the blowing up of the fire in the generator, the entire products of combustion pass through the cellular structure of the superheater, and escape from the latter through the discharge pipe *f*, the valve *g* at the upper end of the same being open, as shown in the drawing. When the blowing up of the fire has been completed, the valve *g* is closed, the valve in the branch *f'* is opened, steam and oil are injected into the generator, and the gas thereby formed is passed through the highly heated cellular mass in the superheater, and thence through the branch *f'* to the hydraulic main or wash box. When all of the products of combustion are passed through the superheater until the mass of fuel in the generator is brought to the desired condition of incandescence, the cellular structure in said superheater is rendered too hot for subsequent action upon the oil, the effect being that a large percentage of the oil is broken up into light carbides or "marsh gas" and lamp black, the destructive breaking up of the oil being greater in the case of the light oils of the naphtha series, than in the case of the crude or heavy oils, but being, in either case, a serious cause of loss, for, as the light carbides have but little illumi-

nating power, it follows that a larger quantity of oil must be used, than if all of said oil was devoted to the production of a fixed olefiant gas, as it would be if the temperature of the superheater was regulated with due reference to the character of the oil which was being used. In order therefore to provide for such regulation of the temperature of the superheater, I provide the apparatus with a supplementary valved escape pipe or by-pass through which a portion of the products of combustion from the generator can escape directly without passing through the superheater, so that the volume of the products of combustion passing through the latter can be so regulated that the heat imparted to the cellular structure of the superheater, may be readily governed. In the drawing I have shown such a valved by-pass forming a communication between the vertical flue or passage *b* of the superheater, and the pipe *f*, the said flue being extended to the top of the superheater, and the communication comprising essentially a right angled section *i*, an elbow *m*, and a T-section *n*, the latter containing the valve *s*. When this valve is open, therefore, more or less of the products of combustion pass directly to the discharge *f*, depending upon the extent of opening of the valve, and as much of the entire volume of the said products as is desired may be directed to the central chamber of the superheater and permitted to pass through the cellular structure

therein. The heating of this structure can thus be readily governed to effect the best possible results with the character of oil which is being used, so that whether said oil be light or heavy, a gas of maximum illuminating power may be produced with a minimum expenditure of oil. Moreover, the deposit of lamp black in the superheater will be in great measure prevented, and the tar which is formed will be of good and marketable quality, and free from water.

Having thus described my invention, I claim and desire to secure by Letters Patent—

The combination of the generator and superheater of a gas apparatus, the discharge pipe at the top of the superheater, a flue or passage in said superheater extending from top to bottom of the same, and communicating with the combustion chamber of the generator, and with the lower end of the superheater chamber, and a by-pass connecting the upper end of said flue with the discharge pipe of the superheater, said by-pass having an adjustable valve for regulating the flow through the same, substantially as specified.

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

THOMAS CURLEY.

Witnesses:

JNO. E. PARKER,
HARRY SMITH.