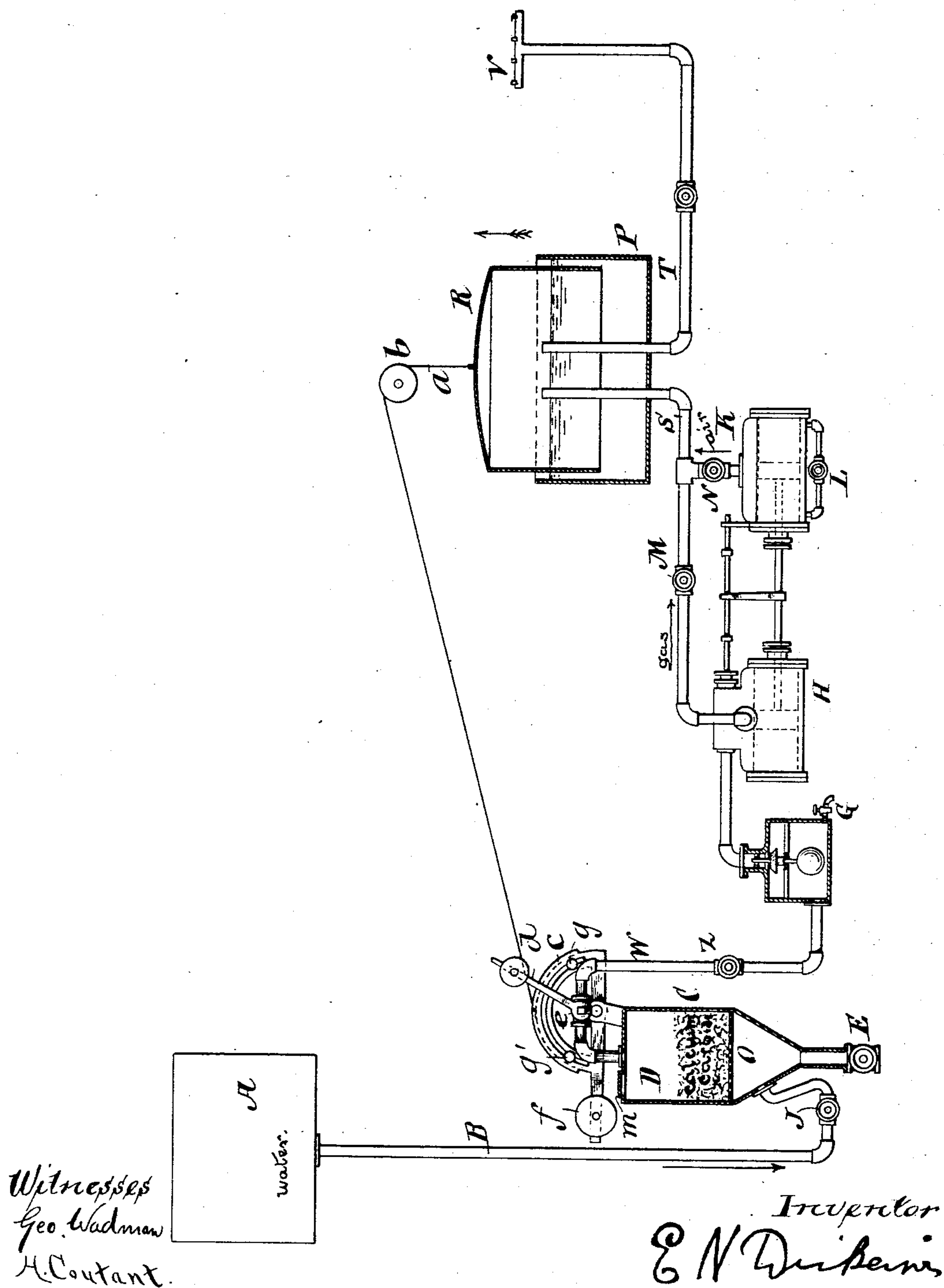


(No Model.)

E. N. DICKERSON.
APPARATUS FOR PRODUCTION OF GAS.

No. 541,427.

Patented June 18, 1895.



UNITED STATES PATENT OFFICE.

EDWARD N. DICKERSON, OF NEW YORK, N. Y.

APPARATUS FOR PRODUCTION OF GAS.

SPECIFICATION forming part of Letters Patent No. 541,427, dated June 18, 1895.

Application filed July 11, 1894. Serial No. 517,220. (No model.)

To all whom it may concern:

Be it known that I, EDWARD N. DICKERSON, of the city, county, and State of New York, have invented a new and useful Improvement
5 in Apparatus for the Production of Gas, especially with reference to the production of illuminating or heating gas, of which the following is a specification.

This invention relates to an improved apparatus for regulating the production of combustible gas. It is especially applicable to the manufacture of gas, in which the said gas is produced by the contact of a liquid with a solid, a type of which is the production of
15 hydrogen gas by the contact of acidulated water and zinc. My apparatus, however, is designed especially to be employed in the production of gas by the combination of a metallic carbide, such as calcium carbide,
20 with water, in which case acetylene gas is produced. The discovery of this method of producing illuminating gas by the mere mingling of a metallic carbide and water enables the production of a satisfactory gas locally
25 at the place of consumption, which has heretofore been practically impossible; but this method of producing the gas renders it important to have a regulated production of the gas, enabling such production to go on in
30 accordance with the consumption. Otherwise a gas holder of considerable size is required, which is, in some cases, a disadvantage.

My invention is designed to accomplish the results of producing the gas whenever it is
35 desired, and mingling the same with any desired proportion of air, and supplying the same to the consumer at a regulated pressure.

My invention will be readily understood from the accompanying drawing, representing, generally, an elevation, partly in cross-section, of my apparatus, in which—

A represents a water receptacle connected by pipe B with generating chamber C. In this chamber the material, say calcium carbide D, is placed on a suitable perforated support O. The production of gas occurs
45 whenever water comes in contact with it, and ceases when the contact of the water ceases. The chamber C is connected with the pipe B
50 and also with the pipe W. The pipe W is

provided with stop-cock *e*, which may be of the kind known as a tumble-bob stop-cock, and which is controlled by the regulator R. When the stop-cock *e* is open, as it is supposed to be in the drawing, water rises in
55 contact with the material D. The gas produced flows through the pipe W, which may be provided with stop-cock Z, thence through the automatic trap G, and thence to the engine H, operating the air pump K. The discharge of the engine H passes by pipe S to
60 the regulator R in water vessel P. This may be of any desired form. I have shown a small gas-holder as suitable.

K is an air-pump, which preferably is provided with a by-pass L containing a suitable valve, and it will be observed that at every stroke of the engine H delivering a determined amount of gas, the air pump K delivers also into the pipe S a proportionate amount
70 of air.

In the case of calcium carbide one-third to one-half the amount of air makes a desirable mixture. The amount of air to be delivered can be determined by the by-pass L, the
75 wider said by-pass is opened the less air will be delivered into the pipe S. The gas and air jointly pass into the regulator R and pass from that regulator through the pipe T to the burner V, or other place of consumption. As,
80 however, the holder R is filled the cord or chain *a* passing over the pulley *b* allows the counter-balance *f* upon the pivoted segment *c* to fall until the adjustable pin *g* strikes the weighted lever *d* attached to the cock *e*,
85 when the lever *d* will be thrown over to the left, thereby closing the cock *e*. There are many known forms of valve of this general construction. Upon the return of the cord, the other pin *g'* throws the lever *d* back into
90 the position shown in the drawing. When the stop-cock *e* is closed the generated gas no longer finds vent, and therefore acting upon the water in the chamber C it depresses the same, forcing it backward and into the chamber A. The generation of gas then ceases
95 until the stop-cock *e* is automatically opened. The chamber C is provided with an outlet E for allowing the water and deposited material to escape, and with suitable supply open-
100

ing *m* for replacing the material. Though an automatic tumble-bob stop-cock *e* is shown, this is not in all cases essential. A stop-cock directly connected with the regulator *R* would
5 also be efficacious.

The arrangement shown is for the purpose of making an intermittent operation of the apparatus. The floating valve *G* is important in case the material *D* having become
10 exhausted water should flow over through the pipe *W* and into the engine *H*. In this case the float valve *G* would prevent the passage of the water until the same was emptied. The stop-cock *Z* regulates the escape of gas
15 to the engine *H* in such manner as that the water under ordinary conditions is not allowed to extend above the vessel *C*.

In place of the regulator *R* a diaphragm regulator may be employed of any of the well
20 known forms, and such diaphragm regulator may be directly connected to the stop-cock *e*. In case of any excess of pressure in the chamber *C* the pipe *B* and chamber *A* act as a safety valve. It is obvious that the chamber *A* must
25 be raised sufficiently high to give a gas pressure sufficient to operate the engine *H* and pump *K*. The water pressure in chamber *A* may be aided by an air pressure upon its surface taken from the pump *K*, or other source.
30 I prefer, however, where it is possible, to have the elevated chamber *A*, because this then operates as a safety valve, which otherwise should be applied to the chamber *C*, to prevent the possibility of explosion, since the

calcium carbide generates acetylene in the 35 presence of water at great pressure.

In place of the direct acting engine and pump *H*, *K*, obviously many other forms of apparatus could be employed, such, for instance, as a rotary engine and pump relay
40 connected therewith. It is also obvious that though my apparatus is shown as designed to mingle the illuminating gas and air in the holder, part of the invention could be utilized where no air is added, in which case the
45 engine and pump *H*, *K*, would be dispensed with.

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

1. The combination of the gas generator *C*, 50 water column *B*, the pipe *W*, the motor *H* and air compressor *L* the outlets of which communicate with the pipe *S*, the governor *R*, and the cock *e* operated by the governor *R*, substantially as described.

2. The combination of the water column *D*, 5 the gas generator *C*, the cock *e*, motor *H*, air pump *K*, regulator *R* operating cock *e*, and floating check valve *G* interposed between the generator *C* and motor *H*, substantially 6 as described.

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

E. N. DICKERSON.

Witnesses:

ANTHONY GREF,
H. COUTANT.