

No. 631,391.

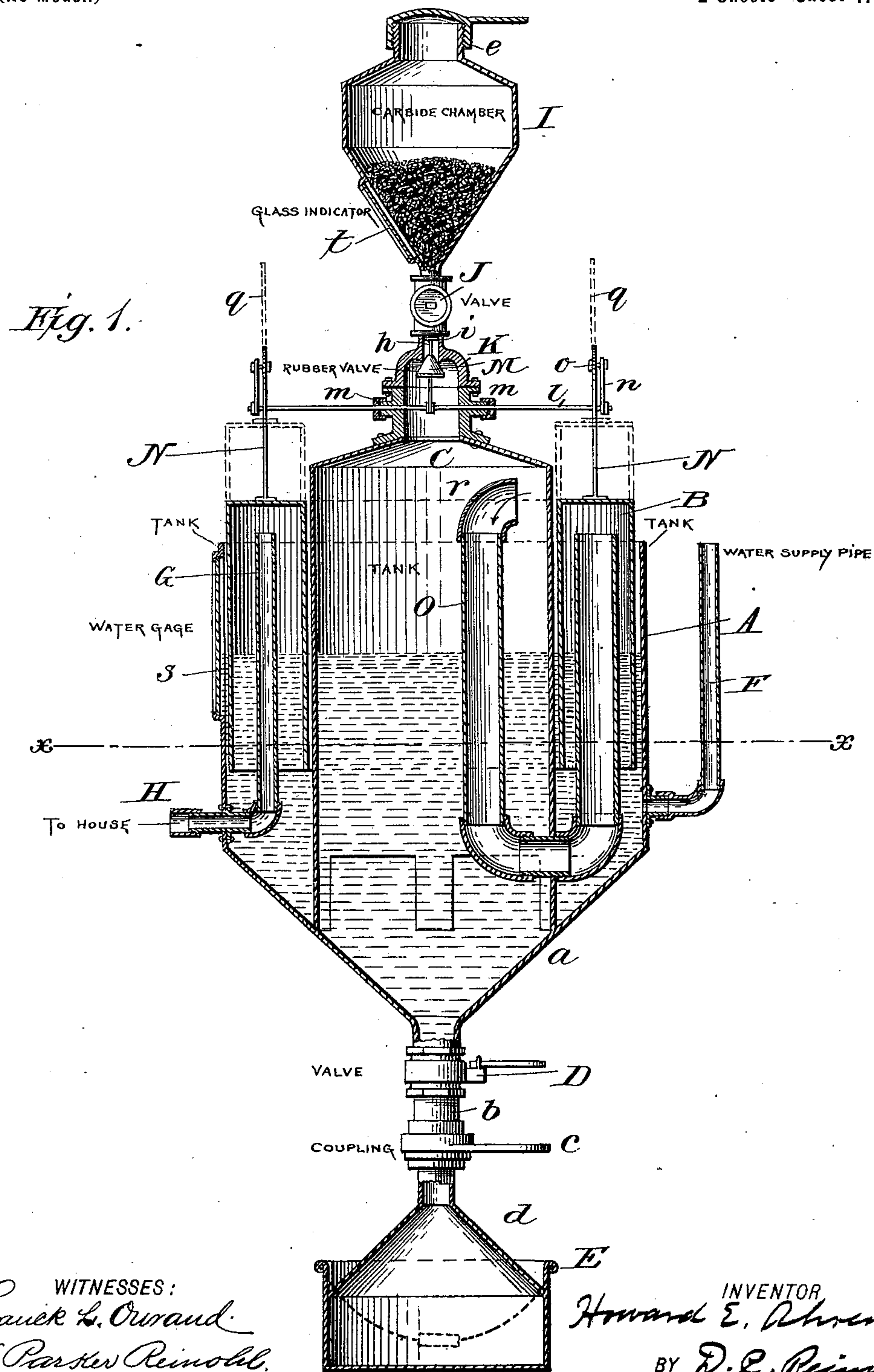
Patented Aug. 22, 1899.

H. E. AHRENS.
ACETYLENE GAS GENERATOR.

(Application filed Dec. 27, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
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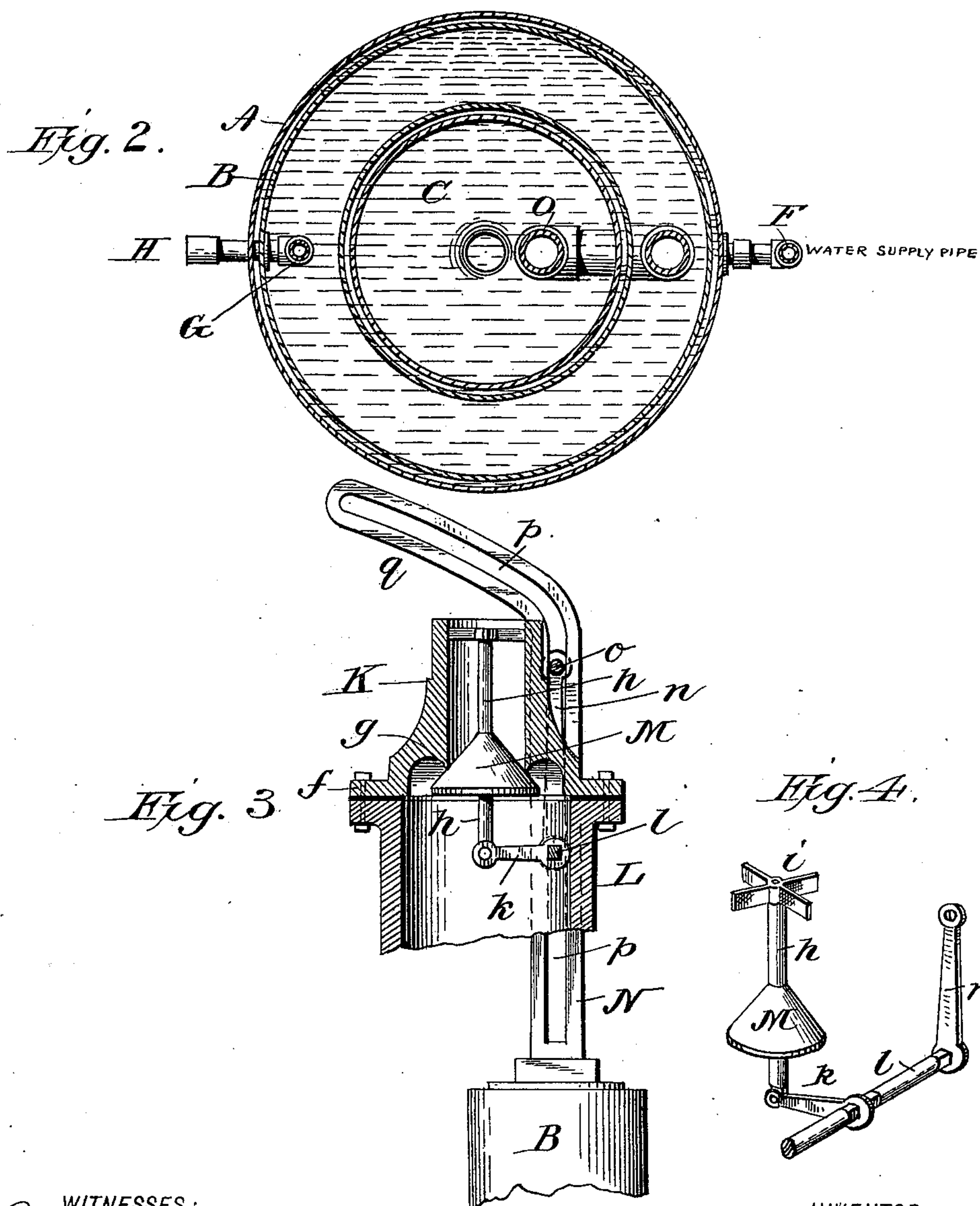
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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 631,391, dated August 22, 1899.

Application filed December 27, 1898. Serial No. 700,381. (No model.).

To all whom it may concern:

Be it known that I, HOWARD E. AHRENS, a citizen of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Generating Acetylene Gas; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the manufacture of acetylene gas, and has for its object the construction of an automatically-operating apparatus dispensing with springs and weights, so simple in its construction and operation that it can be manipulated with ease, and securing absolute safety, so that it can be placed in a building or dwelling without incurring risk to life or damage to property; and it consists in certain improvements which will be fully disclosed in the following specification and claim.

In the manufacture of acetylene gas two of the greatest difficulties encountered have been the heating of the gas-generator by the gas evolved and the moistening of the carbide in the storage-receptacle and in the valve and passage leading therefrom to the gas-generator. It has been my object to overcome these two great desiderata, and I have practically demonstrated that the generator can be kept cool and the carbide dry.

In the accompanying drawings, which form part of this specification, Figure 1 represents a vertical section with the discharge-valve and the coupling in side elevation; Fig. 2, a transverse section on line *x x*, Fig. 1; Fig. 3, a vertical section, on an enlarged scale, of the carbide and the distributing chambers and showing the valve-operating mechanism in side elevation; and Fig. 4, a perspective of the carbide-supply valve and part of its operating mechanism.

Reference being had to the drawings and the letters thereon, A indicates the tank, B the gas-holder or gasometer, and C the gas-generator, the former being partly filled with water and the latter two contained in the

tank and partly immersed in water, which acts in conjunction with calcium carbide or carburet of calcium to generate acetylene gas and forms a seal for the lower and open ends of the gas-generator and the gas-holder to prevent escape of gas into the apartment in which the apparatus is located. These three vessels may be cylindrical or of any preferred form to suit the conditions under which they are to be used and are preferably made of galvanized sheet metal.

The tank A is open at its upper end and is provided with a conical lower end *a* to facilitate the ready discharge of its contents when required, a valve D for controlling the discharge through pipe *b*, a coupling *c*, and an inverted-funnel-shaped end *d*, which extends into a vessel E, and with a water-supply pipe F.

The gas-holder B is annular and rises and falls in the tank A as the gas accumulates therein or is drawn off for consumption through pipe G, which connects with the house supply-pipe H.

The gas-generator C is surmounted by a carbide tank or receptacle I, which is provided with a removable top or cover *e* and an ordinary turning-plug valve J, which is connected to the upper end of the carbide-chamber K, preferably cylindrical in form and provided with a flange *f*, by which it is detachably secured to the upper end of the carbide-distributing chamber L. At the lower end of the carbide-chamber is an annular vertical and sharp valve-seat *g*, which is engaged by a conical distributing-valve M, which valve performs a very important function in the operation of my invention.

Heretofore all valves and other devices used to control the supply of the carbide to the generator have been made of metal and, as a consequence, have accumulated condensation from the gas generated, and the granular carbide in its passage from the tank has accumulated thereon and formed a coating sufficient to prevent the forming of a tight joint against the valve-seat and permitted the gas, with its contained moisture, to penetrate the carbide-tank and permeate the carbide and not infrequently to cause it to clog

and interfere very seriously with its feeding through the distributing-valve.

The valve M is made of a non-metallic yielding or flexible material, preferably pure rubber, upon which no condensation accumulates, and should any fine granules of carbid rest upon the valve they do not prevent the valve seating closely. The valve is supported upon a stem *h*, which extends to the upper end of the chamber K and is provided with a spider *i*, having laterally-extending arms, which engage the wall of the chamber and serve the twofold purpose of a guide to the valve and an agitator for the carbid in said chamber as the valve rises and falls, and the lower end of the valve-stem, which extends into the distributing-chamber L, is connected to an arm *k*, which is secured to a valve-operating rod *l*, which extends through and is supported in bearings *m m* in the wall of said chamber, extends laterally, and is provided at each end with an arm *n*, having a wrist-pin *o* at its outer end, the two arms *k n* and the rod *l* forming a bell-crank lever, the rod *l* turning on its axis to operate the valve.

Upon the upper end of the gas-holder B are secured vertical and slotted standards N N, with the slot *p* of which the wrist-pins *o* engage and rise and fall therein as the gas-holder rises and falls. The upper ends *q* of the standards are bent at an angle to the body thereof, and when the gas-holder sinks in the tank sufficiently to cause the wrist-pins *o* to run into the curved part *q* the operating-rod *l* is turned on its axis and the valve M drawn down from its seat, permitting the calcium carbid to flow into the distributing-chamber L and from thence into the gas-generator C. As soon as gas accumulates in the gas-holder B in sufficient volume or quantity to raise the holder and the wrist-pins *o* leave the curved part *q* of the standards the rod *l* is turned in the opposite direction and the valve M closed.

In the manufacture of acetylene gas great difficulty has been experienced in preventing the gas-generator becoming unduly heated due to the rapid evolution and accumulation of gas in the generator and consequent increase of pressure. To overcome this dangerous condition, efforts have been made to cool the gas by conducting it through coils immersed in water, and other devices have been employed. This difficulty is entirely overcome by the use

of conduit O, which is of a diameter greatly in excess of the diameter of the discharge-pipe G in the gas-holder is placed on one side of the center of the generator C and provided with an elbow *r* to prevent carbid entering it, extends down to the lower end of the generator, and rises in the gas-holder B to a point about three-fourths of an inch above the upper end of tank A to prevent water disturbed by any cause getting into the conduit and preventing the passage of gas from the generator to the holder. The area of the conduit O is four or five times greater than the area of the discharge-pipe G and conducts the gas from the generator C into the holder B as rapidly as it is generated, thus avoiding the accumulation of gas, heat, and pressure in the generator.

The operation of the generator is automatic and gas is produced in quantity to supply the demand, based upon the capacity of the apparatus.

The height of the water in the tank A is ascertained through a sight-gage *s*, and the carbid-tank is provided with a similar gage *t*.

In removing the refuse matter from the generator C, the vessel E having been emptied it is refilled with water and the funnel end *d* immersed therein to prevent air entering the generator through the valve D.

Having thus fully described my invention, what I claim is—

In apparatus for generating acetylene gas, a generator, a receptacle for carbid above the generator, an interposed cylindrical carbid-chamber having a vertical valve-seat formed thereon at the lower end of the cylinder, a conical rubber valve engaging said seat and provided with a stem extending downward from the valve, a distributing-chamber below the carbid-chamber, an arm engaging said stem, a valve-operating rod supported by the distributing-chamber and extending laterally therefrom, a gas-holder, slotted standards having curved upper ends and supported by said holder, a wrist-pin engaging each standard and an arm connecting each wrist-pin to the valve-operating rod.

In testimony whereof I affix my signature in presence of two witnesses.

HOWARD E. AHRENS.

Witnesses:

BENJ. E. DRY,
R. B. KINSEY.