(No Model.) 2 Sheets—Sheet 1.

W. R. KING & F. WYATT.

APPARATUS FOR GENERATING ACETYLENE GAS.

No. 562,401. Patented June 23, 1896.

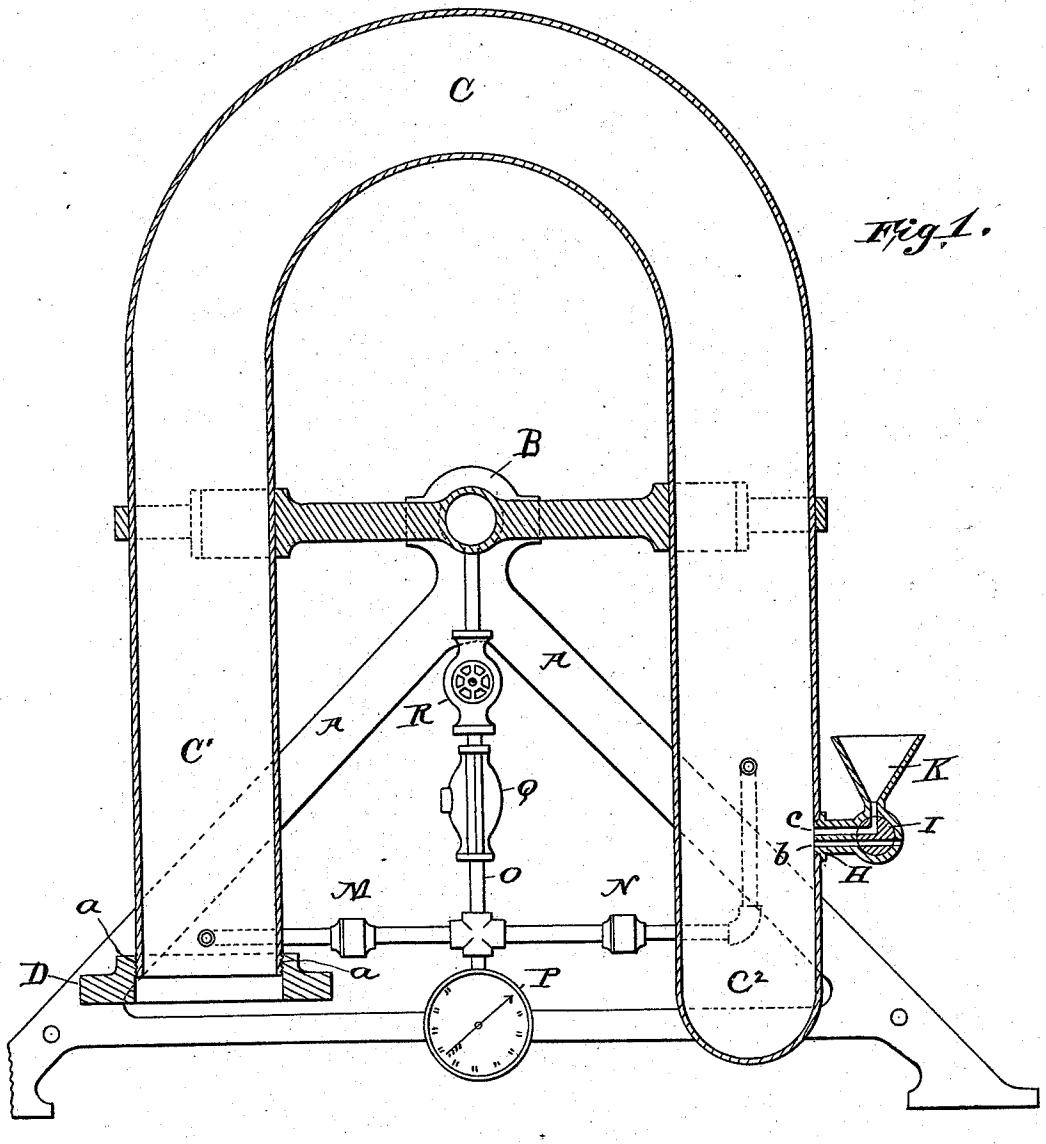


Fig. 1.

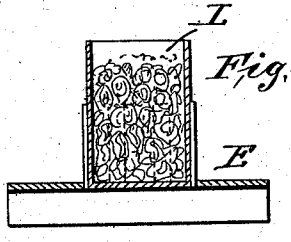


Fig. 2.

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Fig. 3.

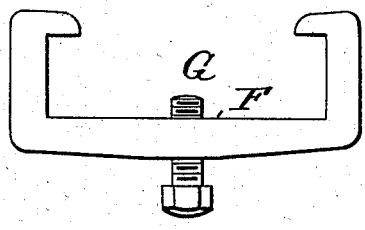


Fig. 4.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR GENERATING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 562,401, dated June 23, 1896.

Application filed January 29, 1896. Serial No. 577,268. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM R. KING, a citizen of the United States, and FRANCIS WYATT, a subject of Her Britannic Majesty, residents of the city, county, and State of New York, have made certain new and useful Improvements in Apparatus for Generating Acetylene Gas, of which the following is a specification.

The object of our invention is to provide a simple, strong, easily-operated generator for acetylene gas and other gases which are evolved by the contact of a liquid and a solid substance. The main purpose for which we design this generator is the production of acetylene gas by bringing about the association of a fixed amount of water and calcium carbid or some other earth alkaline metal carbid. The generator is especially adapted to what is termed "isolated" use, by which is to be understood use in country houses or other isolated places, where an elaborate system of gas generation and distribution is impracticable.

A properly-constructed generator embodying our invention can be used with perfect safety and without requiring expert knowledge in such isolated places; and the size of the apparatus is preferably made such that a single operation of the generator produces a week's supply of acetylene gas.

It has long been known that calcium carbid, though possessing the property of rapidly generating acetylene gas in the presence of moisture, is, when dry, non-explosive and easily handled. Such carbids can therefore readily be shipped to any part of the world in tins or other moisture-proof packages. The other material needed for generating acetylene gas, namely, the water, is of course easily accessible when wanted.

Various forms in detail as to size, configuration, and mechanical adjustment of parts can of course be used to embody our invention; but the form and arrangement which we consider preferable is shown in the accompanying drawings, in which—

Figure 1 is a vertical section of the generator in position for charging. Fig. 2 shows the removable cap with an opened can of calcium carbid thereon. Fig. 3 shows the clamp by which said removable cap is secured to the generator. Fig. 4 is a vertical section taken at right angles to Fig. 1 and showing the generator in position for generating.

Same letters indicate similar parts in the different figures.

A is the frame, upon which the generator is mounted by means of the shaft B. This shaft is preferably hollow, as shown, for the purposes hereinafter stated. A solid shaft may be employed, if desired.

C is the generator proper, which is preferably made out of solid tubing bent somewhat into a U shape with one end sealed, as shown at C^2, and the other end C′ provided with a flange D, adapted to receive a cap E. (See Fig. 2.) This flange may be integral with the tube or may be screw-threaded, as shown at *a*, the end of the tube being correspondingly screw-threaded, if preferred. This is a mere matter of strength and convenience.

F, Fig. 3, is a clamp, by means of which the cap E is securely held onto the flanged end of the generator, when in use. This clamp is provided with the usual screw G, the turning of which produces the requisite pressure between the hooked ends of the clamp and the cap in the way usual to this sort of clamp.

The sealed end C^2 is tapped at a predetermined distance from the end by the inlet H. The amount of water necessary to convert a known amount of calcium carbid into acetylene gas and hydrate of lime is well understood. To take advantage of this known relation in the most convenient form, we provide the tap or inlet H with two channels *b c*, a two-way cock I, and a funnel K. The lower of these channels *b* is used as an overflow-indicator. The upper channel *c* communicates with the funnel. By placing this tap at such a distance from the sealed end of the generator that the water poured therein through the funnel will exactly correspond to the charge of carbid contained in the can L, (see Fig. 2,) when the water-level reaches the channel *b*, it is obvious that the person using the generator need not measure the water beforehand, but can pour freely into the funnel until water begins to run out through the overflow-channel *b*. He then stops pouring, waits till the overflow stops running, turns the two-way cock I, and the generator is ready for use.

In the system of piping which we prefer to use for leading the generated gas to the gasometer or burners, where it is to be consumed, we employ the hollow shaft B, as shown, and lead the generator-pipes thereto. Wherever, for any reason, a solid shaft is preferred, the system of piping would have to be modified. The system of piping, however, is not of the essence of our invention, any system being allowable which allows the generator sufficient freedom of motion to change from the charging position shown in Fig. 1 to the generating position shown in Fig. 4.

The process of generation in our improved generator is exceedingly simple. A can of carbid of given amount being inserted in one end and securely clamped and the proper amount of water being introduced into the other end and sealed by the turning of the two-way cock, the generator being in the position shown in Fig. 1, the generator is reversed into the position shown in Fig. 4. The contents of the can and the water falling to the bottom of the generator in its new position meet and at once combine, generating acetylene gas and hydrate of lime. The acetylene gas at once fills the generator, exerting such pressure as corresponds to the size of the charge. As before stated, the amount thus generated is preferably enough for a week's consumption.

M N are pipes leading from the respective ends of the generator and meeting in the common pipe O, which, as shown, communicates with the hollow shaft B. It is of little importance in what part of the generator end C′ the pipe M terminates. It is important, however, that the pipe N should terminate in the generator end C^2 sufficiently above the water-level to prevent any possibility of water getting into said pipe, as this would seriously interfere with the proper operation of the pipe system.

P is a pressure-gage of usual construction, by which the consumer can always know the pressure and consequent quantity of his supply.

Q is a reducing-valve in the pipe O of usual construction.

R is a valve in the pipe O, by means of which the flow of gas through said pipe is controlled.

When the shaft B is hollow, it is preferably adapted to receive a quantity of calcium carbid or other absorbent suitable for drying the acetylene gas, so that when said gas emerges through the outlet-pipe *d*, which leads to the gasometer or to the jet, the gas shall be dry. To insure the passage of the gas as it comes from the pipe O, passing through the absorbent S the entire length of the shaft, we contract one end of said shaft, as shown at T, so as to allow the gas to pass around between the outer and inner cylinders composing said shaft to the extreme end *e*, where it enters the inner cylinder of the shaft through the perforations *f f*.

Where the shaft B is solid, the pipe O leads preferably to some suitable drier before discharging into the gasometer.

We claim—

1. An apparatus for generating acetylene and other gases by the mixture of a solid with a liquid material, which consists of a U-shaped generator revolubly mounted on a shaft and provided with a removable cap at one end wherein the solid material can be introduced and a sealed other end wherein the liquid material may be introduced through a suitable valve and said liquid and solid substances to be brought together at the middle of said U-shaped generator by inverting the same, pipes leading from each end of said generator and so connected thereto that the generator may be inverted whereby the gas generated is discharged, when required.

2. An apparatus for generating acetylene and other gases by the mixture of a solid with a liquid material, which consists of a generator revolubly mounted on a shaft and provided with means whereby the solid material and the liquid material may be introduced at opposite ends of said generator, when said generator is in its charging position, and may be brought together at the middle thereof by inverting said generator by the turning of said generator and with suitable outlets for the discharge of the generated gas, as desired.

3. An apparatus for generating acetylene and other gases by the mixture of a solid with a liquid material, which consists of a U-shaped generator revolubly mounted on a hollow shaft and provided with a removable cap at one end, wherein the solid material can be introduced and a sealed other end, wherein the liquid material may be introduced through a suitable valve and pipes leading from each end of said generator to said hollow shaft, whereby the generated gas is discharged through said hollow shaft, as required.

4. An apparatus for generating acetylene and other gases which consists of a U-shaped generator revolubly mounted upon a shaft and adapted at one end for the introduction of a can of predetermined capacity for holding a solid substance, and provided at the other end with a combined supply and overflow device adapted to charge said end of the generator with an amount of liquid substance proportioned to said charge of solid substance; the liquid and solid substances to be brought together at the middle of said generator by inverting the same.

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