No. 671,796. Patented Apr. 9, 1901.

P. N. L. GIRARDVILLE.

ACETYLENE GAS GENERATOR.

(Application filed July 19, 1900.)

(No Model.)

Fig. 1

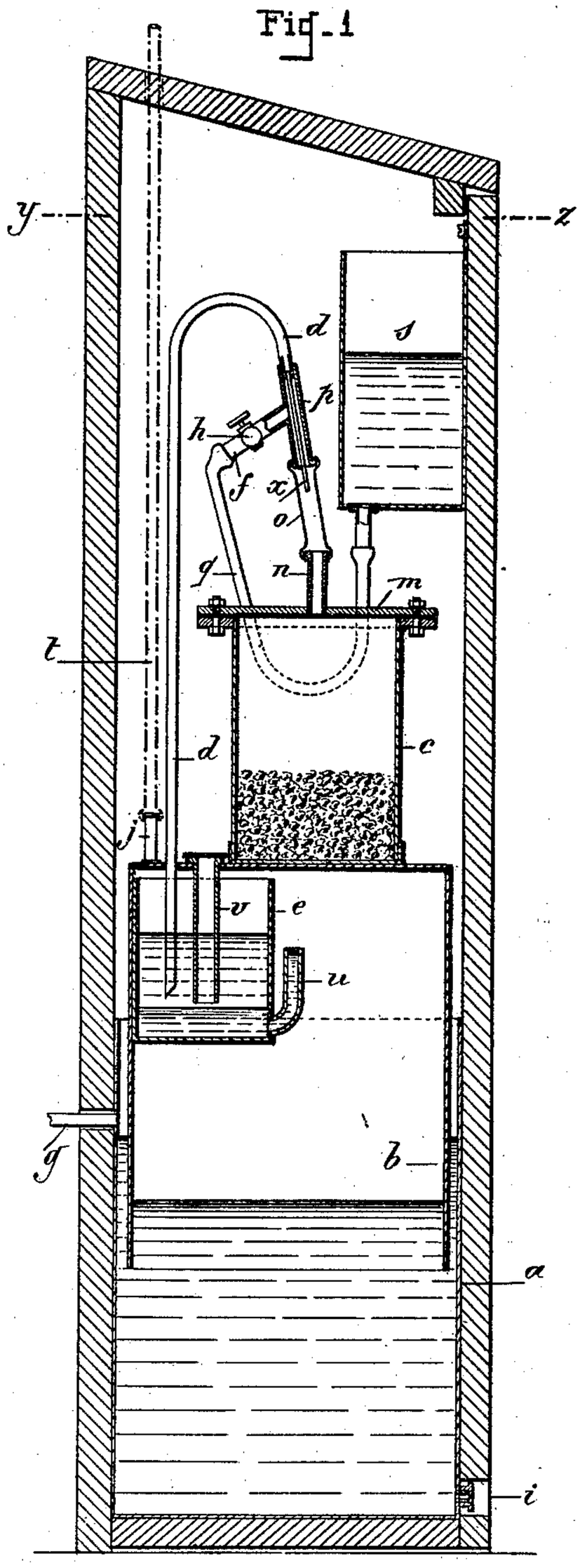
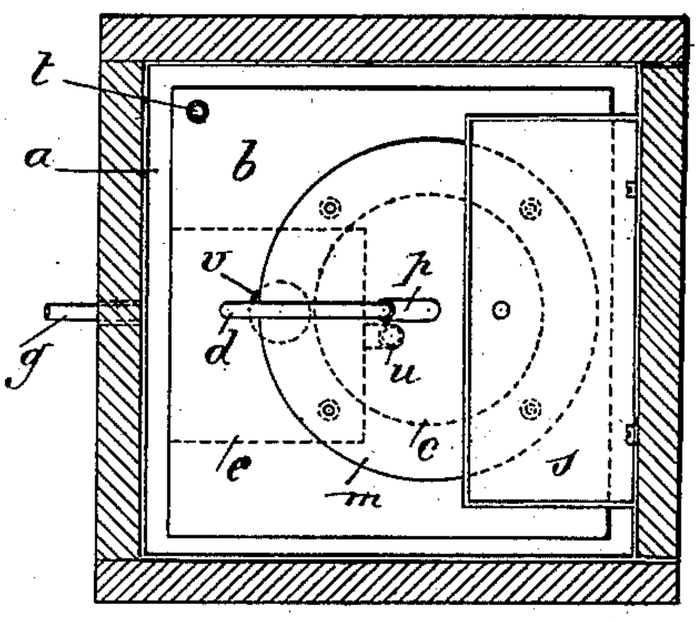


Fig. 2



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UNITED STATES PATENT OFFICE.

PAUL NICOLAS LUCAS GIRARDVILLE, OF PARIS, FRANCE.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 671,796, dated April 9, 1901.

Application filed July 19, 1900. Serial No. 24,177. (No model.)

To all whom it may concern:

Be it known that I, PAUL NICOLAS LUCAS GIRARDVILLE, a citizen of the French Republic, residing at 18 Rue Mogador, Paris, in the department of the Seine, France, have invented a certain new and useful Apparatus for Producing Acetylene, of which the following is a specification.

The known apparatus for producing acetylene may be classed in two categories—those in which the water is added to the calcium carbid and those in which the carbid is added to the water. Both kinds have their drawbacks. In the first kind it is difficult to prevent the afterproduction of gas by the action of the aqueous vapor from the water which is always introduced in excess of the carbid. In the second this afterproduction is avoided by suitably subdividing the carbid; but then recourse must be had to mechanical distributing apparatus, liable to get out of order in unskilled hands.

This invention relates to an apparatus of the first kind in which the afterproduction of gas is suppressed completely, partly because the access of the water to the carbid is so regulated that the water can never be in excess and partly because the receiver containing the carbid is always isolated completely from the atmosphere of the gasometer. Thus this atmosphere, which is saturated with aqueous vapor, cannot exercise any irregular action on the carbid.

In the accompanying drawings, Figure 1 is a sectional elevation of an apparatus for small installations constructed according to my invention and inclosed in a wooden case of parallelepiped form, which serves to contain it and at the same time forms an economical guide for the gas-bell. Fig. 2 is a sectional plan on the line *x y*, which passes through the upper part of the case.

The same reference-letters represent the same parts in the two figures.

Like all apparatus of this kind my new apparatus consists of a gasometer comprising a fixed reservoir *a*, in which a bell *b*, centrally or laterally guided, rises and falls. In the design shown the gasometer and casing are both of parallelepiped form, so that the case constitutes the guide. On this bell *b* is placed the receiver *c* for the calcium carbid, which receiver may be supported in any other manner, provided it is united to the gasometer-bell. The receiver *c* is closed at its upper part by a plate *m*, which makes a tight joint with the receiver by any suitable means and carries a pipe *n*, connected by a tube *o* with a three-way piece *p*, one arm of which is joined to the tube *d* for the escape of the gas, while the other, *f*, is provided with the cock *h* and admits, through a flexible tube *q*, a small quantity of water from the reservoir *s* into the receiver *c* at the required moment. The reservoir *s* is mounted at a suitable fixed point on the casing inclosing the apparatus. It will readily be understood that when the various parts are in the position shown in the drawings the water can trickle from the reservoir *s* into the pipe *p*, provided that the pressure of the gas in the tube *d*, and consequently in the pipe *o*, allows it to do so, since the level of the water in the reservoir is higher than the junction of the tube *f* with the three-way piece *p*. When, however, the gasometer-bell rises in consequence of the entrance of gas into it, the piece *p* will rise with it in consequence of the connection between this piece and the tube *d*, so that the access of water and the evolution of gas are for the time being interrupted.

To avoid interference between the access of water and the escape of gas, which would detract from the regularity of working of the apparatus, the tube *d* is prolonged by a pipe *x*, concentric with the tube *p*. This allows the escape of the gas while the water enters through the space between the tubes. The tube *d* is connected with the bell *b* and opens into the top part thereof, where it dips beneath the surface of petroleum contained in an open vessel *e*, fixed at the top of the inside of the bell. Thus the gas bubbles through the liquid in this vessel *e* and is washed and dried thereby as it enters the bell.

The vessel *e* has a tube *u* projecting from its side, which tube is designed to permit the water which is suspended in the gas and condenses in the vessel *e* to escape automatically. As this water is specifically heavier than the oil it sinks to the bottom of the vessel *e*, rises up the tube *u*, and drops into the reservoir *a* of the gas-holder. This provision for the escape of the water from the ves-

sel *e* is important, inasmuch as it automatically controls the surface level of the contents of the vessel as to position therein, holding it approximately at one point. If no provision of this character were made, the surface would be gradually raised until the entire body of oil would be thrown into the gasometer. This provision also insures the retaining of the outlet-opening for the pipe *d* in the position in which it is intended to be used, whether entirely within the body of oil or within the body of water. This washing vessel *e* serves also to isolate completely the receiver *c* from the moist atmosphere of the bell, by which a double advantage accrues—viz., that the production of gas is arrested entirely when the introduction of water is stopped and that the apparatus can be recharged while it is in use by merely closing the cock *h*, thus cutting off the water-supply and enabling the cover *m* to be removed without liability of generating gas, the vessel *e* preventing the return passage of the gas from the gasometer-bell, thus necessitating no auxiliary means for closing the gas-connecting pipe *d* during the refilling operation. The tube *v*, provided with a screw-stopper at its upper end, allows a fresh quantity of petroleum to be introduced at will into the washer *e*.

The apparatus is completed by a flexible tube *t*, which conducts away the gas and is attached to a pipe *j* on the bell, and an overflow-pipe *g* and a draw-off cock *i*, capable of being operated from without the casing for the water of the reservoir. There is nothing peculiar about these parts.

The apparatus works as follows: When the gas is consumed, the bell *b* sinks, carrying with it the carbid-receiver and the system of tubes *d p o f*. There follows a flow of water into the receiver *c* from the reservoir *s*. A quantity of gas is thus evolved, which passing through the washer *e* causes the bell to ascend. If at this moment there is equilibrium between the production and the consumption, the water continues to flow from the reservoir *s*. If, on the other hand, the demand is smaller than the supply, the bell rises and interrupts the access of water to the carbid. As a fact, the flow of water to the carbid will stop before the bell rises because of the gas-pressure in the carbid-receiver, which pressure is above that of the atmosphere, due to the use of the vessel *e*, the contents of which serve to form a partial back pressure against the passage of the gas, and consequently increases the pressure within the connection between the receiver and the vessel. As this pressure is greater than the atmospheric pressure exerted on the surface of the water in the receptacle *s*, the tendency will be to stop the inlet of water until said pressure in the gas connections is reduced by the movement of the gasometer-bell by the passage of the gas from the vessel *e* thereinto. This causes a "dripping" feed of the water, which continues until the bell rises to a point where the water is automatically cut off by the raising of the pipe *p*.

Having now particularly described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim—

1. In an apparatus for producing acetylene, the combination with a generating-chamber movable with the bell of the gasometer; of a non-moving water-receptacle; and connections between said receptacle and the chamber, and said chamber and the gasometer, said connections comprising a combined water-inlet and gas-outlet tube open to said chamber; a flexible water connection between said tube and the water-receptacle and controlled by the movement of the gasometer-bell; and a gas connection between said tube and the gasometer-bell for the passage of the gas from said chamber, said gas connection having its inlet end of less diameter than the diameter of the tube, said end being located intermediate said chamber and the water connection with said tube.

2. In an apparatus for producing acetylene, the combination with a generating-chamber movable with the gasometer-bell; of a non-moving water-receptacle; connections between said receptacle and the chamber providing a controllable passage-way for the water into the chamber; a gas-washing vessel carried by the bell of the gasometer and located therewithin, the contents thereof having no connection with the liquid contents of the gasometer, said vessel having an open top leading into the interior of the gasometer; and connections between said chamber and said vessel for the passage of the gas into the latter, and below the surface of the contents thereof.

3. In an apparatus for producing acetylene, the combination with a generating-chamber movable with the gasometer-bell; of a non-moving water-receptacle; connections between said receptacle and the chamber providing a controllable passage-way for the water into the chamber; an open vessel fixed at the top of the interior of the gasometer-bell and containing a washing medium, said open vessel having a tube projecting upwardly from its lower part, for controlling the position of the surface level of said washing medium; and connections between said chamber and said vessel for the passage of the gas into the latter below the surface of the contents thereof, substantially as described.

4. In an apparatus for producing acetylene, the combination with a generating-chamber movable with the gasometer-bell; a water-receptacle; and connections between the water-receptacle and said chamber, and between said chamber and the gasometer-bell, for controllably generating the gas; of a gas-washing vessel carried by and within said bell, said vessel forming a part of the connections between the chamber and the bell, said vessel having means for automatically control-

ling and maintaining the position of the surface contents thereof, substantially as described.

5. In an apparatus for producing acetylene, the combination with a generating-chamber movable with the gasometer-bell; a water-receptacle; and connections between the water-receptacle and said chamber, and between said chamber and the gasometer-bell, for controllably generating the gas and delivering the same to the bell; of a gas-washing vessel carried by and within said bell and forming a part of the connections between the chamber and the bell; and a filling-tube for said vessel extending outside of the bell and held normally closed.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

PAUL NICOLAS LUCAS GIRARDVILLE.

Witnesses:
EDWARD P. MACLEAN,
JULES FAYOLLET.