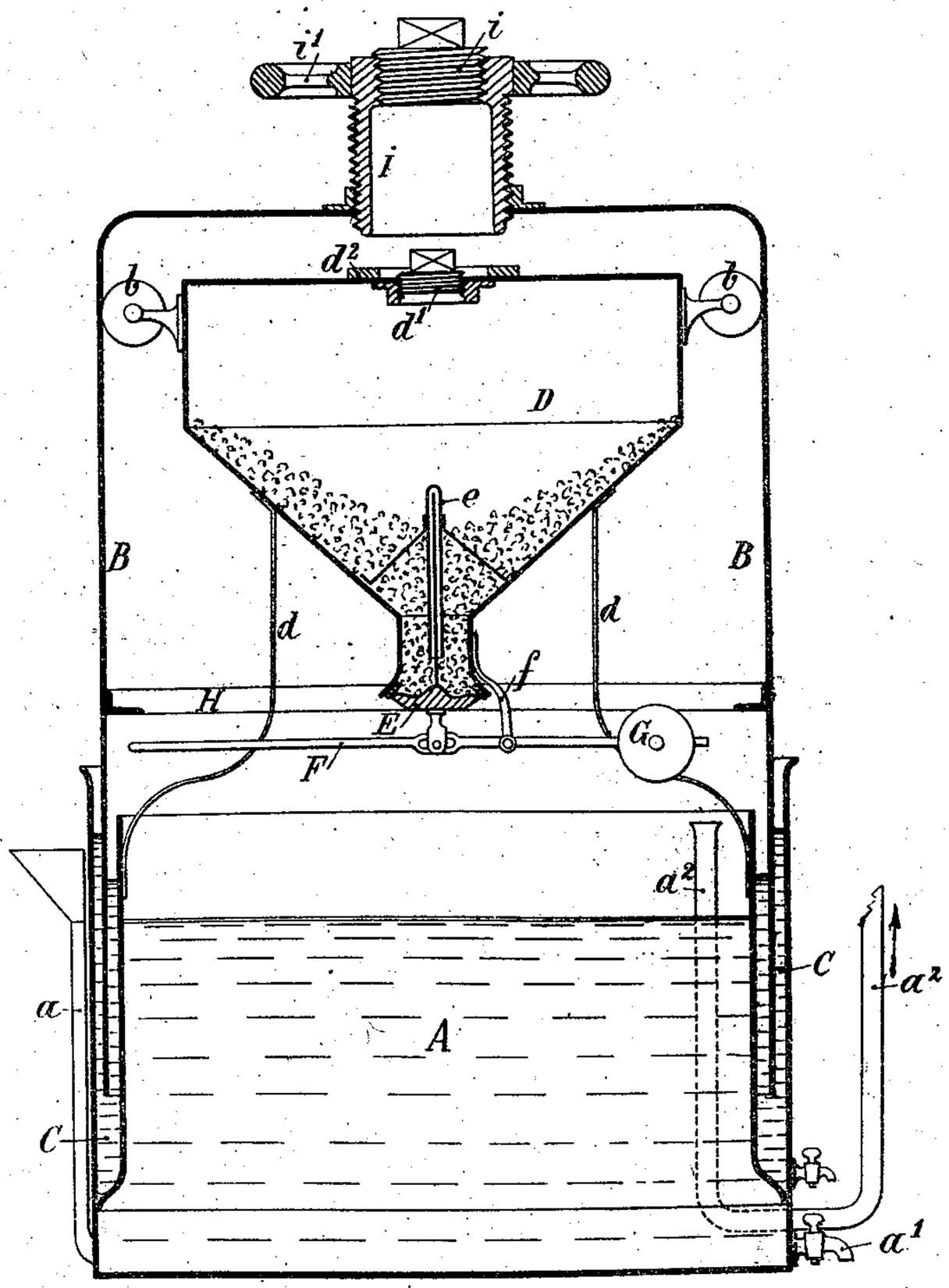
(No Model.)

D. H. CHIVERT.

ACETYLENE GAS APPARATUS.

No. 604,967. Patented May 31, 1898.



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UNITED STATES PATENT OFFICE.

DANIEL HILAIRE CHIVERT, OF NEUILLY-SUR-SEINE, FRANCE.

ACETYLENE-GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 604,967, dated May 31, 1898.

Application filed September 19, 1896. Serial No. 606,338. (No model.) Patented in France February 1, 1896, No. 253,620, and August 18, 1896, No. 258,984; in Belgium April 7, 1896, No. 120,742; in England August 28, 1896, No. 19,059; in Austria August 31, 1896, No. 46/256; in Hungary September 3, 1896, No. 7,168; in Italy September 4, 1896, No. 42,441; in Spain September 5, 1896, No. 19,602; in Portugal September 25, 1896, No. 2,315, and in Argentine Republic October 30, 1896, No. 1,957.

To all whom it may concern:

Be it known that I, DANIEL HILAIRE CHIVERT, mechanician, a citizen of the Republic of France, residing at Neuilly-sur-Seine, near Paris, in the Republic of France, have invented certain new and useful Improvements in or Appertaining to the Production of Acetylene Gas and Apparatus Therefor, (patented in France February 1, 1896, No. 253,620, and August 18, 1896, No. 258,984; in Spain September 5, 1896, No. 19,602; in Italy September 4, 1896, No. 42,441; in England August 28, 1896, No. 19,059; in Portugal September 25, 1896, No. 2,315; in Argentine Republic October 30, 1896, No. 1,957, in Austria August 31, 1896, No. 46/5/256; in Hungary September 3, 1896, 7,168, and in Belgium April 7, 1896, No. 120,742,) of which the following is a specification.

This invention relates to an apparatus for the production of acetylene gas, and has for its object to furnish means for obtaining in an automatic and regular manner and without increase of temperature pure gas under constant pressure and in quantities proportionate to the consumption, the production being stopped immediately on the cessation of the consumption.

It consists of an apparatus of simple and practical construction in which calcium carbid is employed in the form of grains of a given size, as hereinafter shown, said machine being composed, essentially, of a water-reservoir surmounted by a bell or gasometer covering said reservoir in an air-tight manner and a container for crushed carbid fixed rigidly to the reservoir and located within the bell and independent of the same, said container being provided at its base with a valve adapted by the movements of the bell to be operated to admit the carbid to the reservoir.

I have found that in order to realize the advantages hereinbefore mentioned the calcium carbid must first be crushed and sieved in such a way as to bring it to a condition of granules approximately of the size of a grain of wheat. The feed or fall of granules of this size is easily effected and may be regulated with precision by the valve, and, moreover, their weight is sufficient to cause them to fall to the bottom of the reservoir, in which the mass of water absorbs the heat developed and produces a washing of the gas, which insures its purification. Finally the small size of the granules allows chemical action to be immediately developed, so that the production of gas ceases immediately the feed of the granules is stopped. On the other hand, if the carbid be reduced to a fine powder the production of gas takes place at the surface of the water, heat and steam being developed, which act on the carbid still in the valve, causing said valve to cease working. If the carbid be in large pieces, the working of the valve becomes irregular, and, further, these fragments coming in contact with the water become coated with a skin of lime which protects their internal parts and prolongs the discharge of gas for a considerable time after the feed has been stopped. It will be seen, therefore, that the size of the granules of carbid is effectively determined by the conditions hereinbefore stated.

In the accompanying drawing the figure represents a vertical section of the apparatus.

Referring to the drawing, the improved apparatus is composed of a water-reservoir A, surmounted by a bell or gasometer B, the lower part of which is immersed in an annular chamber *c* filled with water, but independent of the water-reservoir A, which latter is provided with a supply-pipe *a*, a discharge-pipe *a'*, and a gas-withdrawal pipe a^2. The calcium-carbid container D is placed inside the bell and supported by bars or brackets *d*, fixed to the reservoir A. Said container carries on its upper part rollers *b*, which serve as guides for the bell B, and is provided in its lower conical part with a valve E in the form of a cupel, the spindle of which valve is guided in a sheath or holder *e*, fixed to the carbid-container D, or in any other suitable manner, the beveled or tapering edge of the valve bearing on a washer, of india-rubber or other suitable flexible material, which forms a seat. The valve is operated by a lever F, pivoted on a

fixed support *f* and having at one of its ends a counterweight G, intended to keep the valve normally closed. The other end of the lever F is sufficiently prolonged to be engaged by an annular projection or strip H, fixed on the bell B. In this manner the bell, which is entirely free in its upward and downward movements, causes, each time that it descends, a certain quantity of the granules of carbid to fall into the water and consequently the production of a corresponding volume of gas, which then forces the bell to rise immediately. The valve E then closes immediately under the action of the weight G, and the production of acetylene is arrested until the consumption of the gas produced causes the bell to again descend and to bring about a fresh fall of carbid into the water. Practice shows that under these conditions the movements of the bell B are very slight, so that the pressure of the gas produced, which escapes by the gas-pipe a^2, may be considered as being constant during the working of the apparatus.

It will be seen that in the drawing the bell B is provided at a point above the screw-stopper d' of the carbid-container with a tubular chamber I, opened at its lower end and closed above by a screw-stopper *i*. This chamber is threaded on its periphery and may thus be raised or lowered by means of a hand-wheel, or in any other suitable manner, in a screw-threaded collar arranged on the bell. When it is desired to introduce granulated carbid into the container D, the said chamber I is turned in such a way as to cause it to descend until its lower edge comes to rest and forms a tight joint, with an india-rubber washer d^2 arranged for this purpose around the stopper d' of the container. The two stoppers d' and *i* are then unscrewed, and the carbid is introduced by means of a funnel or hopper. This operation terminated, it is sufficient to replace the two stoppers and to cause the chamber to rise into its upper position to render the apparatus ready for working. In this manner no gas can escape from the bell, and the operation is effected promptly and without allowing any disagreeable odor to escape.

It is evident that instead of using a screw-thread formed on the periphery of the chamber I any other suitable arrangement may be employed for causing the said chamber to telescope in the interior of the bell for the purpose stated.

I declare that what I claim is—

1. In an apparatus for producing acetylene gas comprising a water-reservoir and a bell or gasometer covering said reservoir in an air-tight manner and including a fixed container for crushed carbid, the combination therewith of a valve E in the form of a cupel and arranged and guided in the discharge-orifice of the container and operated by means of a hinged and counterweighted lever F, the end of which lever is adapted to be engaged by an annular projection or strip H on the interior of the bell, substantially as hereinbefore described and shown.

2. In an apparatus for producing acetylene gas comprising a water-reservoir, a bell or gasometer covering said reservoir in an air-tight manner and including a fixed container for crushed carbid, the combination therewith of a movable chamber I by means of an air-tight joint in an opening formed in the bell above the filling-orifice of the container in such a way as to form when lowered a tight joint on the said reservoir and of the stoppers *i*, d', adapted to the said chamber and container respectively for the introduction of the crushed carbid into the container, substantially as hereinbefore described and shown.

3. In an apparatus for producing acetylene gas, a water-reservoir A, a bell or gasometer B covering the said reservoir, a container D for crushed carbid fixed to the reservoir A and having rollers *b* for guiding the bell, a valve E guided by a sheath or socket *e* arranged vertically in the center of the orifice for discharging the carbid, a chamber I screw-threaded at the top of the bell to form an air-tight joint at the top of the container and stoppers *i*, d', arranged in the chamber I and container D respectively, substantially as described and shown.

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

DANIEL HILAIRE CHIVERT.

Witnesses:
E. DUMAS,
J. CONDSMY.