No. 647,386. Patented Apr. 10, 1900.

E. EVANS.

APPARATUS FOR GENERATING ACETYLENE GAS.

(Application filed Dec. 9, 1897.)

(No Model.) 2 Sheets—Sheet 1.

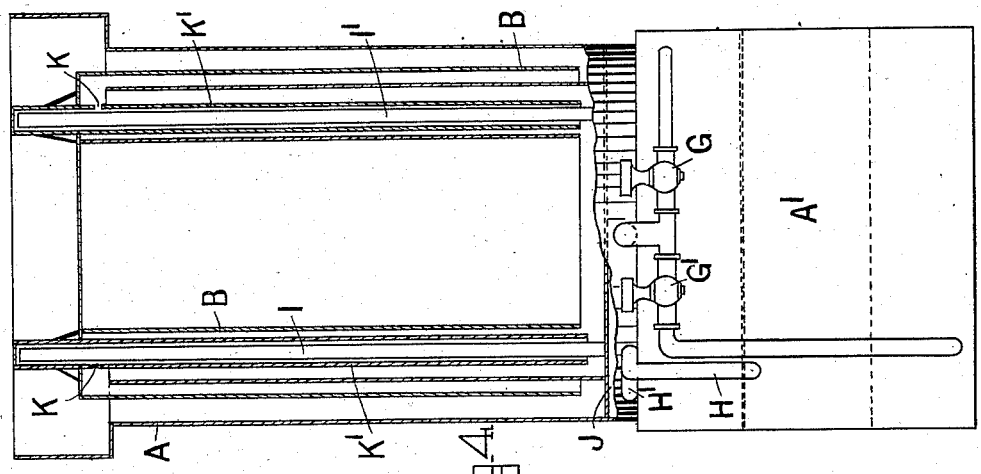

FIG. 4.

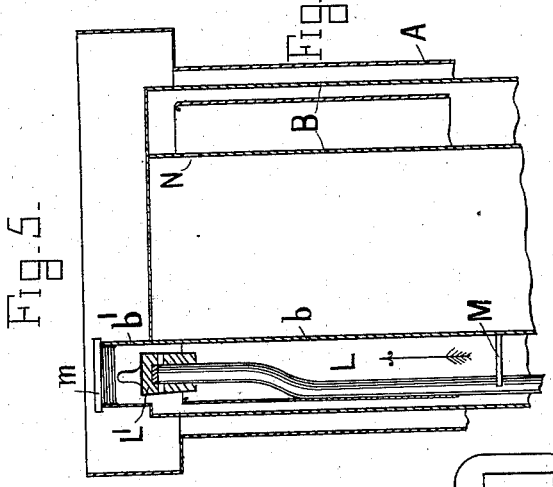

FIG. 5.

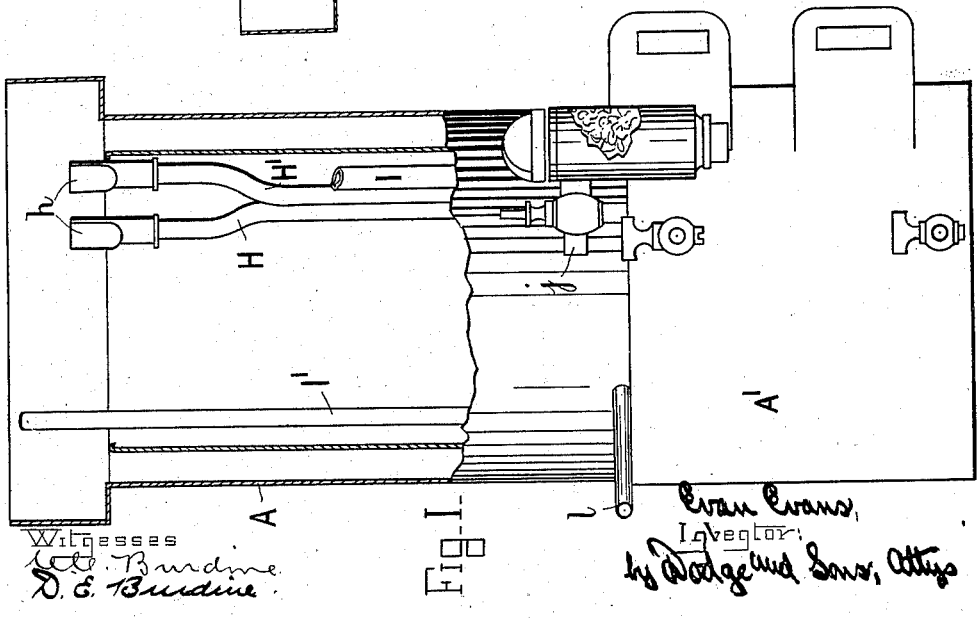

FIG. 1.

Witnesses
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(No Model.) 2 Sheets—Sheet 2.

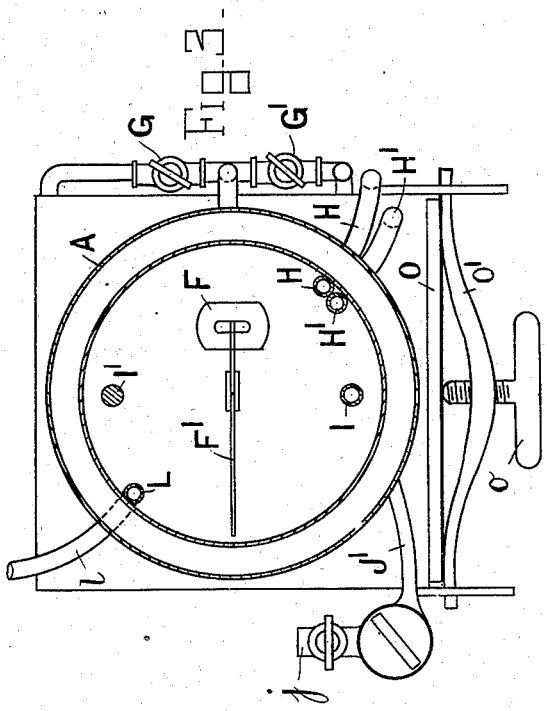

Fig. 1.

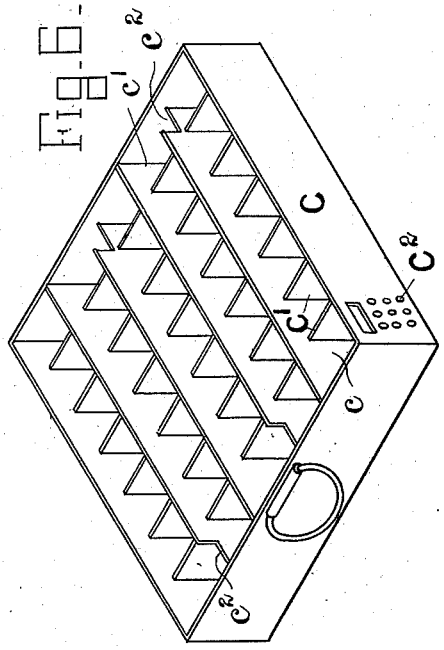

Fig. 3.

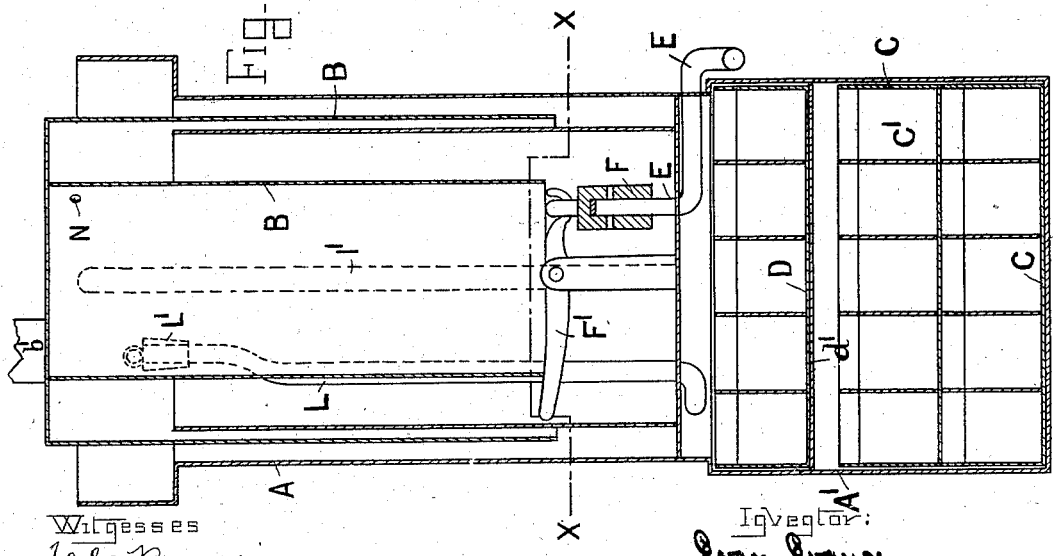

Fig. 2.

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Inventor:
Evan Evans,
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UNITED STATES PATENT OFFICE.

EVAN EVANS, OF LLANRWST, ENGLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE IMPERIAL S. C. ACETYLENE GAS COMPANY, LIMITED, OF MANCHESTER, ENGLAND.

APPARATUS FOR GENERATING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 647,386, dated April 10, 1900.

Application filed December 9, 1897. Serial No. 661,279. (No model.)

To all whom it may concern:

Be it known that I, EVAN EVANS, a subject of the Queen of Great Britain, residing at Llanrwst, in the county of Denbigh, England, have invented certain new and useful Improvements in Apparatus for Generating and Storing Acetylene Gas, (for which I have received Letters Patent of Great Britain, No. 10,508, dated April 27, 1897,) of which the following is a specification.

This invention has for its main object an apparatus for generating acetylene from carbid and water, so that there shall be a uniform pressure and no waste. It is also applicable for generating carbonic-acid and sulfureted-hydrogen and other gases.

The invention is based upon the principle of a gradual and regulated addition of water to the carbid instead of, as is usually the case, a gradual addition of carbid to the water; secondly, whereas the regulation in most cases is effected by increase of pressure of the gas my gas does not materially increase in pressure, but the valve is regulated by the quantity of gas in the gasometer, and in place of having the carbid all in a single receptacle the carbid is placed in a large number of receptacles and no water can run into the second or any subsequent receptacle until the first or the prior receptacles in their order have been first filled with water, and, third, whenever sufficient gas collects to fill the gasometer or raise the gasometer to a given point or to lower the water in the gasometer to a given point the valve regulating the supply of water is closed.

Referring to the accompanying drawings, Figure 1 is a side elevation, partly in section, of one form of apparatus; Fig. 2, a vertical section taken at right angles to Fig. 1; Fig. 3, a sectional plan through *x x;* Fig. 4, a side elevation, partly in section, as seen from the side opposite to Fig. 1; Fig. 5, a vertical section of a detail to be hereinafter described; Fig. 6, an isometric view of one of the drawers or trays.

In the drawings, A is the tank, B the gasometer, and C a series of drawers or trays which in one form of apparatus are arranged in the lower portion A′ below the tank. These drawers are divided into compartments, as best shown in Fig. 6, following each other consecutively and each having a lip C′, over which the water runs into the next following compartments, and so on. There may be a large number of these drawers and a large number of compartments in each drawer. These are filled to about one-third of their height with calcium carbid, and the water runs only into the first compartment *c* through perforations C^2. When the calcium carbid in this compartment is all consumed, the water overflows the lip of this compartment into the next, and so on until all the compartments are done. The water then passes into the next row of compartments *c′* by means of the cut-away portion c^2, and so on until all the compartments in the drawer have been used up, when the water rises into the second drawer. The drawers are so arranged that the last one, which in the drawings is marked D, is closed off by a partition *d* from the others until such time as the water begins to enter it, when, if desirable, an alarm can be attached to notify the caretaker. The supply to the first drawer and also the communication between it and the gasometer are then cut off and a separate supply to the last drawer D is turned on and the communication between the drawers cut off. The other drawers can now be taken out and recharged while the last drawer is being used up. Where a floating gasometer is used, the valve can be connected with the bell of the gasometer in such manner that whenever the gasometer rises to a given point it automatically closes the valve.

On the drawings, E is the water-pipe, and F a valve controlled by the gasometer B, which bears on the lever F′, as shown in Fig. 2.

G is a cock governing the supply of water to the top tray or drawer D, and G′ a cock governing the supply to the lower drawers or trays C.

H is a pipe for conveying the gas from the lower drawers or trays, and H′ a pipe for conveying the gas from the isolated drawer D to the gasometer B. These pipes H H′ are provided with valves *h*, Fig. 1, at the top, which prevent the gas passing back again. Tubes

I I′ serve as guides for the gasometer, and one of them, I, is a hollow tube communicating with the chamber J, Fig. 2, and down which the gas passes to the outlet or supply pipe J′ and cock *j*, Figs. 3 and 1. This chamber J serves as a collecting-box for any water which might accidentally be forced out of the outlet-pipes by reason of any accidental pressure being applied to the top of the gasometer. Were it not present the water could pass down into the carbid-chambers and cause an undue generation of gas and a consequent explosion. Said chamber J also serves the function and purpose of a storage-box for overgenerated gas and may also be used, if so desired, as a collecting-chamber. Holes K are provided in each socket or tube K′ of the gasometer, through which the gas may pass to the pipe I, so that there cannot be any mistake when inserting the gasometer, as whichever socket is placed around the gas-tube I communication will be made between the gasometer and the supply-pipe.

L, Fig. 2, is a pipe communicating with an escape-pipe *l*, Fig. 3, and having a valve L′ at the top, (shown best in Fig. 5,) and M is a bifurcated projection on the inner cylinder *b* of the gasometer, which when the gasometer rises to a given height, or when too much gas is being generated, engages the valve and raises it up, thereby allowing the gas to escape down the pipe L and out through the pipe *l*.

N is a governor-hole.

The trays C are held gas-tight in the tank A, preferably by means of plates O and O′ and tightening-screws *o*, Fig. 3, in a manner well known; but any other equivalent device may be adopted. In order to place the valve L′ on the pipe L, a screwed plug *m*, Fig. 5, is removed from a socket *b*′ on the top of the gasometer and afterward screwed in so as to be gas-tight.

The carbid-trays are first filled or partly filled with carbid and then placed into position in the holder at the bottom of the gasometer or water-container. Tap G′, which communicates by means of the pipe with the lowest series of compartments, is then opened and the water attacks the carbid contained in these compartments by means of perforations C^2, arranged in the side of said compartments. After the carbid has been consumed in the first row of carbid-compartments the water trickles over the cut-away portion c^2 of the first division, and so on until the carbid in the whole series of holders in the said lowest tray has been consumed. The water still flows into said tray and continues to do so until it reaches the perforations C^2 of the tray immediately above it, when the same procedure takes place as in the lowest tray. This continues until all the trays in the lower holder are consumed, when tap G is turned on to allow the water to attack the carbid in the trays contained in the uppermost holder, which latter acts as a reserve while the lower drawers are being recharged with carbid, access being obtained to the lower or upper holder by simply removing the cover or lid O′. Water is supplied to the pipes G and G′ by means of the lever arrangement F′, which is acted on by the rise and fall of the gasometer-bell, the water being allowed to flow through the pipe E, which is connected to the pipes G G′. On the fall of the gasometer-bell, the lower end of which presses on the lever F′, raising the cap or cover F, water is permitted to enter pipe E and afterward G or G′. On the rise of the gasometer-bell as the gas is generated the pressure on the lever F′ is released and the water-valve F closed. The gas generated in the carbid-container is allowed to escape from the lowest tray by means of pipe H and from the upper tray by means of pipe H′. Each of these two pipes H H′ communicates with pipes I I′. Around these pipes I I′ is arranged a socket or tube K′, provided with holes K. The gas thus escapes on the rise of the gasometer through pipes I I′ and holes K into the inner cylinder of the gasometer B, the exit of the gas from the said inner cylinder of the gasometer being governed by means of the hole N, arranged at the top of said inner cylinder. The gas thus passes into the gasometer proper and to the main outlet or supply pipe J′, passing through the filtering material contained in the chamber of the outlet or supply pipe J′.

I declare that what I claim is—

1. In an apparatus for generating acetylene gas and the like, the combination of a tank A provided with a generating-chamber in its base; a gasometer mounted in said tank; means for conveying the gas from the generating-chamber to said gasometer; a chamber J intermediate the gasometer and the generating-chamber; a pipe I extending from the upper portion of the gasometer into said chamber J; an outlet-pipe for said chamber; an escape-pipe L also extending from the upper portion of said gasometer; a valve carried by said escape-pipe; and a projection M for operating said valve, substantially as described.

2. In an apparatus for generating acetylene gas and the like, the combination of a tank A; a gasometer mounted in said tank; generating-chambers formed in the lower portion of said tank; carbid-trays mounted within said chambers; means for supplying water to said trays; pipes H, H′ leading respectively from said chambers; check-valves mounted upon the upper ends of said pipes to prevent the return of gas therethrough; a chamber J intermediate the gasometer and the generating-chamber; a pipe I extending from the upper end of the gasometer and communicating with said chamber J; an outlet-pipe for said chamber J; an escape-pipe L also extending from the upper end of said gasometer; a valve seated upon the upper end of said pipe; and a projection carried by the

gasometer for raising said valve from its seat, substantially as and for the purpose described.

3. In an apparatus for generating acetylene gas and the like, the combination of a tank A; a gasometer mounted therein; independent generating-compartments formed in the base of said tank; carbid-holding trays mounted in said compartments; a water-supply pipe E communicating through branches G, G′ with the upper and lower generating-compartments respectively; a valve operated by the movement of the gasometer for controlling said pipe E; pipes H, H′ extending from the lower and upper generating-compartments respectively into the gasometer; check-valves carried by the upper ends of said pipes for preventing the return of gas therethrough; a chamber J intermediate the gasometer and the generating-compartments; a pipe I extending from the upper end of the gasometer and communicating with said chamber J; an outlet-pipe for said chamber; an escape-pipe L provided with a normally-seated valve at its upper end; and means carried by the gasometer for raising the valve from its seat when too great supply of gas passes into said gasometer, substantially as described.

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

EVAN EVANS.

Witnesses:
H. P. SHOOBRIDGE,
W. P. THOMPSON.