

No. 666,878.

Patented Jan. 29, 1901.

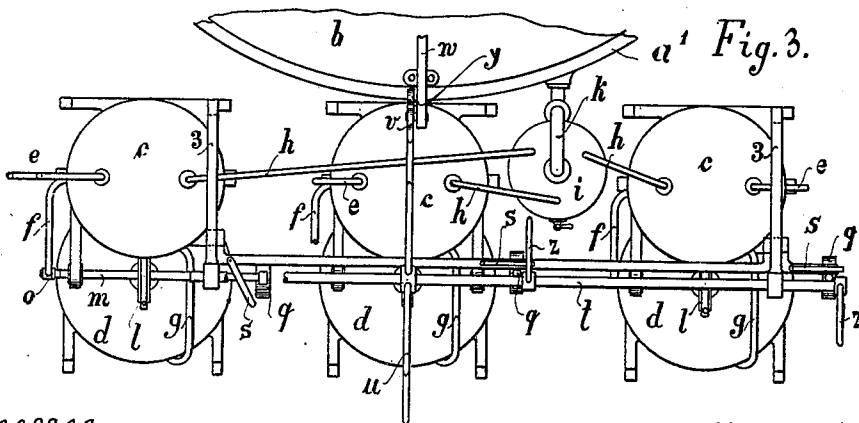
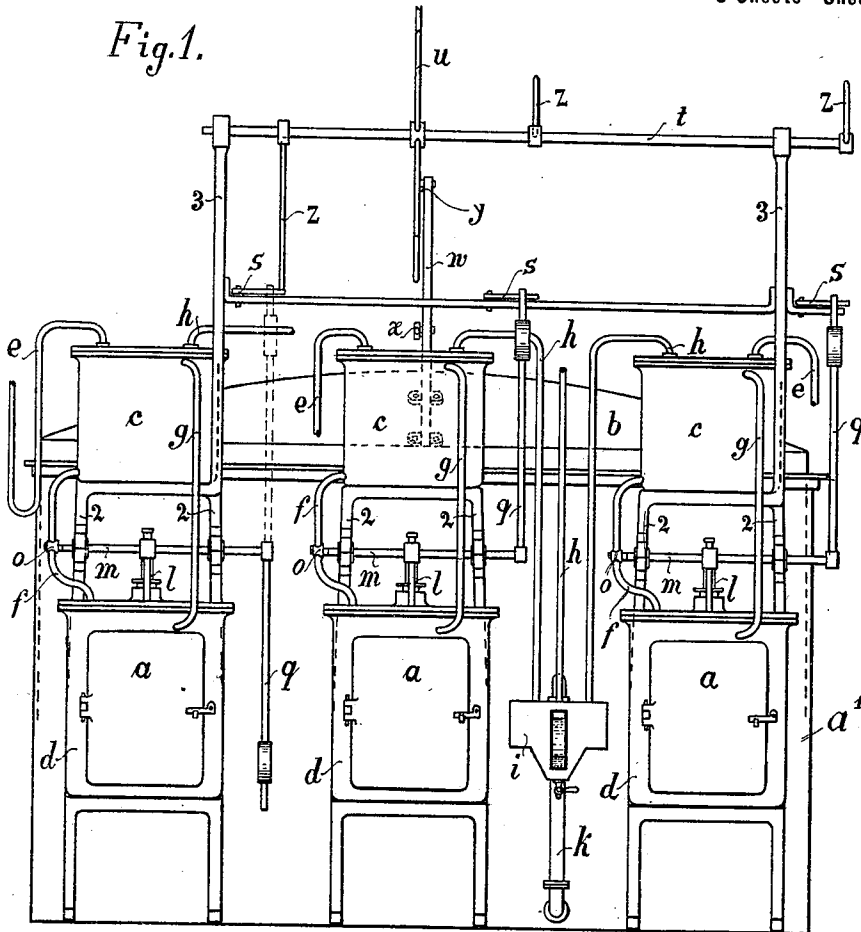
G. G. SMITH.  
ACETYLENE GAS GENERATOR.

(Application filed June 8, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses  
*[Signature]*  
H. Osier

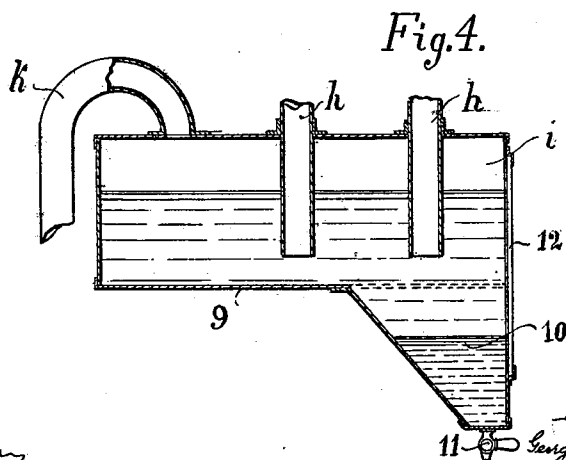
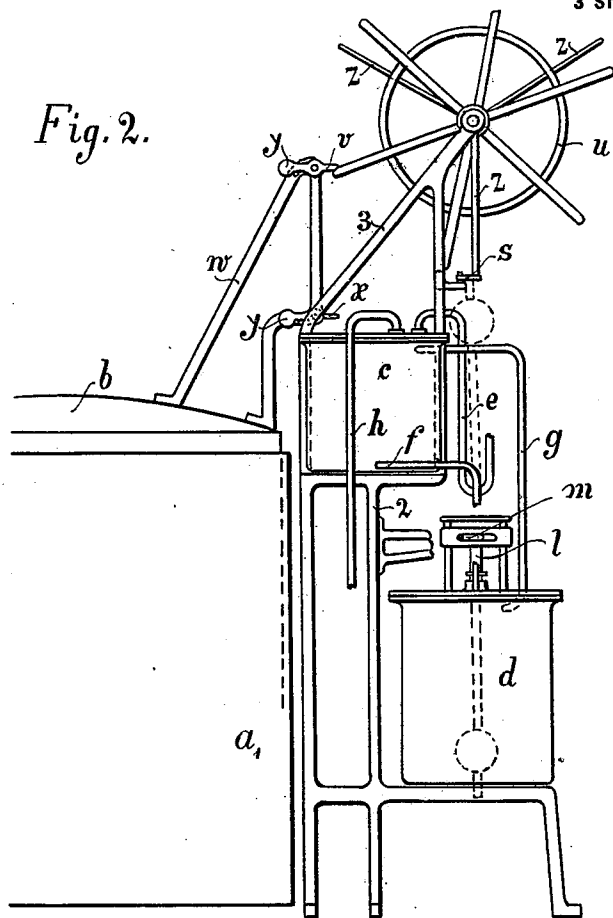
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(No Model.)

3 Sheets—Sheet 2.



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No. 666,878.

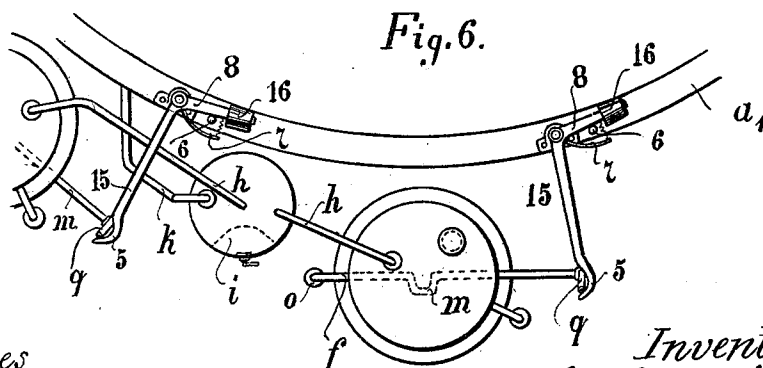
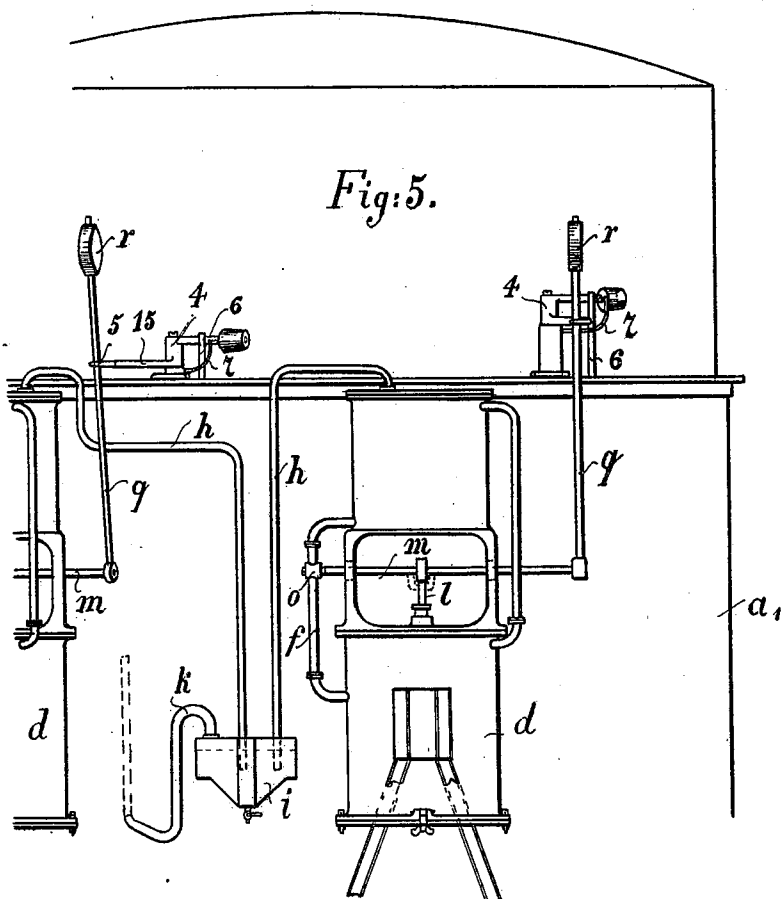
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(No Model.)

3 Sheets—Sheet 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

GEORGE GREGORY SMITH, OF FLORENCE, ITALY.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 666,878, dated January 29, 1901.

Application filed June 8, 1900. Serial No. 19,614. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE GREGORY SMITH, lawyer, a citizen of the United States, residing at Villa Bel Riposo, San Domenico, Florence, Italy, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a full, clear, and exact description.

The present invention relates to that class of acetylene-gas generators in which the carbide is placed in a series of closed carbide-holders in a sealed condition, each holder being provided with a puncturing device and a water-tank and suitable means being provided to successively develop the carbide in each holder by the rise and fall of the gasometer-bell, this being done automatically.

The particular object of the present invention is to provide more simple and effective means for operating the puncturing devices and the water-supply at each fall of the bell in the first place.

The invention further comprises means for positively locking the puncturing devices in their operative position until the bell has sunk below a certain predetermined level, the said devices being locked by the body of the bell itself, and thus any danger of the premature development of any one of the holders by carelessness or inadvertence is effectively prevented.

In order to render the present specification easily intelligible, reference is had to the accompanying drawings, in which similar characters of reference denote similar parts throughout the several views.

Figure 1 is a front elevation of one form of embodying the invention; Fig. 2, a side elevation, and Fig. 3 a plan of same. Fig. 4 is a detail sectional elevation of a back-pressure valve and drier combined. Fig. 5 is a front elevation, and Fig. 6 a plan, of a simplified form of apparatus.

The sealed tin of carbide is placed in the holder *d*, having a vertically-movable puncturing-bar *l*, the said tin of carbide being yieldingly supported above a lower puncturing-point, so that when the puncturing-bar is depressed it will force the tin down onto the lower point or spike and puncture both ends of the same. Two or more of these carbide-

holders are supported in a suitable frame in proximity to the gasometer-tank, or they may, if desired, be mounted on the said tank *a*, which should be properly stiffened so as to carry the same properly. Each carbide-holder is provided with a door *a* and means for properly closing the same, and upon the top cover of the holder standards 2 are mounted, adapted to form bearings for a crank-shaft *m* and at the same time to carry or support the water-tank *c*, each holder being provided with a special water-tank. The gas generated in the holder *d* passes along the pipe *g* into the water-tank, thence through pipe *h* to the combined back-pressure valve and drier *i*, and from this to the gasometer-bell *b* along the pipe *k*. This latter pipe may be provided with a suitable stop-valve to shut off the gasometer from the carbide-holder, if necessary. The water-inlet pipe *e* to the tank *c* is bent siphon-like to form a water seal and prevent the gas entering the tank through *g* from escaping at *e*.

The device for successively operating the carbide-holders consists of the following parts: To a suitable stationary frame 3 bearings are attached for a horizontally-disposed shaft *t*, carrying a star-wheel *u* and a set of radially-projecting arms *z*, one for each carbide-holder. These arms are set at equal angles apart on the shaft *t*. In the present case three arms are shown set at angles of one hundred and twenty degrees apart. A frame *w* is attached to the gasometer-bell *b* and carries two trip-pawls *v* and *x*, mounted one above the other in the path of rotation of the arms of the star-wheel *u*, the said pawls being so disposed that the lower one will first contact with one arm of the wheel and turn the same, and with it the shaft, one-sixth of a turn, and then the upper pawl will contact with the next arm and turn the said wheel a further sixth of a turn. Thus as the bell sinks the wheel and shaft will be turned one-third of a revolution, by which means the arm *z* of the first carbide-holder will have passed by the tail end of a retaining-pawl *s*, horizontally pivoted in a suitable part of the frame, turning the same and releasing an arm *q*, fast on the end of the crank-shaft *m* of the puncturing mechanism of the first carbide-holder.

This arm  $q$  carries a weight at its free end, and when released this weight carries the arm around half a turn, swinging the crank around from one horizontal position to the opposite horizontal position, and thus depressing and again raising the puncturing-bar  $l$  and by suitable mechanism, not forming a part of this application, puncturing the carbide-tin at both ends. At the same time the said shaft  $m$  turns the plug of the water-inlet cock  $o$  in the pipe  $f$ , as will be evident from Fig. 1, so that the water in the tank  $c$  will flow into the carbide-holder  $d$  and flood the same, placing the carbide-tin entirely under water. Gas is now generated in the first holder and passes along the pipe  $g$  to the water-tank  $c$ , thence along pipe  $h$  to the combined drier and back-pressure valve  $i$ , and thence to the gasometer-bell. The latter now commences to rise, and in so doing the pawls  $v$  and  $x$ , which are provided with suitable counterpoise  $y$ , will slide past the projecting arm of the wheel  $u$  without turning the same back. After the gas in the gasometer-bell has been again consumed the bell in falling will turn the wheel  $u$  another third of a revolution, and the arm  $z$  of the second carbide-holder will be caused to release the weight of the said holder and puncture the carbide-tin in the same. After this the third holder will be operated in a similar manner, and then the first and second should be again charged, so as to keep the apparatus continually going.

I will now proceed to describe with reference to Figs. 5 and 6 the improved means for preventing the operation of any of the carbide-holder-puncturing devices by hand or inadvertently until the bell has almost attained its lowest position. This device consists of a horizontally-movable lever 15, pivotally supported on the frame or on the upper angle-iron ring of the gasometer-tank, as at 4, and having its outwardly-projecting arm bent around, as at 5, so as to embrace the rod  $q$ , carrying the weight  $r$ . The arm of the lever 15 which is turned toward the gasometer-bell is curved to the curve of the said bell, as indicated at 8, and when the bell rises the cylindrical side of the same lies in this curve against the roll 16 and prevents the said lever 15 from being turned on its pivot, thus retaining the same in the position shown at Fig. 6, with its projecting hooked arm embracing the rod of the weight  $r$ . From the above description it will be evident that until the bell has sunk low enough to allow the lever 15 to be turned on its pivot 4—i. e., so that its laterally-extending arm may pass freely over the bell—the rod  $q$  and weight  $r$  cannot fall, since they will be retained by the hooked end of the said lever at 5. As soon as the bell has sunk far enough the weight of the lever  $q$  will be sufficient to turn the lever 15 against the force of a light spring 7, so that the said lever will fall and operate the puncturing mechanism. As soon as the lever  $q$  has fallen the lever 15

will be returned to its normal position against the stop 6 by means of the spring 7, so as to allow the bell to rise freely as soon as the gas being generated in the holder causes it to do so.

I will now proceed to describe an improved combined drier and back-pressure valve which has to be inserted in the pipe connection between the carbide-holder and the gasometer. This device consists of a casing 9 of any suitable shape, being approximately filled with liquid vaseline and having a downwardly-projecting chamber 10, communicating with the interior of the said casing 9 and provided at the bottom with a petcock 11 and with a glass window 12, extending from the top of the casing to the bottom of the chamber. The gas-pipe  $h$ , leading from the top of the water-receptacle, dips into the liquid vaseline, as illustrated in Fig. 4, while the pipe  $k$ , leading to the gasometer, opens into the said casing 9 above the level of the vaseline. The gas coming from the generator will thus bubble up through the vaseline and be thoroughly dried, leaving all its moisture in the vaseline, and will then pass out through the pipe  $k$  to the gasometer. This valve has a great advantage over the ordinary metallic back-pressure valves, in that one valve may be employed for any number of carbide-holders, it being immaterial how many pipes  $h$ , each one leading from a different holder, be dipped into the vaseline, since no gas can return into the said pipes from the space in the casing above the vaseline. Then, again, the valve effectually dries the gas, which leaves all its moisture in the vaseline. This moisture sinks below the said vaseline and may be drawn off from time to time by means of the petcock 11. The attendant may see through the window 12 when the water deposited requires to be drawn off.

Although the apparatus has been described as having three holders, it will be obvious that only two or more than three such holders might be employed, without departing from the spirit of the present invention, by simply multiplying the corresponding parts.

No claim is made herein to the combined gas-drier and back-pressure valve, for it constitutes the subject-matter of my application filed August 8, 1900, Serial No. 26,215.

I claim as my invention—

1. In an acetylene-gas generator comprising a carbide-holder and a puncturing device in connection therewith, the combination of a rotary crank-shaft to operate said puncturing device and a water-supply valve, simultaneously, a weighted lever fast to the said shaft and means for retaining the same in its upward position and means to release the said lever as the bell descends in the manner and for the purpose substantially as described.

2. In an acetylene-gas generator comprising a carbide-holder having puncturing device therein and a superposed water-tank, the com-

10 combination of means for operating the said puncturing device and opening the water-supply to the holder simultaneously by the descent of the gasometer-bell, consisting of a rotary shaft to depress said puncturing-rod when turned, a weighted lever to turn said shaft and a lever to positively retain the said weighted lever in its upward position said lever being controlled by the body of the gasometer-bell and prevented from movement thereby substantially as described.

15 3. In an acetylene-gas generator the combination of a carbid-holder having puncturing device therein, a rotary shaft to operate said puncturing device, a weighted lever to operate said shaft and means for retaining the same in its upward position, means in connection with the gasometer-bell for releasing said weighted lever as the bell descends and for simultaneously opening the water-supply, and a combined drier and back-pressure valve between the carbid-holder and the gasometer in the manner and for the purpose substantially as described.

25 4. The combination, with a gasometer, of a carbid-holder; a puncturing device; a normally-locked shaft connected to said device for actuating the same; means actuated by the bell of the gasometer for releasing said shaft; and means for actuating the shaft after it has been released.

35 5. The combination, with a gasometer, of a carbid-holder; a puncturing device cooperating with said holder; a shaft mounted in bearings on the carbid-holder and serving to actuate said puncturing device; a lever attached to said shaft normally locked against movement; and a device actuated by the bell of the gasometer for releasing said lever and

40 permitting the shaft to rotate and actuate the puncturing device.

6. The combination, with a gasometer, of a carbid-holder; a puncturing device cooperating with said holder; a crank-shaft connected to said puncturing device; a weighted lever attached to the crank-shaft; a device for locking said lever; and means actuated by the bell of the gasometer for withdrawing the locking device and thereby releasing the lever.

50 7. In an acetylene-gas generator the combination of a series of carbid-holders having superposed water-tanks and internal puncturing device, a rotary crank-shaft for each holder to operate said puncturing device, a weighted lever to each crank-shaft and a pawl mounted above said shafts to retain each lever in its raised position, a rotary shaft mounted in a stationary frame above said holders and a series of arms on said shaft mounted at equal angles apart, one arm being mounted to move in the path in which the tail of the retaining pawl for each weighted lever lies, a pair of pawls on the gasometer-bell to rotate the said shaft a part of a revolution at each descent of the bell and release one of the weighted arms and means to enable the body of the bell to positively lock the arms in the upward position until the bell has sunk below a certain predetermined level in the manner and for the purpose substantially as described.

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

GEORGE GREGORY SMITH.

Witnesses:

JULIA VALLIE,  
GUSTAVUS W. ST. GUN.