

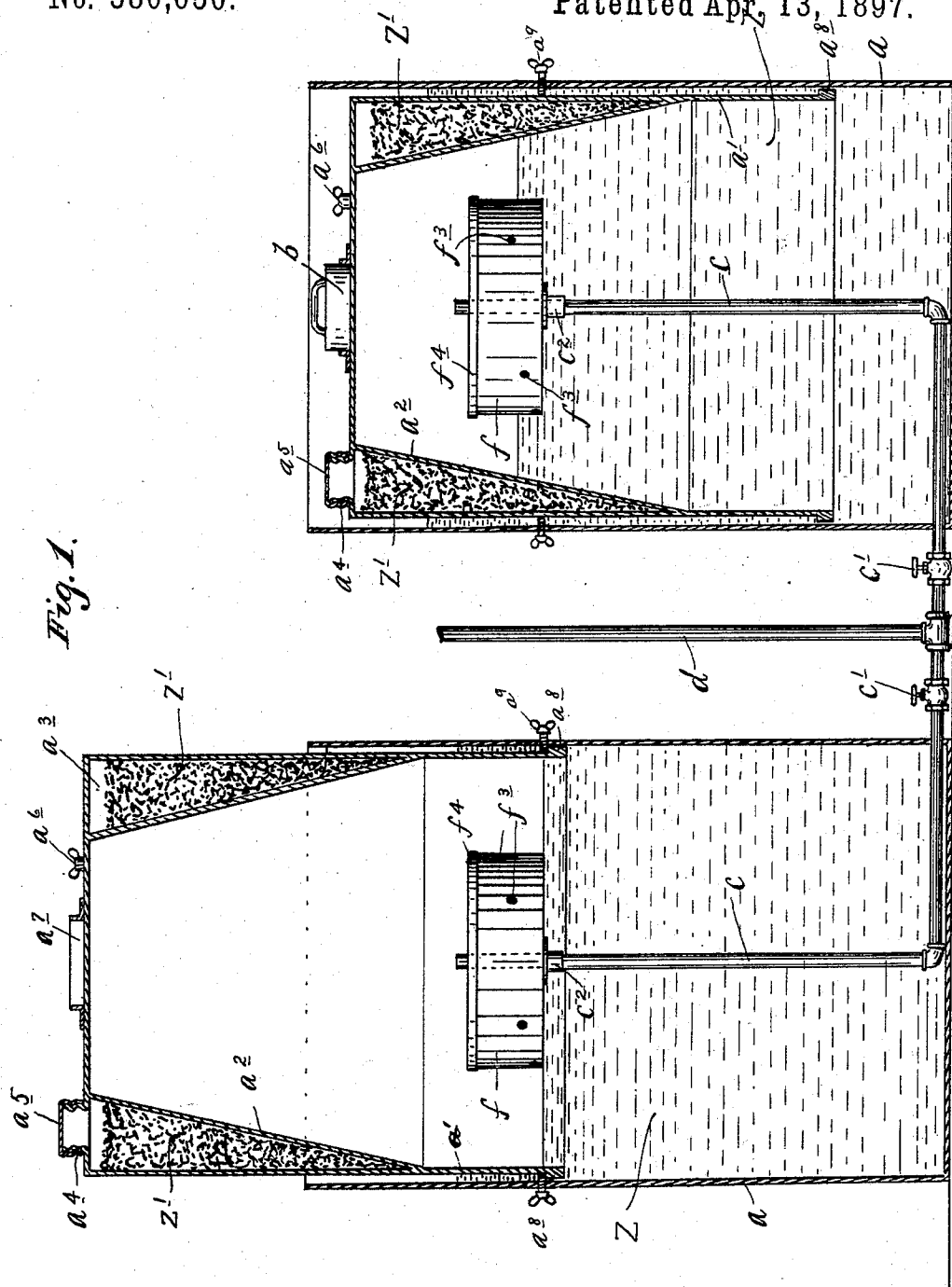
(No Model.)

2 Sheets—Sheet 1.

D. J. REYNOLDS.
ACETYLENE GAS GENERATOR.

No. 580,650.

Patented Apr. 13, 1897.



Witnesses

C. F. Kilgore

F. D. Merchant,

Inventor
Delbert J. Reynolds
By his Attorney

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(No Model.)

2 Sheets—Sheet 2.

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Fig 2

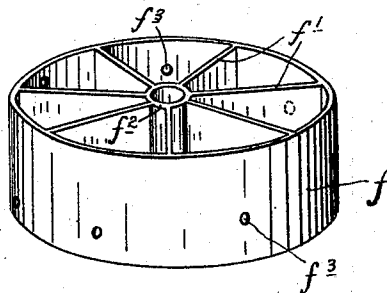
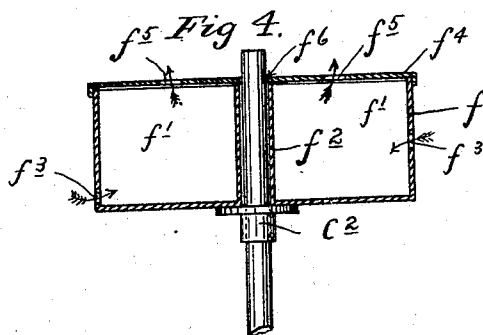
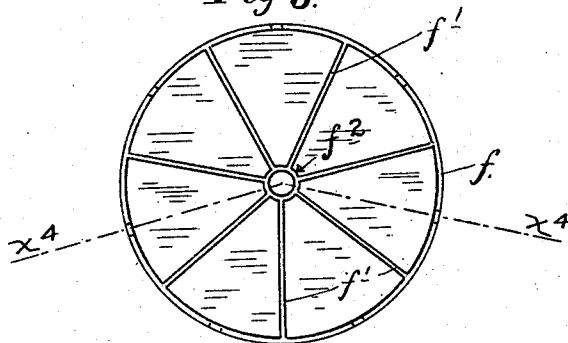


Fig 3.



Witnesses

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UNITED STATES PATENT OFFICE.

DELBERT J. REYNOLDS, OF WINNEBAGO, MINNESOTA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE FINKLER-REYNOLDS COMPANY, OF CHICAGO, ILLINOIS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 580,650, dated April 13, 1897.

Application filed July 17, 1896. Serial No. 599,518. (No model.)

To all whom it may concern:

Be it known that I, DELBERT J. REYNOLDS, a citizen of the United States, residing at Winnebago, in the county of Faribault and State of Minnesota, have invented certain new and useful Improvements in Acetylene-Gas Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved gas apparatus adapted especially for generating acetylene gas from calcic carbide and water.

One feature of my invention consists in combining and connecting a pair of gas-machines, each of which involves an expansible gasometer or gas-holder, and providing in connection therewith means whereby the said machines may be alternately rendered active to generate gas, so that one will always be active and the other inactive or practically so. This enables one of the gas-machines to be recharged while the other is active without stopping the supply of gas to the service-pipe.

Another feature of my invention is directed to an improved form of holder for the carbide.

My invention also comprises other novel features of construction which, as well as the above-noted features, will be hereinafter described, and defined in the claims.

The preferred form of my invention is illustrated in the accompanying drawings, wherein like letters referring to like parts throughout the several views—

Figure 1 is a vertical central section taken through the entire apparatus, some parts being shown in full. Fig. 2 is a perspective view of one of the carbide-holders removed from working position and the cover of the same being removed. Fig. 3 is a plan view of the carbide-holder shown in Fig. 2; and Fig. 4 is a vertical section taken on the line $x^4 x^4$ of Fig. 3, the cover to said holder being shown in place and the holder itself being shown in working position on one end of the gas-conveying pipe.

In the preferred form of my invention, as

shown, I employ two gas-machines which are substantially identical with each other and each of which comprises as follows: a indicates the fixed section adapted to contain a body of water z , and a' indicates the inverted vertically-movable tank-section seated in the column of water z , which sections together constitute an expansible gasometer.

As shown, the movable tank-section a is provided with a water-displacer which is formed by a conical or tapered shell a^2 , the lower end of which blends into the walls of the section a' a short distance above its lower end, and the upper end of which joins the head of said section a' in such manner as to form an annular chamber a^3 between the sections a' and a^2 . This conical water-displacing section a^2 serves to decrease the area of the internal cross-section of the movable tank-section a' toward its top.

The head of the movable tank-section a' is provided at a point just above the annular chamber a^3 with a screw-threaded nipple a^4 , through which sand z' may be introduced into said chamber a^3 to properly weight the said movable tank-section. This screw-threaded nipple a^4 may be tightly closed by means of a screw-threaded cap a^5 .

The tank-section a' is provided on its head with an air-vent a^6 , through which the air may be drawn off in starting the machine to work, and, as shown, the said head is provided at its central portion with an annular flange or ring a^7 , which is adapted to serve as a keeper for a weight b . On its lower edge the movable tank-section a' is provided with an outwardly-projecting annular flange a^8 , and the fixed tank-section a is shown as provided with a pair of inwardly-extending thumb-screws a^9 . When the thumb-screws a^9 are screwed outward, they will permit the free passage of the annular flange a^8 , but when screwed inward they will engage the annular flange a^8 and stop or limit the upward movement of the tank-section a' .

The interiors of the gasometers formed by the pairs of tank-sections a and a' are in communication with each other from above their water-levels through a U-shaped gas-conveying pipe c . The intermediate portion of the

U-shaped gas-pipe c , which extends between the exteriors of the tank-sections a , is in communication with a service-pipe d , and on each side of this service-pipe the said pipe c is provided with a valve c' .

Within each gasometer is located one of my novel carbid-holders. As shown, this carbid-holder is in the form of a cylindrical box f , with a closed bottom and open top, which box is formed into a series of cells or compartments by means of radial dividing-partitions f' . As shown, the partitions f' radiate from a hollow central hub f^2 . Opening into each of the cells formed between the partitions f' is a perforation or water-passage f^3 , cut through the cylindrical wall of the holder. The perforations or water-passages f^3 of the different cells or compartments are located, successively, one above the other, as clearly shown in the drawings, so that as the water in the gasometer raises onto the carbid-holder the contents or carbid in the one cell will be decomposed or eaten up by the water before the contents of the cell whose perforation f^3 is located the next step higher is attacked by the water.

If desired, the carbid-holder may be provided with a removable cover f^4 , which is provided with suitable perforations f^5 for the escape of the gas and with a central perforation f^6 for the passage of the upper end of the gas-pipe c .

To hold the carbid-holder in working position, the inner end of the pipe c is provided with a short distance below its upper end with a fixed supporting collar or flange c^2 . The carbid-holder is readily set in position by placing the hollow hub portion f^2 around the upper end of the pipe c and dropping the holder onto the collar or flange c^2 .

The operation of the apparatus above described is substantially as follows: Let it be assumed, as already indicated, that the two gasometers or gas-machines are substantially duplicates one of the other, so that both would give substantially the same pressure per square inch on the gas confined therein. Let it also be assumed that the carbid-holders of both machines are charged or loaded with carbid and ready for use. Now let the weight b be placed on the movable section of one of the gasometers or machines—for instance, the right-hand member, as shown in Fig. 1 of the drawings. This weight b will cause the weight of the tank-section b' of the right-hand machine to exceed that of the left-hand machine, and hence the two machines or gasometers being in communication through the pipe c the pressure of the right-hand gasometer will be transmitted into the left-hand gasometer, and this will cause the movable section of said left-hand gasometer to rise and remain in its extreme uppermost position. The movable section of the left-hand gasometer will be thus held in its extreme uppermost position and the gasometer itself held inactive or in reserve until the carbid of the right-hand gasometer

is entirely exhausted or used up, so that the generation of gas is stopped.

The amount of carbid which each cell of the carbid-holder will contain should be something less than enough to completely fill the gasometer. It will be noted that as the movable section of the gasometer lowers the conical water-displacer a^2 will cause the water to rapidly rise on the carbid-holder. It will thus be seen that each time the movable section of the gasometer lowers to cause the generation of a new supply of gas it will drop deeper into the column of water, and thus successively cause the column of water to rise a step higher on the carbid-holder. As this movable section lowers to cause the water to flow into the last cell of the holder (which of course has the highest perforation) the carbid-holder will be nearly submerged in the water. After this last cell has been emptied and the gas generated from its contents entirely used up the movable section of the gasometer will lower against the upper end of the pipe c , and the column of water will rise and entirely fill the interior of the gasometer. This feature is very important, as it serves to entirely clear the gasometer of the remnant of gas which would otherwise be left in the same and which, as the movable tank-section is removed to permit the refilling of the carbid-holder, would escape into the room. This complete submersion of the carbid-holder also serves to flood and completely soak the carbid, so that any portion of the carbid which may not have been completely soaked and would otherwise be wasted may be brought into contact with the water and thus used and saved.

In connection with these gasometers or machines some suitable signal or alarm device may be employed for indicating when the carbid of either machine has been exhausted. This signal device is not, however, a necessity, as the machine which has been held in reserve or inactive will, as soon as the excessive pressure caused by the weight b has been thrown off, automatically commence operation in a manner similar to that described in the other gasometer. However, the machine which has thus been automatically thrown into action will generate and contain a gas under a pressure slightly less than the pressure produced by the machine which has just stopped. To restore this normal pressure, it is only necessary to transfer the weight b from the machine which was just stopped to the machine which has just commenced action. Then after first closing the right-hand valve c' of the pipe c and then screwing the thumb-screws a^3 outward the tank-section a' of the right-hand machine may be removed and the carbid-holder removed and recharged. Then after the said parts have been replaced in position and the right-hand valve c' again opened the tank-section a' of this right-hand machine will be held upward to its extreme position in a manner similar to that previ-

ously described in connection with the left-hand machine. By this means the machines may be alternately thrown into action without interrupting the continuous supply of gas to the service-pipe d .

It will be noted that as one of the tank-sections a' is lowered into the column of water its aggregate weight on the gas confined therein will be decreased; but, as already stated, the conical water-displacer a^2 decreases the area of the internal cross-section of the movable section a' toward the top. When properly designed, this water-displacer should decrease the cross-section of the tank a' at such a ratio that the pressure per square inch on the confined gas will remain practically constant throughout its zone of operation. This feature of construction, however, I do not here claim, broadly, as the same is claimed broadly in a companion case, filed of even date herewith, entitled "Acetylene-gas generators."

It will be understood, of course, that so far as the broad principles of my invention are concerned the gas-machines may take various forms and that various alterations in the construction of the carbid-holder and other parts of the apparatus might be made without departing from the spirit of my invention. For instance, the number of cells with which the carbid-holder is provided might be varied indefinitely and the size of these cells might be varied within any limits which would not make the cells large enough to contain an amount of carbid which if generated at one time would more than fill the gasometer. As shown, the carbid-holder is provided with seven cells, which, figured in the rough, might be sufficient to last approximately a week.

It will also be understood that the part which I have here termed a "tapered water-displacer," need not necessarily be formed on a straight-line taper but might be formed on an irregular line, or by a series of steps. The function of this water-displacer in the com-

bination shown is to cause the water to rise onto the stationary carbid-holder.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a generator-tank the movable section of which is provided with a water-displacer, of a holder for the solid gas-producer, mounted in said tank and immovable with the movable tank-section, the relation of said parts being such that the gas-producing liquid in such generator-tank will be caused to rise onto and lower from action on the contents of said holder, respectively, under falling and rising movements of said movable tank-section and water-displacer, substantially as described.

2. The combination with a gasometer, the movable section of which is provided with a tapering water-displacer, of a carbid-holder mounted in said gasometer and held against vertical movement with said movable gasometer-section, comprising a series of rigidly-connected cells or compartments having openings for the inflow of the water or other liquid gas-producer, which openings are positioned at different levels, substantially as described.

3. The combination with the gasometer-section a , of the movable section a' provided with the conical shell or water-displacer a^2 , and the carbid-holder formed by the cylindrical box f with radial partitions f' and perforations or water-passages f^3 arranged successively at higher levels, substantially as described.

4. The holder involving the cylindrical box f divided into cells by the partitions f' and provided with the perforations f^3 , located at different levels, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DELBERT J. REYNOLDS.

Witnesses:

BESSIE B. NELSON,
F. D. MERCHANT.