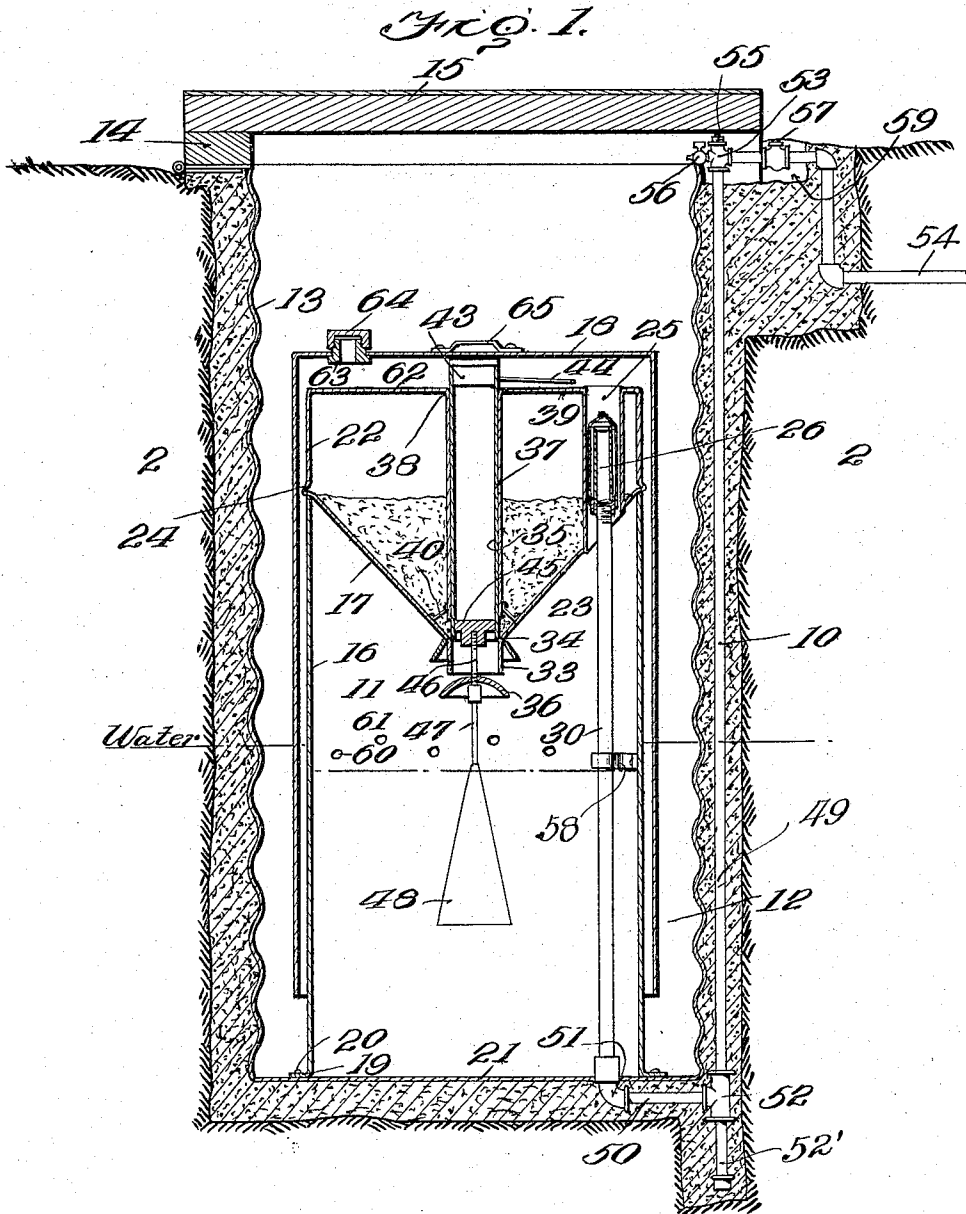


W. M. REECE.
ACETYLENE GAS GENERATOR.
APPLICATION FILED FEB. 3, 1914.

1,154,433.

Patented Sept. 21, 1915.
2 SHEETS—SHEET 1.



Inventor
W. M. Reece.

Witnesses
C. P. Landon.

[Signature]

By

[Signature]

Attorney.

W. M. REECE.
ACETYLENE GAS GENERATOR.
APPLICATION FILED FEB. 3, 1914.

1,154,433.

Patented Sept. 21, 1915.
2 SHEETS—SHEET 2.

Fig. 2.

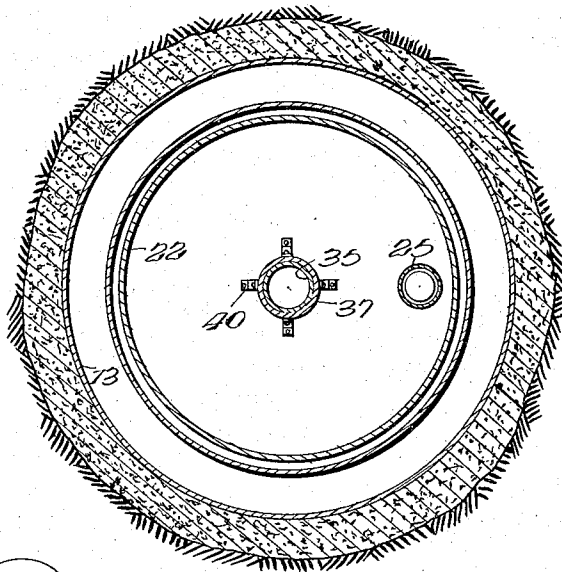
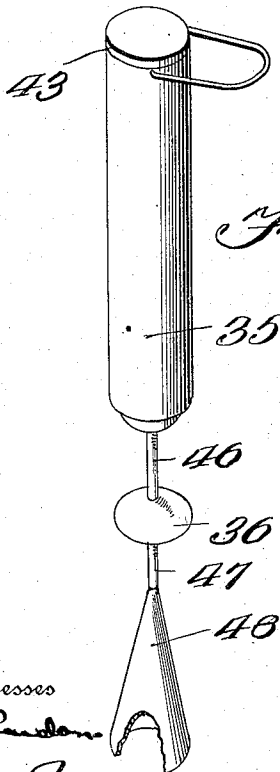


Fig. 3.

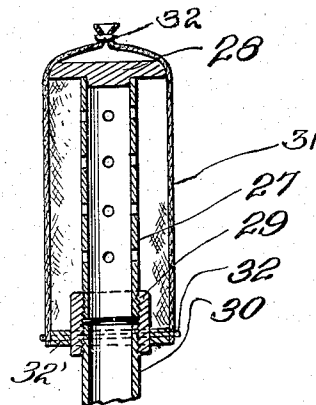


Fig. 4.

Witnesses
C. P. Landon

[Signature]

Inventor
W. M. Reece.

By

[Signature] Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM M. REECE, OF OTTUMWA, IOWA.

ACETYLENE-GAS GENERATOR.

1,154,433.

Specification of Letters Patent.

Patented Sept. 21, 1915.

Application filed February 3, 1914. Serial No. 816,231.

To all whom it may concern:

Be it known that I, WILLIAM M. REECE, citizen of the United States, residing at Ottumwa, in the county of Wapello and State of Iowa, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

The present invention relates broadly to acetylene gas generators of the type which are buried in the ground and incased in a concrete or cement envelop.

The principal object of this invention is to provide an acetylene gas generator in which the gas bell is so arranged that it will automatically operate to feed a quantity of carbid into the water container when the volume of gas in the generator falls below a point, and will also act to automatically shut-off the supply of carbid when the volume of gas increases to a predetermined point.

An object of equal importance with the foregoing is to provide a gas generator constructed with such regard to proportion, number and arrangement of parts that it may be cheaply manufactured, will be durable and efficient in its action, and may be quickly disassembled to permit the substitution of new parts for those parts of the device which may have become damaged or broken in use.

The above and additional objects are accomplished by such means as are illustrated in the accompanying drawings, described in the following specification, and then more particularly pointed out in the claims, which are appended hereto and form a part of this application.

With reference to the drawings, wherein there has been illustrated the preferred embodiment of this invention as it is reduced to practice, and throughout the several views of which similar reference numerals designate corresponding parts, Figure 1 is a vertical section showing the generator in operative assembled position in a concrete casing buried in the ground; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a perspective view illustrating in detail the float controlled valve which is arranged at the mouth of the carbid receptacle for regulating the amount of carbid which is fed into the gas generating chamber; and Fig. 4 is a vertical section taken through the preferred form of filter.

Coming now to the description of the

drawings, and referring particularly to Fig. 1, in which the invention is best illustrated as an entirety, the numerals 10 and 11 designate respectively the metallic-lined concrete casing and the generator which is positioned therein. The casing 10 is, as stated, preferably formed of concrete, although some other plastic material may be employed if found desirable, and is substantially cylindrical in form. The casing 10 is poured after the outer casing 13 of the generator has been arranged within a receiving pit which has been previously dug. The pit is, of course, of greater diameter than the casing 13, so that an annular chamber is formed between the member 13 and the wall of the pit. It may be well to explain at this point that the outer casing 13 is designed to form a packing box or receptacle in which the various parts of the generator may be shipped or stored, and that the concrete casing 10 serves as a water receptacle for the generator after the casing 13 has been destroyed by rust. The outer casing 13 is preferably formed of corrugated sheet steel so that the concrete will act as a binder for holding the member against rotation and against accidental withdrawal from the pit. A rectangular wooden rim or frame, indicated at 14, is applied to the upper terminal of the member 10 so that a wooden closure 15, which is faced with a sheet of galvanized iron, may be properly hinged or otherwise mounted for sealing the upper terminal of the casing 13.

The generator, hereinbefore designated as an entirety by the numeral 11, includes a body member 16 within which is arranged a carbid hopper 17, and a gas bell 18, which is mounted in the well known manner to incase the body member 16. The body member 16 of the generator consists preferably in a cylinder of sheet metal, the lower terminal of which is equipped with an outwardly directed annular flange 19, adapted to be riveted or otherwise secured, as at 20, to the bottom wall 21 of the member 13. The upper end of the body casing 16 is open, but is normally closed by the carbid hopper 17. This carbid hopper 17 is, similarly to the member 16, formed from sheet metal, and includes an upper cylindrical portion 22 and a lower conical portion 23. At the junction of the members 22 and 23 is formed, by stamping or pressing, an outwardly extending annular flange 24, which is of such di-

ameter that it will engage over the upper edge of the member 16, and thus hold the carbid hopper in the proper position, as clearly shown in Fig. 1. Extending through the carbid hopper, and arranged eccentrically therein, is a sleeve member 25, which is designed to receive a gas filter, indicated at 26. This gas filter 26 is best illustrated in detail in Fig. 4, and reference will, therefore, now be had to that figure. As shown, the filter includes a perforate shell 27, the upper terminal of which is provided with a disk-like closure 28, and the lower terminal of which is externally threaded so that it may be engaged in a coupling 29. This coupling 29 is threaded on the upper terminal of a gas conducting pipe 30. A strip of felt, flannel or some other similar filtering cloth, indicated at 31, is arranged to incase the perforate shell 27, being held against displacement therefrom by means of binding wires 32. The upper binding wire is wound around the upper end of the cloth, serving, as shown in Fig. 4, to close this upper end of the cloth. The lower binding wire 32, however, is wound externally around the lower edge of the cloth 31, and is disposed to press a portion of the cloth into a peripheral groove which is formed in a disk member 32'. This disk member 32' is formed with a central opening so that it may be threaded on the coupling 29, as best shown in Fig. 4.

Reverting now to the description of the carbid hopper, and referring particularly to Fig. 1, it will be seen that the apex of the conical portion 23 terminates in a substantially cylindrical sleeve or mouth 33, which is soldered or otherwise secured at its upper terminal, as at 34, to the inner wall of the hopper. The extreme lower terminal of the conical portion 23 is directed outwardly at an angle to form a shedding ring which will deflect the water of condensation which may run down the outside of the member 17. It is, of course, necessary to normally seal the mouth or sleeve 33 so that the carbid will not issue into the member 16 except at pre-determined intervals. There has, therefore, been provided a compound valve member which consists in two co-acting elements. These two elements are designated by the numerals 35 and 36, the former of which is a metallic tube, and the latter of which is a cup-shaped plate or disk valve. The tubular member 35 is mounted for vertical sliding movement through a guide sleeve 37, which extends vertically and preferably centrally through the casing. The upper end of the sleeve 37 is secured in any desired manner to the closure 39 of the carbid hopper, being arranged to surround the opening therein through which the tubular valve member 35 is adapted for reciprocation. The lower terminal of the sleeve 37

is spaced from the conical portion 23 of the hopper a sufficient distance to permit the carbid to pass at pre-determined intervals into the mouth 33. Strap iron legs, indicated at 40, are employed in firmly holding the lower end of the sleeve 37 in the desired spaced relation to the conical portion of the carbid hopper. The upper terminal of the sleeve 35 is closed by a plug member 43, which carries a bail 44, whereby the operator may remove the carbid hopper from the generator for the purpose of refilling it. In the lower terminal of the valve member 35 is threaded a plug 45 adapted to receive the threaded terminal of a valve stem 46. This stem 46 is slightly greater in length than the mouth 33 of the hopper, and is threaded at its lower terminal whereby it may be inserted through an opening formed in the disk valve 36 and threaded into the upper terminal of the float rod 47. On the lower terminal of this float rod 47 is mounted a conical shell float 48, which is preferably formed of sheet metal, and co-acts with the gas bell 18 in operating the valve members of the carbid hopper, as will be hereinafter fully explained in that portion of the specification devoted to the description of the operation of the generator.

The gas conducting pipe, heretofore designated by the numeral 30, extends downwardly through the generator and is connected at its lower terminal to a second gas conducting pipe 49 by means of a short length of pipe, indicated at 50, and of an elbow 51 and a coupling 52. This second pipe 49 is embedded in the concrete casing 10. A short length of pipe, indicated at 52', extends downwardly from the coupling 52, being embedded in concrete, as shown in Fig. 1 particularly. This member 52' is closed at its lower terminal by the plug and serves as a trap or drip pipe for the water of condensation accumulating in the pipe 49. At its upper terminal, this pipe 49 is connected by a coupling 53 to a service pipe 54. The coupling 53 is of the three-way type, the one opening receiving the pipe 49, the second opening receiving the service pipe 54, while the third opening is provided with a threaded plug closure, indicated at 55. This plug 55 may be removed to permit a pump to be connected with the pipe 49 for drawing the water of condensation out of the trap 52'. If desired, a rod having a swab on its end may be inserted in the pipe 49 for removing the water of condensation from the member 52'. A pet-cock 56 is tapped into the side of the opening 53 so that air may be expelled from the pipe 49 when the generator is first filled with carbid, as will be hereinafter more fully explained.

A flat head service cock, indicated at 57, is, of course, interposed in the service pipe for the usual purpose. This cock 57 is ar-

ranged in a small hole in the ground, as indicated at 59, so that access may be readily had to the turn plug for the purpose of controlling the flow of gas through the service
 5 pipe. In the body casing 16 of the generator, and at the approximate center thereof are formed two circumferentially extending series of apertures, indicated at 60 and 61, while in the closure wall 39 of this casing
 10 are provided a number of openings 62 through which the carbid is poured when the hopper 17 is being filled. An opening is formed in the top wall of the gas bell 18, in which opening is threaded a flange sleeve
 15 63. This sleeve receives an internally threaded closure cap 64.

The actual construction and arrangement of the various parts of the generator being thus described in detail, it now remains to
 20 explain the manner in which the generator operates. Briefly the operation is as follows: Having closed the cock 57, the cap 64 on top of the gas bell 18 is then removed and the gas bell taken out by means of the handle 65. The operator then removes the carbid
 25 hopper by means of the bail 44. He then fills the casing 13 with water until the liquid flows through the lower series of holes, indicated at 60, and fills the inner casing to
 30 the level of the pipe braces, indicated at 58. The hopper 17 is then filled with carbid and mounted on the upper edge of the casing 16, being positioned to receive the filter 26 within the sleeve 25, in a manner hereinbefore
 35 explained. When the carbid hopper is being lowered to its operative position on the member 16, the handle member 44 of the tubular valve 35 is pulled up to bring the disk valve 36 into sealing engagement
 40 against the lower terminal of the mouth 33. This sealing of the disk valve against the mouth of the hopper, of course, prevents the issuance of carbid into the water while the hopper is being lowered. The next step is to
 45 open the pet-cock 56 so that when the gas bell 18 is lowered into the generator, the air may pass out through the pipe 49, or otherwise it would, of course, be impossible to lower the gas bell into its proper position.
 50 The gas bell is allowed to sink by gravity until it comes into engagement with the upper terminal of the tubular valve 35. The gas bell will, of course, in bearing against the valve depress this member so that the
 55 disk valve 36 will be spaced from the mouth 33 of the carbid hopper, allowing a certain quantity of carbid to drop into the water. The generation of the acetylene gas is thus initiated.

60 The gas generated in the casing 16 passes through the openings 61 to the space comprehended between the member 16 and the gas bell. The gas then rises into the upper portion of the gas bell, and seeking to escape
 65 enters the sleeve 25 at both the upper and

lower terminals thereof. The gas is, as previously stated, filtered by the fabric wrapping of the filter before it enters the pipe 31. The gas passes through the pipe 31 into the
 70 pipe 49, and when the operator notices an appreciable escape of gas through the pet-cock 56 this member is turned to closed position. The turn plug 57 is then opened so that the gas may enter the service pipe. As the gas continues to generate, the volume of
 75 gas, of course, increases and tends to lift the bell. The lifting of the gas bell allows the buoyant force of the float member 28 to become effective on the disk valve 36 and tubular valve 35. When the float 48 has
 80 moved the disk valve 36 upwardly until it is in sealing engagement with the lower terminal of the mouth 33, it will be obvious that the lower terminal of the tubular valve 35 will have been moved upwardly to open the
 85 lower end of the conical portion 23 so that carbid will pass down into the mouth 33, completely filling this member. It is obvious that when the previous discharge of carbid has been decomposed, and the gas
 90 generated thereby has been consumed, the volume of gas will be diminished in the gas bell, and that as a result this member will again move downwardly. When the gas bell is moved downward a sufficient distance, it
 95 will, of course, depress the tubular member 35 so that the carbid which has been previously disposed in the mouth 33 will be permitted to drop into the water, and the further issuance of the carbid from the hopper
 100 will be prevented by the tubular valve member 35, which will seal the lower end of the member 17 in the manner shown in Fig. 1. It will thus be seen that the valve will be automatically operated in accordance with
 105 the variation in the volume of gas in the bell to feed the carbid into the water so that a continuous generation of gas will take place. When it is desired to again re-charge the hopper and to remove the residuum from
 110 the member 16, the closure cap 64 is first removed, and the gas bell is then lifted out of the casing 13 by means of the handle 65. The operator then grasps the handle 44 and lifts out the hopper 17. It is obvious that
 115 when the hopper is lifted out by means of the handle 44, the disk 36 will be moved into sealing position at the lower terminal of the mouth 23, so that any carbid which may remain in the hopper will not be permitted to accidentally escape into the water.
 120

In reduction to practice, it has been found that the form of this invention, illustrated in the drawings, and referred to in the above
 125 description as the preferred embodiment, is the most efficient and practical; yet realizing that the conditions concurrent with the adoption of this device will necessarily vary, it is desirable to emphasize the fact that
 130 various minor changes in details of con-

struction, proportion and arrangement of parts may be resorted to, when required, without sacrificing any of the advantages of this invention, as defined in the appended
5 claims.

What is claimed is:—

1. In an acetylene gas generator, a carbid
hopper having its lower portion conical and
formed with a discharge opening at the
10 apex, a sleeve surrounding the discharge
opening and depending from the lower end
of the hopper, a second sleeve supported ver-
tically within the hopper in line with the
discharge opening thereof and spaced at its
15 lower end from the lower end of the hopper,
a valve mounted in the second sleeve and
adapted to project above the hopper and to
have its lower end extend across the space
formed between the two sleeves, a second
20 valve suspended below the first-mentioned
sleeve and adapted to close the lower end
thereof, a stem adjustably supporting the
second valve and adjustably connected to
the first-mentioned valve, and a float at-
25 tached to the lower end of the stem.

2. In an acetylene gas generator, a carbid
hopper having its lower portion made con-

ical and formed at the apex with a discharge
opening, a sleeve in line with the discharge
opening and depending from the lower end 30
of the hopper, a conical band surrounding
the sleeve and joined at its upper end to the
lower end of the hopper, a second sleeve sup-
ported within the hopper in vertical line 35
with the discharge opening thereof and
spaced at its lower end from the first-men-
tioned sleeve and connected at its upper end
to the top of the hopper, a tubular valve
mounted in the second sleeve and adapted to 40
project above the hopper in one position and
to extend across the space between the two
sleeves in another position, a stem provided
at its lower end with a float and having ad-
justable connection at its upper end with 45
the tubular valve, and a second valve ad-
justably connected with the stem and dis-
posed below the first mentioned sleeve and
adapted to close the lower end thereof.

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

WILLIAM M. REECE. [L. s.]

Witnesses:

CONRAD OSTERTAG,

CHAS. L. FIRKINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."