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WATER SEAL FOR GAS GENERATORS.  
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1,005,328.

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2 SHEETS—SHEET 2.

Fig. 3.

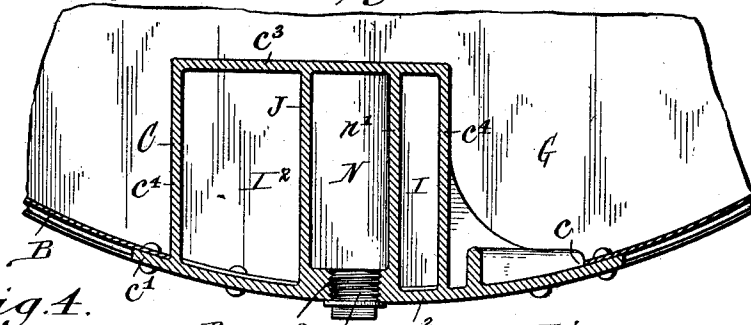


Fig. 4.

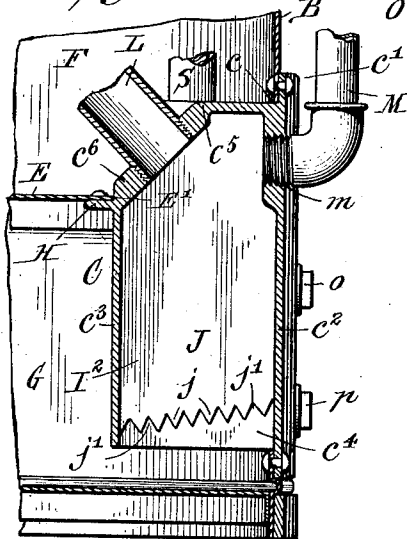


Fig. 5.

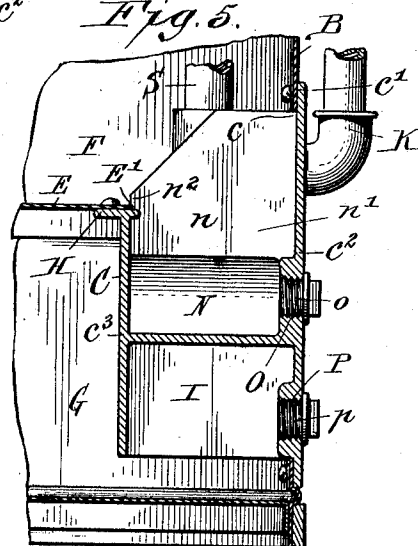


Fig. 6.

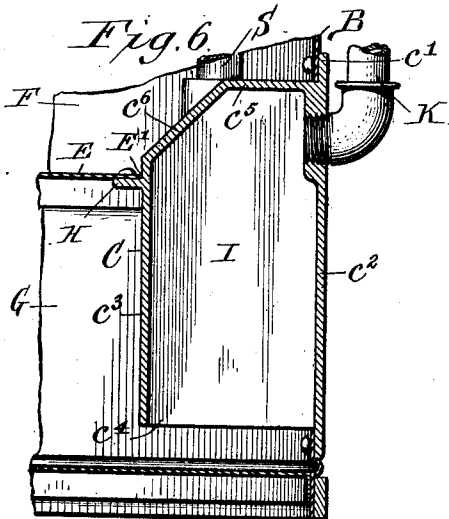
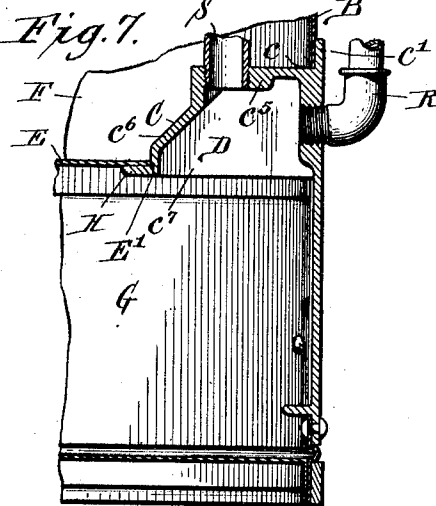


Fig. 7.



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Witnesses: Augustus E. Schlieder, Inventor.  
By Emil Neuhauf Attorney.

# UNITED STATES PATENT OFFICE.

AUGUSTUS E. SCHLIEDER, OF BUFFALO, NEW YORK, ASSIGNOR TO MODEL GENERATOR COMPANY, OF LOUISVILLE, KENTUCKY, A CORPORATION OF KENTUCKY.

## WATER SEAL FOR GAS-GENERATORS.

1,005,328.

Specification of Letters Patent.

Patented Oct. 10, 1911.

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*To all whom it may concern:*

Be it known that I, AUGUSTUS E. SCHLIEDER, a citizen of the United States, and a resident of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Water Seals for Gas-Generators, of which the following is a specification.

This invention relates to improvements in an acetylene gas generator and more particularly to an improved water-seal box or casing in the form of a casting adapted to be fastened to the casing of the gas storage-tank.

The primary object of my invention is to so construct a generator that the numerous openings through the sheet-metal wall of the gas-tank may be dispensed with, also the usual lock-nuts used in conjunction with pipes entered into or passed through the sheet-metal walls of the gas-tank.

Another object of my invention is to dispense with the pipes in the water-seal, which after a short period of time would have their screw-threads rust and would tend to break in two.

A further object of my invention is to so construct the gas-tank that the water-seal chamber as well as the tank-proper may be emptied through openings in the water-seal box or casing instead of applying internally-threaded metallic-bushings in openings formed in the side of the sheet-metal tank and closing the bores of the same with plugs.

It also has for its object the provision of means for assuring a graduated feed of gas into the gas-bell of the gas-tank, so that the pressure in said bell can never be increased in impulses or sudden jerks, thus assuring a steady light without flickering.

These and other objects to be hereinafter described, provide a more economical structure than has heretofore been possible to produce and save considerable expense and labor on account of the dispensation of pipes to form the water-seal, and it also avoids the necessity of cutting numerous small holes into the sheet-metal wall of the tank for the reception of internally-threaded metallic bushings into which the several pipes of a gas-tank are usually threaded.

To these ends the invention consists in the provision of a cast-metal water-seal box

or casing introduced into the gas-tank through a single opening and having the various pipe-connections threaded thereinto without exposing the threads to the action of the water in the water-seal chamber.

It also consists in the construction, arrangement, and combination of parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the drawings,—Figure 1 is a perspective view of my improved water seal box or casing and the adjacent portion of the gas tank, the pipes connected thereto being omitted. Fig. 2 is a vertical longitudinal section taken on line 2—2, Fig. 1. Fig. 3 is an enlarged horizontal section taken on line 3—3, Fig. 2. Fig. 4 is a vertical section taken on line 4—4, Fig. 2 looking in the direction of the arrow crossing said line. Fig. 5 is an enlarged vertical section taken on line 5—5, Fig. 2 looking in the direction of the arrow crossing said line. Fig. 6 is a vertical section taken on line 6—6, Fig. 2 looking in the direction of the arrow crossing said line. Fig. 7 is a vertical section taken on line 7—7, Fig. 2 looking in the direction of the arrow crossing said line.

Referring now to the drawings in detail, like letters of reference refer to like parts in the several figures.

The reference letter A designates the gas-generating-chamber wherein calcium carbide is deposited and which by contact with water causes generation of gas to be delivered into the gas-bell B through a water-seal usually in the lower end of the gas-tank.

My improved water-seal comprises a box or casing C of cast metal which is set into an opening *c* in the wall of the gas-tank and it has its outer wall extended beyond its sides to provide flanges *c*<sup>1</sup> that overlap the sheet metal of the tank and are riveted or other-wise secured to the same in a watertight manner. The walls of this water-seal box or casing, are of sufficient thickness to enable pipes to be threaded into them. Said box or casing comprises an outer wall *c*<sup>2</sup>, a rear wall *c*<sup>3</sup>, side walls *c*<sup>4</sup>, and a top wall *c*<sup>5</sup> having its rear portion inclined, as at *c*<sup>6</sup>. The top wall is extended beyond one of the side walls of the box or casing proper and with a short vertical wall *c*<sup>7</sup> forms a cap or dome D lying wholly in a plane above

a wall or partition E which separates the gas-chamber F of the tank from the water-seal chamber G at the bottom of the tank.

The upper end of the water-seal box or casing proper also extends into the gas-chamber and said box or casing is provided with a horizontal flange H which extends also along the lower edge of the cap or domes D and is adapted to bear against the underside of the wall or partition E to which it is riveted or otherwise fastened, said wall or partition having an opening E<sup>1</sup> through which the upper end of said box or casing projects. The lower end of said box or casing is open to permit the water in the water-seal chamber G to enter the same.

The water-seal box or casing is divided into two main chambers I, and I<sup>2</sup>, which are separated by a vertical wall J having its lower edge provided with teeth *j* and being inclined from the front wall of the box or casing to the rear wall thereof; said teeth being preferably V-shape for a purpose to appear hereinafter.

Threaded into the front wall of the box or casing so that it will open into the upper end of the chamber I is a gas inleading-pipe K leading from the upper end of the gas-generating chamber A to the water-seal box or casing; and threaded into the inclined portion *o*<sup>o</sup> of the top wall is an outlet-pipe L which delivers the gas to the gas bell (not shown) of the gas-tank after having passed through the water-seal box or casing. The gas delivered into the chamber I of the water-seal box or casing forces down the water therein until the gas is permitted to pass around the toothed lower edge of the wall J, and on account of said edge being inclined, the gas will first pass around the highest point of said edge, which is at the inner end of the first of the series of notches *j*<sup>1</sup> formed by the teeth *j*, until the pressure increases and passes between other teeth in succession and finally clears said edge at every point. The inverted V-shaped notches *j*<sup>1</sup> formed by the V-shaped teeth permits a constant feed of gas around the edge of said wall or partition, irrespective of the pressure under which said gas is delivered into the water-seal box or casing, and consequently the gas is stored in the gas-bell of the gas-tank with an unbroken flow so that the pressure within said bell will be increased gradually; thus assuring steady lights and preventing flickering of the same.

The toothed wall J may well be termed a graduated gas-feed or regulator and as gas cannot be generated under a constant pressure, said graduated gas feed or regulator prevents the feeding of gas to the gas-bell in impulses or under quick variations of pressure.

A gas delivery pipe M is threaded into the outer wall of the box or casing at *m* to de-

liver gas from the upper end of the chamber I<sup>2</sup> and, as this chamber is in constant communication with the gas-bell, the gas therein is held at the same pressure as the gas in said bell when generation of gas ceases, but during the generation of gas, the pressure in said chamber momentarily exceeds the pressure of the gas in the gas-bell, until the excess pressure is sufficient to raise said gas-bell. The gas stored within the gas-bell may be forced down through the pipe L and may be delivered through the pipe M for use.

A transverse-chamber N is provided about midway between the upper and lower ends of the chamber I and has a passage *n* extending therefrom to the upper end of the box or casing where it opens into the gas-chamber F; said transverse chamber and the passage *n* being formed by a wall *n*<sup>1</sup> connecting the rear wall of the water-seal box or casing with the front wall thereof. A threaded opening O is provided in the front wall of the water-seal box or casing in line with said transverse chamber; and said opening is closed with a plug *o*. The passage *n* also opens at the rear of the box or casing, as at *n*<sup>2</sup>, so that the water in the gas-chamber can be completely drained by removing the plug *o* and allowing the water to pass through the passage *n*, into the transverse chamber N and out the threaded opening O.

For the purpose of draining the lower or water-chamber of the tank, a threaded opening P is provided in the front wall of the water-seal box or casing near the lower end thereof and it has a plug *p* threaded therein to close said opening in a water-tight manner.

A vent-pipe R is threaded into the front wall of the water-seal box or casing for communication with the cap or dome, and a safety or gas-escape pipe S is threaded into the upper wall of said cap or dome to permit the escape of the gas from the gas-bell when under excess pressure; said gas escaping through the pipe S from the gas-bell, entering the cap or dome D and passing out through the vent-pipe R into the open air. Owing to the cap or dome lying in a plane above the bottom of the gas-chamber F and being closed to said chamber, the water cannot enter it, neither can the gas escape through said cap or dome and pass around the lower edge of the water-seal box or casing proper, as this is prevented by the water in the water-seal chamber and on account of the pipe R being open at all times for the escape of the excess quantity of gas, the gas will pass out of said pipe and thereby avoid all possibility of the apparatus becoming damaged or exploding.

By providing a water-seal box or casing made of cast metal and having comparatively thick walls, the various pipes and outlets with which gas-tanks are usually pro-

vided, can be threaded into said box or casing; and by locating said box or casing at the side of the gas-tank, it is accessible for threading pipes into it from the outside as well as from the inside. It also possesses the advantage of dispensing with numerous openings in the thin sheet-metal walls of the tank and also with the cast nuts or thimbles which must be secured in the numerous openings in a water-tight manner for the reception of the threaded ends of the various pipes. My invention also dispenses with the pipes and pipe-fittings to form the water-seal and which invariably become rusted and weakened at the threads of the pipe and are considered the weakest part of the gas-tank, they sometimes rusting to such an extent as to break in two at the threads. Another desirable feature of my invention is the provision for draining both the water-seal chamber and the gas-chamber through openings in the cast water-seal box or casing. If for any reason the pressure of the gas becomes excessive, it can break the water-seal and escape around the lower edge of the box or casing, rise into the cap or dome D, and pass out into the open air through the pipe R.

By the use of my invention, all pipes are drained directly into the water-seal box or casing.

Various modifications of this invention may be resorted to without departing from the principle involved, and I therefore do not wish to limit myself to the exact construction herein shown, but desire that the subjoined claims be given the broadest interpretation permissible by the prior art.

Having thus described my invention, what I claim is,—

1. The combination with a tank having a water-seal chamber, a gas-chamber and a wall separating said chambers, said wall and the side wall of said water-seal chamber having openings formed therein, of a water-seal box fitting into said openings to partly extend into the water-seal chamber and partly into said gas-chamber and closing the opening in the side wall of said water seal chamber, and pipes connected to the outer wall of said box and to that portion of the same projecting into the gas-chamber.

2. The combination with a tank having a wall forming a water-seal chamber and a gas-chamber, said wall and the side wall of said tank having contiguous openings, of a cast water-seal box fitting into the tank to enter said openings and having a marginal flange secured to said side wall, said water-seal box extending partly into said water-seal chamber and partly into said gas-chamber and having threaded openings in that portion extending into the gas-chamber and also in the outer wall thereof, and pipes threaded into said opening.

3. The combination with a tank having a horizontal wall forming a gas-chamber and a water-seal chamber, said wall and the side wall of said tank having contiguous openings with the opening in the side wall arranged to extend above and below the plane of said horizontal wall, of a cast-metal water-seal box fitting into said openings so as to extend above and below said horizontal wall and having an outstanding flange secured to the under-side of said horizontal wall and a marginal flange secured to the outer side of said side wall, said box having threaded openings in its top wall and threaded openings in its outer wall, and pipes threaded into said openings.

4. The combination with a tank having a horizontal wall forming a gas-chamber and a water-seal chamber, said wall and the side wall of said tank having contiguous openings with the opening in the side wall arranged to extend above and below the plane of said horizontal wall, of a cast-metal water-seal box fitting into said openings so as to extend above and below said horizontal wall and having an outstanding flange secured to the under-side of said horizontal wall and a marginal flange secured to the outer side of said side wall, said box having two threaded openings in its top wall and three threaded openings in its front wall, a gas-pipe threaded into one of the openings in its top wall and extending to the upper portion of said gas-chamber, a safety gas-escape pipe threaded into the other opening of said top wall, a gas inleading-pipe threaded into one of the openings in the front wall, a delivery-pipe threaded into a second opening in said front wall, and a gas-escape pipe threaded into the third opening in said front wall.

5. The combination with a tank having a horizontal wall forming a gas-chamber and a water-seal chamber, said wall and the side wall of said tank having contiguous openings with the opening in the side wall arranged to extend above and below the plane of said horizontal wall, of a cast-metal water-seal box fitting into said openings so as to extend above and below said horizontal wall and having an outstanding flange secured to the underside of said horizontal wall and a marginal flange secured to the outer side of said side wall, said box being open at its lower end and divided into three chambers, a gas-inleading-pipe connected to the front wall of said box and opening into one of said three chambers, a gas pipe connected to the top wall of said box and opening into a second chamber and serving to deliver gas therefrom to the gas-chamber, a gas delivery-pipe connected to the front wall of said box and opening into the last-mentioned chamber thereof, a safety gas-escape pipe threaded into the upper wall of said

box and opening into the third chamber, and a pipe connected to the front wall of said box and opening into said third chamber.

5 6. The combination with a tank having a water-seal chamber and a gas-chamber, of a cast metal water-seal box arranged to one side of said chambers, and pipes connected to said box and extending into said gas-chamber, a gas inleading-pipe, a gas-delivery  
10 pipe, and a gas escape-pipe arranged outside of said tank and also connected with said box.

7. The combination with a tank having a horizontal wall forming a gas chamber and  
15 a water-seal chamber, said wall and the side wall of said tank having contiguous openings with the opening in the side wall arranged to extend above and below the plane of said horizontal wall, of a water-seal box fitting into said openings and secured to said  
20 horizontal wall and to said side wall in a water-tight manner, said box being open at its lower end and having three chambers, one of said chambers having an opening accessible from the outside of the tank and a water-passage connecting the chamber with  
25 said gas-chamber, a gas inleading-pipe connected to another of said chambers, a pipe connected to the third chamber and extending to the upper portion of said gas-chamber,  
30 and a delivery-pipe connected to said last-mentioned chamber of the box to deliver the gas for use.

8. A water-seal for gas-tanks having two  
35 chambers separated by a wall and open at their lower ends, said wall having its lower edge inclined, a gas-inleading-pipe connected to one of said chambers, and a gas delivery-pipe connected to the other chamber.

40 9. A water-seal for gas-tanks comprising a hollow structure open at its lower end, and having a vertical wall terminating at its lower end in a plane above the lower end of said structure, said wall having its lower  
45 edge inclined and provided with V-shaped teeth, a gas inleading-pipe connected to said

box to open into one of said chambers, and a gas delivery-pipe also connected to said box and opening into the other chamber.

10. The combination with a gas-tank hav- 50 ing a water-seal chamber and a gas-chamber separated by a horizontal wall, of a water-seal box having comparatively thick walls and located at one side of said tank so as to expose one of its walls and so that it ex- 55 tends partly into the gas-chamber and partly into the water-seal chamber, pipes connected to that portion of the box extending into the water-seal chamber and pipes connected to the exposed wall of said box. 60

11. The combination with a tank having a horizontal wall forming a gas-chamber and a water-seal chamber, said wall and the side wall of said tank having contiguous open- 65 ings with the opening in the side wall arranged to extend above and below the plane of said horizontal wall, of a cast-metal water-seal structure comprising a box-like portion and a dome arranged to one side of said box-like structure at the upper end 70 thereof, said structure fitting into the openings in said horizontal wall and the side wall and having the upper end of its box-like portion and the dome extending into said gas-chamber, a pipe extending from 75 said dome to the upper portion of said gas-chamber, a second pipe connected to the outer exposed wall of said dome for the escape of excess gas, a pipe connected to the upper end of the box-like portion and extending upward into the gas-chamber, and a gas-inleading pipe and a gas delivery-pipe connected to the outer wall of said box-like portion and opening into the upper end 80 thereof. 85

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

AUGUSTUS E. SCHLIEDER.

Witnesses:

ELLA C. PLUECKHAHN,  
JACOB OBERST, Jr.