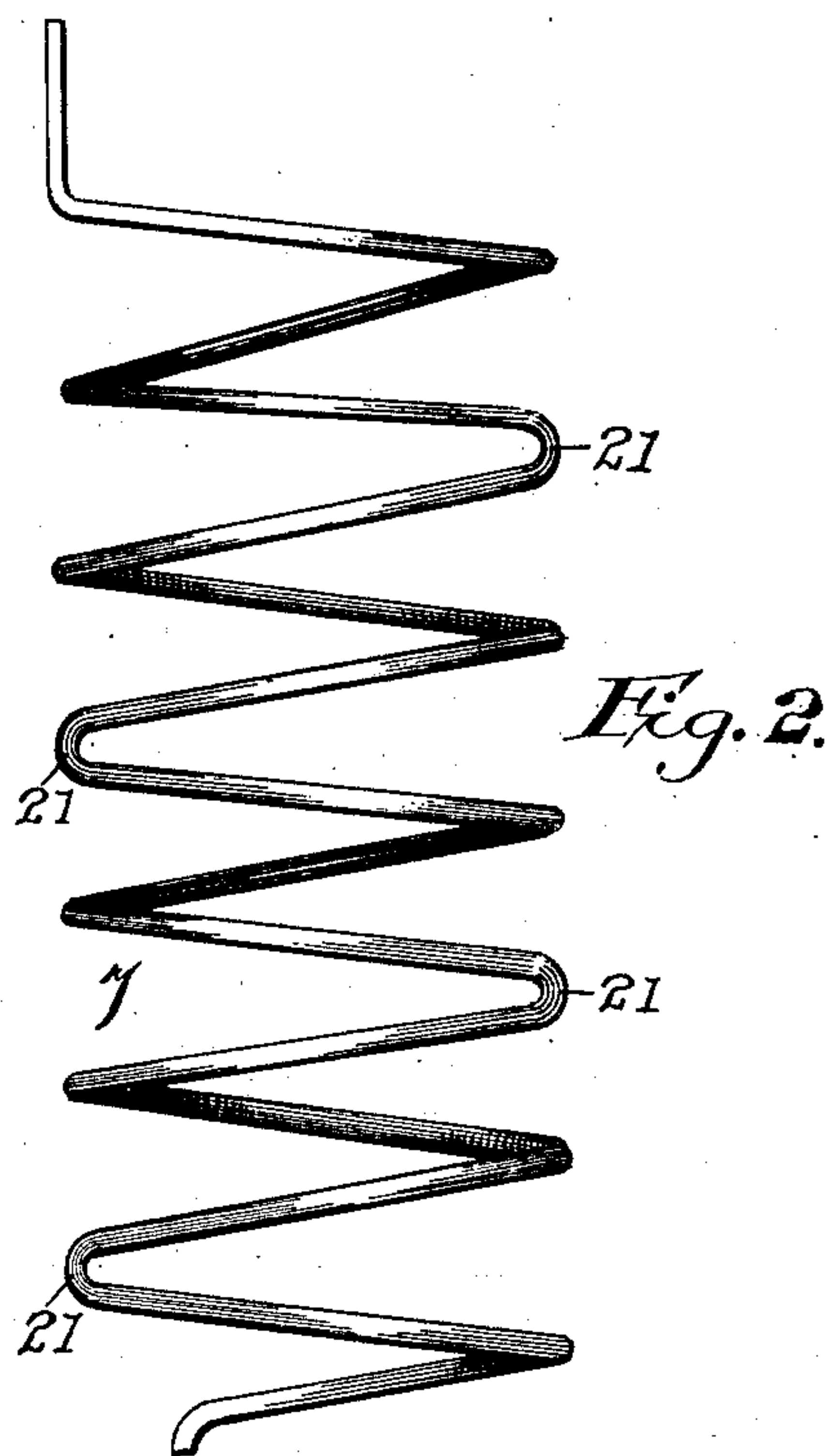
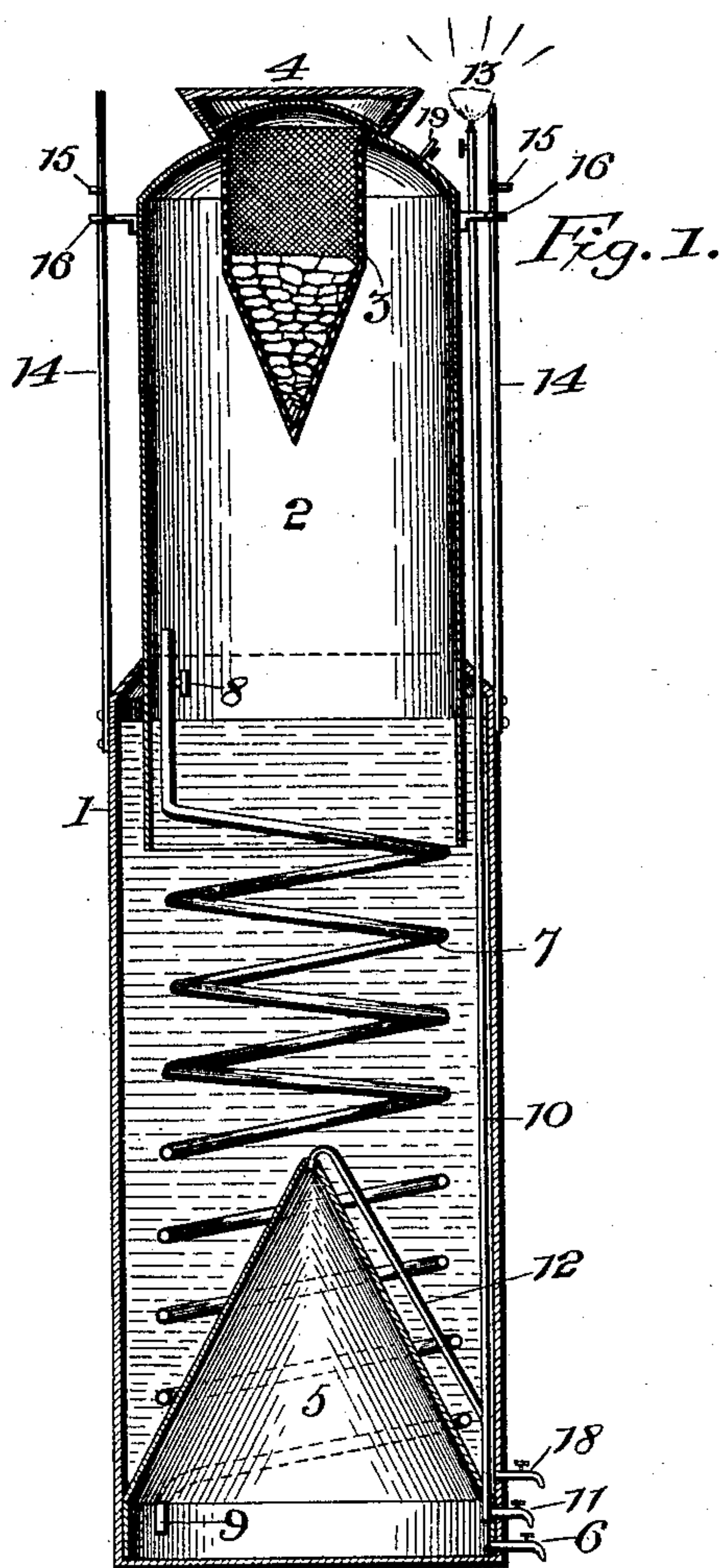


(No Model.)

C. OGBURN.  
ACETYLENE GAS GENERATOR.

No. 603,655.

Patented May 10, 1898.



Witnesses

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# UNITED STATES PATENT OFFICE.

CALVIN OGBURN, OF PHOENIX, ARIZONA TERRITORY.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 603,655, dated May 10, 1898.

Application filed July 19, 1897. Serial No. 645,152. (No model.)

*To all whom it may concern:*

Be it known that I, CALVIN OGBURN, a citizen of the United States, residing at Phoenix, in the county of Maricopa and Territory of Arizona, have invented a new and useful Acetylene-Gas Generator, of which the following is a specification.

My invention relates to improvements in acetylene-gas generators for the production of illuminating or heating gas by the chemical action due to the immersion of calcium carbide in water; and the object of my invention is to provide a simple apparatus in which the immersion of the carbide in water is controlled automatically by the pressure of the gas in the vertically-movable bell of the generator.

A further object of my invention is to provide means for condensing the watery vapor contained in the gas evolved by the action of the carbide and water and to effect automatically the separation of the products of condensation from the purified and cooled gas to enable the gas to be drawn off from the reservoir-chamber in a relatively cool, dry, and pure condition for consumption at a burner or burners.

Other objects and advantages of my improved construction of the generator will appear from the annexed description.

The invention consists in the combination, in an acetylene-gas generator, with a water-tank and a bell carrying a carbide-receptacle, of a conical storage and condensing chamber situated within the water-tank at or near the bottom thereof, a condensing-coil passing through the water in the tank and connected at its lower end with the storage and condensing chamber, suitable means for drawing off the products of condensation from the chamber, and a gas-outlet pipe leading from the condensing and storage chamber; and the invention further consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a vertical sectional elevation through an acetylene-gas generator constructed in accordance with my invention. Fig. 2 is a detail view of one form of the condensing-pipe which may be used in my generator.

Like numerals of reference denote corresponding parts in both figures of the drawings, referring to which—

1 designates the tank, adapted to receive the supply of water, and 2 is the vertically-movable bell, which is arranged to slide or telescope within the tank 1, according to the pressure of gas in the generator. At its upper end the head of the bell 2 is provided with a central opening through which the wire-cage receptacle 3 is inserted into the bell 2, so as to be suspended downwardly from the head of the bell. This cage-like receptacle is designed to contain the calcium carbide, and the upper end of said receptacle and the opening in the head of the bell are closed by the imperforate cap or closure 4, which may be screwed in place on or clamped tightly to the head of the bell to prevent the escape of the gas.

Within the water-tank is arranged the storage and condensing chamber 5, which is arranged at or near the bottom of said tank 1, so as to be always immersed in the water in the tank. This storage and condensing chamber is of conical form to present inclined surfaces for the gas to impinge against as it rises through the chamber, and said chamber has a suitable cock 6, by which the "drip" or water of condensation may be drawn off from said chamber.

The gas contained in the bell 2 is conducted to the storage-chamber 5 through a condensing-coil 7. This coil passes through the water contained in the tank 1, and its upper extremity projects above the water-level in the tank for the gas to enter freely into said condensing-coil. This protruding end of the condensing-coil is equipped with a stop-cock 8, which may be adjusted prior to fitting the bell to the tank to regulate the flow of gas from the bell to the conical chamber 5. The lower part of the condensing-coil surrounds the conical chamber, and the lower extremity of said coil is connected to the chamber 5 near the bottom thereof, as at 9, to discharge to



the chamber 5 in a manner to precipitate the products of condensation upon the bottom of the chamber 5, while the gas is free to rise through the chamber. By immersing the condensing-coil in the water of the tank 1 and by placing the storage-chamber 5 at the bottom of said tank the coil and chamber are kept in a cool condition by the water. As the gas passes from the bell through the condensing-coil it is cooled and the watery vapors are condensed, thus precipitating the products of condensation upon the bottom of the chamber 5, while the gas is free to rise through the chamber to make its escape from the apex of the conical chamber 5. As the gas rises in this chamber 5 it impinges against the inclined walls thereof, and any surplus of the watery vapor not condensed by the coil is deposited upon the walls of said chamber and thence conducted to the bottom of the chamber, from whence the products of condensation may be drawn off through the cock 6. This construction and organization of parts operates very efficiently to purify, dry, and cool the gas, and it may thus be conducted from the generator in a condition fit for immediate service by a suitable pipe. In the drawings I have shown this gas-pipe as extending through the water-tank, close to the wall thereof, and through the shell of the storage and condensing chamber 5, and this pipe 10 is closed at its lower end, and it is further provided with a draw-off cock 11, by which any surplus matters of condensation which may accumulate in the pipe may be drawn off from the lower extremity thereof. This gas-pipe is connected to the conical chamber by means of the branch pipe 12, arranged outside of the chamber 5 in an inclined position. The lower end of the branch pipe is attached to the gas-pipe 10, while the other or upper end of said branch pipe is attached to the chamber 5 at the apex of the cone-shaped extremity thereof. This gas-pipe 10 may be provided at its upper extremity with a burner (indicated at 13) for consuming the gas, or the pipe may be conducted to any suitable place and there equipped with a burner.

From the tank 1 rise the guide or stay rods 14, which are rigidly attached to the tank, and these rods are provided at or near their upper ends with suitable stop devices 15. The bell is provided on its outside with loops or eyes 16, which are fitted loosely on the rods 14, and said loops or eyes thus serve as guides to direct the rising and falling motions of the bell, and they also are adapted to abut against the stops 15 to limit the upward movement of the bell.

The water-tank 1 is provided at or near its bottom with a draw-off cock 18, by which the sediment or spent carbid in the water of the tank may be drawn off as desired.

The bell 2 is equipped with a vent-cock 19, which is designed to be opened to allow escape of the air contained in the bell when it is desired to start the apparatus in service.

The operation may be described, briefly, as follows: The charge of carbid is placed in the receptacle and the latter is secured in the head of the bell, after which the closure is secured to the bell. Water having been supplied to the tank, the cock 19 is opened to allow the air to escape from the bell as it settles or descends into the water of the tank. The carbid carried by the bell is immersed in the water when the bell descends a certain distance, and such immersion of the carbid in the water generates the acetylene gas, which accumulates in the bell 2. When the generation of gas begins, the vent-cock 19 is closed, and as the gas accumulates in the bell it lifts the latter. The pressure of gas in the bell forces the gas through the condensing-coil and into the chamber 5, and as the gas passes through the coil and the chamber the watery vapor in the gas is condensed and precipitated upon the bottom of the chamber 5, from whence it may be drawn off through the cock 6. The gas flows from the apex of the chamber 5 through the branch pipe to the gas-pipe 10, by which it is conducted to the burner for consumption.

The condensing-coil may be a pipe bent into spiral form, as shown by Fig. 1, or this condenser may be a pipe coiled in the peculiar manner indicated by Fig. 2 of the drawings. This type of the condenser contemplates the provision of a pipe which is bent reversely upon itself, as at 21, at intervals between the spiral lengths of the pipe; but these doubled or looped parts of the condenser are continuous with the spiral lengths of the pipe to provide for the free flow of gas through the condenser.

I am aware that changes in the form and proportion of parts and in the details of construction herein shown and described as the preferred embodiment of my invention may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of my invention. I therefore reserve the right to make such modifications and alterations as fairly fall within the scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an acetylene-gas generator, the combination with a tank, and a vertically-movable bell carrying a carbid-receptacle, of the storage and condensing chamber of conical form substantially from its lower end to the discharge-apex thereof, a condensing-pipe coupled at its lower end to said condensing and storage chamber to discharge directly into the same and with its upper end extended above the water-line in the tank, and an outlet-pipe leading from the lower part of said condensing-chamber and having a branch attached to the apex of said conical condensing and storage chamber, whereby the gas as it passes from the enlarged lower end to the discharge-apex of said chamber is checked



and thereby compressed and also caused to impinge against the converging walls of the chamber, substantially as described.

2. In an acetylene-gas generator, the combination with a tank, and a bell carrying a carbid-receptacle, of a conical storage and condensing chamber united to the bottom of said tank and immersed in the water contained therein, a condensing-coil occupying the space between the tank and said conical chamber in compact relation thereto and coupled at one end directly to said chamber near the bottom thereof and having its other end extended above the water-line in said tank, an outlet-pipe coupled to the chamber and having a branch connection coupled to the discharge-apex of said chamber, and a draw-off cock from said chamber, substantially as described, for the purposes set forth.

3. In a gas-generator, the combination with a tank, and a vertically-movable bell, of a

conical condensing-chamber situated in the tank below the water-level therein, a condensing-coil having its lower end connected to said condensing-chamber and its upper end terminating above the water-level, and a gas-outlet pipe attached to the apex of the condensing-chamber and leading therefrom through the tank, whereby the gas as it passes upward through the conical condensing-chamber impinges against the walls of said chamber and the watery vapor is eliminated from the gas and precipitated to the bottom of said tank, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CALVIN OGBURN.

Witnesses:

D. A. GIVENS,  
J. W. WALKER.