No. 640,558. Patented Jan. 2, 1900.

O. H. HAMPTON.

ACETYLENE GAS GENERATOR.

(Application filed Mar. 16, 1899.)

(No Model.)

Fig. 1.

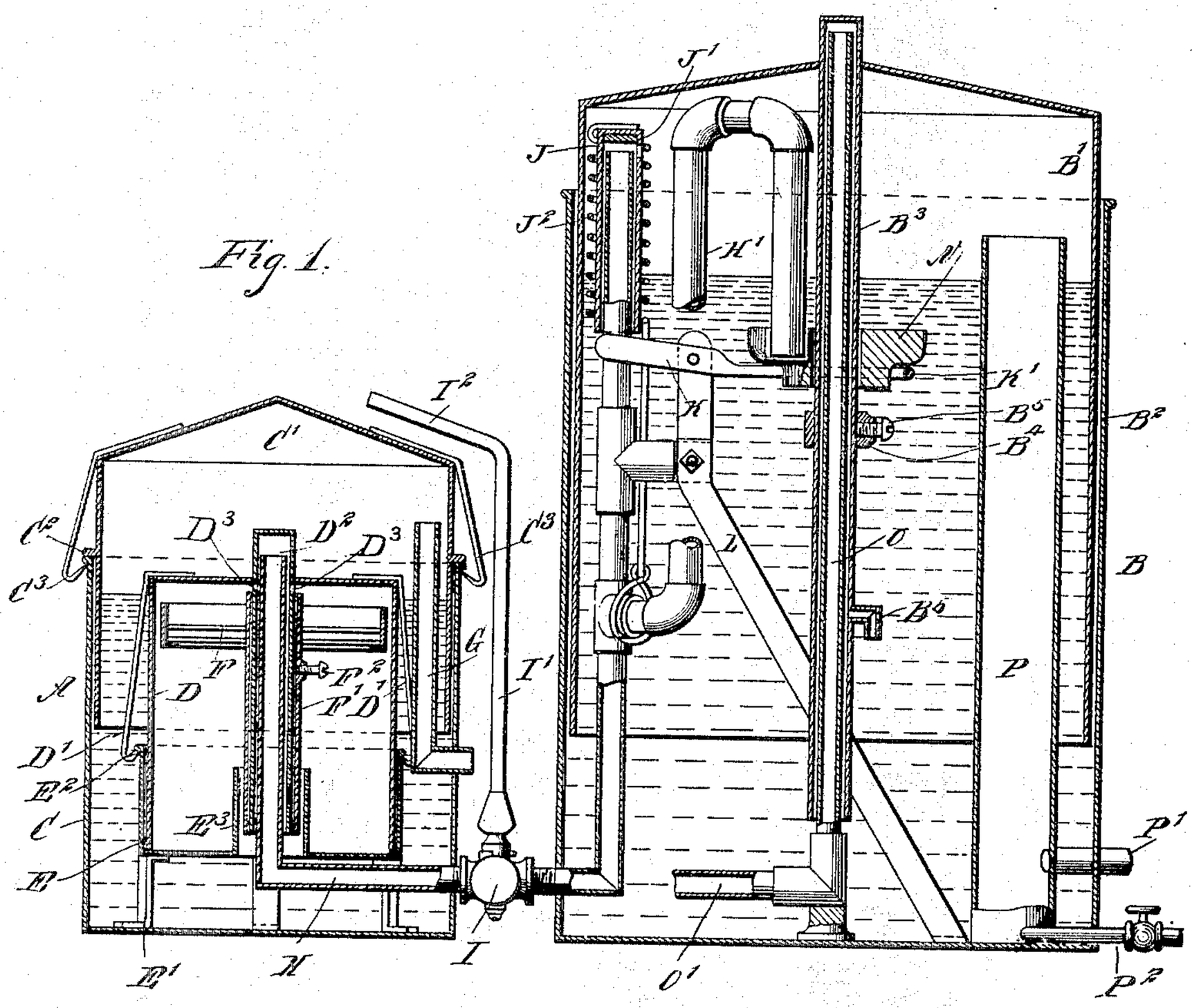
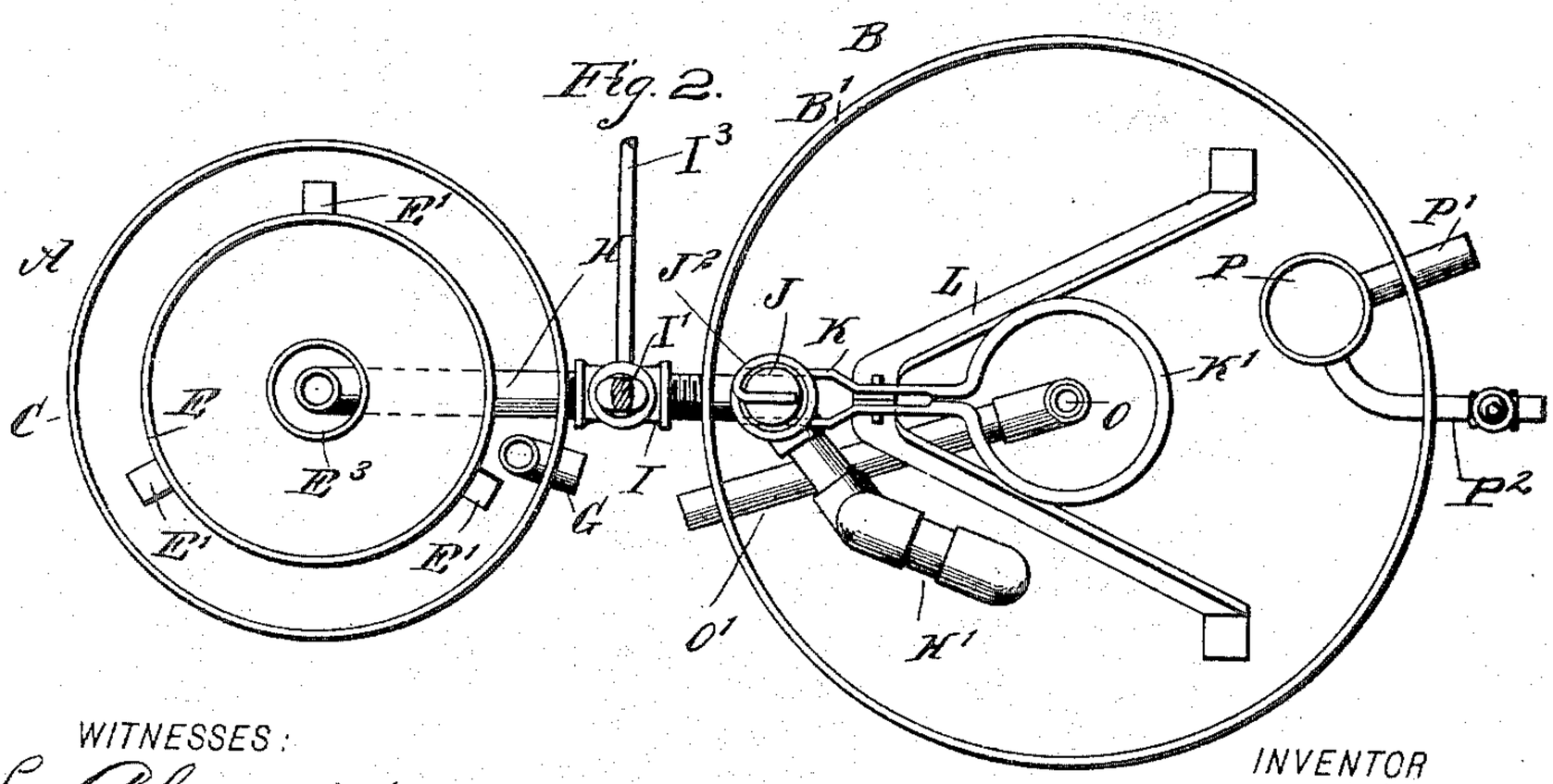


Fig. 2.



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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 640,558, dated January 2, 1900.

Application filed March 16, 1899. Serial No. 709,304. (No model.)

To all whom it may concern:

Be it known that I, OLIVER H. HAMPTON, of Williamsburg, in the county of Wayne and State of Indiana, have invented a new and Improved Acetylene-Gas Generator, of which the following is a full, clear, and exact description.

The invention relates to acetylene-gas generators such as shown and described in the application for Letters Patent of the United States, Serial No. 679,802, filed by me on May 5, 1898, and allowed on November 12, 1898.

The object of the present invention is to provide a new and improved acetylene-gas generator arranged to generate gas in proportion to the amount needed and consumed by the burners, to withdraw the carbid-ashes with the carbid-holder upon removing the latter for recharging, and in case of excess pressure of gas to prevent the water from being forced out of the generator-tank.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of my invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a sectional side elevation of the improvement, and Fig. 2 is a plan view of the same with the cover for the water-tank and the carbid-casing and the gasometer-bell omitted.

The improved acetylene-gas generator is provided with a generator proper, A, and a gasometer B, having the usual bell B′ arranged to rise and fall in the water contained in the tank B^2. The generator A is provided with a tank C, adapted to contain the water for generating gas by coming in contact with the calcium carbid, and said tank is provided with a cover C′, having an annular shoulder C^2, adapted to rest on the upper edge of the tank C, spring-catches C^3 being secured on the cover for engaging the upper flanged end of said tank C and locking said cover in place.

Within the tank C is arranged a carbid-casing D, open at the bottom and fitted with its open end into a bucket E, adapted to receive the ashes from a carbid-holder F, held in the upper end of the carbid-casing D. The bucket E is provided with legs E′, adapted to rest on the bottom of the tank C, and the casing D is provided with spring-catches D′, adapted to engage an annular shoulder or flange E^2 on the upper end of the bucket to lock the casing and the bucket together.

From the bottom of the bucket E rises a short pipe E^3 to permit the water from the tank C to pass through said pipe into the bucket and into the carbid-casing D to finally rise therein and pass upon the carbid contained in the holder F. When this takes place, gas is generated in the casing D, and unless this gas is withdrawn and used it accumulates in the casing to such an extent that it exerts a pressure on the water, drives the same downward in the casing D, and moves the water out of contact with the carbid, thereby preventing a further generation of gas. Any ashes falling from the carbid-holder F through the grate-bars thereof in a downward direction will drop into the bucket E and accumulate therein, and when the device is recharged the bucket is removed, with the casing D, from the tank C, and then said casing and said bucket are separated to permit of emptying the bucket of the ashes. Thus no ashes pass into and accumulate in the water-tank C.

The carbid-holder F is preferably of the construction shown and described in the application previously referred to and is provided with a central pipe F′, adapted to be fastened by a set-screw F^3 to a pipe D^2, closed at its upper end and depending from the top of the casing D. The holder can be filled with calcium carbid by removing it from the casing upon releasing the screw F^3 and sliding the pipe F′ off the pipe D^2 at the time the casing is detached from the bucket E, and both are removed from the water-tank C. The casing D, with the bucket E, can be readily removed from the tank by unlocking and removing the cover C′ and then lifting the casing, with the bucket, out of the tank.

In case any gas passes into the cover C′ of the water-tank C it is automatically discharged from said cover by a stand-pipe G, secured to the tank C and leading to the outside, as is indicated in the drawings.

Into the pipe D^2 extends a gas-conducting pipe H, extending through the wall of the

tank C and that of the tank B^2 to rise in the gasometer B, so that the gas generated in the casing D can pass to the gasometer-bell B'. A three-way valve I is arranged in the pipe H between the tanks C and B^2, and the stem I' of said valve I extends upward and is formed at its upper end with an angular extension I^2, reaching over the top of the cover C', so that the valve I has to be closed before the cover C' can be removed from the tank C, it being understood that the extension I^2 extends over the top while the valve is open, and when the valve is turned the extension swings out of alinement with the top to allow of removing the top from the tank.

The valve I is arranged in such a manner that when the extension I^2 extends over the cover C' the valve is open and communication is established between the casing D and the gasometer-bell B', and when a quarter-turn is given to the said valve I the said casing D and the gasometer-bell B' are disconnected, and the casing is connected with a pipe I^3, leading outdoors from the valve I, to allow air to escape from the casing when the latter is put in position in the tank and generation of the gas first begins and also to allow air to pass into the casing when it is desired to remove it from the tank for recharging with calcium carbid. The pipe D^2 is provided with apertures for the passing of the generated gas in the casing D to the pipe H.

On the upper end of the conducting-pipe H, within the bell B', is arranged a valve J, preferably in the form of a tube closed at its upper end and fitted to slide on the upper end of the pipe H. An opening J' is formed in the upper end of the tubular valve to allow the gas to pass from the pipe H into the gasometer-bell at the time the valve is off its seat at the upper end of the pipe H. The valve J is normally held to its seat by a spring J^2, secured at one end to the valve J, and has its other end secured to the pipe H, as is plainly indicated in Fig. 1. A lever K presses against the under side of the valve J to lift the latter off its seat, and this lever is fulcrumed on a bracket L, secured in the tank B^2 and forming a brace for the pipe H. The lever K has its free end formed into a ring K', adapted to receive a weight N for imparting a swinging motion to the lever K and sliding the valve J upward into an open position against the tension of the spring J^2. This weight N is held to slide loosely on a pipe B^3, depending from the top of the gasometer-bell B', and said weight is adapted to rest on a collar B^4, adjustably held on the pipe B^3 and adapted to be secured thereto at a suitable point by a set-screw B^5. From the pipe H, below the valve J and within the bell B', leads a branch pipe H', which extends first upward above the level of the water in the tank B and then downward, terminating in the water below the level thereof.

In order to allow the escape of an excess of gas in the bell B', the pipe B^3 is fitted to slide loosely on a pipe O, secured to the bottom of the tank B^2 and having a branch pipe O' leading to the outside of the tank and out of the building in which the apparatus is located, and near the lower end of the pipe B^3 is arranged a branch pipe B^6, adapted to allow escape of gas from the bell B' in case the latter is raised to such height by excessive pressure as to bring the lower end of the branch pipe above the level of the water in the gasometer-tank B^2. The branch pipe B^6 is bent downward a short distance, so that when the lower end of the said pipe passes above the water-level the gas can readily escape from the bell without danger of siphoning the water out of the tank by way of the pipes B^3 O, as is so frequently the case where the pipe B^3 is only provided with a hole instead of the branch pipe B^6.

The gasometer is provided with the usual stand-pipe P, from which leads a pipe P' to the burners, and a pipe P^2 for carrying off any water that may accumulate in the bottom of the stand-pipe, the pipe P^2 being provided with a cock and the pipe P' being preferably located a distance above the water-pipe P^2 to prevent water from passing into the pipe P'.

The operation is as follows: When the several parts are in the position illustrated in Fig. 1, and calcium carbid is contained in the holder F and the pressure of the gas in the gasometer-bell has been reduced to such an extent that said bell B' moves into a lowermost position to finally deposit the weight N on the loop K' of the lever K, so that the latter opens the valve J, as shown, then the gas contained in the casing D from a previous generation of gas passes through the conducting-pipe H into the bell B', and in doing so the pressure in the casing D is reduced to allow the water in the tank C to pass through the short pipe E^3 into the casing D to finally come in contact with the calcium carbid in the holder to generate a new batch of gas. The gas thus generated passes through the conducting-pipe H into the bell B', so that the latter finally rises and in doing so carries along its pipe B^3 and the collar B^4, so that the latter finally comes in contact with the weight N and lifts the same off the loop K' to allow the spring J^2 to close the valve J on the upper end of the conducting-pipe H. When this takes place, the connection between the casing D and the gasometer-bell is shut off and gas now accumulates in the casing D, and as the pressure therein increases the water is driven downward in the casing and out of contact with the calcium carbid to prevent further generation of gas. As the gas is withdrawn from the bell B' to supply the burners the bell B' again sinks and finally brings the weight N back to the loop K' to impart a swinging motion to the lever K and reopen the valve J, so as to repeat the above-described operation.

It is understood that when the burners are shut off the gasometer-bell B' rises until the

spring J^2 has securely closed the valve J on the pipe H, and while gas production now practically ceases it frequently happens that some of the wet ashes or parts of the calcium carbid contain sufficient moisture to cause a slow production of gas in the casing after the valve J is closed. To save this gas and at the same time maintain a pressure in the casing D sufficient to hold the water out of contact with the carbid until the valve J is reopened, as above described, it is necessary that this gas, generated in excess of the gas required for the purpose mentioned, be passed into the bell B', and this takes place by way of the branch pipe H'. It is evident that the gas passing up the branch pipe H' has to overcome the pressure of the water above the discharge end of the pipe, and when this takes place the gas passes into the water and rises up therein to accumulate in the bell B'. It will also be seen that any small lumps of carbid dropping from the grate of the holder F fall into the water in the bucket E to cause a generation of gas, which rises in the casing D and passes off with the other gas to the gasometer. By the construction described the water in the tank is not liable to be spilled on an excess of gas-pressure in the casing D, as the water in the pipe E^3 can be pushed out into the tank D after the water has once receded to the top edge of said pipe, the water in the bucket remaining therein at all times.

I do not limit myself to the particular construction of the valve J as described and shown, as it is evident that valves of different construction can be readily employed.

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

1. An acetylene-generator comprising a carbid-casing, a gasometer having a tank and a bell, a gas-conducting pipe leading from said carbid-casing to said gasometer, a valve on the said pipe within the gasometer and normally held to its seat by a spring, and a weight carried loosely by the gasometer-bell and adapted to move the valve into an open position against the tension of its spring upon the descent of the bell, substantially as shown and described.

2. An acetylene-gas generator, comprising a carbid-casing in which gas is generated by water coming in contact with carbid held in said casing, a gasometer having a tank and a bell, a gas-conducting pipe leading from said carbid-casing to said gasometer, a self-closing valve on said conducting-pipe in the gasometer, and adapted to be opened by said bell, upon the bell descending, and a branch pipe leading from said conducting-pipe and extending above the water in the gasometer-tank, and then extending downward therein, to open into the water a distance below the level thereof, substantially as shown and described.

3. An acetylene-gas generator, comprising a carbid-casing in which gas is generated by water coming in contact with carbid held in said casing, a gasometer having a tank and a bell, a gas-conducting pipe leading from said carbid-casing to said gasometer, a self-closing valve on said conducting-pipe in the gasometer and adapted to be opened by said bell upon the descent of the valve, a lever connected with said valve for opening the same, and a weight carried loosely by the gasometer-bell and adapted to press on said lever and impart a swinging motion thereto, to open the valve against the tension of its spring, substantially as shown and described.

4. An acetylene-gas generator, comprising a carbid-casing in which gas is generated by water coming in contact with carbid held in said casing, a gasometer having a tank and a bell, a gas-conducting pipe leading from said carbid-casing to said gasometer, a self-closing valve on said conducting-pipe in the gasometer, and adapted to be opened by said bell upon the descent of the valve, a lever connected with said valve for opening the same, a weight carried loosely by the gasometer-bell and adapted to press on said lever and impart a swinging motion thereto, to open the valve against the tension of its spring, and a collar adjustable on a pipe depending from said bell, for engaging and carrying said weight upon the rising of the said gasometer-bell, substantially as shown and described.

5. An acetylene-gas generator provided with a water-tank, a carbid-casing removably held in said tank and closed at the top and open at the bottom, an ash-bucket arranged to be held at the lower end of the carbid-casing, the said bucket having an inlet for the water at the lower end thereof, a carbid-holder in said casing above the bucket, so that the carbid-ashes drop into the bucket, and means for locking the carbid-casing and ash-bucket together, whereby the bucket may be removed with the casing, from the tank, substantially as described.

6. An acetylene-gas generator provided with a water-tank having an upper flanged end, a removable cover for said tank having an annular shoulder adapted to rest on the upper edge of the tank, means for locking said cover in place on the tank, a carbid-casing in said tank closed at the top and open at the bottom, an ash-bucket, means for locking the casing and the ash-bucket together, a carbid-holder removably held in said casing above the ash-bucket, and a gas-conducting pipe extending into the carbid-casing to carry off the generated gas, substantially as shown and described.

7. An acetylene-gas generator provided with a water-tank, a carbid-casing removably held in said tank and closed at the top and open at the bottom, an ash-bucket having a water-inlet pipe and arranged to receive the lower end of the carbid-casing, and spring-catches carried by said casing and adapted to engage an annular shoulder or flange at

the upper end of the bucket, substantially as shown and described.

8. An acetylene-gas generator provided with a water-tank, a carbid-casing removably held in said tank and closed at the top and open at the bottom, an ash-bucket having a water-inlet pipe and arranged to receive the lower end of the said carbid-casing, means for locking said casing and bucket together, a pipe closed at its upper end and depending from the top of the casing, a carbid-holder provided with a pipe held on the said pipe depending from the casing, and a gas-conducting pipe extending into the pipe depending from the top of the carbid-casing, substantially as shown and described.

9. An acetylene-gas generator provided with a water-tank, a casing containing carbid and held in said tank, a gasometer having a tank and a bell, a gas-conducting pipe leading from said carbid-casing to said gasometer, a valve in said pipe between the generator and the gasometer, and a valve on the upper end of said pipe within the gasometer and normally held to its seat by a spring, the said valve being adapted to be opened by said bell when the bell descends, substantially as described.

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Witnesses:
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