

G. L. HARVEY.  
ACETYLENE GAS GENERATOR.

(Application filed Feb. 23, 1897.)

(No Model.)

Fig. 1.

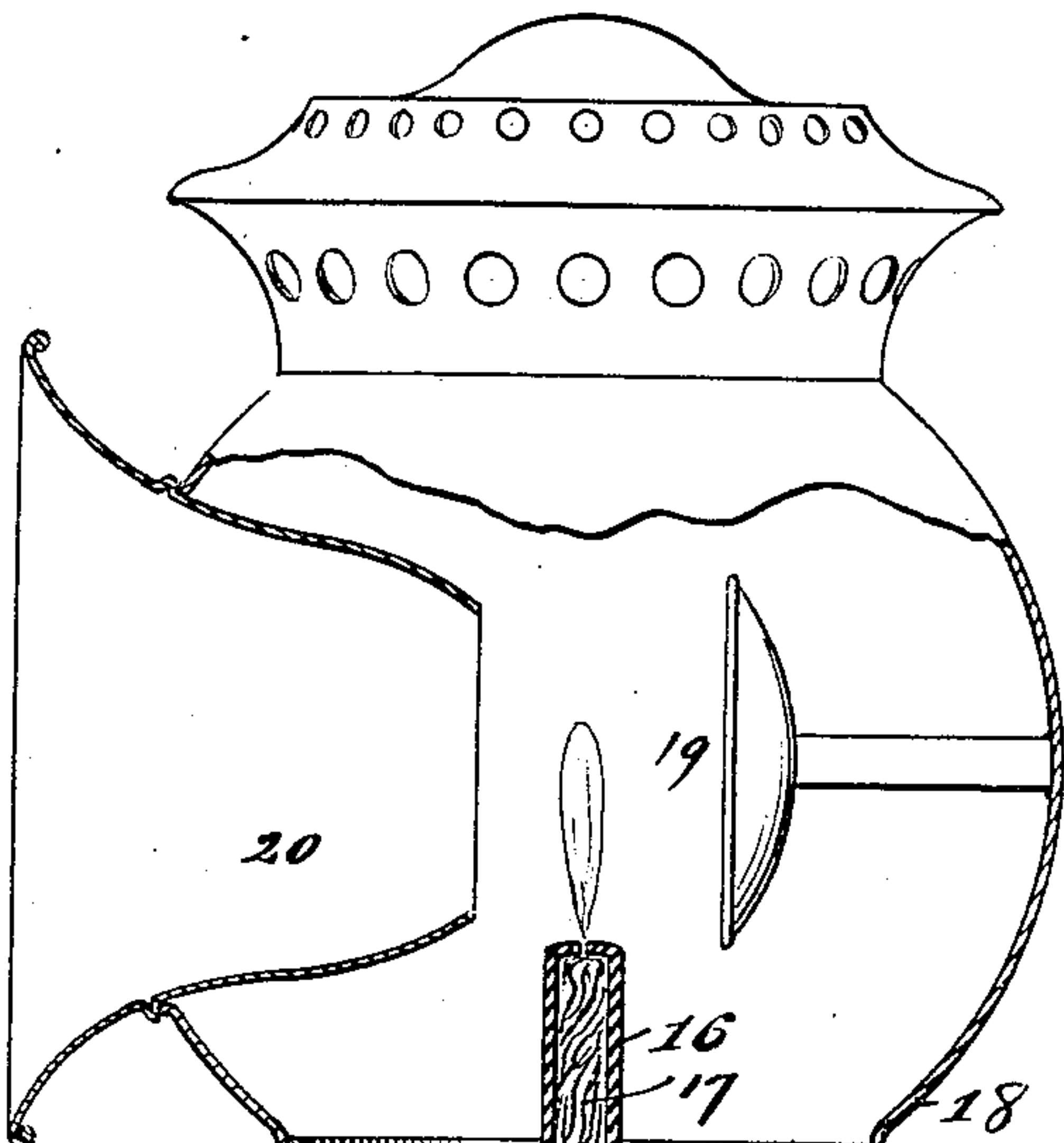


Fig. 2.

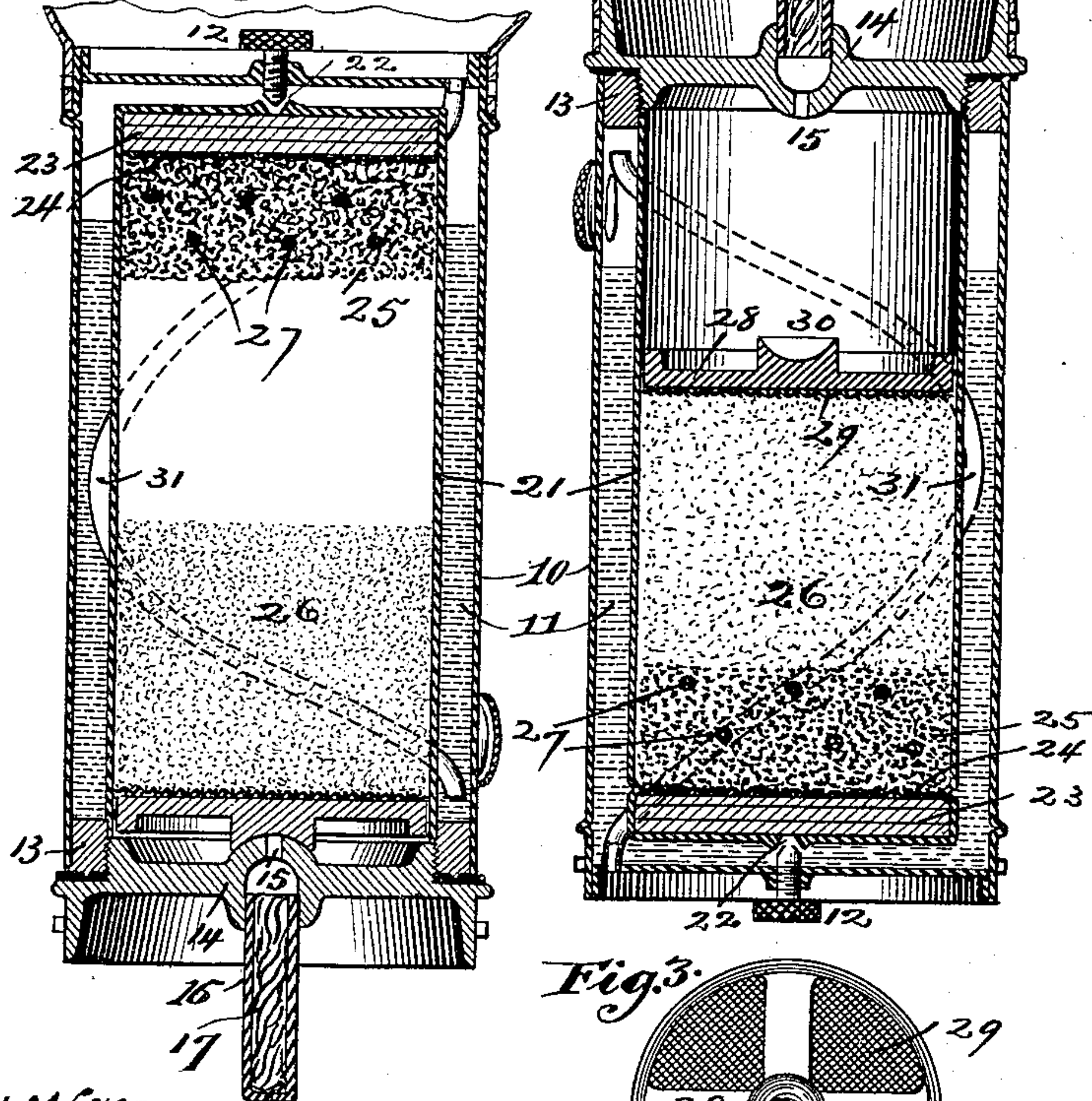
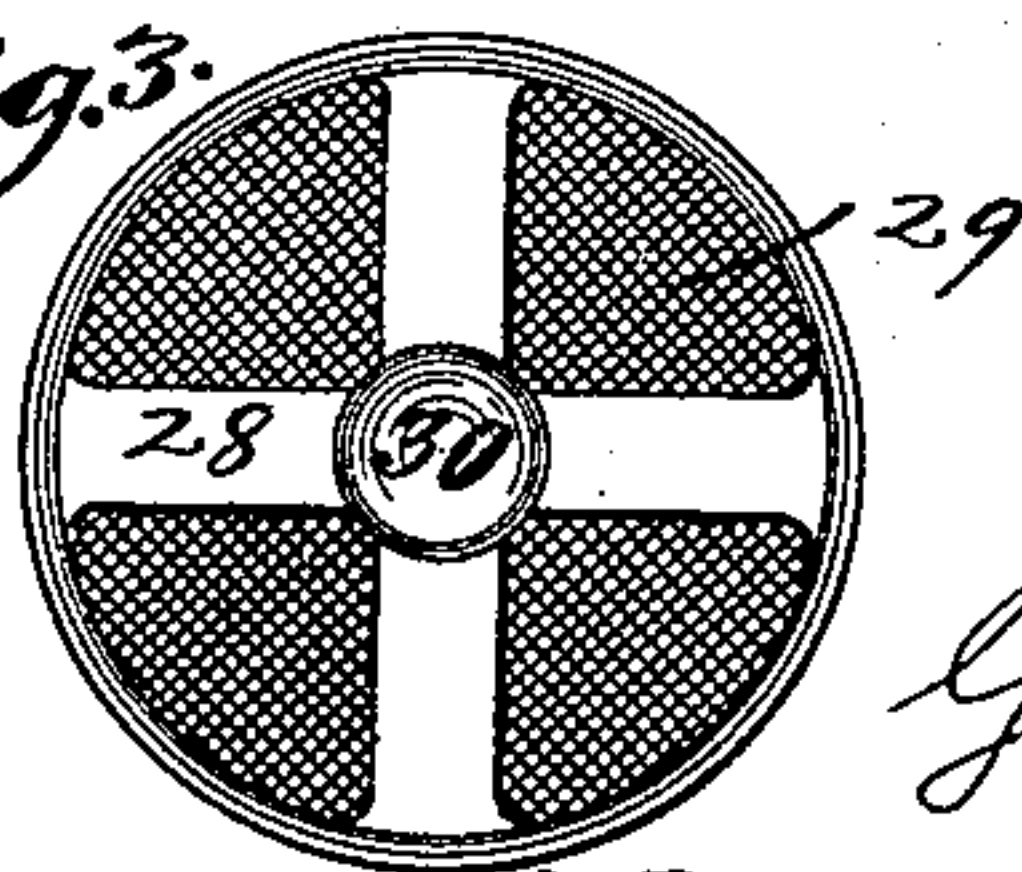


Fig. 3.



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# UNITED STATES PATENT OFFICE.

GEORGE L. HARVEY, OF CHICAGO, ILLINOIS.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 614,652, dated November 22, 1898.

Application filed February 23, 1897. Serial No. 624,518. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE L. HARVEY, of Chicago, Illinois, have invented certain new and useful Improvements in Gas Generators and Burners, of which the following is a specification.

My invention relates to that class of generators wherein a solid, such as calcium carbide, and a liquid, such as water, are brought into contact and a gas thereby generated.

My invention relates primarily to the generator itself, but it may be embodied in a lamp or lantern, and in such case will be provided with a suitable burner and also, if desired, with a globe, reflector, and other accessories.

My invention has two leading or principal objects—first, to separate the liquid from the solid, so that the generation of gas may be arrested by such separation, and, second, the separation of the spent or residuum from the active or unconsumed portion of the solid.

To these ends my invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 represents a lamp or lantern in sectional elevation through the gas-generating chamber and burner-tip, the globe being partially broken away. Fig. 2 is a sectional view of the gas-generating chamber inverted and attached to the base-ring of the globe, the latter being broken away; and Fig. 3 is a plan view of a follower having a perforated or reticulated body.

In the said drawings, let 10 represent a cylindrical casing, which provides a reservoir for a liquid, (indicated at 11.) This cylinder has a closed bottom through which may be threaded a regulating-valve 12. Within the upper end of the reservoir is secured a ring 13, threaded upon its interior to adapt it for engagement with the burner-base 14, said base having a perforation 15, leading to the tip 16. Said tip preferably has a filtering material 17 therein to prevent the burner-orifice from being closed by the solid or semisolid particles of carbon carried upwardly toward the burner-orifice by the gas, and which filtering material will also prevent the closing of the burner-orifice by the dry particles of

the carbide or other solid material used in the generation of the gas. The burner-base is detachably connected to the globe 18, which will have a bail or bracket by which it is carried when used as a lantern or as a vehicle-lamp and which may be provided with the usual reflectors 19 and 20.

Within the liquid-reservoir formed by the cylinder 10 is suspended an interior cylinder 21, which may have a threaded connection with the ring 13 at its upper end and which is provided in its bottom with a liquid-inlet 22 in line with the valve 12. I preferably place in the bottom of this cylinder 21, which forms the gas-chamber, one or more layers of absorbent or fibrous material, and I have found blotting-paper well adapted for my purpose. Over these layers I preferably provide a covering of wire-gauze 24, and upon the wire-gauze the solid material is placed. The spent portion of such material is indicated at 25 and the dry or unconsumed portion at 26. I preferably stretch wires transversely across the bottom portion of the generator-chamber and also employ a follower therein, consisting of a spider 28, over the openings of which wire-gauze 29 is stretched. In the central portion of the upper side of said follower is a stud 30, having a concavity therein which is adapted to fit over the bulb of the burner-base, so as to cover the gas-aperture 15. The follower serves by its weight to pack the spent or wet portion of the carbide, so as to cause it to adhere to the walls of the generating-chamber when the latter is reversed in position, and the follower also prevents the surface particles of the dry carbide from excessive movement, which free movement would tend to produce an excess of gas and also free dust particles, which would pass into the burner-tube.

Within the liquid-space is arranged a spiral tube 31, whose ends are open, the upper end to the liquid-chamber and the lower to the atmosphere, the body of the tube or duct being deflected, preferably, so as to permit the lamp to be turned in all positions.

In this apparatus the gas is generated in that position of the parts shown in Fig. 1, the water filtering through the layers in the bottom of the generator-chamber and the supply of water being regulated by the valve 12 and



the thickness of the layers of absorbent material. Air is supplied above the water through tube 31. Should an excessive pressure of gas be formed, it will escape through  
 5 the water-inlet and tube 31, and thereby diminish or cut off the water-supply. The gas-pressure will be dependent upon the size of the burner-orifice and the height of the water column above the inlet, and when the gas-  
 10 pressure exceeds the weight of the water column the excess will be relieved through the water and air inlets, the gas passing in the form of bubbles upwardly through the column of water in the water-chamber and thence  
 15 escaping downwardly and outwardly through the air-tube 31. To stop the generation of gas, the generator-chamber is reversed or inverted, its lower end being adapted for connection with the base-ring of the globe.  
 20 When inverted, the dry carbid separates from the moist, while the follower closes over the gas-aperture. The spent or moist portion of the solid will adhere to the walls of the chamber and to the retaining-wires and the dry  
 25 portion will fall away by gravity. The flame will be extinguished for lack of gas, and the safety of the device when used as a lamp or lantern is thus assured. The use of the tube permits the lamp to be placed in any position  
 30 without allowing the liquid to escape. The follower serves to pack the moist substance when the generator is in operative condition.

The size and form of the several parts are not essential. Obviously a gas-space of requisite cubical capacity is to be provided, and  
 35 as the solid portion somewhat increases in bulk by the accession of the water and its action the chamber should not be filled with the solid. Instead of the spiral tube a minute  
 40 orifice may be provided in the wall of the outer casing above the normal water-level, the escape of water through such orifice not being of consequence.

I claim—

45 1. In a gas-generator, the combination with

a generating-chamber of a water chamber or reservoir arranged concentrically thereto and an air-supply duct having one end opening within the water-chamber and near to one  
 50 end thereof, and its opposite end opening to the atmosphere near to the opposite end of said water-chamber and said duct being deflected between its ends, whereby air is supplied to the water-chamber above the body of water therein and excessive gas-pressure re-  
 55 lieved by the passage of bubbles thereof through the water column and out through the air-tube, the deflection of said tube preventing the escape of the water in all positions of the device substantially as and for  
 60 the purpose described.

2. In a gas-generator the combination with a generating-chamber adapted to contain a solid, such as calcium carbid, said chamber having a liquid-inlet therein, a reservoir or  
 65 liquid-chamber in open communication with said generating-chamber through said liquid-inlet and the generating-chamber being invertible whereby its liquid-inlet may be raised above the water-level and a sliding fol-  
 70 lower within the generating-chamber, said follower being freely movable whereby when the generating-chamber is in one position its weight is imposed upon the solid, while in the other position the solid is relieved from  
 75 said weight, substantially as described.

3. A gas lamp or lantern, having a body providing a flame-chamber, a burner extending into the flame-chamber, and a gas-generator invertibly connected with said body, sub-  
 80 stantially as described.

4. A gas lamp or lantern, having a body providing a flame-chamber and a gas-generator adapted for detachable connection with the body in two positions, substantially as  
 85 described.

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