

**No. 614,664.**

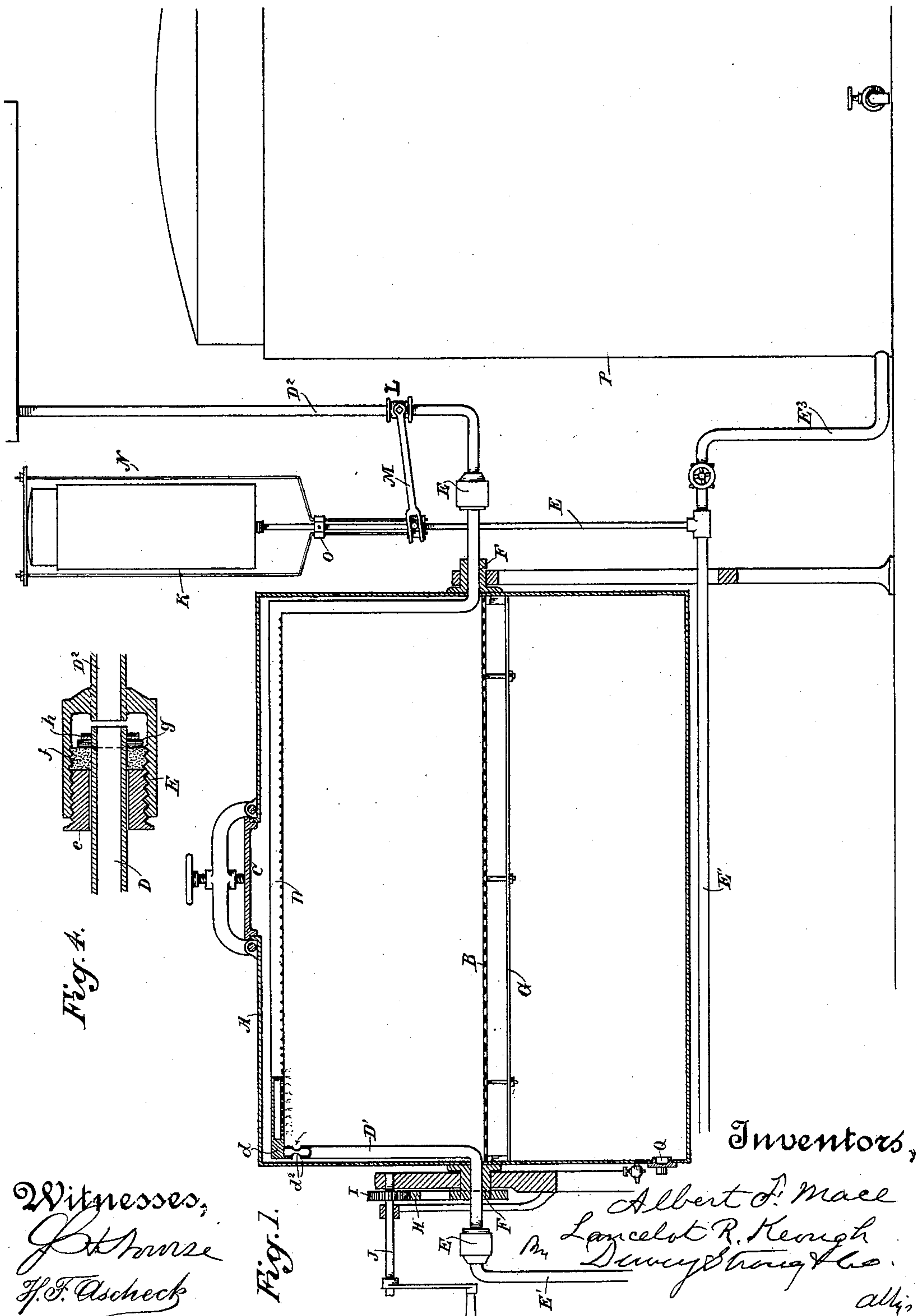
**Patented Nov. 22, 1898.**

**A. F. MACE & L. R. KEOUGH.**  
**ACETYLENE GAS GENERATOR.**

(Application filed May 4, 1898.)

(No Model.)

**2 Sheets—Sheet 1.**



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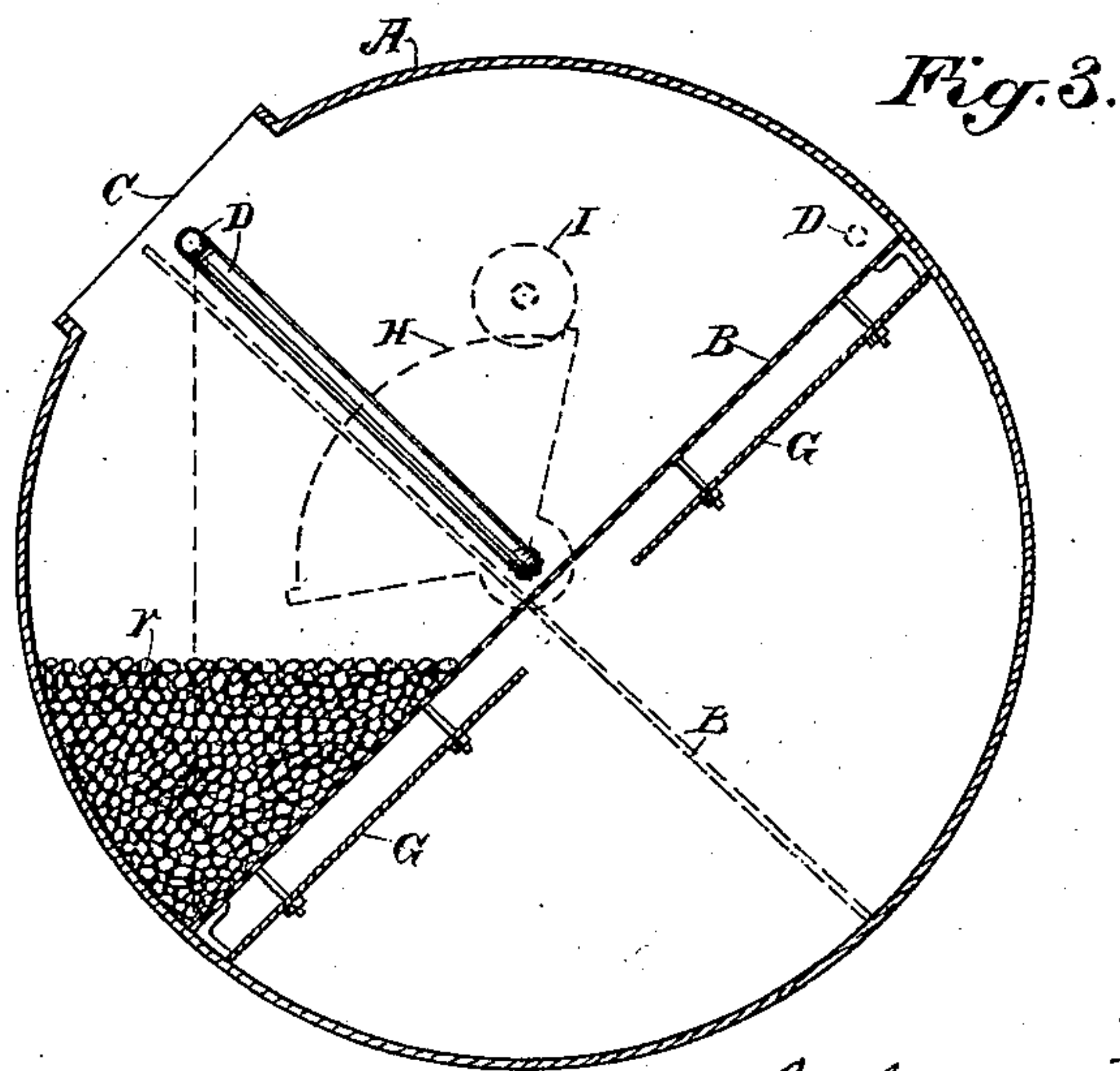
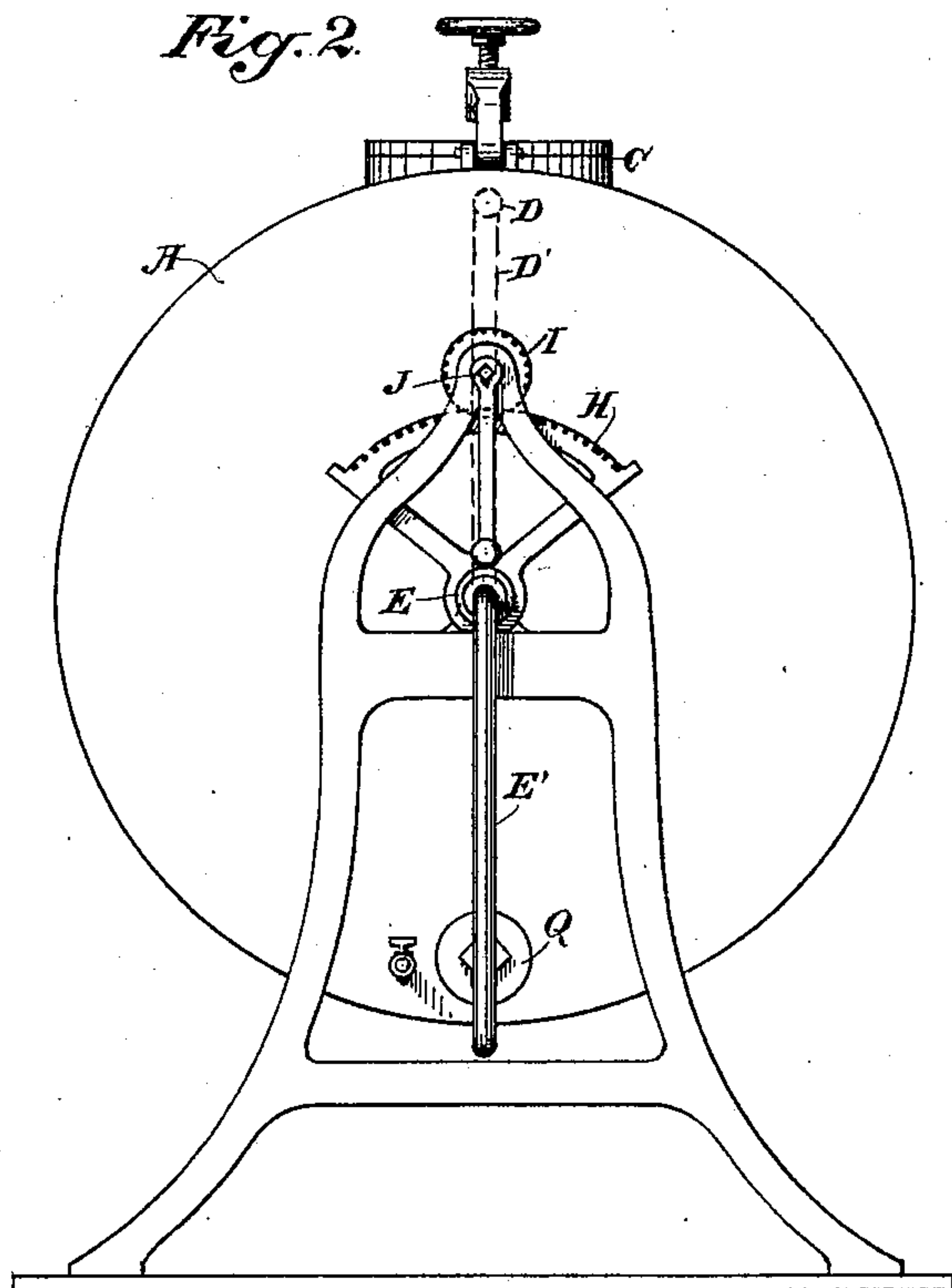
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

ALBERT F. MACE, OF STOCKTON, AND LANCELOT R. KEOUGH, OF OAKLAND,  
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## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 614,664, dated November 22, 1898.

Application filed May 4, 1898. Serial No. 679,663. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT F. MACE, residing at Stockton, county of San Joaquin, and LANCELOT R. KEOUGH, residing at Oakland, county of Alameda, State of California, citizens of the United States, have invented an Improvement in Acetylene-Gas-Generator Apparatus; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to an apparatus which is especially designed for the generation of acetylene gas; and it consists in the novel arrangement of the carbid-containing tray and in the novel method of removing the ash or residue from the carbid of calcium while the same is being used inside of a gas-tight cylinder or other receptacle and the mechanism by which it is operated and means for regulating the supply of water to the apparatus, and in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of the apparatus. Fig. 2 is a front view. Fig. 3 is a transverse section of the same. Fig. 4 is a section through a stuffing-box and connections.

The object of our invention is to provide an improved means for obtaining acetylene gas from carbid of calcium and to effect a sufficient disturbance or reversal of the carbid of calcium which is held and used in a gas-tight compartment, so as to quickly and efficiently remove the ash from the carbid for adjusting the mechanism by which the operation is carried out, so as to free the unused carbid of the ash which accumulates from that which has been used, and in regulating the supply of water by the movement of the gas produced.

Various devices may be employed to carry out this invention.

In the present case we have shown an exterior cylinder A of such size as the requirements of gas production would make necessary. Within this cylinder is fixed the carbid-containing tray or platform B. This tray is perforated and made foraminous in any suitable manner, and the carbid of calcium is introduced from the upper part of

the chamber or cylinder A through an opening C, which has a properly-disposed cover and means for securing it after the charge is introduced. Water is introduced above the charge of carbid of calcium after it has been placed upon the tray B through perforated or slotted pipe D, which extends along the upper part of the chamber A, thence down the inner side, and thence outwardly through the heads of the cylinder and journals to which the pipe is fixed and with which it is turnable, and into suitable stuffing-boxes E, where the continuations of the pipes join the opposite ends, as will be hereinafter described.

The journals F of the cylinder are supported in suitable standards, so that the cylinder and this portion of the water-pipe within it may be turned from side to side, moving through an arc of a circle, so that the tray or platform B may be tilted first to one side and then to the other. Beneath this perforated tray B are closed diaphragms G, situated a short distance from the lower surface of the tray and extending from the sides of the cylinder to a point near the center, where an open space is left between the edges of these trays. Upon the exterior journal-shaft, at one end, is fixed a gear or segment H, and this is engaged by a pinion I upon a crank-shaft J, by which it may be turned to either one side or the other, and by this means the cylinder may be tilted as far as desired in either direction. The operation of this portion will then be as follows: The water being admitted through the spray-pipe D will be delivered upon the top of the body of carbid within the chamber and the production of gas will commence, the gas being conveyed away, as will be hereinafter described. As the gas is produced and the surface of carbid is exhausted it is necessary to in some manner dispose of the ash or residue which is thus produced in order to expose a new body of the carbid for the action of the water. This is effected by turning the cylinder so as to tilt the tray B to a sufficiently-sharp incline to cause the mass of carbid to roll and change position, so as to lie in the angle formed between the tilted tray B and the side of the cylinder, and in doing this there will be a



certain reversal of the material which will eventually carry the exhausted residue to the bottom, where it will pass out through the perforations in the tray and will drop into the lower part of the cylinder. The water-pipe D being so fixed that it moves with the cylinder, the water dripping from the pipe will strike along the center line of the carbid held in the space between the side of the cylinder and the tilted tray, and when turned to the opposite side will likewise strike the center line of the carbid. After the apparatus has remained in this position a certain length of time it may be again reversed by turning the cylinder in the opposite direction, so as to tilt the tray B to incline in the other direction. This movement causes the material upon the tray to again roll down to the opposite side and another portion of the waste material will be discharged through the holes in the tray. This operation is continued until the body of carbid within the chamber has been entirely used, when the apparatus can be again recharged. The waste is removed from time to time through a suitable discharge-opening Q in the lower part of the cylinder, and a cock similarly located serves for the discharge of any water or air at the beginning of the operation.

In order to prevent the residue which has already been discharged into the lower part of the cylinder from clogging the holes in the bottom of the tray B, the diaphragms G, previously described, extend from the sides toward the center of the cylinder, so that when the cylinder is tilted to one side any residue which has passed through and fallen upon the diaphragm G at the upper side will slide downwardly and pass out through the central space between the two diaphragms, and each tilting of the cylinder to one side or the other causes a similar operation. The diaphragms being tight will prevent the mass of material which has already been deposited in the lower part of the cylinder from being thrown up against the bottom of the perforated tray when tilted to either angle, thus leaving the tray at all times clear for the passage of the waste.

As previously described, the water-pipe D has two branches extending from its ends toward the center within the heads of the cylinder. One of these branches is intended for the admission of water to the pipe. A stop is fitted in the other end of the pipe D, as shown at *d*, and this prevents the water from passing in that direction. The branch D', which extends from this top toward the center, has openings or perforations *d*<sup>2</sup>, through which the gas may enter into the part D', passing thence out through the journal and stuffing-box E, as shown, into a connecting-pipe E', which also terminates in the stuffing-box with its open end adjacent to the end of the pipe D'. The stuffing-box is so constructed as to allow that portion of the pipe connected with the cylinder to turn with the

cylinder, while the portion E', which conveys the gas away, remains stationary, the joint being kept tight by the stuffing-box. The gas passes through the pipe E' and thence into a small gasometer K, which is supported in line above the upturned end of the pipe E', and this small gasometer serves as a regulator for the water-supply, as will be hereinafter described. The end of the pipe D which projects through the journal at the water-supply end of the cylinder meets with a similar pipe D<sup>2</sup> within the stuffing-box E, so that communication may be made between the two without leakage at the joint, while the pipe D being connected with the cylinder is turnable with it.

The stuffing-box may be of any suitable construction. In the present case we have shown a hollow cylindrical box E, having a screw-gland *e*, adapted to fit into one end and compress the packing *f* against a washer *g*, located within the stuffing-box, this compression being sufficient to make the joint tight. A collar *h*, outside of the washer *g*, prevents the portion D of the pipe from being drawn bodily out of the stuffing-box.

Both of the stuffing-boxes E are arranged in a similar manner, a description of one answering for the other.

In order to regulate the supply of water to the apparatus, we have shown a cock L in the water-pipe D<sup>2</sup>, having a lever-arm M extending from it and connecting with rods N, and these rods pass through guides upon a clamp O, which incloses the upwardly-projecting gas-pipe E' and which is secured to said pipe. The rods N diverge just above this guide and extend up on each side of the gasometer-tank, having a bar across the top, which connects directly with the gasometer K. It will thus be seen that as the gasometer rises and falls it moves the rods N with it, and as these rods are connected with the lever M, as shown, this lever will be moved up or down as the gasometer fills or empties. This gasometer is of comparatively small size and is intermediate between a gas-producing apparatus and the main gasometer P, into which the gas for use is conveyed by a branch pipe E<sup>3</sup>, as shown, the object of this small gasometer being to act quickly by any increase or decrease of the gas, and thus automatically operate the cock by which the water is supplied.

*r* represents a pile of the carbid in the angle of the tray and cylinder.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for producing acetylene gas, a cylindrical chamber with means for introducing carbid of calcium in charges, a perforated tray or holder fixed across the interior and forming a support for the carbid, a spray-pipe turnable with the cylinder and through which water is delivered into the upper part of the horizontally-journaled cylinder so as to discharge upon the body of car-



bid, and mechanism by which the cylinder is oscillated upon its journals so as to alternately tilt the containing-tray to an angle upon either side whereby the mass of carbid rolls and shifts its position so as to be contained in the angle formed between its support and the inner wall of the cylinder.

2. In an apparatus of the character described, an exterior containing horizontally-journaled cylinder, and mechanism by which it may be turned a part of a revolution in either direction, a perforated tray or holder fixed within the cylinder and adapted to receive charges of carbid of calcium, pipes through which water is introduced to act upon the carbid contained within the cylinder and to convey away the gas when produced, and closed partitions situated below and essentially in parallel planes with the carbid-tray, said partitions having a space central between them for the discharge of waste which passes through the trays.

3. In an apparatus of the character described, a horizontally-journaled cylinder having an interior perforated tray fixed to form a support for carbid of calcium, means for introducing the same in charges upon said tray, mechanism by which the cylinder is alternately tilted so that the tray stands at an angle to one side or the other of a vertical central plane, closed diaphragms extending beneath the trays from the sides and ends of the cylinder and having an open space centrally between them, a pipe fixed and passing through one of the journals of the cylinder, bent within the cylinder and having a perforated spray portion extending along the upper periphery of the cylinder with which it is movable, and a stationary connecting-pipe with a loose intermediate joint whereby water is supplied thereto, a second pipe correspondingly leading outward through the opposite journal of the cylinder and perforated for the admission of gas which escapes there-through to the gasometer, a regulating-valve in the water-pipe having a lever-arm by which it is turned to open or close and a small rising-and-falling gasometer intermediate between the generator and the main gasometer, said intermediate gasometer being connected directly with the lever-arm of the water-con-

trolling cock whereby the movements of said gasometer open or close the cock and regulate the supply to the generating-chamber.

4. In an apparatus of the character described, a horizontally-journaled cylinder having an interior tray extending from one side to the other to divide the cylinder into separate compartments, said tray being perforated throughout and adapted to support a mass of carbid of calcium, means for spraying water upon said carbid and means whereby the cylinder is rocked about its journals to cause the carbid to roll and shift its position on the tray from one side of the cylinder to the other, and thereby separate its ash or residue, which sifts through the tray into the chamber beneath.

5. In an apparatus of the character described, a horizontally-journaled cylinder and a perforated tray fixed therein said cylinder having a water-pipe entering one of the journals, which water-pipe is fixed to and moving with the journal, and bent within the cylinder so as to bring the perforated or slotted spray portion along the upper periphery of cylinder so that when cylinder is turned or tilted to either side the water from pipe will strike along the center line of the carbid held in the chamber between the side of cylinder and perforated tray.

6. In an apparatus of the character described, a horizontally-journaled cylinder, a tray fixed therein, extending from one side to the other and perforated substantially throughout, and forming separate chambers above and below, a superposed water-supply, means for oscillating the cylinder whereby the carbid, supported on the tray, is caused to roll across the tray and thereby separate its ash or residue, which passes through the tray into the lower chamber, the gas and water pipes and the intermediate rotary joint connections.

In witness whereof we have heréunto set our hands.

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LANCELOT R. KEOUGH.

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