

No. 719,303.

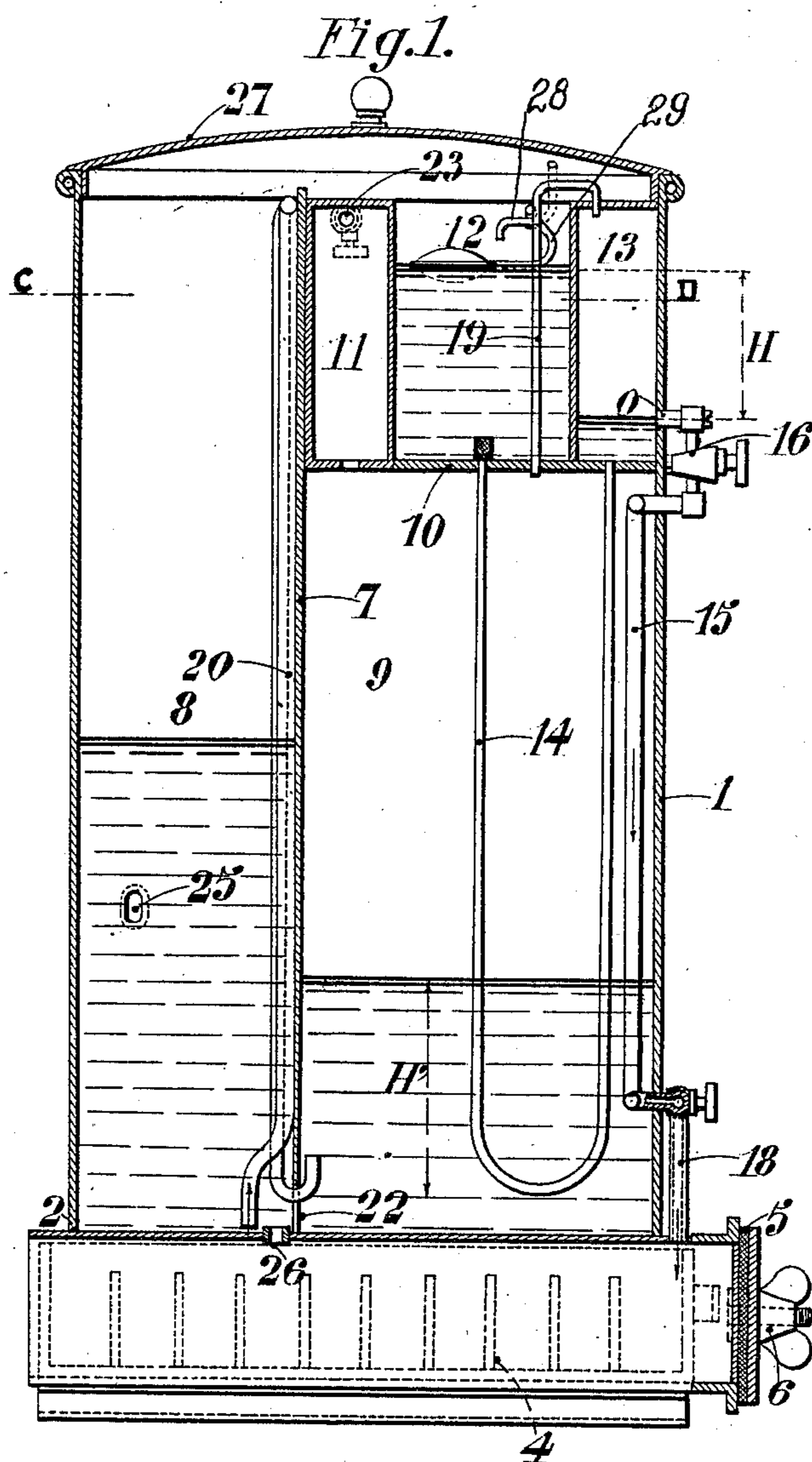
PATENTED JAN. 27, 1903.

J. CHOLET.
ACETYLENE GAS GENERATOR.

APPLICATION FILED JUNE 19, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
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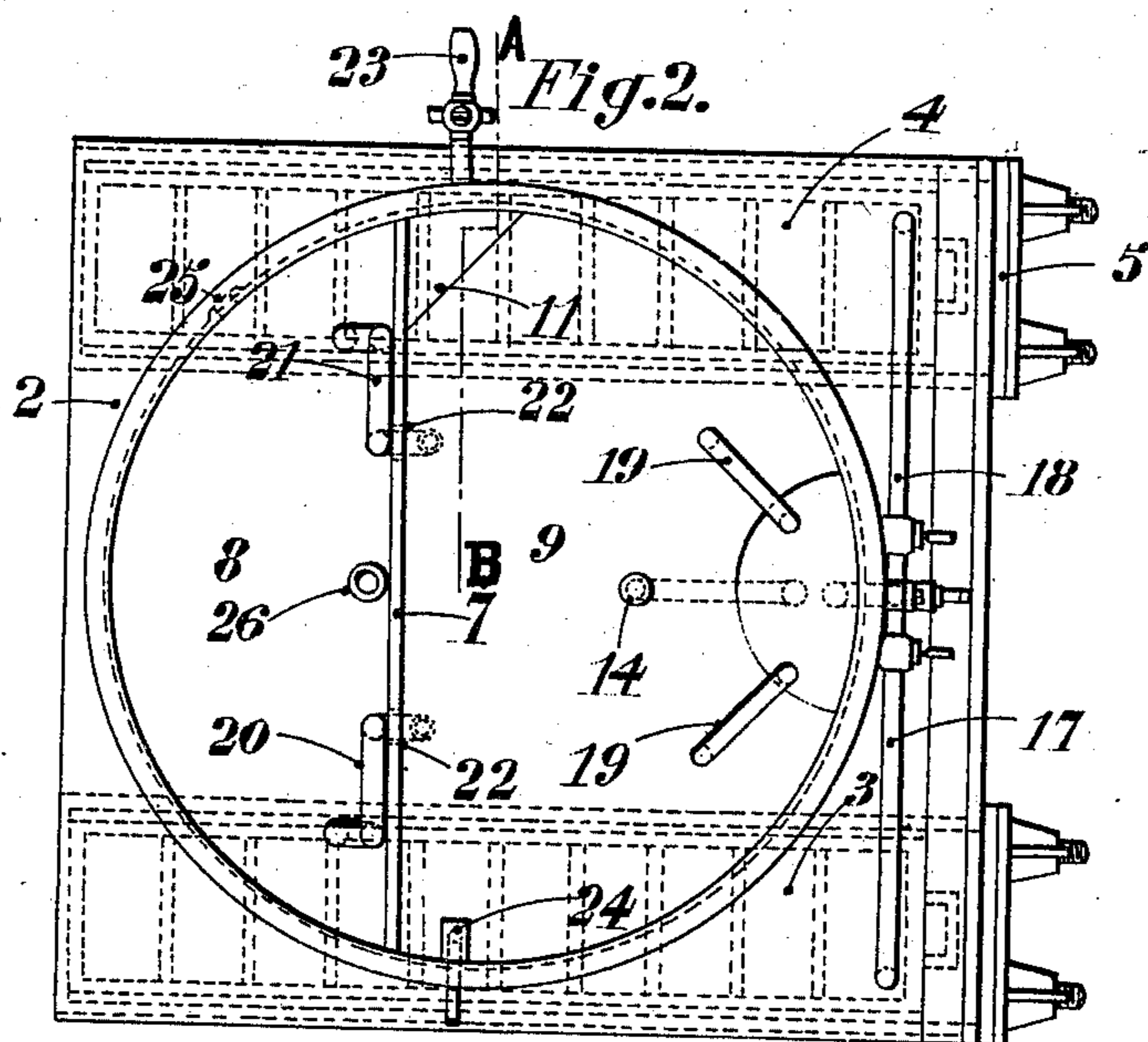
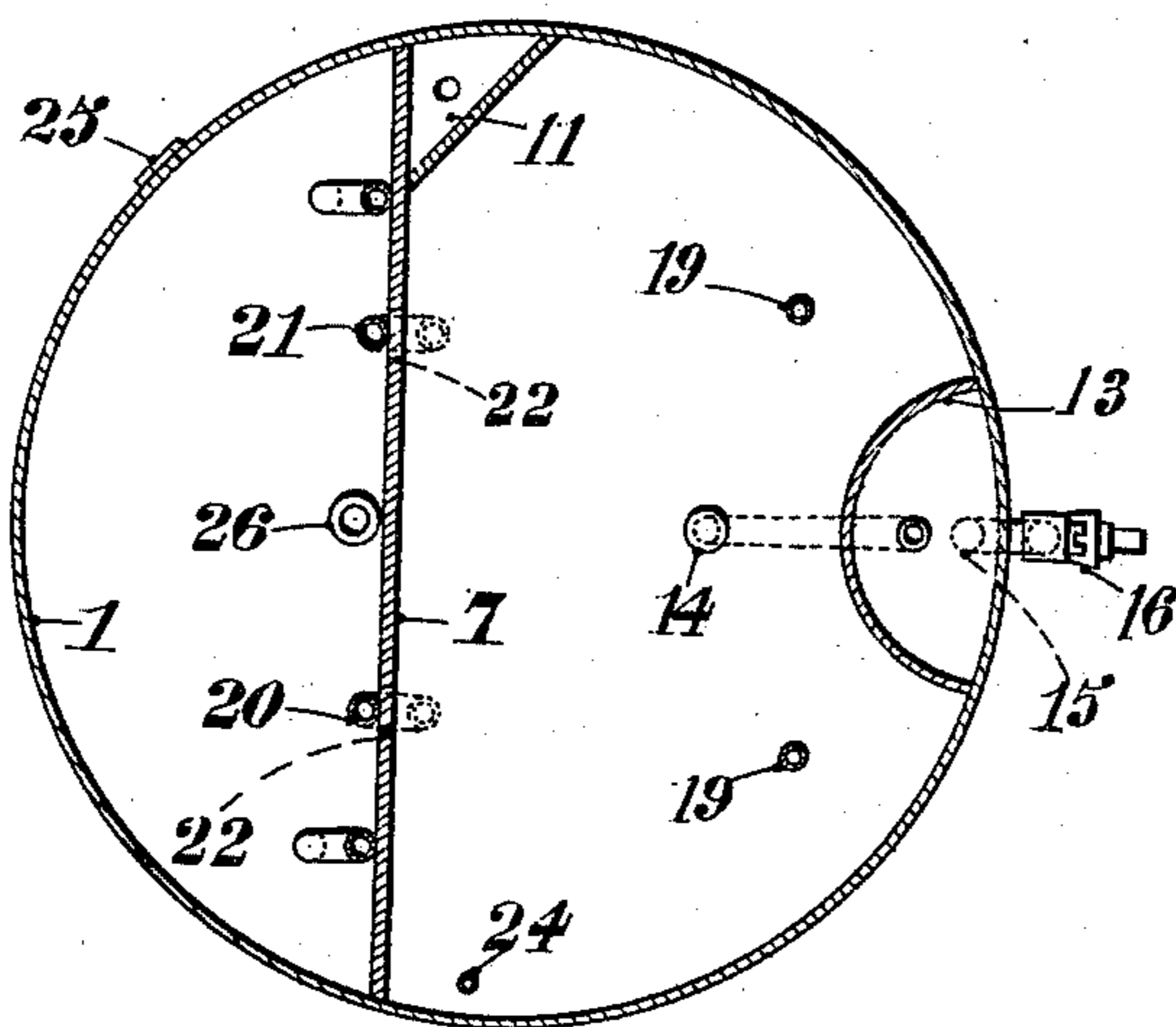


Fig. 4.



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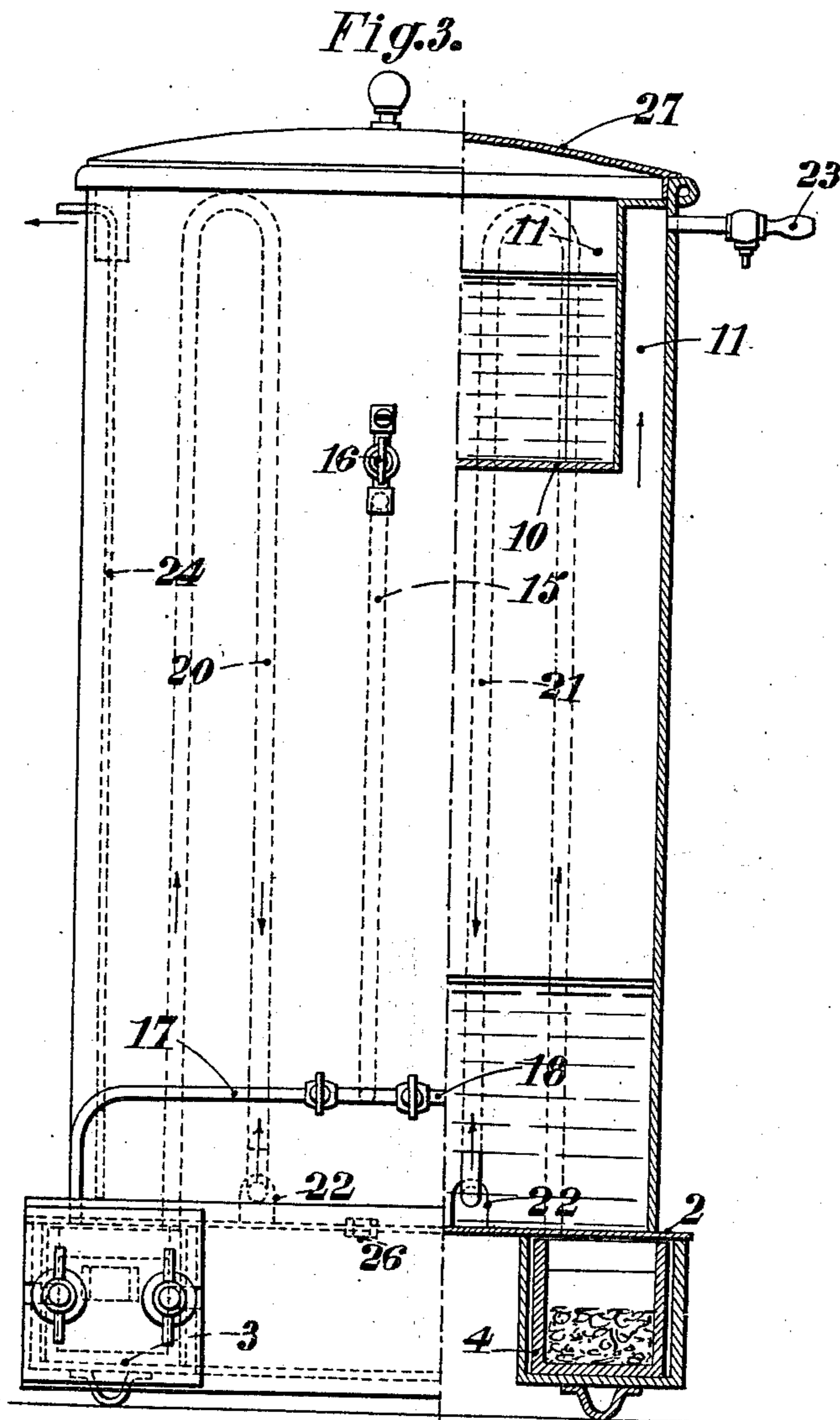
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NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOSEPH CHOULET, OF ALGIERS, ALGERIA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 719,303, dated January 27, 1903.

Application filed June 19, 1902. Serial No. 112,371. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH CHOULET, engineer, a citizen of the French Republic, residing at Algiers, Algeria, (post-office address, 83 Rue de Constantine, Algiers,) have invented certain new and useful Improvements in Apparatus for Use in the Production of Acetylene Gas, of which the following is a specification.

This invention relates to apparatus in which the liberation of acetylene gas is produced by adding water to carbide of calcium; and it has for its object to provide an apparatus which operates for a very long period of time with great efficiency and safety, the said apparatus being arranged so as to occupy but small space, while giving a considerable quantity of gas; and in order that my invention may be fully understood I will now describe the same with reference to the accompanying drawings, of which—

Figure 1 is a central vertical section of the apparatus. Fig. 2 is top view of the same, the lid being removed therefrom. Fig. 3 is a side view of the apparatus, partly shown externally and partly in section through line A B of Fig. 2. Fig. 4 is a horizontal section through the upper part of Fig. 1, showing the shape of the chambers 11, 12, and 13.

The main casing 1 or body part of the apparatus is cylindrical or of rectangular or other convenient form and rests upon a square or other suitably-shaped base 2, in which are provided spaces for boxes 3 and 4, containing the carbide. These boxes are divided into compartments which the water successively enters as the carbide becomes exhausted. The said spaces are closed by tight covers 5, which can be secured, for example, by screw-bolts 6.

The casing or body part 1 is divided by a partition 7 into first and second chambers 8 and 9, communicating at bottom. The first chamber 8 may be open to the air; but the second chamber 9 is closed above by a partition 10, above which are a third chamber 11, (preferably triangular,) in communication with the second chamber 9 and from which the supply of gas is drawn off, a vat 12, isolated from the second chamber 9 and forming the feed-water reservoir, and a closed chamber 13, which I will call the "regulating-chamber." The interior of this regulat-

ing-chamber communicates with the feed-water reservoir 12 by a trap-tube 14 and with the boxes containing the carbide by a pipe 15, on which is a distribution-cock 16. This pipe branches off into two parts 17 18, with cocks allowing the water to be directed on the one or the other of the said boxes. In order to protect the pipes, they may be situated inside the aforesaid second chamber, as shown. The top of the regulating-chamber 13 communicates on either side with the chamber 9 by pipes 19. From each of the boxes containing the carbide 3 and 4 lead, respectively, gas-pipes 20 21, which are preferably fixed along the partition 7 between the first and second chambers and rising to the upper part and then redescending and terminating in a bent portion at the lower part of the chamber 9 after passing through openings 22 beneath the partition 7. On the upper part of the chamber 11 is the gas-supply pipe 23, and a waste-pipe 24 enters the water contained in the chamber 9 and branches off at the sides of the apparatus. In the chamber 8 is a level stopper 25 and at bottom a discharge-stopper 26.

The apparatus is closed by a lid 27, which need not be a tight closure.

The working of the apparatus is as follows: After having placed carbide in the boxes 3 and 4 to about a third of the height of the divisions therein and introduced the boxes into their receptacles and after having closed all the cocks except cock 23 water is introduced into the chambers 8 and 9 up to the height of the opening, which is afterward closed by the level stopper 25. Cock 23 is then closed. Water is also introduced into the feed-water reservoir 12 by a water-pipe 28, which may be provided with a ball-cock 29 to maintain a constant level of water, the height of which above a drain-hole α , situated at a short distance above the bottom of the regulating-chamber 13, determines the minimum pressure in the apparatus. From the feed-water reservoir 12 the water enters by the trap-tube 14 into the regulating-chamber 13, and the apparatus is ready to work. If the cock 16 for supplying water to the carbide-boxes and also the cock on one or other of the branches 17 18 be opened, water enters one of the said boxes 3 or 4 and the evolution of gas com-

mences. The gas ascending through the water-supply pipes 17 and 15 traverses the regulating-chamber 13 and enters the chamber 9 by the tube 19, where it becomes cooled, its pressure lowering the level of the water in the chamber 9 and in the bent pipe 20, passing under the partition, as aforesaid, while the level of water in the chamber 8 rises. The chamber 9 and the regulating-chamber 13 being in communication by the tube 19, the pressure of the gas will be balanced in these two chambers, and as the pressure in the regulating-chamber is at the minimum equal to the height, H representing the difference between the level of the outlet *o* in the regulating-chamber 13 and the water-level of the feed-water reservoir 12, and as the maximum is very little superior to this height, the pressure of the apparatus can be regulated within very narrow limits. When the production of gas increases, the pressure in the regulating-chamber forces down the water above the outlet *o*, so that the flow of water ceases, and consequently the production of gas is lessened. As soon as the pressure of the gas diminishes, either by reason of the lessening of production or by reason of an excess of consumption, the water in the regulating-chamber reascends and the apparatus resumes its normal working. If the water-supply cock 16 be closed, the production of gas does not immediately cease, and since the passage 15 13 19 for it is closed the pressure in the calcium-box will be increased to an extent that might become dangerous. The pressure of gas then drives back the water in the pipe 20, whose bent end passes under the partition, as aforesaid, and as soon as it has overcome the pressure of the depth or column of water H' the gas from the carbid-box will freely enter the chamber 9. If the pressure still increase, the water in the chamber 9 will be driven back, and when it has reached the waste-pipe 24 the surplus gas will escape, and this will be the case if through any other kind of defective working the pressure increases to a dangerous degree. When the carbid in all the divisions of the one box 3 is exhausted, the cock on the branch pipe 18 to the other box is opened and the action is continued, as aforesaid. The operation is therefore of very long duration, which may be further increased by providing three or a greater number of carbid-boxes. This will not entail any modifications, except in the arrangement of the water-supply pipes 17 and 18 and the safety-pipes 20 21.

The arrangement is characterized by its regular working and by the smallness of the space which it occupies. The internal arrangement of the various compartments may, moreover, be varied without departing from the nature of the invention—for example, by giving the various chambers any convenient shape, say by extending them in a horizontal direction, so as to occupy a minimum height, which would allow of the application

of the apparatus to railway-carriages, for example.

A very considerable advantage of my apparatus is that it allows of the recharging of the carbid-boxes without stopping the work.

Having now particularly described and ascertained the nature of my invention and in what manner it may be performed, I declare that what I claim is—

1. In an apparatus of the character specified, the combination of a first chamber open at the top, a second chamber closed at the top, said chambers being adapted to contain a body of liquid, a waste-pipe in said second chamber, a communication between the lower portions of said chambers, a feed-water reservoir, a regulating-chamber, a connection between said reservoir and said regulating-chamber, a communication between the upper part of said regulating-chamber and said second chamber, a receptacle for containing gas-generating material, a communication between said regulating-chamber and said receptacle, a passage leading from said receptacle to said second chamber, said passage first extending above the body of liquid contained in said second chamber and then terminating below the surface of said liquid, and means for drawing off the gas contained in said second chamber.

2. In an apparatus of the character specified, the combination of a first chamber open at the top, a second chamber closed at the top, said chamber being adapted to contain a body of liquid, a waste-pipe in said second chamber, a communication between the lower portions of said chambers, a feed-water reservoir, a regulating-chamber, a connection between said reservoir and said regulating-chamber, a communication between the upper part of said regulating-chamber and said second chamber, a receptacle for containing gas-generating material, said receptacle consisting of a number of separate compartments open at their upper portions, a communication between said regulating-chamber and said receptacle, a passage leading from said receptacle to said second chamber, said passage first extending above the body of liquid contained in said second chamber and then terminating below the surface of said liquid, and means for drawing off the gas contained in said second chamber.

3. In an apparatus of the character specified, the combination of a first chamber open at the top, a second chamber closed at the top, said chambers being on approximately the same level and being adapted to contain a body of liquid, a communication between the lower portions of said chambers, a waste-pipe in said second chamber, a feed-water reservoir located above said second chamber, a regulating-chamber on approximately the same level as said reservoir, a connection between said reservoir and said regulating-chamber, a communication between the upper part of said regulating-chamber and said

second chamber, a plurality of separate receptacles for containing gas-generating material located beneath said first and second chambers, each of said receptacles being divided into a number of separate compartments, open at the top, by partitions, a main pipe leading downwardly from said regulating-chamber, a cock in said pipe, plurality of branch pipes, each leading from the end of said main pipe to one of said receptacles, a cock in each of said branch pipes, a passage leading from each of said receptacles, each of said passages first extending above the surface of the body of liquid contained in said second chamber and then terminating below the surface of said liquid, and means for drawing off the gas contained in said second chamber.

4. In an apparatus for use in the production of acetylene gas, the combination of a first chamber, a second chamber, a commu-

nication between said first and second chambers, a feed-water reservoir, a regulating-chamber connected with said reservoir, a communication between said regulating-chamber and said second chamber, a receptacle for containing gas-generating material communicating with said regulating-chamber, a passage leading from said receptacle to said second chamber, said passage first extending above the body of liquid contained in said second chamber and then terminating below the surface of said liquid, and means for drawing off the gas contained in said second chamber.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH CHOULET.

Witnesses:

FRÉDÉRIC SECORD,
LOUIS PIEROT.