

No. 710,159.

Patented Sept. 30, 1902.

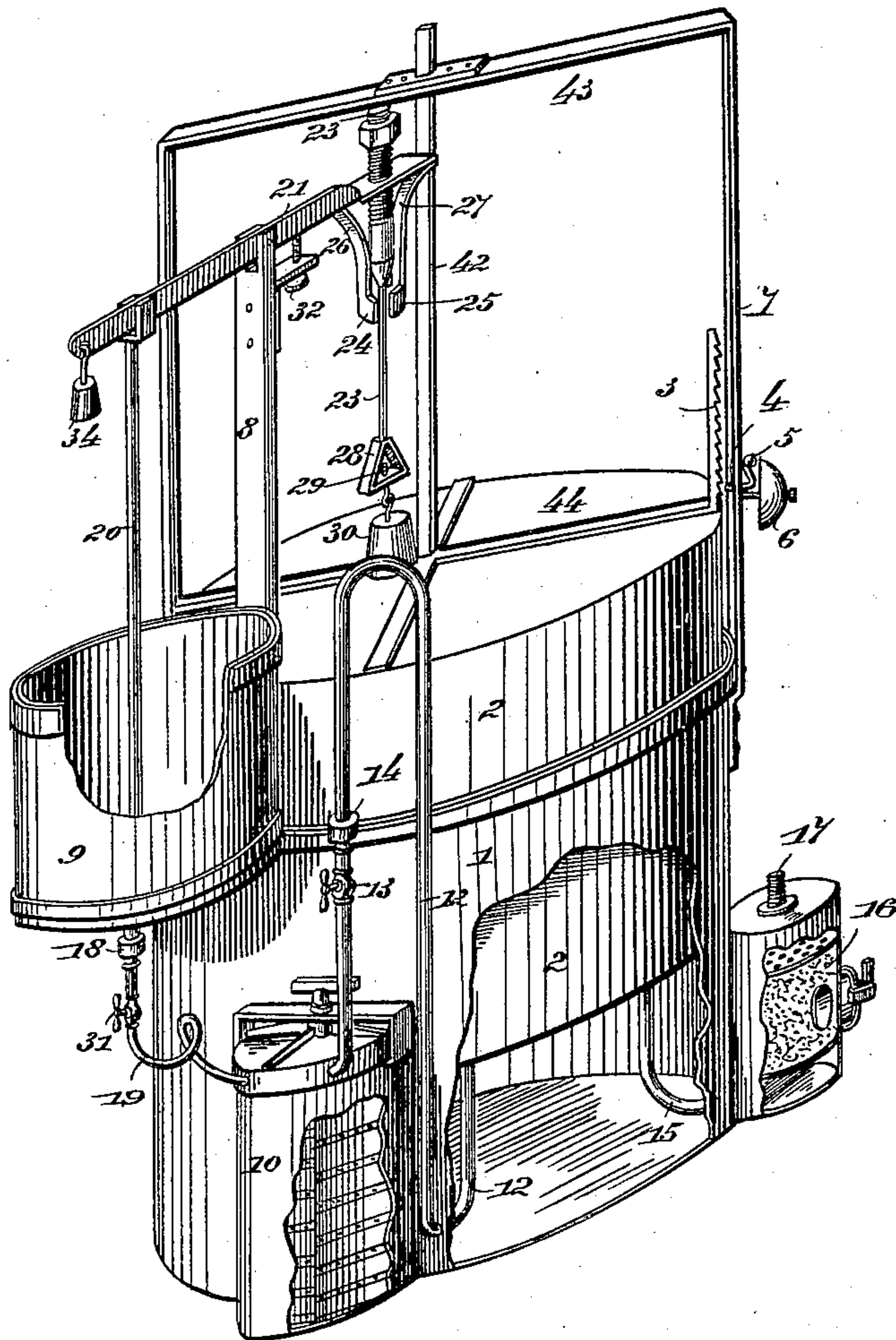
J. LEDRU.
ACETYLENE GAS GENERATOR.

(Application filed Apr. 9, 1902.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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2 Sheets—Sheet 2.

Fig. 2.

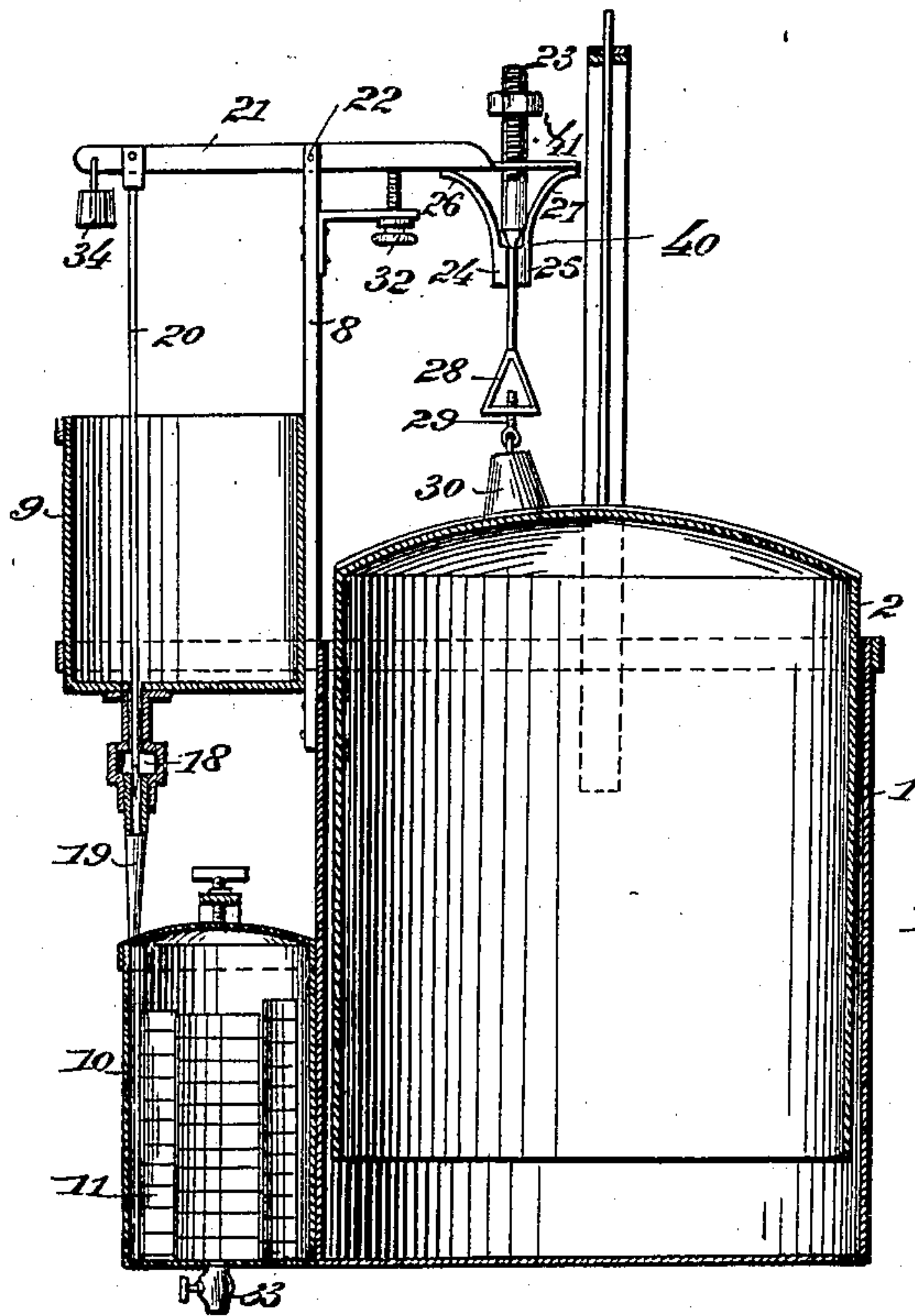
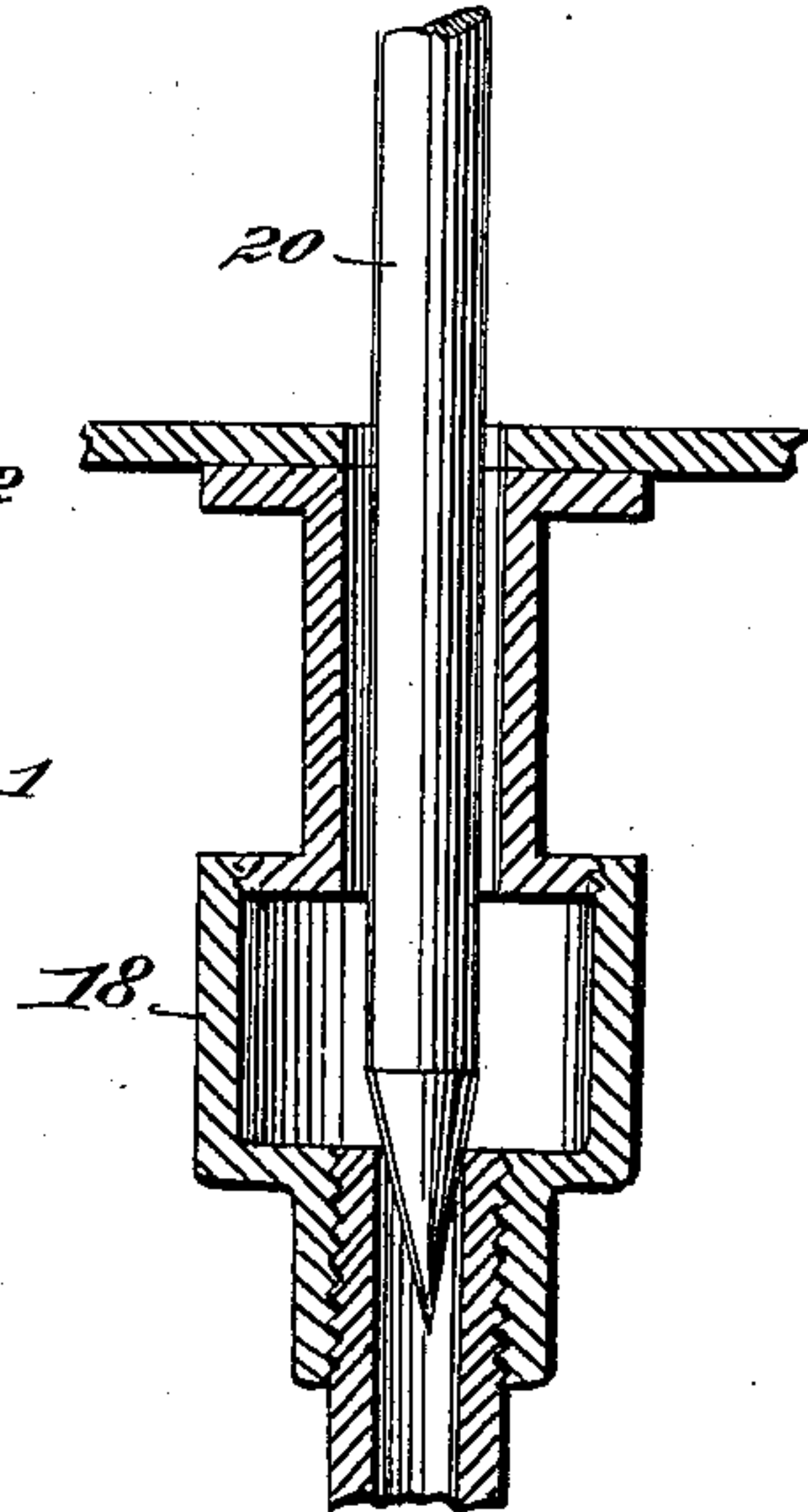


Fig. 3.



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JÉRÔME LEDRU, OF BASÈCLES, HAINAUT, BELGIUM.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 710,159, dated September 30, 1902.

Application filed April 9, 1902. Serial No. 102,030. (No model.)

To all whom it may concern:

Be it known that I, JÉRÔME LEDRU, of Basècles, Hainaut, Belgium, have invented certain new and useful Improvements in Acetylene-Gas-Generating Plants, of which the following is a specification.

My invention relates to acetylene-gas-generating plants; and its special objects are to provide means for automatically supplying the water to the gas-generator in accordance with the requirements of the service, means to prevent excessive gas generation and consequent explosion, while at the same time enabling the apparatus to operate safely without attention.

The accompanying drawings show the preferred form of acetylene-gas-generating plant whereby I am enabled to attain the aforesaid objects, and in which—

Figure 1 is a perspective view of the complete apparatus. Fig. 2 is a vertical section of the same. Fig. 3 shows the means for regulating the supply of water to the gas-generator.

My invention is embodied in a compact apparatus and comprises, broadly, a gasometer, a gas-generator, and a water-tank, with automatic regulating device for controlling the supply of water to the gas-generator.

The gasometer consists of a cylindrical tank 1, containing water and fitted with a movable bell 2, which is vertically guided by a central slide-rod 42, adapted to move in the bore of a cross-bar 43, the lower extremity of said bar 42 being firmly secured to cross-bars 44 upon the top of the bell.

To one end of the cross-bars 44 is connected a rack 3, which, as shown in Fig. 1, is disposed vertically and with the rack-teeth facing outward. When the bell descends, the rack-teeth operate a hammer-rod 4, connected with a hammer 5 of a bell secured to the upright 7, fixed to the cylindrical tank 1. The top end of the gasometer-tank is strengthened by a strong iron hoop connected with another hoop fixed around the body of the water-supply tank 9, open at top and containing the feed-water for the gas-generator. The said supply-tank is supported on brackets fixed to the stationary part of the gasometer. To the lower end of the gasometer and beneath the water-supply tank is further fixed the

gas-generator, which consists of a cylindrical vessel 10, closed at top by a gas-tight cover. In the interior of the generator are placed baskets or trays containing calcium carbide. These trays are so disposed that the water from the supply-tank 9, flowing through the tube 19, is caused to act successively upon the carbide contained in the superposed trays 11 by gradually rising in the interior of the generator. The form of carbide-tray may conveniently be of triangular shape and disposed to form a regular hexagonal design in plan, although any other shape may equally well be adopted.

The gas evolved in the generator is delivered into the gasometer through the tube 12, (see Fig. 1,) said tube being fitted with a cock 13 and with a non-return valve 14 to prevent back pressure from the gasometer. In order to withdraw the gas from the gasometer for utilization, it passes from the latter through a tube 15, through a purifier 16, filled with wadding and other filtering material to free it of all impurities, and finally through the tube 17 into the service-pipe. The essential feature of my invention consists in the automatic regulation of the water-supply to the gas-generator to suit variations in the service. For this purpose the water-supply tube 18 is fixed to the under side of the tank 9, which supplies all the water required for the generation of the gas through the tube 19, and the flow thereof may be regulated or cut off by a pin-valve 20, the rod of which is pivoted to a balance-lever 21, adapted to oscillate on a pin 22, carried by a support 8. Near the rear of the balance-lever is formed a round hole in which a spindle 23 can freely slide. The said spindle is suspended vertically and is further held between two semi-bushes 24 and 25, each fixed to a spring 26 and 27, respectively, the ends of which latter are fixed beneath the aforesaid balance-lever. The spindle 23 is formed with a stirrup at its lower end, and the bottom portion of which latter has a screw-threaded hole to serve as a nut for the screw 29, supporting a weight 30. The upper end of said spindle 23 forms a long screw-threaded portion fitted with a nut 41.

The apparatus operates in the following manner: When first starting the operation,

after the gas-generator has been supplied with the carbid charges the cock 31 is opened, so as to permit the water to flow from the tank 9 through the tubes 18 19 into the gas-generator and there to act on the first carbid charge in the lowermost tray, and thus produce the gas, which passes into and is collected in the gasometer. The gas causes the bell to ascend to a sufficient elevation to contain the amount of gas evolved from about two or three trays of carbid. The bell meanwhile comes into contact with the weight 30 and raises the same. The spindle 23, which is formed with different diameters, at this moment has its largest diameter intermittent with the two semi spring-clutches 24 and 25 in such a manner as to cause the ascending weight and the spindle 23 to move the right arm of the balance-lever upward. At the same time the left arm descends and the pin-valve 20 closes the water-supply tube 18. If the gasometer still continues to rise, the thin portion of the spindle 23 passes between the semiclutches and while sliding freely allows the weight 30 to hold the pin-valve in its lowest position, and thus prevents the supply of water to the gas-generator. When the gasometer-bell descends by reason of the consumption of gas, the spindle 23 descends at first freely between the two divided clutch members till at a subsequent moment its largest diameter becomes engaged with the said clutches, which grip it, and thereby move the right arm of the balance-lever downward, while the left arm is raised and lifts the valve 20 to permit the water to flow through the tube 18 into the generator, and so generate a fresh supply of gas and consequent rising of the bell in the gasometer. The extent of the oscillation of the balance-lever 21, and consequently the effective opening of the tube 18 by the valve, can be regulated by a stop-screw 32, so as to admit the required quantity of water at each operation of the balancing mechanism to reach either one, two, three, or even four trays of carbid at a time and according to the momentary consumption of gas.

From the foregoing it will be readily understood that the gasometer is capable of holding a reserve supply of gas, and for this purpose the parts hereinbefore described are disposed in such a manner that the balance-lever is operated for a fresh supply of water when the gasometer-bell is still one-sixth of its full height out of the water. At this moment the conical shoulder existing between the two different portions of the rod 23 comes into engagement with the clutch.

When all the carbid-trays have been utilized and the water reaches above them, it still continues to flow, while the gasometer-bell descends and causes the rack 3 to operate on the hammer-rod 4, so as to ring the bell, denoting that the carbid is exhausted. It is then only necessary for the attendant to turn off the cock 31, withdraw the cover of the gas-generator, to take out the crate con-

taining the empty carbid-trays, and to drain the water off by means of the drain-cock 33 and thereupon place in position a fresh crate of carbid-trays. With this manner of operating the apparatus may be used continuously without stoppages.

When all the carbid is consumed and the gasometer-bell is reaching its lowest point, the weight 30 follows the latter and keeps the valve open by the action of the springs 24 and 25, which resist the pull of the weight 34. The weight 30 is, however, arrested at a slight distance from the gasometer-bell when the latter arrives at the end of its travel.

After the supply of water and carbid has been renewed the cock 31 is reopened, a predetermined quantity of water as regulated by the stop-screw is introduced to one, two, or three charges of carbid, as may be desired, and the gasometer ascends and engages almost immediately with the weight 30, which is held suspended at a slight distance above and is regulated by a screw 41. Immediately thereupon the valve-spindle descends and closes the valve for the admission of water, the thickest portion of the rod 23 engaging with the spring-clutch and the weight 34 being thus enabled to act on the balance-lever. By means of the set-screw 32 it is possible to fix the position of the weight 30 in accordance with the storage amount of gas required to remain in the bell after reaching its lowest position and also the quantity of water to be admitted at each operation.

It may be advantageous to interpolate between the gas-generator and the gasometer a gas-scrubber to wash the gas.

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

In an acetylene-gas generator, the combination with the gas-tank and bell, of a carbid-chamber in communication with the tank, a water-tank arranged above the carbid-chamber, a pipe leading from the water-tank into the carbid-chamber and provided with a valve-seat, a vertical support secured to the gas-tank, a lever pivotally mounted in the upper end of the said lever and having its lower end extending through said water-tank into the valve-seat of the said pipe, a pair of depending spring-arms secured to the inner end of the said lever, a spindle having an enlarged screw-threaded upper end loosely mounted in an opening in the inner end of the said lever, and arranged between the said spring-arms, a nut on the upper end of the said spindle, and a weight on the lower end thereof, said weight being arranged directly above the bell, substantially as described.

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

JÉRÔME LEDRU.

Witnesses:

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C. SCHEL.