

No. 692,638.

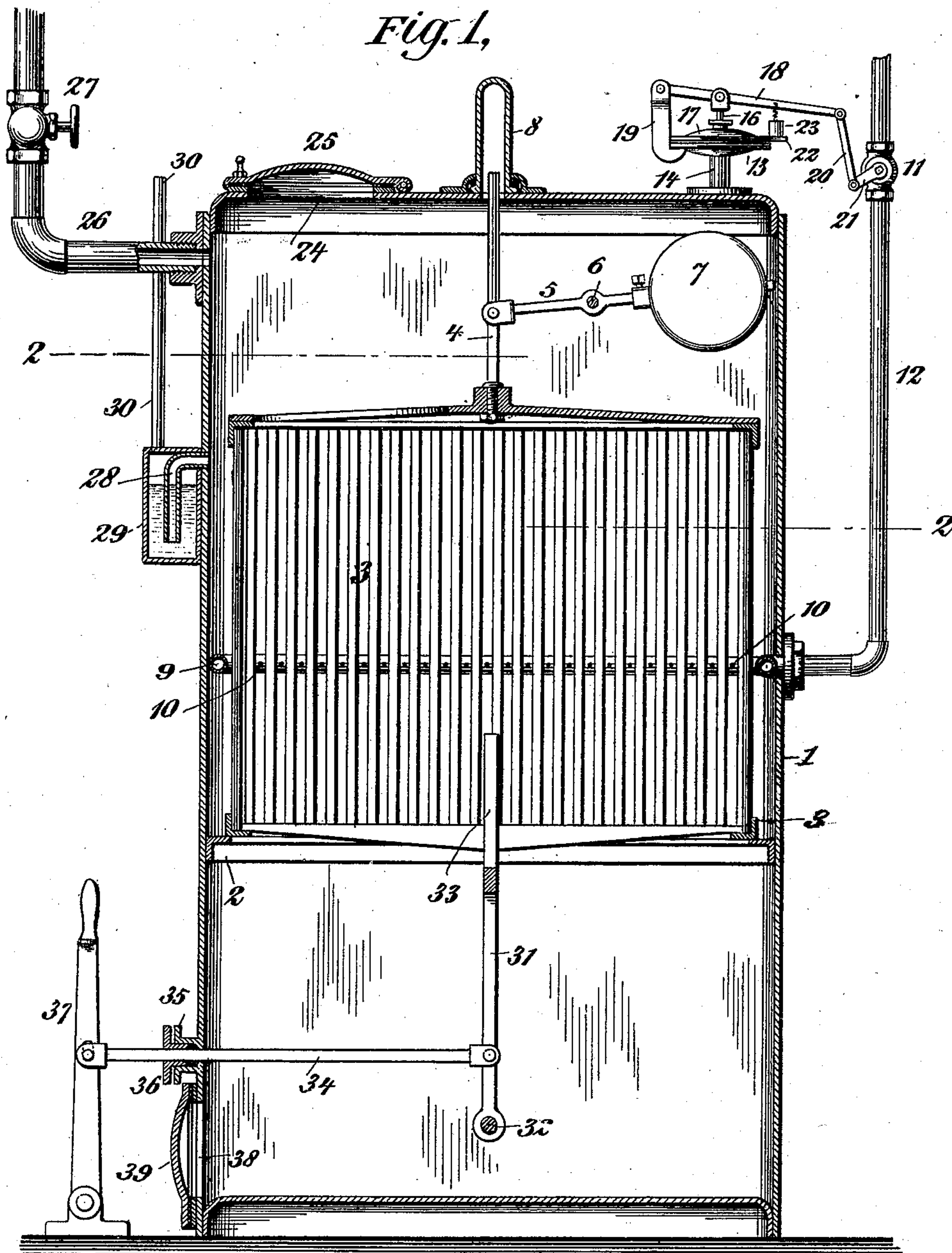
Patented Feb. 4, 1902.

E. N. DICKERSON.
ACETYLENE GAS GENERATOR.

(Application filed May 17, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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2 Sheets—Sheet 2.

Fig. 2,

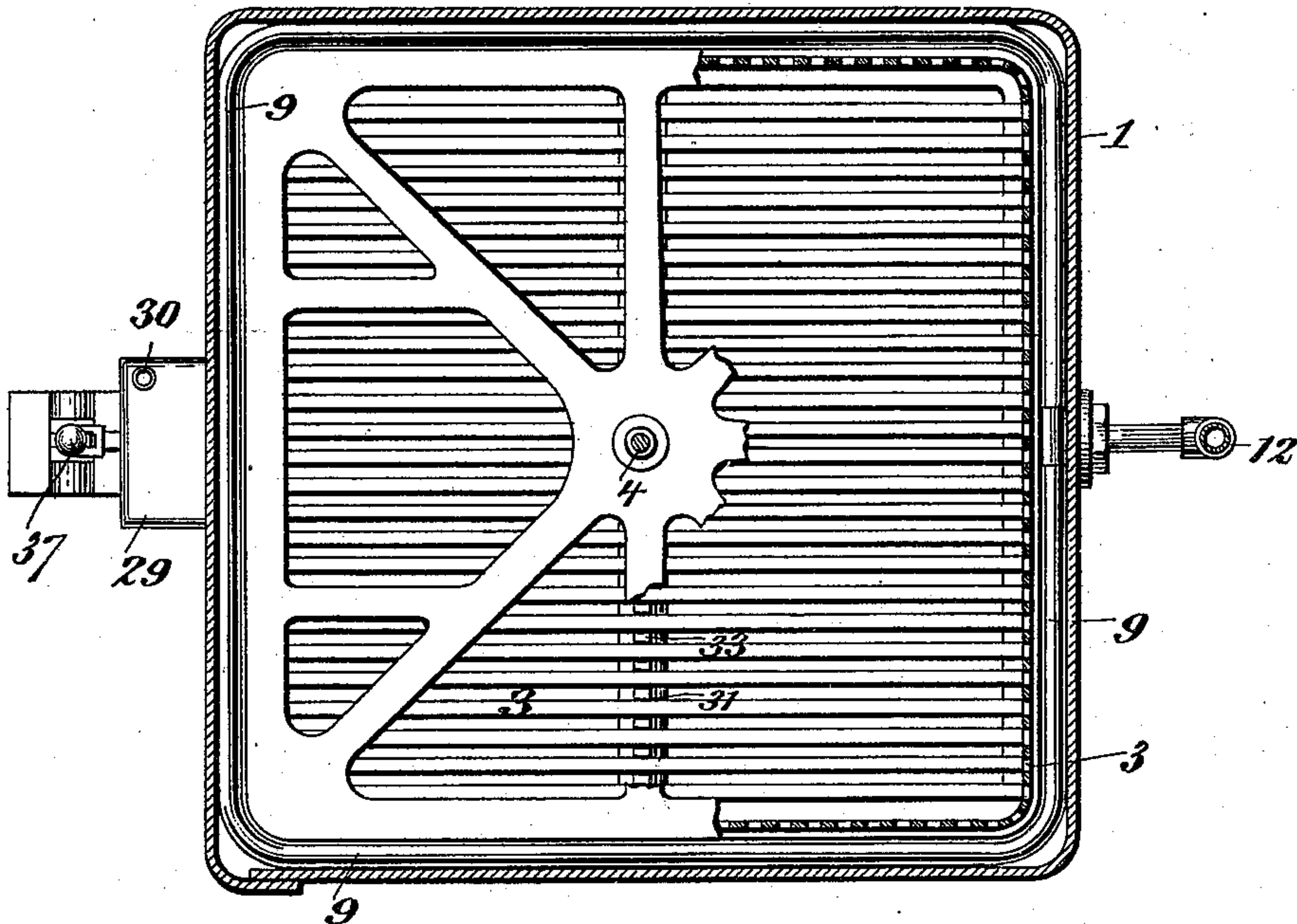
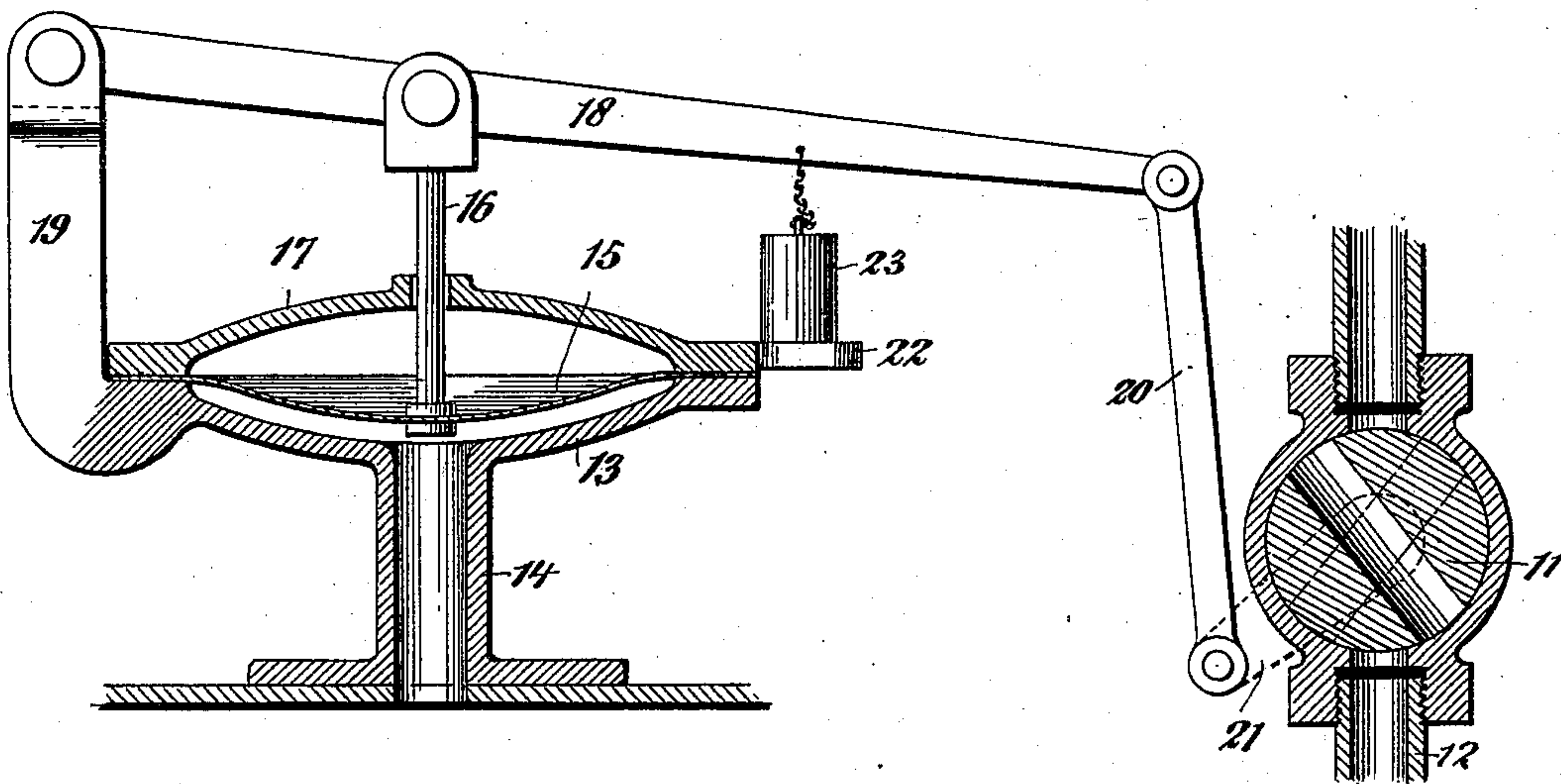


Fig. 3,



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD N. DICKERSON, OF NEW YORK, N. Y.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 692,638, dated February 4, 1902.

Application filed May 17, 1897. Serial No. 636,845. (No model.)

To all whom it may concern:

Be it known that I, EDWARD N. DICKERSON, of the city, county, and State of New York, have invented a new and useful Improvement in Acetylene-Gas Generators, of which the following is a specification.

The present invention relates to an apparatus for generating acetylene gas, and especially to a generator which is capable of automatically generating gas according to the rate of consumption of the gas generated.

The special objects which I desire to accomplish in this apparatus are the mechanical separation of the refuse material, such as lime, produced by the decomposition of calcium carbide with water. In order to present continually a fresh surface to the action of the water, it is essential that the lime shall be shaken free from the calcium carbide. This can be done in various ways, and I desire to claim, broadly, such mechanical separation. Furthermore, in apparatuses of this kind in which a charge of calcium carbide is placed it is desirable to know when the charge is about exhausted. The apparatus cannot conveniently be opened for this purpose, nor can the mass of carbide be well seen through glass openings. By my invention I counterbalance the carbide-carrying basket or container in such a way that it changes its position when the carbide is exhausted to a predetermined point. The operation of the counterweight then causes a mechanical movement of some part, which movement is indicated in some way on the outside of the apparatus. I have shown one such mechanism, but do not limit myself to that. Again, in apparatuses of the kind in which the supply of water to the apparatus is governed by the pressure of gas, in case the carbide becomes exhausted and the pressure of gas thereby falls the water will continue to flow into the apparatus and gradually fill the service-pipe of the house. I therefore, in order to avoid this result, open the water-supply only automatically at an intermediate pressure, closing the water-supply both when the pressure falls and when the pressure rises.

In the drawings I have illustrated an apparatus embodying my invention, in which—

Figure 1 is a central vertical section, cer-

tain parts being shown in full. Fig. 2 is a transverse section along the broken line 2 2 of Fig. 1; and Fig. 3 is a detail view, partly in section and on an enlarged scale, of the devices for controlling the admission of water.

In the several views of the drawings like letters of reference refer to like parts.

Referring to the drawings in detail, 1 represents a suitable casing, which is provided with a support 2, upon which rests a cage 3, designed to constitute a receptacle for the carbide from which the gas is generated. This cage is secured, by means of a rod 4, to a lever 5, pivoted on the rod 6, said lever being provided with the counterweight 7, adjustably secured thereon and arranged to be overbalanced by the initial weight of the carbide in the cage. At the commencement of the operation of generating gas the cage is supplied with the desired amount of carbide, and when this carbide has been reduced by the generation of gas in the operation of the device the counterweight 7, being calculated to counterbalance a minimum quantity of carbide, automatically raises the cage so that the stem 4 projects up into the glass dome 8, thus indicating that the quantity of carbide has fallen below the required amount and must be replenished. For the purpose of supplying water to the carbide contained in the cage I use a water-supply pipe 9, which is shown as extending around the inner surface of the casing about midway between the top and bottom of the cage. This tube is provided with a series of inwardly-opening apertures 10, through which the water is sprayed upon the carbide contained in the cage. The supply of water is automatically controlled by the pressure of the gas generated by means of a valve 11 in a water-supply pipe 12. The regulating device which controls the movements of the valve admitting water to the carbide consists of a casing 13, which I have shown as situated on the top of the casing 1, communicating with the interior of the vessel by means of a tube 14. In the casing 13 is a flexible diaphragm 15, to which is attached a stem 16, passing through an opening in an upper portion 17 of the casing. On this upper end the stem 16 is secured to the lever 18, one end of which is pivoted on an arm 19, extending from the casing 13, the other end of

said arm being attached by means of a link 20 and a crank-arm 21 to the valve 11. Projecting from the casing 13 is a ledge 22, which supports a weight 23, secured to the arm 18 intermediate of its connection with the stem 16 and the link 20; this weight compensating for a predetermined pressure in the interior of the generating vessel. These parts constitute a balanced regulating mechanism, which is controlled by the pressure in the generator, and are shown in detail in Fig. 3, in which they are in the position closing the valve 11. The desired amount of carbid is placed in the cage 3 through the opening 24 in the top of the vessel, which opening is hermetically closed by a cover 25. When the apparatus is in operation, the valve 11 is opened (as by hand) to admit water through the supply-pipe 12 to the tube 9, which sprays it upon the carbid contained in the cage 3, which immediately causes the generation of acetylene gas, whereupon the regulation of the supply of water to the carbid, upon which depends the amount of the gas generated, is controlled by the pressure in the interior of the vessel acting upon the diaphragm 15 and causing corresponding movements of the valve 11. If the gas generated acquires a pressure greater than that compensated for by the weight 23, the diaphragm 15 rises above the horizontal position, (in which position the valve 11 is open to permit of the passage of water,) so that said valve gradually shuts off the water until the passage is entirely closed, and the valve assumes the position shown in dotted lines in Fig. 3. Upon the pressure of gas being reduced, as by consumption, the diaphragm gradually returns to horizontal position and admits more water to the carbid, as before explained, which in turn brings about the generation of more gas to restore the pressure or to supply the demand, more or less water being admitted, according to the rate of consumption of the gas generated. In case the carbid is exhausted and the pressure falls below the minimum regulated point the valve takes the position shown in Fig. 3, and the water is once more cut off and can only be turned on again by raising the lever 18 by hand.

26 designates the service-pipe, which is provided with a valve 27. Should the generation of the gas after water has been admitted and the valve 11 closed (the pressure having attained the predetermined limit) continue, any excess of pressure above the predetermined maximum passes off through the tube 28, whose end is submerged to a desired depth in a vessel 29, containing mercury, and is discharged after passing through the mercury through the discharge-tube 30.

An agitator is provided for agitating and exposing new surfaces of the carbid to the action of the water. It consists of the arm 31, pivoted on a shaft 32 and having prongs 33, projecting upwardly between the bars of the grate of the cage 3. An oscillating or recip-

rocating movement is given to the agitator 31 by means of a rod 34, pivoted to the arm 31 and passing to the exterior of the vessel through an opening in the side thereof, provided with a thimble 35, into which is screwed a nipple 36, packing material being interposed between the nipple and thimble to produce a tight fit around the rod 34. The outer end of the rod 34 is operated by and has vertical movement in a fulcrumed hand-lever 37. For the purpose of removing the refuse from the receptacle there is provided an opening 38 in the bottom portion thereof, which is normally hermetically closed by means of a cover 39.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a closed vessel, a receptacle adapted to contain carbid hung therein upon a pivotally-supported lever, a counterbalance for said receptacle, and means for indicating on the exterior of the vessel the movements of said vessel, substantially as described.

2. The combination of a closed vessel, a counterbalanced receptacle in the interior of said vessel adapted to contain carbid, means for indicating on the exterior of said vessel the movements of the carbid-receptacle, means for agitating the contents of said vessel, and means operated by the pressure in the interior of the vessel to automatically control the admission of fluid to the interior of said vessel, substantially as described.

3. The combination of a closed vessel, a counterbalanced cage adapted to contain carbid, means for indicating on the exterior of the vessel the movements of said cage, means for agitating the contents of said cage, and means operated by the pressure in the interior of the vessel to automatically control the admission of fluid thereto, substantially as described.

4. The combination of a closed vessel, an interior receptacle adapted to contain carbid, a reciprocating agitator for agitating said carbid, to remove the refuse material therefrom, a spraying device for spraying water on said carbid, and means for automatically controlling said spray as the pressure of the gas varies, substantially as described.

5. The combination with a generating-chamber adapted to contain carbid, and a water-supply pipe for conveying water to said chamber, of a valve in the water-supply pipe, and a regulating mechanism connected thereto, consisting of a casing, a diaphragm therein, a stem connected to the diaphragm, a lever pivoted to the stem, one end of said lever being pivoted to the casing and the other end being connected to the valve in the water-supply pipe, a support, and a weight secured to the lever and adapted to rest on the support and to compensate for a predetermined pressure in the interior of the generating-chamber, the said regulating mechanism being set to hold the valve open under a predetermined pres-

sure within the chamber, and to close it when the pressure is below such predetermined pressure, substantially as described.

6. The combination with a generating-chamber adapted to contain carbid, and a water-supply pipe for conveying water to said chamber, of a valve in the water-supply pipe, and a regulating mechanism connected thereto, consisting of a casing, a diaphragm therein, a stem connected to the diaphragm, a lever pivoted to the stem, one end of said lever being pivoted to the casing and the other end being connected to the valve in the water-supply pipe, a support, and a weight secured to the lever and adapted to rest on the support and to compensate for a predetermined pressure in the interior of the generating-chamber, the said regulating mechanism being set to hold the valve open under a predetermined pressure within the chamber and so connected to the valve as to close it when the pressure exceeds or falls below such predetermined pressure, substantially as described.

7. The combination with a generating-chamber adapted to contain carbid, and a valved water-supply pipe for conveying water to said chamber, of a regulating mechanism consisting of a casing situated on the top of the generating-chamber and communicating with the interior thereof, a flexible diaphragm in the casing, a stem connected to the diaphragm and passing through an opening in the upper portion of the casing, a lever pivoted to the upper end of the stem, one end of which lever is pivoted on an arm extending from the casing, the other end of said lever being attached by means of a link and crank-arm to the valve in the water-supply pipe, a ledge on the casing adapted to support a weight secured to the lever intermediate of its connection with the stem and link, the said weight being adapted to compensate for a predetermined pressure in the interior of the generating-chamber, and the said regulating mechanism being set to hold the valve open under a predetermined pressure within the chamber, and to close it when the pressure is below such predetermined pressure, substantially as described.

8. The combination with a closed vessel, of a support connected to the vessel within the

same, a movable receptacle in the interior of the vessel, for supporting carbid, and normally resting directly on said support, a rod connected to the receptacle and to a lever pivoted on the closed vessel, and a counterweight on said pivoted lever, balanced by the weight of the carbid and adapted to raise the receptacle only when the latter contains a minimum of carbid, substantially as described.

9. The combination with a closed vessel, of a support within the vessel, a movable receptacle resting upon said support in the interior of said vessel adapted to contain carbid, means for bringing water in contact with the carbid, an agitator extending upwardly through said receptacle, and means for reciprocating the agitator in the bottom of the receptacle, to agitate the carbid for removing refuse material therefrom and thereby expose fresh surfaces of carbid, substantially as described.

10. The combination with a closed vessel of a support within the vessel, a movable cage resting upon said support in the interior of said vessel, the said cage having a grated bottom formed of bars and being adapted to contain carbid, means for bringing water in contact with the carbid, an agitator having prongs extending upwardly through said grated bottom of the cage, and means for reciprocating the prongs of the agitator through the bars of the grated bottom to agitate the carbid for removing the refuse material therefrom and thereby expose fresh surfaces of carbid, substantially as described.

11. The combination with a closed vessel, of a support within the vessel, a movable interior receptacle resting upon said support adapted to contain carbid, a reciprocating agitator operating through the bottom of said receptacle for agitating said carbid, to remove the refuse material therefrom, and a spraying device for spraying water on said carbid, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

E. N. DICKERSON.

Witnesses:

ANTHONY GREF,
H. COUTANT.