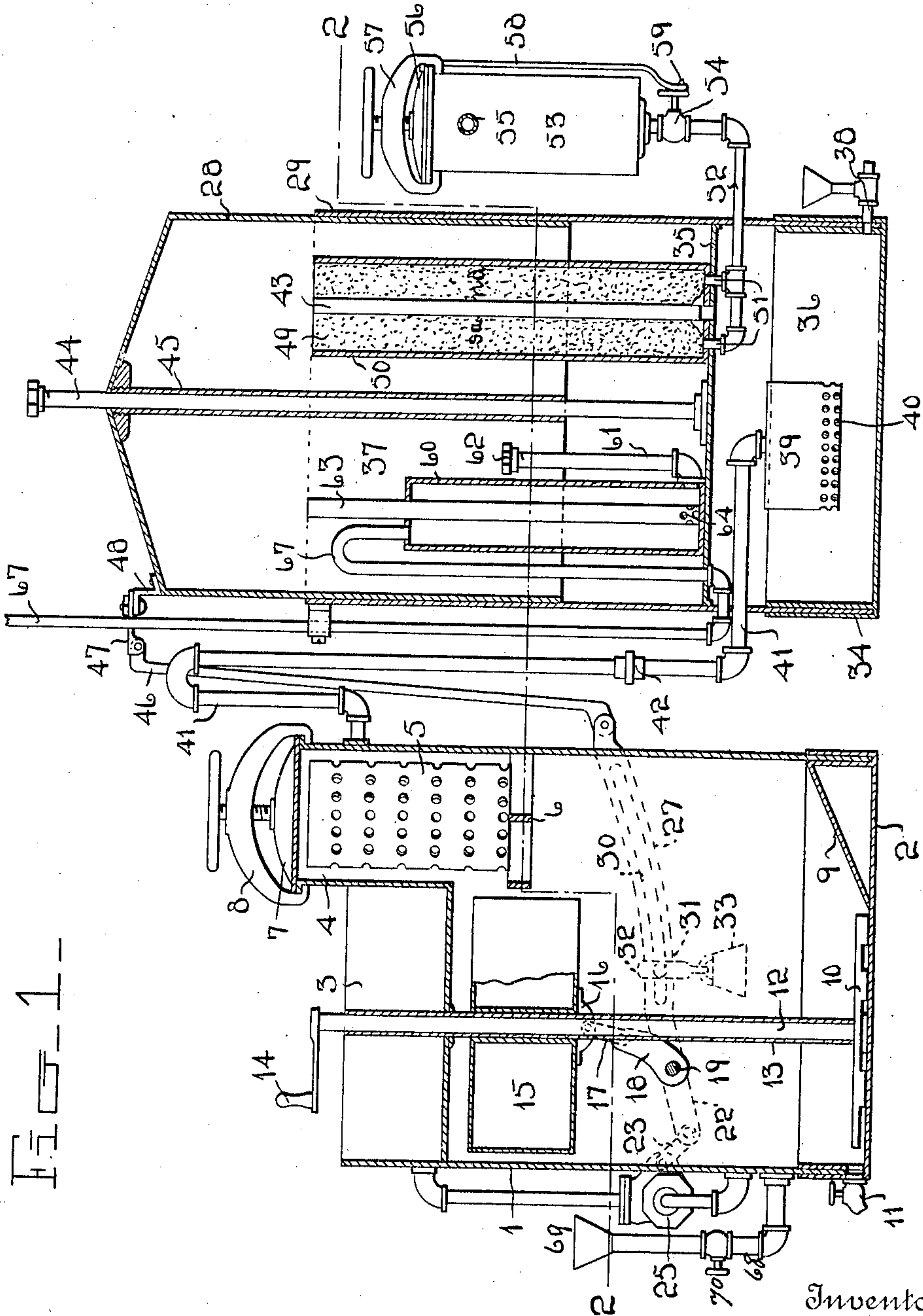


No. 871,719.

PATENTED NOV. 19, 1907.

C. E. MALMBORG.  
ACETYLENE GAS GENERATOR.  
APPLICATION FILED NOV. 8, 1906.

2 SHEETS—SHEET 1.



Witnesses  
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2 SHEETS—SHEET 2.

FIG. 2—

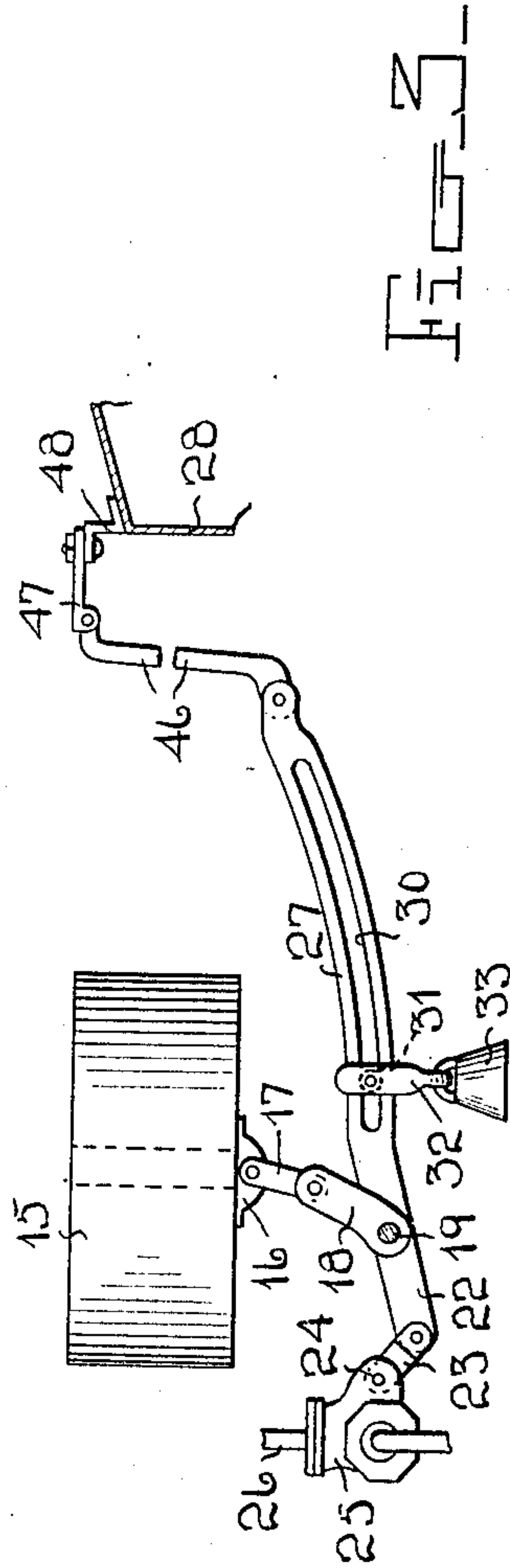
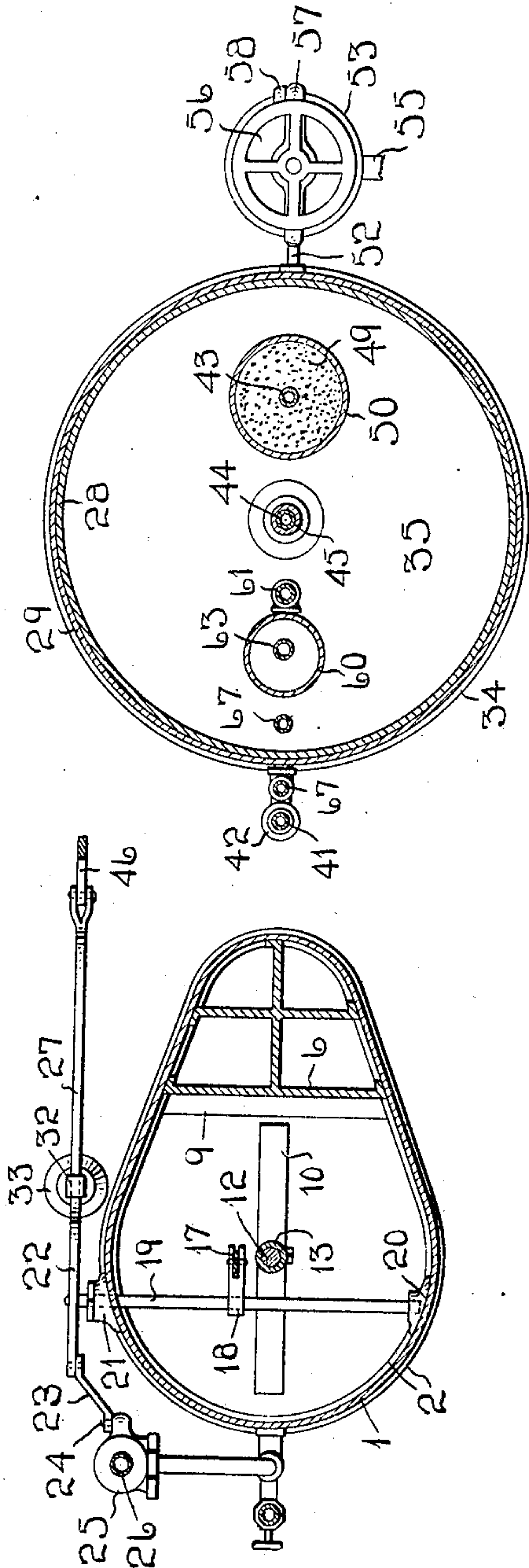


FIG. 3—

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# UNITED STATES PATENT OFFICE.

CARL EMIL MALMBORG, OF GALESBURG, ILLINOIS, ASSIGNOR OF ONE-HALF TO OTTO E PRYTZ AND JOHN A. RUNDQVIST, OF GALESBURG, ILLINOIS.

## ACETYLENE-GAS GENERATOR.

No. 871,719.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed November 8, 1906. Serial No. 342,589.

*To all whom it may concern:*

Be it known that I, CARL EMIL MALMBORG, a subject of the King of Sweden, residing at Galesburg, in the county of Knox and State of Illinois, have invented certain new and useful Improvements in Acetylene-Gas Generators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in acetylene gas generators, and consists in the novel construction, combination and arrangement of devices hereinafter described and claimed.

The object of the invention is to improve and simplify the construction and operation of machines of this character and thereby render the same safer, more reliable and efficient and less expensive.

The above and other objects which will appear as the nature of my invention is better understood, are accomplished by means of the construction illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical longitudinal sectional view through my improved acetylene gas generator and its storage tank; Fig. 2 is a horizontal sectional view, taken on the plane indicated by the line 2—2 in Fig. 1; and Fig. 3 is a detail view of the connection between the gas bell, the water inlet valve for the generator and the float in the generator.

Referring to the drawings by numeral, 1 denotes the generator tank or vessel, which is preferably of elliptical form in cross section, one end being somewhat smaller than its other end. The body of the tank 1 is removably connected to a base 2 and upon the large end of its closed top is arranged a water supply tank or receptacle 3. Projecting upwardly from the small end of the top of the tank 1 is a casing 4 for the reception of a perforated carbid holder or basket 5. The latter has its bottom projecting downwardly into the upper portion of the tank 1 and supported upon crossed bars 6, as shown. The top of the enlargement or casing 4 is closed by a removable cover 7, which is held in place by the usual screw clamp 8. Upon the bottom of the tank 1 at its small end and beneath the carbid holder 5 is an incline 9, which directs the lime and residuum toward the large end of the tank and into the path

of a rotary agitator or cleaner 10, which is operated when it is desired to clean out the generator tank through the usual clean-out valve 11. The agitator 10 is secured by a set screw upon the lower end of a vertical shaft 12, which extends through and rotates in a tube or pipe 13. The latter is arranged concentrically in the large end of the tank 1 and extends through the water supply receptacle 3. Upon the upper projecting end of the shaft 12 is arranged a crank handle 14, by means of which the agitator 10 is rotated. Arranged for vertical sliding movement within the tank 1 upon the tube or pipe 13 is a circular float 15 in the form of a hollow body, which is constructed to be submerged in the water in the tank 1 for the purpose of quickly raising the level of the water to bring it into contact with the carbid in the holder 5. This float or body 15 has a central opening, through which the pipe 13 extends and secured upon its bottom is a bracket 16 to which is connected one end of a link 17. The other end of the latter is pivotally connected to an arm 18 fixed upon a transverse shaft 19 having one of its ends mounted in a bearing 20 within the tank 1 and its other end projecting through a bearing and stuffing box 21 arranged upon the opposite side of said tank 1.

Upon the projecting outer end of the shaft 19 is secured a lever 22, which has its short arm connected by a link 23 to the crank handle 24 of a water inlet valve 25 arranged in a water supply pipe 26 leading from the tank or receptacle 3 to the lower portion of the tank 1. The long arm 27 of the lever 22 is adapted to be actuated by the rise and fall of a gas bell 28 in a storage tank 29, and if desired said end 27 may be formed with a guide slot 30 for an anti-friction roller 31 arranged in a hanger or carrier 32, which supports a weight 33.

The storage tank 29 has its body removably secured to a base 34 and arranged within it is a horizontal partition 35, which divides it into a lower chamber 36 and an upper chamber 37 both of which are adapted to contain water. The lower chamber 36 is supplied with water through a filling pipe 38, which has the usual funnel-shaped top. The water in the chamber 36 is adapted to wash the gas generated in the tank 1 and for this purpose a box 39 is arranged in said chamber, so that its perforated bottom 40 is submerged. The gas is admitted into the box



39 through a pipe 41, which leads from the upper portion of the carbid chamber 4 and contains a detachable coupling 42, so that the generator and storage tanks may be dis-  
 5 connected. The gas after being washed in the chamber 36 passes upwardly through a pipe 43 into the top of the gas bell 28, which latter telescopes into the upper chamber 37 in the storage tank 29, and has its lower end  
 10 sealed by the water therein. The gas bell 28 rises and falls according to the gas within it and it is guided in its vertical movement by a concentrically arranged upright pipe 44 projecting from the center of the partition  
 15 35 and through a concentrically arranged tube or sleeve 45 depending from the center of the top of the bell 28, as clearly shown in the drawings. In order to permit the rise and fall of the bell 28 to actuate the lever  
 20 22 the end 27 of the latter is connected to the lower end of a rod 46, the upper end of which is attached to a link 47, which is adjustably secured upon a bracket 48 provided upon the top of said bell. The gas within the bell in  
 25 passing from the latter to the burner passes downwardly through sand or other filtering material 49 provided in a cylindrical casing 50, which is secured to the partition 35 and arranged concentrically with the pipe 43.  
 30 Opening into the lower end of the sand chamber or compartment 50 are one or more branches 51 of a pipe 52, which opens into the bottom of a gas purifier 53 and contains a cut-off valve 54. The purifier 53, which  
 35 may be of any suitable form and construction is arranged upon the out side of the tank 29 and has adjacent to its top a gas supply pipe, which leads to the burners. Its top is closed by a removable cover 56  
 40 held in place by a screw or clamp 57. A safety device 58 is provided between the cover 56 and the valve 54, so that the former cannot be removed without first closing said valve. This device is in the form of a rod  
 45 having its upper end connected to the cover 56 and its lower end connected to a crank handle 59 of the valve 54. A safety device is also provided within the storage tank to permit of the escape of gas in case the pres-  
 50 sure of the gas exceeds a predetermined amount. This safety device comprises a closed water receptacle 60 arranged within the chamber 37 of the tank 29 upon the partition 35. This receptacle or tank 60 may  
 55 be filled with water through a filling pipe 61 which has its lower end opening into said receptacle and its upper end closed by a screw cap 62. Extending downwardly into the receptacle 60 is a gas inlet pipe 63, which  
 60 has its lower end perforated, as at 64. When the pressure of gas in the bell 28 rises above the predetermined point, it will force the water in the pipe 63 downwardly and permit the gas to pass through the apertures 64 and  
 65 then rise through the water in the receptacle

60. From the top of the receptacle 60 the gas passes into a waste pipe 67, which is connected to the top of the receptacle 60 then extends downwardly in the chamber 37 through the partition 35, then outwardly 70 through the side wall of the tank 29 and then upwardly into the exterior of the building in which the generator is located.

In operation, when the gas in the bell 28 is consumed and the latter lowers the rod 46 75 will swing the long arm 27 of the lever 22 downwardly and thereby rock the shaft 19 and at the same time swing the valve 25 to its open position to permit some of the water in the supply tank 3 to pass into the tank 1. 80 As the shaft 19 is rocked its arm 18 draws the body or float 15 downwardly and into the water in the generator tank 1. When the body 15 is thus submerged, the water is caused to rise, so that it comes into contact 85 with the carbid in the holder 5 and thereby starts the generation of the gas. The gas thus generated passes through the pipe 41 into the perforated box 39 and from the latter upwardly through the water in the cham- 90 ber 36. From the chamber 36 it passes upwardly through the pipe 43 into the bell 28 and from the latter downwardly through the sand 49 and then through the pipe 52 to the purifier 53 from whence it is supplied to 95 the burners through the pipe 55. As the gas is generated, the bell 28 rises and causes the lever 22 to elevate the float body or displacer 15 so as to lower the level of the water in the tank and to close valve 25, and hence 100 cut off the supply of water to said tank from the tank 3. On one side of the tank 1 is a water supply pipe 68, which has a valve 70 and is provided at its upper end with a funnel 69. Said tank is initially charged with 105 water by means of the said pipe 68. The function of the tank 3 and of the valve 25, which is operated by the displacer and the bell, is to maintain the required water level in the tank 1. 110

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention, as defined by the append- 115 ed claims.

Having thus described my invention, what I claim as new and desire to secure by Letters-Patent, is:—

1. In an acetylene gas generating appa- 120 ratus, a closed generator tank having a carbid holder above the water level therein, a water supply for said generator tank having a controlling valve, a displacer, and a lever connected to said displacer and said valve to 125 simultaneously operate them, in combination with gas storage means having a movable element operated by variations of gas pressure, said movable element being connected to and operating said lever. 130



2. In an acetylene gas generating apparatus, a closed generator tank having a carbid holder above the water level therein, a water supply for said generator tank having  
5 a controlling valve, a displacer, and a lever connected to said displacer and said valve to simultaneously operate them, in combination with gas storage means having a movable element operated by variations of gas  
10 pressure, said movable element being connected to and operating said lever, and means to vary the load of the lever.

3. In an apparatus of the character described, a closed generator tank, a water  
15 supply receptacle upon the top of said tank, a pipe leading from said receptacle to said generator tank, a valve in said pipe, a carbid holder supported in the generator tank above the level of the water therein, a rock  
20 shaft, an arm thereon, a body in said gener-

ator tank adapted to be submerged to elevate the water therein in contact with the carbid in said holder, a link connecting said body to the arm on said rock shaft, a lever upon the outer end of said rock shaft, a link  
25 connecting said lever to said valve, a shiftable weight upon said lever, a storage tank, a movable bell in said storage tank to receive the gas generated in said generator tank, and a rod connecting said bell and said  
30 lever, substantially as shown and for the purposes set forth.

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

CARL EMIL MALMBORG.

Witnesses:

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P. N. GRANVILLE.