No. 860,370. PATENTED JULY 16, 1907.

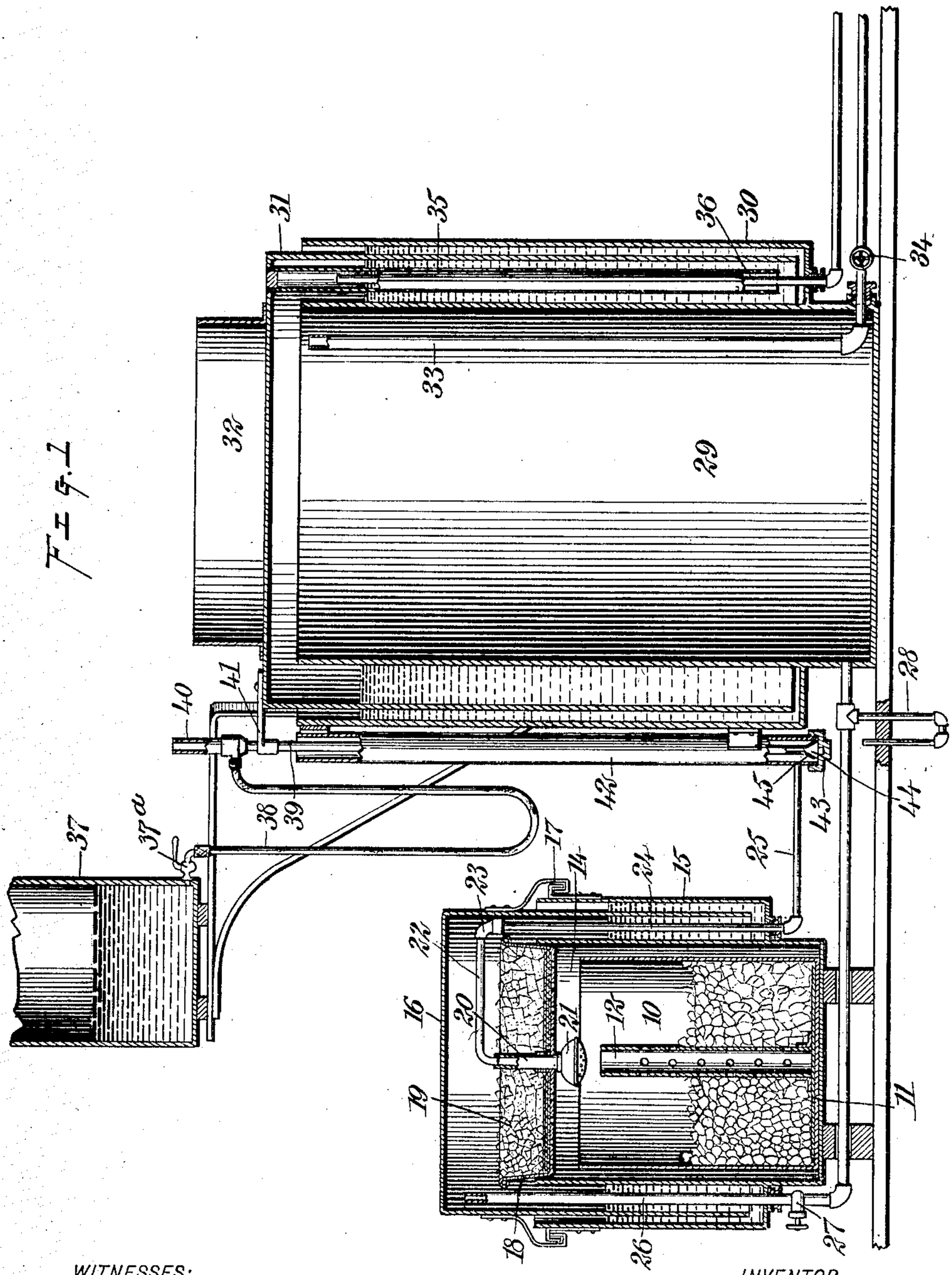
L. H. HALLAM.

ACETYLENE GAS GENERATOR.

APPLICATION FILED OCT. 19, 1905. RENEWED MAY 7, 1907.

2 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

John J. Kitle

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2 SHEETS—SHEET 2.

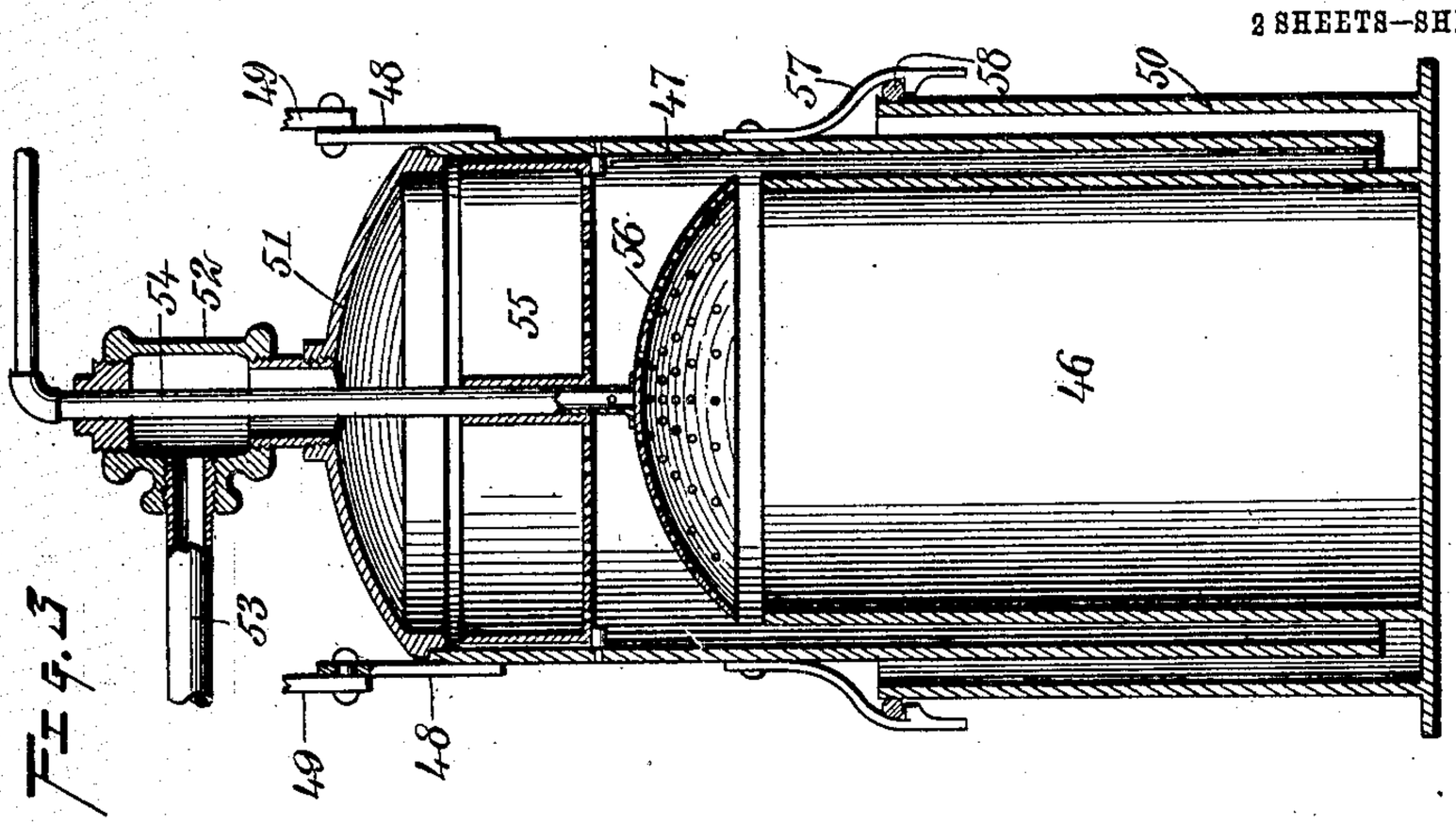

FIG. 3

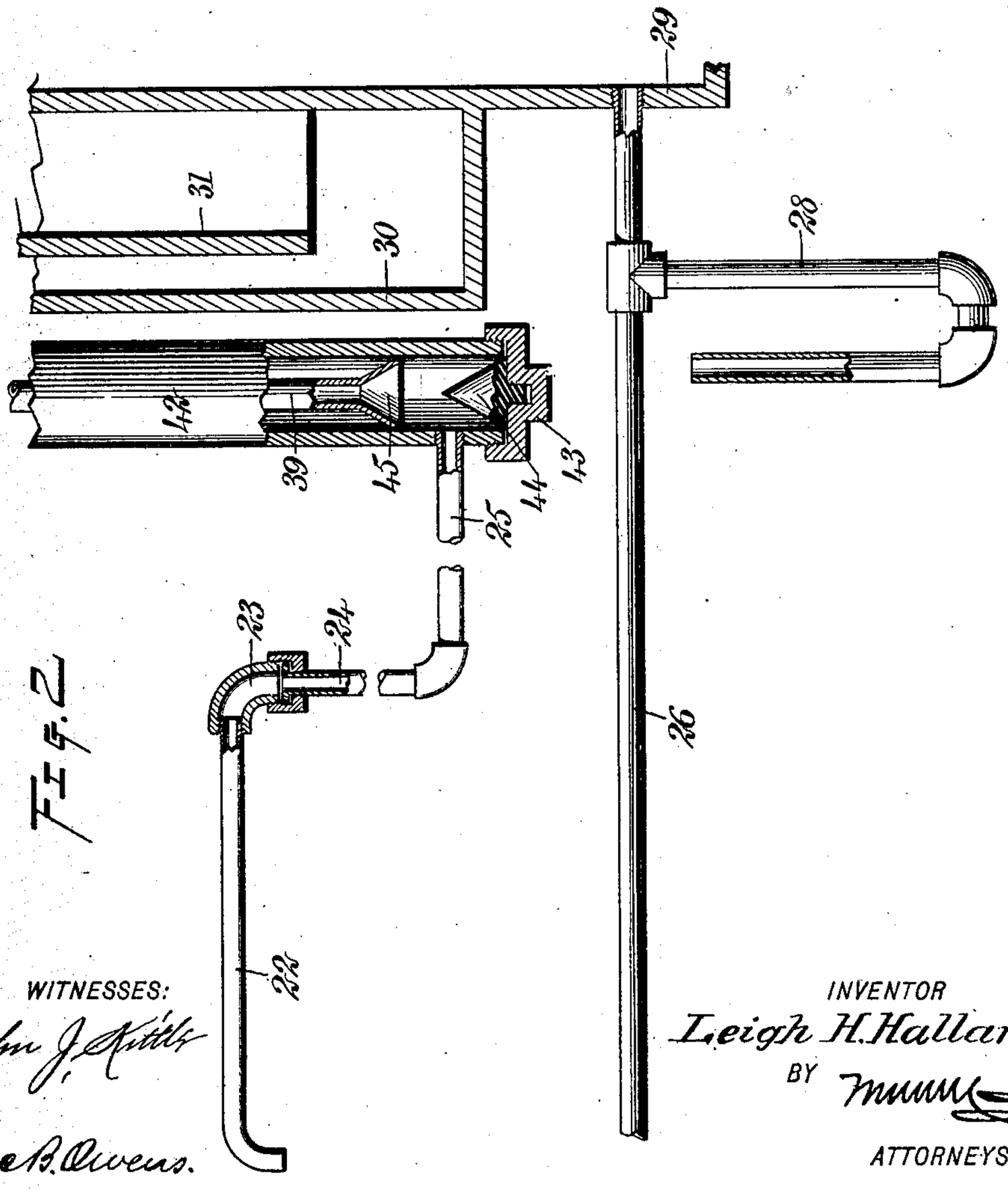

FIG. 2

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UNITED STATES PATENT OFFICE.

LEIGH HUNT HALLAM, OF ROSWELL, TERRITORY OF NEW MEXICO.

ACETYLENE-GAS GENERATOR.

No. 860,370. Specification of Letters Patent. Patented July 16, 1907.

Application filed October 19, 1905. Serial No. 283,418. Renewed May 7, 1907. Serial No. 372,342.

To all whom it may concern:

Be it known that I, LEIGH HUNT HALLAM, a citizen of the United States, and a resident of Roswell, in the county of Chaves and Territory of New Mexico, have invented a new and Improved Acetylene-Generator, of which the following is a full, clear, and exact description.

The invention relates to a mechanism for automatically generating acetylene gas, and it resides in certain novel features of construction and arrangement of parts which will be fully set forth hereinafter and particularly pointed out in the claims.

Reference is had to the accompanying drawings which illustrate the preferred manner in which my invention may be practically embodied, in which drawings

Figure 1 is a sectional view of the complete apparatus; Fig. 2 is a fragmentary section showing the water supply for the carbid chamber, and the self sealing drain for the service pipe; Fig. 3 is a sectional view of a slightly modified form of the carbid holder.

Referring to Figs. 1 and 2, 10 indicates the carbid holder which is in the form of a receptacle with an open top, and in which is loosely arranged a false bottom 11 carrying a perforate open ended stand pipe 12. Calcium carbid is charged into the receiver 10 and surrounds the pipe 12, as indicated in Fig. 1. Said receiver 10 is placed in a chamber 14 which has an open end and is surrounded by a water jacket 15.

16 indicates a bell which is dipped into the water jacket and constitutes a hermetic closure for the chamber 14.

17 indicates any suitable catch for removably holding the bell 16 in place.

A tray or pan 18 is placed in the open upper end of the chamber 14, said tray having a perforate bottom and containing filtering material 19 of any suitable character. Secured in the tray 18 and extending through the filtering material is a water pipe 20 which terminates in a rose 21 intended to spray the water into the receptacle 10 where in contact with the calcium carbid acetylene gas is generated. Communicating with the water pipe 20 is a tube 22 and as best shown in Fig. 2 this tube is connected by a swing union 23 with a water pipe 24 which passes upward through the jacket 15 of the chamber 14. The pipe 24 is stationary, but the swing joint 23 allows the pipe 22 to be moved horizontally to a position at one side of the filter tray 18. When it is desired to reach the interior of the chamber the bell or closure 16 should be lifted out of position, and the pipe 22 disengaged from the pipe 20 and swung to one side. After this has been done the filter tray 18 may be lifted out of position, and finally the carbid receptacle 10. An extension 25 of the pipe 24 leads the water to said pipe from the water supply, as will hereinafter be fully set forth.

26 indicates the gas pipe which passes from the upper part of the closure or bell 16 downward through the jacket 15 and out below the same. Said pipe is provided with an ordinary three port valve 27 shown in Fig. 1. By means of said valve the pipe may be opened to allow the free movement of gas, or the valve may be operated to cut off the gas holder and open the upper part of the generator to the atmosphere.

28 indicates a water drain for the gas pipe 26. The water drain is in the form of a U-shaped pipe, one limb of which is in communication with the gas pipe, and the other limb of which is in communication with the atmosphere. Said pipe 28 projects downward from the gas pipe so that it will drain off any water in the pipe, and so that this water will lie in the bend forming an effective seal, preventing the escape of gas from the service pipe. The gas pipe enters the gas holder 29 at its lower portion. Said gas holder has a water jacket 30 in which is placed the bell 31 of the holder. Said bell is provided with a receptacle 32 on its top for weights by which to regulate the pressure on the gas in the holder. The service pipe 33 passes from the upper part of the gas holder downward and out through the lower part thereof, and is provided with a valve 34, as shown. Attached to the upper part of the bell 31 and projecting downward in the jacket is a tube 35, the lower part of which is open. Said tube is perforated near its lower end as shown. In this tube is located a second tube 36, the upper end of which is open. Said tube extends downward through the bottom of the jacket 30 to the atmosphere. Upon over generation and an excess of gas in the holder the bell 31 will rise, exposing the perforations in the pipe 35, thus allowing the gas to escape through the pipe 36 to the atmosphere.

37 indicates the water supply, which as here shown is an elevated tank fitted with a cock 37^a. Communicating with the lower part of the tank by means of the cock 37^a is a flexible pipe 38 which also communicates with a pipe 39. This pipe 39 has an open extension 40 which prevents the formation of a siphon. The pipe 39 is attached to and carried by the bell 31 of the gas holder through the medium of a bracket 41, and said pipe projects downward through a stand pipe 42 which is fastened in a stationary position alongside of the jacket 30 of the gas holder. The upper end of the pipe 42 is open and the lower end is closed by a fitting 43 which carries interiorly a conical plug 44 adapted to coact with the correspondingly flared lower end 45 of the pipe 39, all of which is best shown in Fig. 2. The before described pipe 25 passes into the lower part of the stand pipe 42.

When gas is not being generated and the gas holder is empty or practically so, the bell 31 will drop to the position shown in Fig. 1, the cock 37^a should be closed and

the flared lower end 45 of the pipe 39 will be engaged against the conical plug 44, thus sealing the water pipe and preventing the passage of water into the generator. When it is desired to start the generation of gas, the cock 37ª should be open and the bell 31 slightly raised. If desired, a latch or other means may be provided for temporarily holding the bell in raised position. As soon as this is done the water will flow from the tank 37 through the flexible pipe 38 and into the pipe 39. The water in escaping from the lower end of the pipe will enter and fill the lower part of the tube 42, and thence pass by the pipes 25, 24, 22 and 20 to the rose 21 which sprays the water upon the calcium carbid in the receiver 10. This starts the generation of gas, which passes through the filter 19 and collects in the upper part of the bell or closure 16 from which the gas is withdrawn through the gas pipe 26 and passed into the gas holder. The gas entering the holder by its own pressure raises the bell. As the generation of gas continues, an increased volume is collected in the gas holder, and the bell 31 is further raised. The generation further continues followed by a corresponding raising of the bell 31 and the pipe 39 until the end of the flexible pipe 38 connected with the pipe 39 is above the water level in the tank 37. At this time or almost immediately after the water will cease to flow into the chamber and the generation of gas will be arrested. The apparatus will remain at rest until sufficient of the gas is withdrawn from the gas holder to permit the bell 31 again to descend, and when the pipe 38 at its connection with the pipe 39 is brought below the water level the flow of water will be resumed and further gas will be generated as explained. It thus appears that the apparatus is kept in a constant state of action dependent upon the supply and consumption of gas, the generation of gas being arrested as soon as the pre-determined volume is accumulated, and resumed as soon as this volume is reduced below the predetermined point.

Fig. 1 shows the position the parts would occupy when the generator is first loaded with carbid and the gas holder is empty. In this position, with the construction shown, the top of the pipe 40 is below the water level in tank 37. Now if the cock 37ª should be opened without raising the gas bell, the water would overflow pipe 40. When the gas bell is slightly raised the water passes to the generator and as action of the water on a new carbid bed is very rapid the end of the pipe 40 will be quickly raised above the water level. Any accidental overflow of the pipe 40 can be prevented by increasing the height of the said pipe so that its top will be above the water level when the gas bell is in its lowest position.

When from neglect the carbid is allowed to become exhausted at a time when gas is being used, the gas bell will drop to its lowest point and the remaining water in the tank 37 will overflow. In practice, however, the size of the supply tank 37 is proportioned to the size of the carbid load and hence at that time there will be very little water in the tank to overflow.

The lower end of the pipe 39 engages the plug 44 and prevents any water being admitted to the generator, when from accident or any other cause the gas bell does not rise. This may happen when there is a large gas leak in which case the flow of water to the generator will be stopped and the water will overflow until the cock 37ª is closed, or the tank 37 is exhausted, but it will overflow at a point where no damage can occur as it will not come in contact with any carbid and can be easily drained out of the building.

The position of the end of the flexible pipe 38 connected with the pipe 39, determines whether water does or does not flow into the stand pipe 42. The end of the flexible pipe is carried above or below the water level in the tank 37 by the movement of the gas bell.

When the apparatus is in normal operation, the end of the flexible pipe 38 moves but slightly above or below the water level in the tank 37 and the end of the pipe 40 is above the water level. When the end of the flexible pipe 38 moves below the water level a small amount of water passes, and the slightest generation of gas causes this end of the flexible pipe to rise above the water level and cut off the water. The amount of water admitted at each downward movement of the gas bell is therefore very small and in case of any accident the water supply is entirely cut off from the generator. The point where the water is discharged into the generator is much lower than the top of the stand pipe 42. When the apparatus is in normal working position the water has free exit to the generator and the overflowing of the stand pipe 42 or vent pipe 40 is not likely to happen, as the pipe 39, the stand pipe, and the pipes leading to the generator are much larger than the flexible pipe supplying the water.

In connection with this apparatus, it is pointed out that the water supply means are entirely automatic and absolutely reliable, their action not depending upon valves and other complicated devices. It is also pointed out that the generator proper during the operation of the apparatus is completely sealed and rendered impossible for any of the gas to escape.

The parts of the generator may be readily removed for cleaning the same, and after removing the bell 16 and filter tray 18, as above explained, the carbid receptacle 10 may be bodily lifted out of the chamber 15 and carried to any point where it may be desired to dump the ashes of the carbid. This allows for absolute cleanliness in the vicinity of the generator.

When the gas is withdrawn from the holder the bell 31 drops to the position shown, and the plug 44 completely cuts off any water supply to the generator, insuring that the parts remain in a position of rest until the bell of the generator is intentionally elevated.

Fig. 3 shows a modified form of the holder, in which the carbid receptacle 46 is introduced into the lower part of an inclosure 47 adapted to be sustained through the medium of ears 48 connected with a suitable support or supports 49. The carbid receptacle 46 has a jacket 50 between which and the carbid receptacle the lower part of the inclosure 47 extends, thus forming a water seal preventing the escape of gas at this point. The inclosure 47 has a top 51 secured therein, and said top is provided with a fitting 52 from which the gas pipe 53 passes to the gas holder. A water pipe 54 extends through the fitting 52, and through a filter tray 55 supported in the upper part of the inclosure 47. At its lower end the pipe 54 carries a perforated spray plate 56 adapted to spray the water uniformly on the carbid within the receptacle 46. The carbid receptacle 46

is removably held in position by means of latches 57 which engage a rim or other part 58 on the jacket 50 of the carbid receptacle. With this arrangement upon releasing the latches 57 the carbid receptacle may be dropped from the position and carried away to a point where its contents may be conveniently dumped.

It will be seen that in both forms of my invention the filter lies above the carbid bed and precipitates into the same any solid matter rising with the gas. Further, the filter being above the water bed is not liable to saturation and is kept always in proper condition.

Having thus described the preferred form of my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an acetylene gas generator, the combination of a chamber having an open upper end, a carbid holder in said chamber, a filter tray removably placed in the upper end of the chamber, a jacket surrounding said chamber, a bell covering the chamber and fitted in the jacket, a gas holder having stationary and movable parts, means establishing communication between the interior of the bell and the gas holder, a stationary stand pipe juxtaposed to the gas holder, a connection between the lower part of the stand pipe and the carbid holder to supply water from the stand pipe, a water pipe in connection with the movable part of the gas holder and communicating with the water supply, said water pipe fitting movably in the stand pipe, and means for closing the water pipe when the movable part of the gas holder is in its lowermost position.

2. In an acetylene gas generator, the combination of a chamber having an open upper end, a carbid holder placed therein, a gas filter tray removably placed in the open end of the generator, a water supply means passing through the filter tray and discharging at the lower side thereof, and a cover for the generator chamber.

3. In an acetylene gas generator, the combination of a chamber having an open upper end, a carbid holder arranged therein, a filter tray placed removably in the open upper end of the chamber, means for introducing water to the carbid, a cover for the chamber, and means for withdrawing the gas from a point between the cover and the filter tray.

4. In an acetylene gas generator, the combination with a generator proper, of a gas holder communicating therewith, the holder having stationary and movable parts, a stationary stand pipe juxtaposed to the gas holder and communicating with the generator proper to supply water thereto, a water pipe movable in the stand pipe and connected with the movable part of the gas holder, the said water pipe communicating with the water supply, and devices for closing said water pipe as the movable part of the gas holder reaches its lowermost position.

5. In an acetylene gas generator, the combination with the generator proper, of a gas holder having stationary and movable parts, means establishing communication between the generator proper and the gas holder, a stationary stand pipe juxtaposed to the gas holder and communicating with the generator proper to supply water thereto, a plug in the lower part of the stand pipe, and a water pipe movable in the stand pipe and adapted in its lowermost position to have its lower end closed by the plug, said water pipe having connection with the movable part of the gas holder and communicating with the water supply, for the purpose specified.

6. In an acetylene gas generator, the combination with the generator proper, of a gas holder communicating therewith and having stationary and movable parts, a stationary stand pipe juxtaposed to the gas holder and communicating with the generator proper to supply water thereto, a stand pipe having in its lower end a conical plug, and a water pipe movable in the stand pipe and having a flared lower end adapted when the water pipe is in its lowermost position to receive said conical plug, for the purpose specified, the water pipe communicating with the water supply and having connection with the movable part of the gas holder.

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

LEIGH HUNT HALLAM.

Witnesses:
WILL E. FRIEND,
R. S. CRAVENS.