No. 856,148. PATENTED JUNE 4, 1907.

P. O. HAYS.

ACETYLENE GAS GENERATOR.

APPLICATION FILED OCT. 25, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

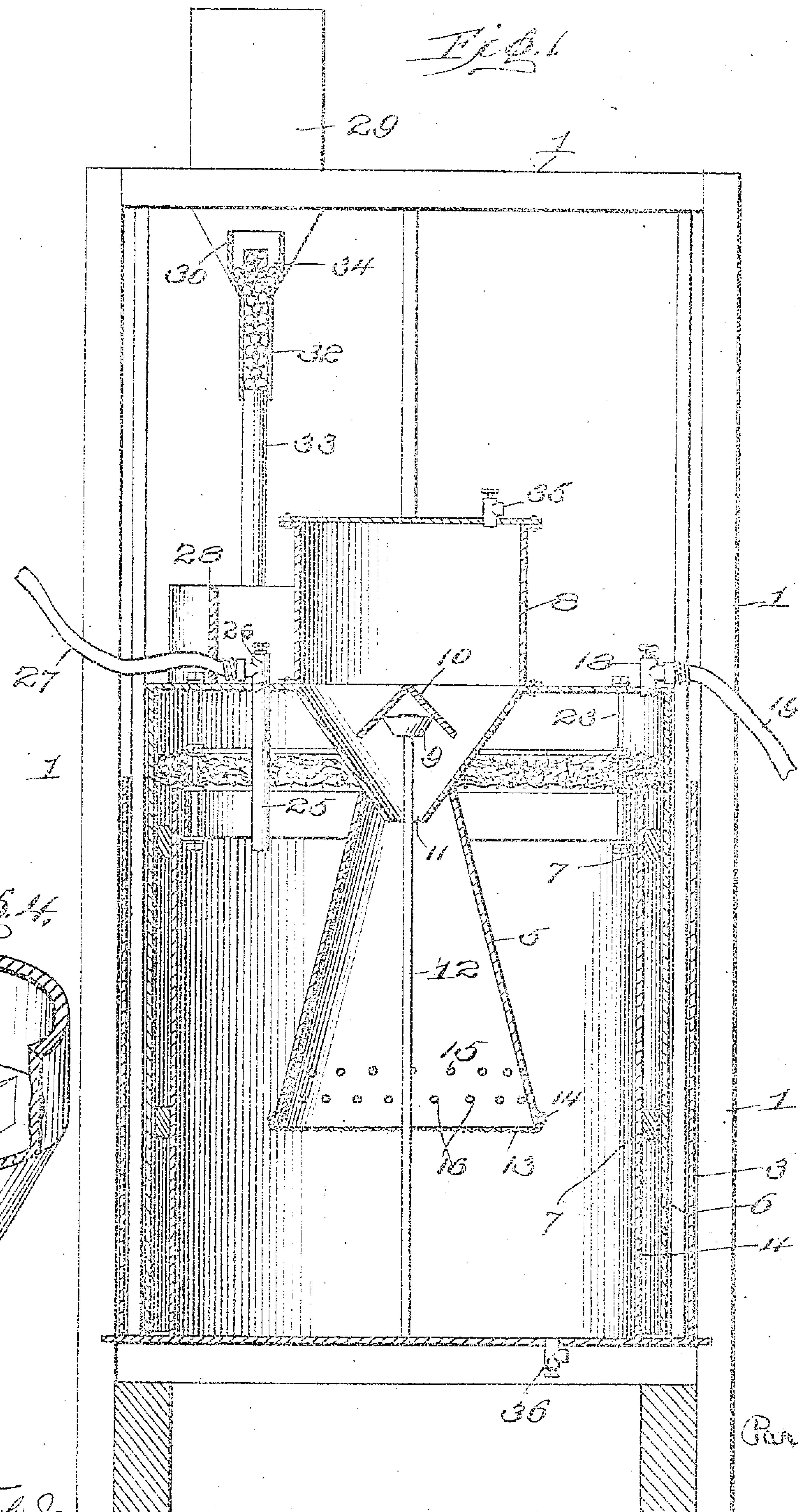
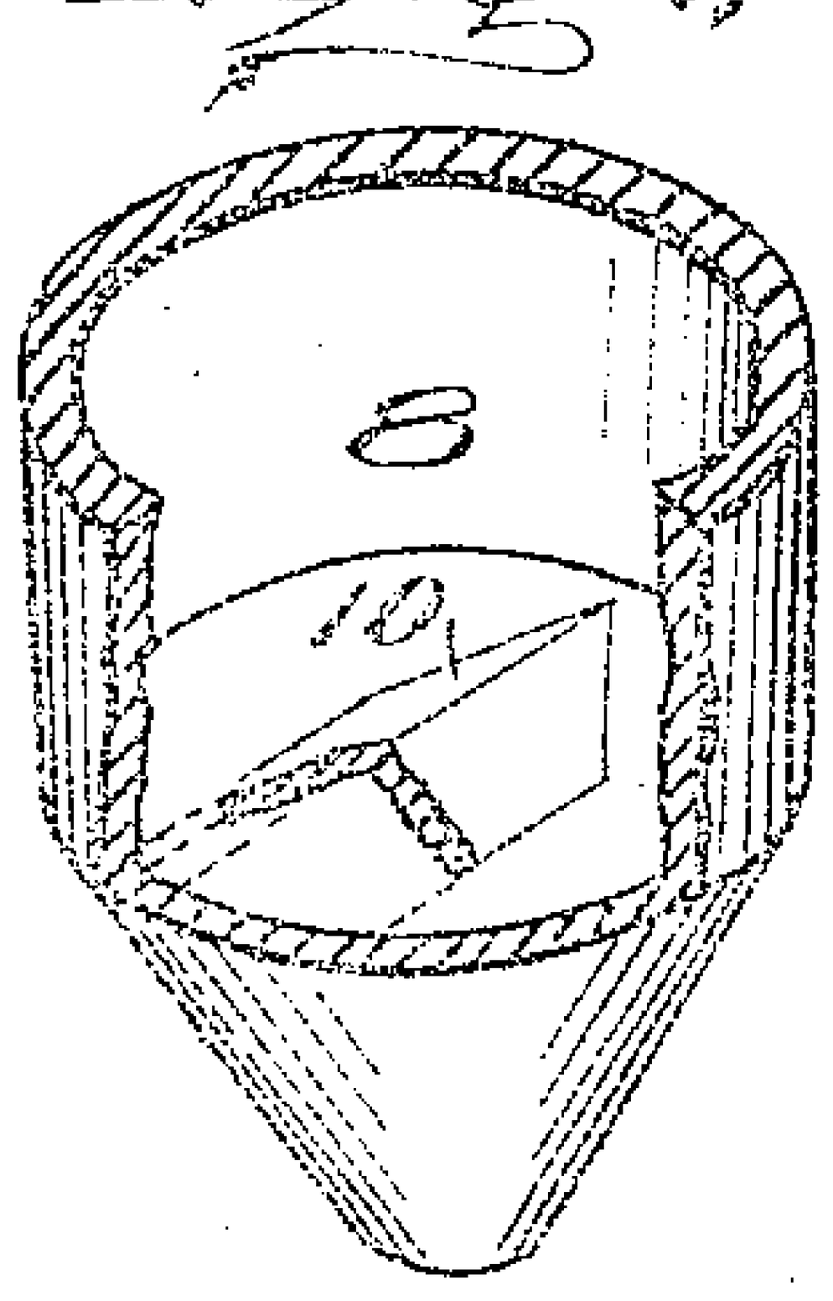


Fig. 4.



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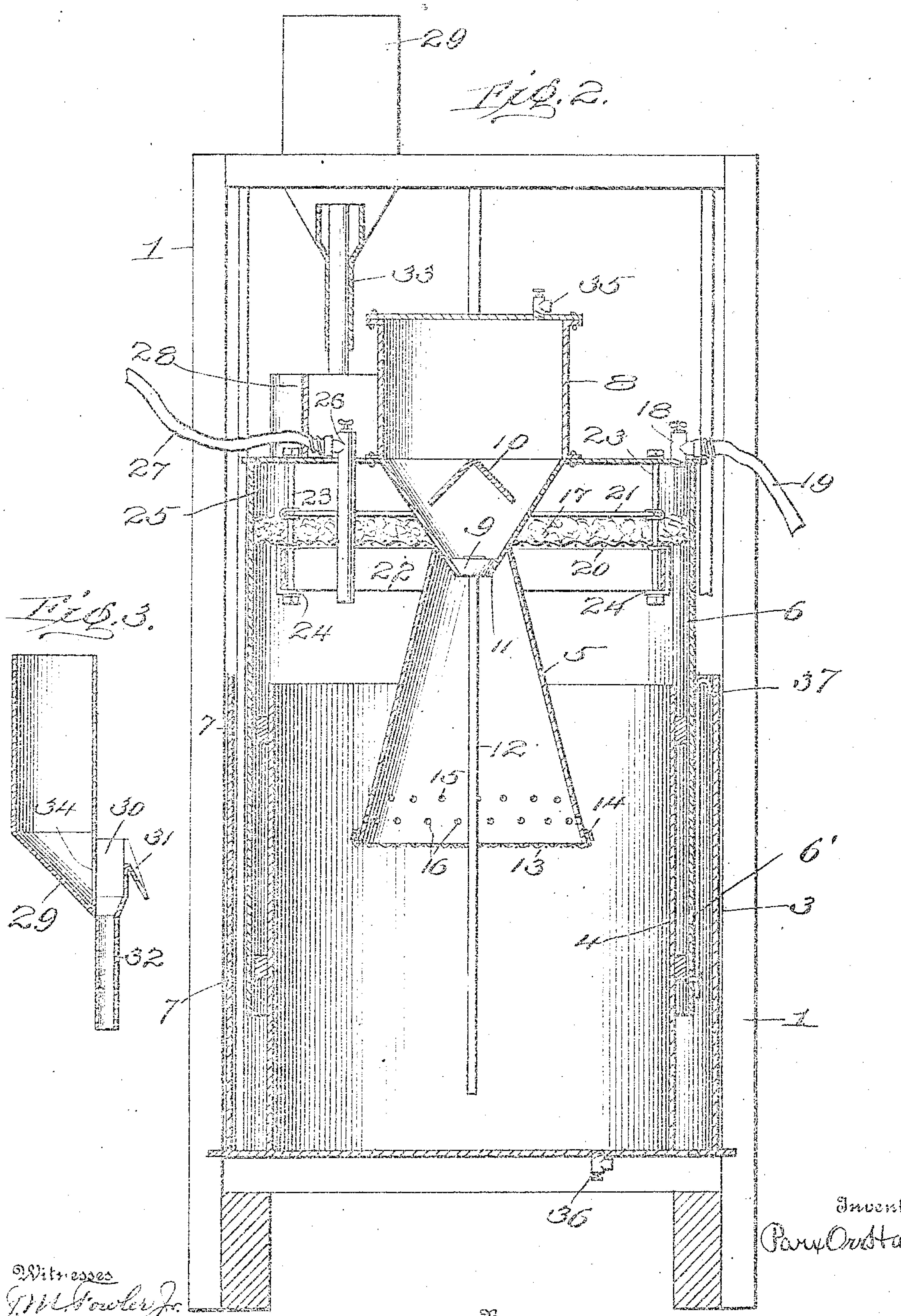
2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

No. 856,148. Specification of Letters Patent. Patented June 4, 1907.

Application filed October 25, 1906. Serial No. 340,587.

To all whom it may concern:

Be it known that I, PARX ORR HAYS, a citizen of the United States, residing at Gainesville, in the county of Cooke and State of Texas, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

This invention relates to improvements in acetylene gas generators.

The invention comprises the production of a suitable frame, a receptacle positioned within said frame and a gas-bell positioned to reciprocate in said frame and partially in said receptacle.

The invention further comprises the production of a gasometer having a gas strainer and receiving chamber positioned therein and means positioned above the gasometer for compensating for the loss of weight as the carbid is used.

The object in view is the production of a gas generator that will continually furnish dry, cool gas and at a substantially even pressure at all times.

Another object in view is the production of mechanism for keeping constant the pressure upon the gas for automatically feeding carbid for the generation of gas, and means for collecting and holding said gas ready for distribution at a predetermined pressure at all times.

With these and other objects in view the invention comprises certain novel constructions, combinations and arrangements of parts as will be hereinafter more fully described and claimed.

In the accompanying drawings:—Figure 1 represents a vertical section through a gas-generating device embodying the features of the present invention. Fig. 2 is a vertical section taken through a gas generating device embodying the features of the present invention, the gas-bell and mechanism connected therewith being shown in an elevated position. Fig. 3 is a detail, sectional view of a receptacle and chute used for holding means for regulating the pressure in the gas-bell of the present invention.

In acetylene gas generators the carbid is either dropped into water or water is forced in contact with the carbid in order to generate gas and when contact is thus made, often times more gas is generated than desired, and also more than can be conveniently accommodated. When this occurs the pressure in the gas generator increases considerably and often times to an undesirable extent. Various means have been arranged for regulating the feed of the carbid or the water in order to regulate the amount of gas generated and consequently regulate, to a certain extent, the pressure in the gas-bell of the generator. Means have also been provided with more or less success for filtering or straining the gas after the same has been generated and then holding the same in a compartment or receptacle under pressure ready for use.

This invention relates to a device that is adapted to accomplish the above desirable results, and like results by a simple mechanism that is easily manufactured and not easily gotten out of order.

Referring more particularly to the drawings, 1 indicates a frame of any suitable construction to which is secured a gasometer 2. The gasometer 2 is provided with an outer tank 3 and an inner tank 4, made independently or integral as may be most convenient. The casing 4 is adapted to hold water for use in connection with carbid for the generation of gas as will be hereinafter fully described. The water in the tank or casing 4 is usually quite above the top row of holes of a small gas-dome 5 to be hereinafter more fully described. The tank 3 is adapted to contain liquid of any kind, preferably water, and is usually filled almost entirely full so that as the large gas-bell 6 reciprocates therein a water seal will be continually provided for preventing gas from escaping from the bell. Surrounding the tank 4 is any suitable number of packing rings, as 7, that are adapted to prevent the gas-bell 6 from contacting with the receptacle 4, and also to normally hold the gas-bell 6 in a vertical position. A plurality of uprights as 7′ are preferably positioned between the gas-bell 6 and the tank 3 and extends to any desirable distance above the bell 6 for assisting in guiding the same in its movement. Positioned upon the top of the gas-bell 6 and formed integral therewith or rigidly secured thereto is a carbid chamber 8, the bottom of the carbid chamber 8 extends into the bell 6 and is made conical in shape for accommodating a valve 9 which is positioned therein. Directly above the valve 9 in the conical part of the chamber 8 is an inverted V-shaped deflecting member 10 that is used to support substantially all of the carbid in the chamber 8. As will be clearly seen from the drawings the carbid will rest upon the sides of the member 10 and the sides of

the chamber 8. A small opening is left between the lower edges of the member 10 through which carbid is permitted to feed down upon the valve 9. In this way the valve 9 in operation is not compelled to raise almost the entire amount of carbid in the chamber 8, but is compelled to raise simply what carbid is fed into the portion of the chamber below the member 10.

In practice it has been found that the carbid in the space below the member 10 does not fill the same and consequently when the valve 9 is raised it can easily push aside the carbid as required. As will be evident when the valve 9 rises the carbid will feed through the opening 11 in the bottom of the chamber 8 into the small gas-bell 5. When the large bell 6 is lowered, as seen in Fig. 1 of the drawings, the valve 9 is raised through the action of the rod 12 coming in contact with the bottom of the tank 4. In Fig. 1 of the drawings the bell 6 is shown as being in its lowest position and the valve 9 in its outermost position, but it will be evident that in case the bell is not lowered entirely to its lowest position it will yet allow the rod 12 to operate the valve 9 for permitting a small amount of carbid to feed into the small bell 5. After the carbid is allowed to drop by gravity into the bell 5, it is arrested in its downward movement by coming in contact with a wire netting or screen 13 removably secured on the lower end thereof. A band 14 is preferably used to firmly secure the screen 13 in place. When the lower part of the bell 5 is in a position sufficiently near the bottom of the chamber 4, water will cover the netting 13 to a more or less extent, and as the carbid is dropped upon the netting it comes in contact with the water and consequently evolves gas. If there is a considerable amount of gas already in the large bell 6, the water in the small bell 5 will usually be of no great depth and consequently the gas evolved will be produced slower and consequently only a sufficient amount is evolved for raising the bell 6 to such a position that sometimes the wire netting 13 will be entirely out of contact with the water in tank 4. When the small bell 5 is thus raised it will be evident that the carbid that is still therein undissolved will not dissolve or evolve the gas until sufficient gas has been withdrawn from the gas-bell 6 to permit the wire netting 13 to descend into the water in the tank 4, and consequently will permit the carbid resting thereon to be dissolved. In this way only sufficient carbid will be dissolved to hold the large bell 6 within certain limits and consequently hold the pressure of the gas substantially the same, although the volume contained in the gasometer may vary slightly. When considerable gas has been withdrawn from the large bell 6, the bell 6 will descend carrying with it all the mechanism secured thereto and will continue to descend until the rod 12 contacts with the bottom of the tank 4, which will in turn operate the valve 9 and permit carbid to fall in the bell 5. Carbid falling in the bell 5 when the same is partially submerged in water will cause gas to be evolved and in turn raise the bell 6 upward again. If for any reason an overcharge of gas should be generated, the bell 6 will raise until the gas will escape from an aperture 6′ in the bell 6, and thus insure against the displacement of the gas bell.

In practice it is preferably desirable to have the apertures 15 and 16 normally below the water line in the tank 4 so that when carbid is dropped upon the screen 13 the gas evolved therefrom will fill the bell 5 and chamber 8, and will finally force its way out through the apertures 15 and 16, and then pass upward through the water in the upper part of tank 4 into the large bell 6. As the gas rises in the bell 6 it comes in contact with a sieve or strainer 17 composed of cotton or any other desirable material for thoroughly straining and drying the gas before the same reaches the extreme top of the bell 6. In arranging the bell 5 so as to compel the gas generated therein to pass through the water it was designed that the passage of the gas through the water was for washing and cleaning and cooling the same. After the gas has thus been cleaned and cooled, it is further cleaned and also dried by passing through the strainer 17 and finally when it reaches the extreme top of the bell 6 it is in condition for consumption and may be removed therefrom through a valve 18 and a pipe 19. The strainer 17 is supported by means of a wire netting 20, preferably of a coarse mesh, and is held in a compact form by means of a wire 21 placed above the same. The wire 21 is adapted to keep the cotton 17 and the like from entirely filling the upper part of the bell 6. By thus using the wire 21 to hold the cotton 17 in a compact form, a small chamber or receptacle is formed at the extreme top of the bell 6 in which the cleaned and dried gas is permitted to accumulate preparatory to consumption. As shown there is only one wire 21 used to hold the cotton 17 in place, but it will be evident that any number may be used as may be desired. The wire 21, straining material 17, and the netting 20 is supported by a member 22 preferably circular in contour which in turn is supported by suitable means as bolts 23. In supporting the member 22 in place substantially U-shaped members 24 are used for firmly clamping the member 22 to the bolts 23.

Secured to the top of the large bell 6 is a pipe 25 that is adapted to permit water to be placed into the tank or receptacle 4. The pipe 25 is provided with a suitable valve 26 and hose connections 27 for readily supply-

ing the water to the receptacle 4 in any position of the bell 6.

Mounted upon the top of the large bell 6 in any suitable manner is a receptacle 28 which is adapted to receive small particles, as for instance, shot or sand from a tank 29. The tank 29 is rigidly secured to the frame 1 and is provided with a hopper 30 and chute 31. Below the hopper 30 and preferably formed integral therewith is a sleeve 32 in which reciprocates a plunger 33. The plunger 33 and the tank 28 are rigidly secured to the top of the bell 6 and are adapted to reciprocate therewith. When the bell 6 is lowered until the valve 9 opens the carbid is fed from chamber 8 and plunger 33 will be lowered and consequently permit material from the tank 29 to feed through opening 34 into the hopper 30. As the carbid fed from the chamber 8 is dissolved, the weight of the bell 6 is decreased and consequently the same requires less pressure to be held in its raised position. In order to compensate for this the plunger 33 is arranged to be forced upward through the hopper 30 when the bell 6 rises, and consequently most of the material in the hopper 30 will be forced out and will pass down through chute 31 into the receptacle 28. The size of the hopper 30 and the plunger 33 is such as to automatically feed out material from tank 29 at such a weight as will approximately equal the weight of the carbid fed from the chamber 8. At each movement of the bell 6 when carbid is fed into tank 8, an equal amount of material will be fed from tank 29 and drop into the receptacle 28 and consequently the weight of the large bell 6 will be substantially the same at all times with the result that the gas pressure therein will be automatically kept at an even pressure. It is also to be observed that when the carbid is dropped upon the screen 13 in the small bell 5 it comes in contact with the upper part or stratum of the water and consequently the purest contained in the tank 4. After the carbid has dissolved the sediments therefrom will descend by gravity to the bottom of tank 4 and leave the water in the upper part of the tank practically pure. In this way each new charge of carbid is permitted to contact with substantially pure water and as a result more thoroughly dissolve and evolve readily the entire amount of gaseous matter contained therein.

When filling the carbid chamber 8 the bell 6 is held elevated by means of any suitable number of supporting hooks 37 that are preferably secured to the bell 6 at one end and having hooks formed upon the opposite end. When it is desired to hold the bell 6 elevated the hooks are simply placed over the top of the tank 3. After the carbid chamber has been filled and the receptacle 28 emptied the hooks 37 are removed from the tank 3 and the bell 6 is permitted to operate in the usual manner.

A valve 35 is provided at the top of the chamber 8 through which excessive pressure may be permitted to escape or if desirable the gas may be removed therefrom for consumption. It is also adapted for use in filling the chamber 8 with carbid. When the valve 35 is used for filling the chamber 8 it is made of a large size for accommodating the carbid. Another valve as 36, is provided in the bottom of tank 4 for removing the water and sediments from the carbid from said tank. The valve 36 may be of any size and construction that will accomplish these purposes.

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

1. An acetylene gas generator comprising a tank, a gas-bell, a secondary gas-bell mounted in said first-mentioned gas-bell, means for feeding carbid to said secondary gas-bell, a wire netting removably secured to said secondary gas-bell for supporting said carbid in the upper strata of water contained in said tank, said secondary bell being formed with apertures below the water line for forcing the gas generated therein to pass through part of the water contained in said receptacle, and a strainer and drier in said first-mentioned bell positioned above said secondary bell for drying and cleaning the gas generated in said secondary bell, said strainer and drier being spaced from the top of said first mentioned bell for forming a gas chamber.

2. An acetylene gas generator comprising a receptacle, a gas-bell, a carbid receptacle, means for feeding said carbid and means for straining the gas generated from said carbid, said means comprising a wire mesh, a layer of fibrous material, a rod for holding said material in compact form, and means for sustaining said wire mesh and said fibrous material in position a short distance from the top of said gas bell for forming a gas chamber.

3. An acetylene gas generator comprising a receptacle containing water, a gas-bell, a carbid chamber mounted upon said bell, means for feeding carbid to said water containing chamber and a gas strainer positioned within said gas-bell below the top thereof, and means for holding said strainer out of contact with the top of said gas-bell for creating a receptacle for the strained gas.

4. An acetylene gas generator, comprising a receptacle, a gas-bell, a carbid chamber mounted on said gas-bell, means for feeding carbid from said carbid chamber, a tank positioned above said bell and out of contact therewith containing loose material, a plunger secured to the top of the gas-bell, said plunger being adapted to force material from said chamber at each reciprocation of said bell and

means secured to the top of said bell for receiving the material forced from the receptacle positioned above said bell.

5. An acetylene gas generator comprising a tank, a gas-bell therefor, a carbid receptacle positioned upon said gas-bell, means for feeding carbid therefrom, a receptacle positioned above said bell and out of contact therewith, said receptacle comprising a tank, a hopper, and plunger receiving sleeves, and a plunger secured to the top of said bell for forcing material from said hopper upon the top of said bell.

6. An acetylene gas generator comprising a generator having a stationary and a movable member, a receptacle carrying loose material positioned out of contact with said movable member, said movable member carrying a carbid receptacle and means for feeding carbid therefrom and a reciprocating plunger secured to said movable member for feeding loose material to the top of said movable member from first said receptacle as the carbid is fed from said carbid receptacle.

In testimony whereof I affix my signature, in presence of two witnesses.

PARX ORR HAYS

Witnesses:
JNO. T. REID,
R. R. HAYS.